Volume I – Report

CITY OF MERCED WASTEWATER TREATMENT PLANT EXPANSION PROJECT

Draft Environmental Impact Report

SCH No. 2005101135

Prepared by:
City of Merced

August 2006

August 14, 2006

Subject: Availability of Draft Environmental Impact Report Addressing the Proposed City of Merced Wastewater Treatment Expansion Project (SCH#2005101135)

To Whom It May Concern:

The City of Merced (City) has completed preparing a Draft Environmental Impact Report (DEIR) addressing the potential environmental consequences of expanding its existing wastewater treatment plant (WWTP) to meet future discharge requirements and demand in the City service area. The WWTP is located at 10260 Gove Road. As lead agency, in accordance with the California Environmental Quality Act (CEQA), the City is distributing the DEIR to interested public and regulatory authorities for review and comment.

As part of the proposed project, the City intends to submit an application for a loan from the State Water Resources Control Board (SWRCB) State Revolving Fund (SRF). The SWRCB will be responsible for reviewing the loan application and issuing funds consistent with its policy for implementing the SRF program.

The DEIR consists of two volumes: Volume I contains the text of the DEIR, while Volume II contains a series of technical appendices providing supporting information for the findings presented in Volume I. The City is distributing Volumes I and II to all reviewing agencies and will make Volumes I and II available for review to interested persons at the City offices and local public libraries. All documents referenced in the DEIR are either available for review at the City offices or can be made available upon request.

Based on the analyses presented in the DEIR, the proposed project could result in the loss of 20 acres of land currently in agricultural production; short-term increase in air pollutant emissions (NOx) associated with construction equipment and vehicles during Project construction. These emission would contribute in a cumulative manner with pollutants from other sources to degrade regional air quality; and remove an obstacle to planned urban growth, as described in the City Specific Urban Development Plan and associated EIR, and the UC-Merced Campus Long-range Development Plan and associated EIR. These impacts are considered to be significant adverse effects on the enviroment.

The City will receive public/agency comments on the DEIR for a 51-day period beginning August 14, 2006 and ending on October 4, 2006. Written comments should be submitted to the following address:

Dave Tucker, City Engineer
City of Merced
Department of Planning and Community Development
678 West 18th Street
Merced, CA 95340

Comments may also be submitted via electronic mail to tuckerd@cityofmerced.org or sent via facsimile to 209-725-8775.

In addition, the City Planning Commission will hold a public meeting on October 4, 2006, at 7:00 p.m. in the City Council Chambers at the above-referenced location to receive oral and written comments from the public and interested regulatory agencies regarding the DEIR. The public is invited to attend this meeting and submit comments on the DEIR. The City is currently intending to hold a public meeting on December 4, 2006 before the City of Merced City Council and will consider certification of the Final EIR.

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8950 Cal Center Drive
Building 3, Suite 300
Sacramento, CA 95826
916.564.4500
www.esassoc.com

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Introduction

The City of Merced (City) is proposing to install improvements to its wastewater treatment plant (WWTP) that would achieve effluent quality capable of meeting current and anticipated future water quality standards and expand the WWTP capacity to 20 million gallons per day (mgd) for serving the planned demand within the City's Specific Urban Development Plan (SUDP) area and the adjacent University of California Merced (UC-Merced) Campus Long-Range Development Plan (LRDP) area. 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 WWTP Expansion Project (Project). This Draft 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).

The City intends to partially fund the construction of the Project with a loan from the State Water Resources Control Board (SWRCB) State Revolving Fund loan program. This program is partially funded by U.S. Environmental Protection Agency (USEPA), and therefore, the program is subject to federal environmental regulations. The USEPA and SWRCB have established specific requirements for complying with federal environmental regulations. These "CEQA-Plus" requirements expand the typical content requirements of an EIR to include additional information regarding federally designated endangered species, cultural resource protection, and conformity with applicable air quality management plans (SWRCB, 2004).

The City is the lead agency for completing the EIR and meeting the requirements of CEQA. The City will use this EIR to (a) support the decision to initiate construction and operation of the Project; (b) support the City's application(s) for various permits to construct the Project; and (c) support the issuance of federal, state, and local permits that are needed by the City to implement the Project.

The agencies with regulatory authority over portions of the Project that will rely on this document include, but are not limited to, the SWRCB, Central Valley Regional Water Quality Control Board, California Department of Fish and Game, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, State Historic Preservation Office, Merced County, and local agencies including the San Joaquin Unified Air Pollution Control District.

CEQA Process

Several steps are required to prepare and complete an EIR in accordance with CEQA. These steps include preparing a Notice of Preparation (NOP) enabling the public and interested agencies to submit comments on the content, format, and issues to be addressed in the document. This step is followed by preparation and distribution of a Draft EIR allowing the public and interested agencies to submit comments on the analyses conducted. The final step in preparing an EIR is the preparation and release of a Final EIR. The lead agency will use this document, along with the mitigation monitoring program report, statement of findings, and other materials composing the administrative record, to certify completion of the EIR.

The City encourages public participation in the planning and environmental review processes. Opportunities for the public to present comments and concerns regarding the Project and the adequacy of this Draft EIR will be provided during a public review and comment period. A public meeting to hear comments on this Draft EIR will be held at 7:00 p.m. on October 4, 2006 before the City Planning Commission at the City of Merced City Council Chambers, located at 678 West 18th Street, Merced, California.

At any time during the 51-day public review and comment period, August 14, 2006, through October 4, 2006, the public may submit its written comments on this Draft EIR to:

Dave Tucker, City Engineer
Department of Planning and Community Development
678 West 18th Street
Merced, CA 95340

Comments may also be submitted via electronic mail to tuckerd@cityofmerced.org or sent via facsimile to 209-725-8775.

Opportunities for Public Comment

The NOP was circulated for a 30-day public review on October 28, 2005, in accordance with Section 15082 of the CEQA Guidelines. The NOP included a preliminary analysis of the potential environmental effects of the Project.

As a result of this effort, the City received seven letters of comment, addressing 14 environmental issues. A copy of the Initial Study and the NOP can be found in Appendix A. Written comments received on the NOP were considered in the preparation of this DEIR and are included in Appendix B. Concerns, comments, and issues raised during this review period are summarized in Table ES-1. Those comments that are within the purview of CEQA are addressed within the Draft EIR.

Description of Proposed Project

The following information summarizes the key features of the Project. A detailed Project description is presented in Chapter 2 of this Draft EIR.

TABLE ES-1
SUMMARY OF COMMENTS RECEIVED
DURING THE NOTICE OF PREPARATION PUBLIC REVIEW PERIOD

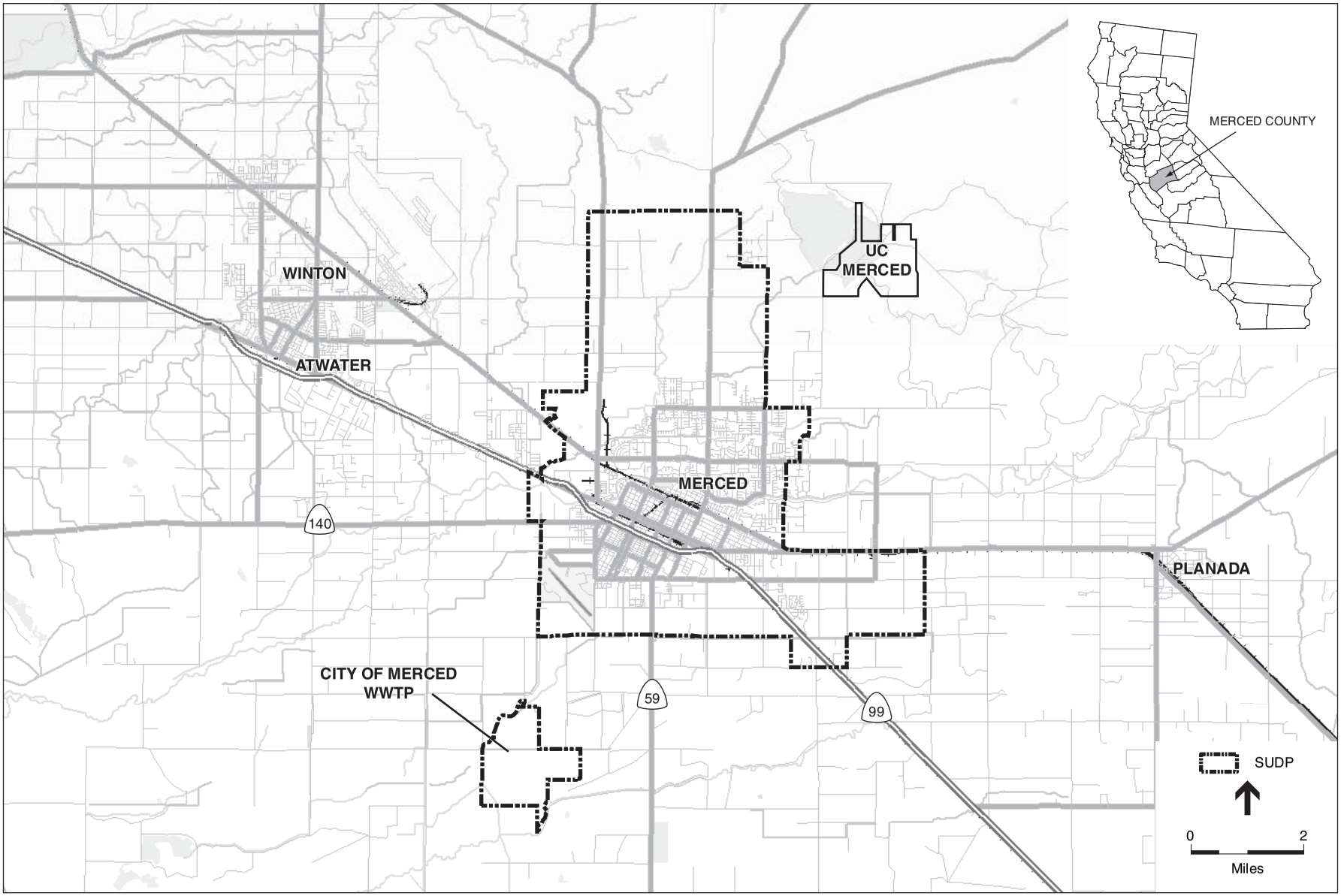
Commenter	Topic	Comments
Office of Planning and Research	Receipt of NOP filing	• Designates SCH# 2005101135
Central Valley Regional Water Quality Control Board	Water Quality	• Both onsite and offsite biosolids disposal options should be discussed. • An anti-degradation analysis for all discharges to surface and groundwater should be prepared. • An evaluation of effect on the salt total maximum daily load developed for the lower San Joaquin River should be discussed. • A General Permit for Discharge of Stormwater Associated with Construction Activity will be required. • If the Project will result in the dredge and/or fill of navigable waters or wetlands, the Central Valley Regional Water Quality Control Board will be responsible for issuing a Section 401 certificate.
California Department of Transportation	General Comment	• Encourages consultation with Native American Heritage Commission
Merced Irrigation District	Hydrology and Water Systems	• The district owns and operates Paden Drain and Hartley Lateral and other underground utilities in vicinity of the Merced Wastewater Treatment Plant. • An agreement between the City of Merced and the district is needed for relocation of the district's facilities.
Merced County Farm Bureau	Agricultural Lands	• EIR should consider mitigation for conversion of farmlands. • Analyze impact of planned growth on resource use and environment. • Assess effect of biosolids management on local water quality.
Community Systems, Associates, Inc. (Weaver Union School District)	Public Services (Schools)	• EIR should address Project-specific and cumulative effects on the school district. • EIR should address consistency of Project with General Plan goals, policies, and implementation actions. • EIR should present data and qualitative and quantitative analysis that provides evidence of consistency with General Plan.
San Joaquin Raptor Center and Protect Our Water	General Comment	• Please inform of progress of EIR for potential future comment.

Project Objectives

The City has two primary objectives for implementing the Project. The first is to install sufficient WWTP capacity to meet wastewater loads generated by planned population growth and development within the City's service area. The second includes installing additional levels of wastewater treatment sufficient to meet current and future effluent quality regulatory limits by replacing aged facilities and adding improved wastewater treatment technologies and processes.

Project Location

The WWTP is located within the City limits at the south end of Gove Road about 1.5 miles south of the main part of Merced. Figure ES-1 shows the relative location of the WWTP in relation to the Merced urban area.



SOURCE: ESRI, 2005; City of Merced; and ESA, 2005

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure ES-1
Project Location Map

The Merced Municipal Airport is located approximately 2.0 miles north of the WWTP. Hartley Slough flows along the western perimeter of the WWTP property, while Miles and Owens Creeks separate the northern and southern portions of the property. Duck Slough borders the southern perimeter.

Description of Major Project Features

The WWTP currently provides secondary level treatment, disinfection of wastewater with subsequent discharge of treated effluent to Hartley Slough. The WWTP currently operates at a rate of 8.5 mgd, but has a permitted capacity to discharge up to 10 mgd. The City's WWTP site can readily accommodate expansion to meet the City's planned buildout capacity of 20 mgd. In order to comply with expected requirements of the National Pollution Discharge Elimination System (NPDES) permit, scheduled to be renewed by the California Regional Water Quality Control Board in December of 2006, several facility upgrades including tertiary filtration, UV disinfection, effluent re-aeration, as well as solids dewatering and stabilization will be required. The NPDES permits are on a 5 year compliance schedule and will require the City to have various improvements completed by the end of 2011.

The City has completed engineering studies (ECO:LOGIC, 2005) finding that the WWTP can achieve a treatment capacity of 11.5 mgd if an additional blowers is installed. This project is currently underway and planned to be completed in late 2006 to provide redundancy for the existing 10 mgd capacity. The 11.5 mgd of secondary treatment capacity would be available immediately upon issuance of a new NPDES permit and after certification of this EIR.

In addition to constructing necessary treatment process upgrades, the City will also expand the treatment capacity to served planned population growth and development in the City Specific Urban Development Plan (SUDP) area and adjacent UC-Merced Campus Long-Range Development Plan (LRDP) area. Full development of the SUDP is expected to increase wastewater flow to 17.1 mgd by about 2025. Development of the UC-Merced LRDP would generate about 2.25 mgd. The combined wastewater volume to be generated from planned land uses within the SUDP and UC-Merced campus planning area equals about 19.35 mgd.

The City is currently assessing the number of new sewer connections that would be established in the immediate future to determine the size of the first WWTP expansion increment beyond 11.5 mgd. If the City continues to experience high growth rates, it will expand WWTP facilities in a single phase from 11.5 to 16 mgd. A subsequent expansion phase from 16 to 20 mgd would be implemented in response to longer-term future growth.

If it is concluded that the City will grow at a slower rate, it may elect to limit the first phase of the WWTP Expansion Project to 12 mgd, followed by subsequent 16 mgd and 20 mgd capacity phases.

To accommodate the new facilities, the City would acquire about 46 acres of land immediately north and east of the WWTP and develop this area for the installation of the proposed WWTP facilities. An area of about 20 acres would be used for the expansion of the new WWTP

headworks, a combined administrative/laboratory building, and access to portions of the incoming City sewer. About 22-acres would remain in its undeveloped state and be used to provide access to the influent sewer line and as additional buffer lands, while the remaining 4 acres, consisting of two small parcels, are needed for reconstruction of the WWTP entrance and roadway. To dispose of Class A biosolids, the City may acquire an additional 300 acres to the northwest of the WWTP.

As part of the Project, a new outfall structure would be constructed in Hartley Slough about 3,000 feet upstream of the current WWTP effluent discharge. The structure would be a 54-inch pipe with a bar screen outlet to prevent unauthorized access into the pipe. As proposed, a single pipeline would be buried roughly 8 to 10 feet below the ground surface.

Summary of Environmental Impacts

Table ES-2 presents the conclusions developed for this Draft EIR. It identifies the potential impacts found to be significant or potentially significant and the proposed mitigation measures that are available to avoid or minimize these potential impacts. The level of significance of each environmental impact after the application of the recommended mitigation measure(s) is indicated. Chapter 4 presents a detailed discussion of Project impacts and mitigation measures, while Chapters 6 and 7 address Cumulative Effects and Growth-Inducing Effects, respectively. Provided below is a list of significant unavoidable effects that are identified in Chapters 4, 6, and 7 of this DEIR.

Significant Unavoidable Effects

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

- The permanent conversion of 20 acres of Farmland, Unique Farmland or Farmland of Statewide Importance to non-agricultural use that would occur with the Project implementation.

- The significant unavoidable secondary effects associated with removing an obstacle to planned urban growth, as described in the SUDP and UC-Merced Campus LRDP associated EIRs. Based on findings adopted in conjunction with these planning documents, the implementation of the 20 mgd WWTP project would accommodate planned growth, thereby resulting in several significant and unavoidable environmental impacts associated with implementing the City's SUDP and the UC-Merced Campus LRDP to occur. These impacts include:

    - Loss of agricultural land
    - Loss of habitat
    - Increased traffic and traffic congestion
    - Air quality impacts
    - Increased traffic noise
    - Increased energy demand

- Alteration of the region's visual character
- Increased use of non-renewable fossil fuels

The 1997 Merced Vision 2015 General Plan contains policies that would reduce these potential environmental effects. Two impacts, however, would not be reduced to a less than significant level and were therefore considered to be significant and unavoidable. These impacts include:

- Effects to Air Quality. Implementation of the General Plan would contribute to the cumulative regional impact on PM_{10} and ozone concentrations that exceed the Attainment status of the San Joaquin Valley Air Basin.

- Loss of Agricultural Soils. Implementation of the General Plan would result in the loss of prime farmland as a consequence of conversion to urban land uses.

The EIR prepared for the UC-Merced LRDP identified significant impacts that could not be eliminated or reduced to a less-than-significant level by mitigation measures imposed by the university (UC-Merced, 2001). These significant and unavoidable impacts would result from development proposed under the build-out of the Phase 1 portion of the LRDP and include:

- Aesthetic Resources. Implementation of the Phase 1 Campus would create new sources of light or glare. Campus development, in combination with other community development, would change the visual character of the area and affect scenic vistas and other scenic resources.

- Aesthetic Resources. Lighting for Phase 1 Campus buildings and other facilities would create a new source of light or glare that could spill onto Lake Yosemite Regional Park and other sensitive areas.

- Agriculture. Implementation of the LRDP will result in the conversion of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland to nonagricultural use.

- Air Quality. Development of the Phase 1 Campus would generate increased emissions levels of carbon monoxide and ozone precursors (reactive organic gases and nitrogen oxides).

- Biological Resources. Development under the LRDP, in conjunction with other development would result in the loss or adverse modification of important native plant and wildlife habitat, including wetlands, vernal pool habitat, clay playa habitat, and annual grassland habitat, and adverse effects to special-status species associated with these habitats.

- Noise. Implementation of the Phase 1 Campus development would result in significant and unavoidable increased ambient noise levels because of increased traffic on the local roadways. Construction of the campus facilities could expose nearby receptors, especially users of the county park, to elevated noise levels.

- Public Services. The development of the Phase 1 Campus would generate demand for elementary and secondary educational services, which could result in physical effects on the environment.

- Recreation. Cumulative growth in area population will result in an increased demand for recreational facilities, which could cause a deterioration of the facilities.

- Traffic and Circulation. Implementation of the LRDP, in combination with the proposed University Community and regional growth in Merced County, would result in increased traffic levels in the vicinity of the campus and exceed the roadway level-of-service thresholds.

- Utilities. Implementation of the LRDP would induce substantial economic and population growth in the region and would result in the construction of additional housing.

In addition to these significant unavoidable effects, the university identified significant irreversible changes to the environment resulting from build-out of the Phase 1 Campus. These significant irreversible changes generally fall into three categories: (1) irretrievable commitment of materials and energy during construction and maintenance of the project; (2) loss of agricultural, biological, and cultural resources as undeveloped lands are converted to urban uses; and (3) increased use of natural resources due to increased population at and surrounding the campus site. In the context that the Project would accommodate a critical infrastructure component of both plans, this impact is identified as a significant and unavoidable effect of the Project for which no mitigation is available.

Effects That Are Less Than Significant with Mitigation

The potential significant impacts associated with the construction and operation of the Project that have been found to be less than significant with implementation of mitigation measures are summarized below and presented in detail in Table ES-2.

Alternatives to the Proposed Project

The CEQA Guidelines (Sections 15123(b)(3) and 15126(d)) requires that an EIR consider a range of alternatives that could feasibly attain the basic objectives of the project. As part of previous engineering and planning studies, the City concluded that alternative facility sizes less than 20 mgd would not meet the primary objective of the Project, which is to serve planned population and development that would occur in the SUDP and UC-Merced LRDP. Because reduced WWTP capacity alternatives would not meet this objective, they were eliminated from detailed discussion in this document.

The City evaluated several alternative treatment technologies, alternate locations including establishing satellite treatment facilities in the community, biosolids disposal options, and the No Project Alternative.

No Project Alternative

With the selection of the No Project Alternative, the Project would not be constructed. The No Project Alternative would avoid construction-related impacts to wetlands and local air quality impacts that are associated with the installation of the Project. Other impacts that would initially be avoided include land use conflicts, construction- and operation-related noise, potential erosion, conversion of prime agricultural land, and potential disruptions to traffic and emergency service. Wastewater flows would continue to be discharged into Hartley Slough at the current rate of approximately 8.5 mgd.

Environmentally Superior Alternative

The Project is considered to be the environmentally superior alternative. Although the No Project Alternative would avoid many of the potential environmental effects associated with the construction of the Project, the No Project Alternative would not achieve the long-term water quality improvements that are associated with the Project.

If the No Project Alternative were selected, the City would be unable to meet planned wastewater demands and to achieve improved effluent quality. The No Project Alternative would conflict with the City's General Plan objective to update the City's sanitary sewer infrastructure and facilitate continued implementation and buildout of the SUDP and the UC-Merced LRDP. In addition to local infrastructure objectives, the No Project Alternative would not enable the City to fulfill the objectives of the Central Valley Regional Water Quality Control Board to improve the water quality within Hartley Slough, which is classified as an effluent-dominated water body that ultimately drains toward the San Joaquin River.

TABLE ES-2
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Water Quantity		
Impact 4.1.1: The change in point of discharge to Hartley Slough and increase in treated effluent flow would result in substantial adverse effects to the physical character and channel hydrology of Hartley Slough. (Potentially significant)	**Mitigation Measure 4.1.1:** The City shall develop and implement a monitoring program to determine if increased effluent discharges are inducing excessive stream channel erosion on Hartley Slough downstream of the effluent discharge to the location of the existing agricultural water diversion facility. If observed, bank stabilization practices and other Best Management Practices to control erosion shall be implemented. Measures could include placing riprap and planting stabilizing vegetation. If no substantial stream channel erosion is observed, the program may be terminated	LTS
Impact 4.1.2: The expanded WWTP would result in increased surface runoff resulting from new impervious surfaces, which could result in impacts to Hartley Slough. (Less than significant)	None required.	LTS
Impact 4.1.3: Implementation of the Project would deplete local groundwater supplies or interfere substantially with groundwater recharge. (Less than significant)	None required.	LTS
Water Quality		
Impact 4.2.1: Construction of the Project would result in increased erosion and degrade water quality in Hartley Slough and downstream waterways. (Potentially significant)	**Mitigation Measure 4.2.1a:** An Integrated Water Pollution Control Program (IWPCP) shall be developed and implemented to manage and control potential erosion and water quality degradation that would occur during Project construction. Additionally, the program shall describe monitoring during construction activities, dewatering operations, in-water construction activities, and specific best management practices (BMPs) to avoid and minimize impacts to water quality. The plan shall be approved by the City prior to commencement of construction and shall be made conditions of performance with the City's contractor selected to build the Project. The IWPCP shall incorporate control measures in the following categories: • Soil stabilization practices • Sediment and runoff control practices • Monitoring protocols • Non-storm water management and waste management and disposal control practices • Construction dewatering • Hazardous materials management Once approved by the City, the contractor shall be responsible throughout the duration of Project construction for installing, constructing, inspecting, and maintaining the control measures included in the IWPCP. **Mitigation Measure 4.2.1b:** The City will monitor groundwater that is collected during groundwater dewatering and, if it exceeds applicable surface water quality standards, will convey it into a water treatment system, where it will undergo treatment prior to its discharge to Hartley Slough. The water treatment system may use either temporary mobile	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	treatment equipment or the WWTP. Either system would need to have applicable capability (i.e., activated carbon filtration or other suitable treatment technology) to treat and/or remove water quality constituents that exceed applicable surface water criteria	
Impact 4.2.2: The discharge of treated wastewater from the expanded WWTP would increase the receiving water temperature in Hartley Slough to exceed Basin Plan objectives. (Potentially significant)	**Measure 4.2.2:** The City shall assess and install a suitable effluent cooling system to comply with temperature receiving water objectives as identified in the Basin Plan (CVRWQCB, 1998). The selected system for effluent cooling, including use of the equalization basins, or installing mechanical chillers or cooling towers, would be sized to provide sufficient cooling to maintain effluent temperature within 5°F of the average annual ambient water temperature. The cooling system shall be constructed within the boundaries of the expanded WWTP site and not generate additional adverse effects to biological resources, wetlands, or sensitive habitats; would not pose a visual nuisance; or would not create obtrusive noise or other emissions. Cooling technologies will initially be sized for the 16 mgd capacity, with a provision to add additional units to accommodate the ultimate 20 mgd capacity.	LTS
Impact 4.2.3: The Project would eliminate chlorine disinfection from the wastewater treatment processes. As a result, several disinfection by-products would no longer be formed in the treated effluent as a result of wastewater disinfection. (Beneficial)	None required.	Beneficial
Impact 4.2.4: The Project would continue to discharge in the treated effluent other Criteria Pollutants, Non-Priority Pollutants, and 303(d) Listed Contaminants at levels consistent with the California Toxics Rule (CTR) and other applicable water quality standards. (Less than significant)	None required.	LTS
Impact 4.2.5: Expansion of the WWTP would increase the discharged salt load to downstream surface waters. (Less than significant)	None required.	LTS
Impact 4.2.6: The application of biosolids to lands within and surrounding the City's WWTP property would degrade local groundwater quality. (Less than significant)	None required.	LTS
Impact 4.2.7: Land application of disinfected tertiary treated water would result in degradation of groundwater quality, and over-application of disinfected tertiary water could result in direct runoff to surface water bodies. (Potentially significant)	None required.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Air Quality		
Impact 4.3.1: Construction activities associated with development of the Project would generate short-term emissions of criteria pollutants, including suspended and respirable particulate matter (PM_{10}) and equipment exhaust emissions. (Potentially significant)	**Mitigation Measure 4.3.1a:** The City shall submit fees, consistent with the Rule 9510 offset program, to fund further reductions in regional NO_x emission sources; enabling consistency with SJVAPCD emission NO_x threshold.	LTS
Impact 4.3.2: The Project would result in an increase in operational emissions of criteria air pollutants (ROG, NO_x and PM_{10}) and other TACs from on-road motor vehicle traffic traveling to and from the Project area and onsite area sources associated with the Project. (Less than significant)	None required.	LTS
Impact 4.3.3: The Project could create objectionable odors affecting a substantial number of people. (Less than significant).	None required.	LTS
Geology		
Impact 4.4.1: In the event of a major earthquake in the region, seismic ground shaking could cause collapse or structural damage to the WWTP and associated facilities. Structural damage to Project components resulting from substantial displacement along various fault sources could indirectly result in significant injury to people and disruption of major services (e.g., sanitary sewer). (Less than significant).	None required.	LTS
Impact 4.4.2: The Project area could be subjected to geologic hazards, including liquefaction, differential settlement, total settlement, and minor slumping along Hartley Slough. (Less than significant)	None required.	LTS
Soils		
Impact 4.5.1: The presence of expansive and corrosive soils could result in structural damage to the proposed pipeline and associated facilities. (Less than significant)	None required	LTS
Vegetation		
Impact 4.6.1: Construction and/or operation of the Project would conflict with local policies or ordinances for protecting biological resources. (Potentially significant)	Implementation of Mitigation Measure 4.2.1a will reduce potential impacts from soil erosion to less than significant **Mitigation Measure 4.6.1a:** The City shall avoid spreading invasive plants that could impact biological resources in the Project area. The City will ensure that all fill material brought onto the Project area from offsite shall be from weed-free sources. The upland filled	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	areas and upland areas disturbed by grading and excavation activities will be re-vegetated with appropriate native species to discourage the colonization of invasive plants in the Project study area. All seed for re-vegetation shall consist of 100 percent native plant species. The seed mix shall be premixed and packaged by a commercial seed supplier, labeled in accordance with the California Agricultural Code; shall be delivered to the site in original, unopened containers; and shall bear a dated guaranteed analysis. **Mitigation Measure 4.6.1b:** The City shall avoid unnecessary disturbance to native vegetation. In order to avoid and minimize potential impacts from trampling to established vegetation communities, construction activities will be limited to designated staging areas, construction footprints, and construction easements. These areas shall be reseeded with native plants (as prescribed in Mitigation Measure 4.6.1a).	
Impact 4.6.2: The Project would jeopardize or eliminate plant and wildlife habitats. (Less than significant)	None required.	LTS
Fish and Wildlife		
Impact 4.7.1: The expansion of the WWTP will not impede or interfere with the regional movement or migration of wildlife species in the area. (No impact)	None required.	NI
Impact 4.7.2: Expansion of the WWTP will not create new ponds or waterbodies that would attract waterfowl. (No impact)	None required.	NI
Impact 4.7.3: Proposed improvements to the WWTP treatment process will increase effluent volume and improve produce higher quality effluent. Changes to Hartley Slough aquatic species may occur as effluent quantity increases and quality improves. (Less than significant)	None required.	LTS
Aesthetic Resources		
Impact 4.8.1: The Project would adversely affect a scenic vista or scenic resources within a state scenic highway or a City scenic corridor. (No impact)	None required.	NI
Impact 4.8.2: The Project would modify the visual character of the Project area. (Less than significant)	None required.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Impact 4.8.3: The Project would construct structures that would result in the creation of new sources of daytime glare and/or nighttime illumination. (Potentially significant)	**Mitigation Measure 4.8.3:** The City shall install security lighting with directional shields to concentrate lighting toward the Project site. The nighttime security and associated parking lighting fixtures will be equipped with directional shields that aim light downward and away from adjacent properties and public roadways. In addition, lighting fixtures will be placed to concentrate light onsite to avoid spillover onto adjacent properties and public roadways	LTS
Noise		
Impact 4.9.1: Project construction would temporarily increase noise levels at nearby sensitive receptor locations. (Potentially significant)	**Mitigation Measure 4.9.1:** The applicant shall implement the following measures: • Construction activities shall be limited to between 7:00 a.m. and 10:00 p.m. Monday through Saturday to avoid noise-sensitive hours of the day. Construction activities shall be prohibited on Sundays and holidays. • Construction equipment noise shall be minimized during Project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools. • Construction contractors shall locate fixed construction equipment (such as compressors and generators) and construction staging areas as far as possible from nearby residences.	LTS
Impact 4.9.2: Project operational activities associated with traffic and WWTP equipment operation could increase ambient noise levels at nearby land uses. (Less than significant)	None required.	LTS
Recreation		
Impact 4.10.1: The Project would result in an increase in visitor use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (No impact)	None required.	NI
Impact 4.10.2: The Project would substantially disrupt or conflict with the use of existing recreational facilities to the extent that it would affect the recreational value of such facilities. (No impact)	None required.	NI
Open Space		
Impact 4.11.1: The Project would displace about 20-acres of open space currently in an agricultural land use. (Potentially significant)	**Mitigation Measure 4.11.1:** (Same as Mitigation 4.14.1) The 20 acres of farmland within the WWTP expansion area, not required for the WWTP facility, shall remain in an agricultural land use. The City shall pay into a "farmland trust" fund for Merced County that will acquire agricultural conservation easements to compensate for the conversion of 18 acres of farmland within the WWTP expansion area. 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 WWTP.	SU

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	With the implementation of Mitigation Measure 4.14.1, the impact to the remaining 22 acres would be reduced to a less-than-significant level. However, offsite conservation easements on existing farmland would not provide full mitigation, because they would not compensate for the loss or farmland resulting from the Project or replace the resources lost because they would not reduce the overall net loss of farmland by the WWTP. Therefore, the direct impact and permanent conversion of important farmlands as a result of the expanded WWTP would be significant unavoidable.	
Impact 4.11.2: The Project would conflict with an existing policy for managing open space or other agreement /easement for open space protection. (No impact)	None required.	NI
Impact 4.11.3: The Project would result in the loss of open space which acts as a buffer and could result in conflict between adjacent land uses. (No impact)	None required.	NI
Cultural Resources		
Impact 4.12.1: The Project would cause adverse effects to unknown historical resources, including unique archaeological resources. (Potentially significant)	**Mitigation Measure 4.12.1:** In the event of accidental discovery of cultural resources, such as structural features or unusual amounts of bone or shell, artifacts, human remains, architectural remains (such as bricks or other foundation elements), or historic archaeological artifacts (such as antique glass bottles, ceramics, etc.), work will be suspended and City staff will be contacted. A qualified cultural resource specialist will be retained and will perform any necessary investigations to determine the significance of the find. The City will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts to historical resources or unique archaeological resources, the Project proponent will determine whether avoidance is feasible in light of the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the Project site while the mitigation for historical resources or unique archaeological resources is carried out. In addition, pursuant to Sections 5097.97 and 5097.98 of the California Public Resources Code and Section 7050.5 of the California Health and Safety Code, in the event of the discovery of human remains, all work will be halted and the County Coroner will be immediately notified. If the remains are determined to be Native American, their treatment and disposition will adhere to the Native American Heritage Commission guidelines.	LTS
Impact 4.12.2: The Project would cause adverse effects on unknown paleontological resources. (Potentially significant)	**Mitigation Measure 4.12.2:** The City shall notify a qualified paleontologist of unanticipated discoveries, in order to document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in Section 15064.5 of the CEQA Guidelines. In the event a fossil is discovered during construction, activities that could potentially affect the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist, in accordance with Society of Vertebrate Paleontology standards.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	The paleontologist will notify City to determine procedures to be followed before construction is allowed to resume at the location of the find. If the City determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the Project on the qualities that make the resource important, and the plan will be implemented. The plan will be submitted to the City for review and approval.	
Threatened and Endangered Species		
Impact 4.13.1: Construction of the Proposed Project could result in impacts to the following special-status species: valley elderberry longhorn beetle, blunt-nosed leopard lizard, giant garter snake, Swainson's hawk, greater sandhill crane, and San Joaquin kit fox. (Potentially significant) **Impact 4.13.1a:** One elderberry shrub is located along an access road north of the firing range in the eucalyptus grove. As currently planned, construction of the proposed Project would require the removal of the one shrub located in the eucalyptus grove. This shrub contains five stems greater than 1 inch (but less than 3 inches) in diameter, does not have beetle exit holes, and is within historically riparian habitat. Without mitigation, this is considered to be a significant impact.	**Mitigation Measure 4.13.1a:** The one elderberry shrub that cannot be avoided by the project shall be transplanted following USFWS (1999) guidelines. Transplanting this shrub meets the definition of "take" of a federally-listed species and will require coordination with and approval from the USFWS. Transplanting shall only occur when the shrub is dormant (approximately November through the first two weeks in February) and shall follow the procedures described in USFWS (1999) as updated. The area that the shrub is transplanted to shall also be planted with at least 10 additional elderberry cutting or seedlings, and at least 5 associated native species, and shall be protected in perpetuity per USFWS (1999).	LTS
Impact 4.13.1b: Habitat for the blunt-nosed leopard lizard (alkali scrub and non-native annual grasslands) occurs in the former peach pit disposal area in the western portion of the Project study area. No Project construction would occur in the alkali or grassland habitat of this area. (Less than significant)	None required.	LTS
Impact 4.13.1c: Construction of the new roadway over Hartley Slough at the WWTP entrance and the new effluent outfall, the filling of the southern portion of the effluent channel, the rerouting of Hartley Lateral and Paden Drain, and subsequent dewatering of a portion of Hartley Lateral would involve work within potential giant garter snake aquatic and upland habitat and would result in 2.03 acres of temporary and 1.24 acres of permanent habitat loss.	**Mitigation Measure 4.13.1c:** The following mitigation measures shall be implemented to reduce Project impacts on giant garter snake: • All construction activity within giant garter snake habitat shall be conducted between May 1 and October 1. This is the active period for giant garter snakes and the potential for direct impacts are reduced because snakes are actively moving and avoiding danger. More danger is posed to snakes during their inactive period, because they are occupying underground burrows or crevices and are more susceptible to direct effects, especially during excavation. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
In addition, inadvertent construction of the Project would result in temporary habitat degradation and, potentially, direct take. Permanent loss includes temporary impacts that span more than two seasons (one season is May 1 to October 1). Without mitigation, this is considered to be a potentially significant impact.	• Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat. • Construction personnel shall participate in a worker environmental awareness program. Under this program, workers shall be informed about the presence of giant garter snakes and habitat associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of the Federal Endangered Species Act (FESA). This instruction shall be conducted by a qualified biologist prior to construction activities. Proof of this instruction shall be submitted to the City. • Within 24 hours before construction activities begin in areas of giant garter snake habitat, the site shall be inspected by a qualified biologist. The biologist will provide the City with a field report form documenting the monitoring efforts within 24 hours of commencement of construction activities. The monitoring biologist shall be available thereafter; if a snake is encountered during construction activities, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities will be allowed to move away from construction activities on their own. Capture and relocation of trapped or injured individuals shall only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)1(A) of FESA. The biologist shall be required to report any incidental take to the City immediately by telephone and by written letter within one working day. The Project area shall be reinspected whenever a lapse in construction activity of two weeks or greater has occurred. • Clearing of wetland vegetation will be confined to the minimal area necessary to excavate toe of bank for riprap or fill placement. Excavation of channel for removal of accumulated sediments will be accomplished by using equipment located on and operated from top of bank, with the least interference practical for emergent vegetation. • Movement of heavy equipment to and from the project site shall be restricted to established roadways to minimize habitat disturbance. Preserved giant garter snake habitat shall be designated as Environmentally Sensitive Areas and shall be flagged by a qualified biologist and avoided by all construction personnel. • After completion of construction activities, any temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions. • Affected giant garter snake habitat shall be replaced or restored in kind at a 3:1 ratio (see Table 4-9). This table assumes that temporary impacts will only last one season. • All replacement habitats must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres (see Table 4-9).	

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	• Restored habitat shall receive one year of monitoring with a photo documentation report due to the City one year from implementation of the restoration with pre- and post-project area photos. • Monitoring replacement habitat with photo documentation report shall be conducted for five years and submitted to the City annually. The calculations of acres lost assumes no impacts to land north of the access road paralleling the north bank of the southern reach of the effluent channel; disturbance during only one season; and the revegetation of all temporarily disturbed areas.	
Impact 4.13.1d: A relatively small amount of potential foraging habitat would be lost to Project construction; however, nesting pairs of Swainson's hawks in the Project study area could be adversely affected by construction activities. (Potentially significant)	**Mitigation Measure 4.13.1d:** In order to avoid impacts to nesting Swainson's hawk, pre-construction surveys shall be conducted by a qualified biologist during the bird and raptor breeding season (March 1 to August 15), before the start of any construction activities. Similar to Mitigation Measure 4.13.2d, the Project applicant shall contract with a qualified biologist to conduct surveys in habitat suitable for nesting raptors. However, for Swainson's hawk, the survey area includes a one-half mile zone from any construction activities. Surveys may be combined with general raptor surveys as detailed in mitigation measure 4.13.2d and shall follow the same survey schedule. If nesting Swainson's hawk is detected within the survey area, the Project applicant shall install a one-half-mile buffer around the nests of Swainson's hawk. No construction activities shall be allowed within these buffers during active nesting. Buffers shall be marked in the field with stakes and flagging at all potential access points to the buffer. Buffers shall remain in place until the nest is no longer active, as determined by a qualified biologist. If a buffer distance needs to be reduced, a qualified biologist will determine if the reduction is appropriate, and what the reduced buffer distance will be. A reduction in buffer distance must be approved by the City of Merced, who may consult with CDFG. If the buffer is reduced, a qualified biologist shall be retained to monitor the nest daily during construction activity occurring within one-half-mile of the nest. The biologist shall inform the City's construction manager immediately if construction activities within the half mile buffer threaten to cause the nest to fail.	LTS
Impact 4.13.1e: Construction activities could cause the loss of foraging habitat for wintering greater sandhill crane within the Project study area. (Less than significant)	None required.	LTS
Impact 4.13.1.f: The Project would impact potential San Joaquin kit fox denning habitat in the grasslands and alkali scrub in the western portion of the Project study area or to the open areas within and surrounding the Project study area that may serve as movement or linkage habitat for San Joaquin kit fox. (No impact)	None required.	NI

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Impact 4.13.2: The Project study area provides habitat for several species of concern. The species with potential to occur are: Sacramento splittail, western pond turtle, tricolored blackbird, burrowing owl, ferruginous hawk, mountain plover, white-tailed kite, loggerhead shrike, Merced kangaroo rat, San Joaquin pocket mouse, and American badger. Construction and/or operation of the proposed Project may temporarily or permanently impact fish and wildlife species or substantially reduce their habitats. This is a potentially significant impact. **Impact 4.13.2a:** Construction activities may affect nesting tricolored blackbird, potentially reducing reproductive success. Without mitigation, this is considered a significant impact.	**Mitigation Measure 4.13.2a:** Implement measures to avoid construction-related impacts to tricolored blackbirds. In order to avoid impacts to nesting tricolored blackbirds, pre-construction surveys shall be conducted in potential breeding habitat within 500 feet of construction by a qualified biologist during the breeding season (March 1 to July 15), before the start of any construction activities. The Project applicant shall contract with a qualified biologist to conduct surveys in habitat suitable for tricolored colonies. Any construction within the Project study area shall avoid active tricolored blackbird colonies by a 500 foot buffer. If warranted by site conditions (as evaluated and documented by a qualified biologist), this buffer may be reduced with the approval of the City, which may consult with CDFG.	LTS
Impact 4.13.2b: Construction within aquatic habitats in the Project study area may result in direct mortality of western pond turtle, as well as basking habitat for western pond turtle. Construction of the outfall in Hartley Slough would permanently remove about 0.1 acre of aquatic habitat. Relative to the availability of aquatic habitat, the loss of this habitat would be considered less than significant for this species.	**Mitigation Measure 4.13.2b:** Implement measures to avoid construction-related impacts to Sacramento splittail and western pond turtle. To avoid mortality of Sacramento splittail or western pond turtle during construction, a qualified biologist shall be onsite during any dewatering activities. This biologist shall remove any stranded Sacramento splittail or western pond turtles and shall release them to Hartley Slough.	LTS
Impact 4.13.2c: Several areas within the Project study area have potential to support burrowing owls. If burrowing owl is found to occupy the Project study area, then construction activities may result in direct habitat loss, take, or cause abandonment of the nest. Without mitigation, this is considered a significant impact.	**Mitigation Measure 4.13.2c:** Implement measures to avoid construction-related impacts to burrowing owl. The following mitigation will be implemented to avoid potential impacts from Project construction activities: • A pre-construction survey of suitable habitat and buffers will be conducted within 30 days prior to construction to ensure no additional burrowing owls have established territories since the initial surveys. If ground disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site shall be resurveyed. • No disturbance shall occur within 75 meters (~250 feet) of an occupied burrow during the breeding season (February 1 – August 31) or within 50 meters (~160 feet) during the non-breeding season.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	• Foraging habitat contiguous with occupied burrow sites shall be permanently preserved at a ratio of 6.5 acres per pair of breeding or single unpaired resident burrowing owl; this is equivalent to a 100-meter (~300-foot) foraging radius around the burrow. The protected habitat shall be adjacent to occupied burrowing owl habitat and its configuration shall be approved by a qualified biologist. • When destruction of occupied burrows is unavoidable, existing unsuitable burrows shall be enhanced (enlarged or cleared of debris) or new burrows shall be created by installing artificial burrows at a ratio of 2:1 on the protected lands site. If owls must be moved away from the disturbance area, passive relocation with one-way doors shall be used, but only during the non-breeding season. Owls shall be excluded from burrows in the immediate impact zone and within a 50-meter (~160-foot) buffer zone by installing one-way doors in burrow entrances. One-way doors shall be left in place 48 hours to ensure that owls have left the burrow before excavation. Two natural or artificial burrows shall be provided for each burrow in the Project study area that will be rendered biologically unsuitable. The Project study area shall be monitored daily for one week to confirm owl use of the new burrows before excavating burrows in the immediate impact zone. Burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe shall be inserted into the tunnels during excavation to maintain an escape route for any animals within the burrow.	
Impact 4.13.2d: The Project area provides suitable nesting and foraging habitat for white-tailed kite, loggerhead shrike, and other birds. The approximately 18 acres of potential foraging habitat lost to Project construction is unlikely to affect the success of these birds. Therefore, the loss of foraging habitat is considered less than significant. However, nesting pairs of white-tailed kite, loggerhead shrike, and other birds in the Project study area may be adversely affected by construction activities. Failure of a raptor nest (protected under Fish and Game Code Section 3503) due to Project construction would be a significant impact.	**Mitigation Measure 4.13.2d:** Implement measures to avoid construction-related impacts to nesting raptors. In order to avoid impacts to nesting raptors, pre-construction surveys shall be conducted 30-days prior to the start of construction by a qualified biologist during the raptor breeding season (March 1 to August 15). The City shall have a qualified biologist conduct three surveys in habitat suitable for nesting raptors and other birds within 500 feet of any construction activities. These surveys shall be conducted by a qualified biologist with demonstrated bird and raptor nest-searching experience. If nesting raptors are detected within the survey area, the Project applicant shall maintain a 500-foot buffer around the nest. No construction activities shall be allowed in these buffers. Buffers shall be marked in the field with stakes and flagging at all potential access points to the buffer. Buffers shall remain in place until the nest is no longer active, as determined by a qualified biologist. If warranted by site conditions (as evaluated and documented by a qualified biologist), this buffer may be reduced with the approval of the City, which may consult with CDFG. The biologist shall submit the locations of nests detected during the surveys to the CNDDB.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Impact 4.13.2e: The Project area and surrounding vicinity may provide foraging habitat for wintering ferruginous hawk and mountain plover. Given the abundance of available open habitat surrounding the Project study area, the loss of foraging habitat to construction within the Therefore, the loss of foraging habitat is considered less than significant. Potential year-round habitat exists in the Project area for Merced kangaroo rat, San Joaquin pocket mouse, and American badger. These species have potential to occur in the grassland and scrub habitat within the peach-pit disposal and wildlife area in the western portion of the Project study area, adjacent to Hartley Slough. No construction activities would occur in this area. Therefore, with respect to these species, the Project would have no impact.	None required.	LTS
Environmentally Sensitive Areas		
Impact 4.14.1: Implementation of the Project would result in the conversion of economically viable prime farmland and farmland of statewide importance to non-agricultural uses. This impact is considered significant and unavoidable.	**Mitigation Measure 4.14.1:** The 22 acres of farmland within the WWTP expansion area, not required for the WWTP facility, shall remain in an agricultural land use. The City shall pay into a recognized trust fund that will acquire agricultural conservation easements to compensate for the conversion of 20 acres of farmland within the WWTP expansion area. 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 WWTP. With the implementation of Mitigation Measure 4.14.1, the impact to the remaining 22 acres would be reduced to a less-than-significant level. However, offsite 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 Project or replace the resources lost because they would not reduce the overall net loss of farmland by the WWTP. Therefore, the direct impact and permanent conversion of important farmlands as a result of the expanded WWTP would be significant unavoidable.	SU
Impact 4.14.2: Construction and/or operation would affect federally protected wetlands, as defined by Section 404 of the Clean Water Act, by removal, filling, hydraulic interruption, or other disturbance. This impact would be potentially significant.	**Mitigation Measure 4.14.2a:** Permanent impacts to jurisdictional waters of the U.S. will be mitigated at a minimum 1:1 ratio consistent with the regulatory guidance of the Corps and/or other agencies with regulatory authority. Compensatory mitigation may include the purchase of mitigation credits at a Corps-approved wetland mitigation bank, or through other options consistent with the Section 404 regulatory program including “in-lieu-fee” mitigation in which the applicant provides funds to an in-lieu-fee sponsor such as the National Fish and Wildlife Foundation (NFWF), or onsite mitigation.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	Mitigation Measure 4.14.2b: Construction activities shall avoid and minimize adverse impacts to jurisdictional waters of the U.S. the maximum practicable extent. Areas used for staging and temporary stockpiling during project construction shall be prohibited from being within such waters including wetlands, and shall be clearly defined on final construction plans. Storage of equipment and/or debris shall not occur within 25 feet of jurisdictional waters. Work within jurisdictional waters including trenching and bridge construction shall occur during low-flow or dry periods. Standard and appropriate BMPs including use of silt fences and/or straw bales shall be utilized to prevent incidental discharge of material into jurisdictional waters.	
Impact 4.14.3: Project construction and/or operation could impact sensitive natural communities identified by CDFG or USFWS. (No impact)	None required.	NI
Impact 4.14.4: The Project would conflict with an adopted HCP, NCCP, or other approved local, regional, or state plan for conservation of habitat. (No impact)	None required.	NI
Impact 4.14.5: Project construction on floodway that could impede floodwaters or expose structures to significant losses. (Less than significant)	None required.	LTS
Impact 4.14.6: Project construction could cause the loss of critical habitats. (No impact)	None required.	NI
Solid Waste and Energy		
Impact 4.15.1: Project construction and operation wastes would be disposed of in a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (Less than significant)	None required.	LTS
Impact 4.15.2: Construction of the Project would not conflict with federal, state, and local solid waste management statutes and regulations. (Less than significant)	None required.	LTS
Impact 4.15.3: Operation of the Project would use substantial amounts of energy, which in turn could create a substantial increase in demand upon existing sources of energy, or require construction of additional facilities for energy generation or distribution to meet the increased demand. (Potentially significant)	**Mitigation Measure 4.15.3:** The City will consult with MID to determine the appropriate energy facility upgrades needed to supply the expanded WWTP and in turn will obtain a will-serve letter from MID for energy supplies.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Transportation and Circulation		
Impact 4.16.1: Construction of the Project would increase the number of daily vehicle trips on local roadways that provide access to the WWTP, in relation to existing traffic and roadway capacity. (Potentially significant)	**Mitigation Measure 4.16.1a:** Prior to the start of Project construction, a Traffic Control Plan shall be prepared addressing vehicle movement along Project-affected roadways and intersections. This plan shall designate haul routes for the Project in consultation with Caltrans and Merced County Department of Transportation. The plan should include the following measures: • Maintaining the maximum amount of travel lane capacity during non-construction periods. • If larger construction equipment or articulated trucks will have difficulty maneuvering at haul route-affected intersections, provide a flagman for traffic control at the access road on an as-needed basis. **Mitigation Measure 4.16.1b:** The City shall arrange for a 24-hour telephone hotline to address public questions and complaints during Project construction. **Mitigation Measure 4.16.1c:** Heavy trucks and other construction transport vehicles shall avoid the busiest commute hours (7 to 8 a.m. and 5 to 6 p.m. on weekdays) on highly congested roadways in the Merced community.	LTS
Impact 4.16.2: Operation of the Project would substantially increase the number of daily vehicle trips on local roadways that provide access to the WWTP, in relation to existing traffic and roadway capacity. (Potentially significant)	**Mitigation Measure 4.16.2:** Implement Mitigation Measures 4.16.1a and 4.16.1c.	LTS
Impact 4.16.3: Construction of the Project would affect general and emergency traffic access to the WWTP, the adjacent shooting range, and the Merced Wildlife Management Area. (Less than significant)	None required.	LTS
Impact 4.16.4: Construction of the Project would result in significant disruptions to transit service. (Less than significant)	None required.	LTS
Impact 4.16.5: Construction of the Project would generate a need for construction crew parking. (Less than significant)	None required.	LTS
Impact 4.16.6: Construction of the Project would increase wear and tear on the access routes used by construction vehicles to access the Project work site. (Potentially significant)	**Mitigation Measure 4.16.6:** Prior to construction, the City's shall assess current road conditions for the Project construction haul routes including the local access roads and identify post-construction road restoration requirements. An agreement shall be entered into by Merced County prior to construction that details suitable post-construction road restoration improvements. The City shall fund roadway repairs or rehabilitation as necessary such that post-construction requirements are met.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Public Services		
Impact 4.17.1: The WWTP Expansion Project would generate the need to alter existing government facilities and services including fire protection, police protection, schools, parks and other public facilities. (Less than significant)	None required.	LTS
Public Health and Safety		
Impact 4.18.1: Construction of the Project may expose construction workers, the general public, and the environment to pre-existing hazardous materials contamination. (Potentially significant)	**Mitigation Measure 4.18.1a:** If contaminated soil and/or groundwater or suspected contamination were encountered during Project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. A contingency plan to dispose of any contaminated soil or groundwater should be developed through consultation with the appropriate regulatory agencies. If dewatering were to occur during Project construction, the RWQCB should be consulted for any special requirements such as containing the water until it can be sampled and analyzed to ensure that no contaminants are in the groundwater that could be released into the Merced Irrigation District drainage system. Hazardous materials associated with construction equipment, such as fuels, oils, antifreeze, coolants, and other substances could adversely affect water quality if released to surface waters. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality. In addition, hazardous materials associated with construction equipment could adversely affect surface and groundwater quality if spilled or stored improperly. Without mitigation, construction of the Project could result in potentially significant impacts. **Mitigation Measure 4.18.1b:** Implement Mitigation Measure 4.2.1b.	LTS LTS
Impact 4.18.2: During construction, there is a risk of exposure to hazardous materials such as fuel and other chemicals used for excavation and construction activities. (Potentially significant)	**Mitigation Measure 4.18.2:** The City shall ensure, through the enforcement of contractual obligations, that all contractors transport, store and handle construction-related hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the Department of Transportation, California RWQCB, the local fire departments, and the local environmental health department. Recommendations shall include as appropriate transporting and storing materials in appropriate and approved containers, maintaining required clearances, and handling materials using applicable federal, state and/or local regulatory agency protocols. In addition, all precautions required by the RWQCB issued NPDES construction activity stormwater permits would be taken to ensure that no hazardous materials enter any nearby waterways.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
	In the event of a spill, the City shall ensure, through the enforcement of contractual obligations, that all contractors immediately control the source of any leak and immediately contain any spill utilizing appropriate spill containment and countermeasures. If required by the local fire departments, the local environmental health department, or any other regulatory agency, contaminated media shall be collected and disposed of at an offsite facility approved to accept such media.	
Impact 4.18.3: The Project could interfere with an emergency response or evacuation plan. (Less than significant)	None required.	LTS
Impact 4.18.4: Construction of the Project would interfere with safe operations of the Merced Municipal Airport or result in a safety hazard for people residing or working in the Project area, due to its proximity to the airport. (No impact)	None required.	NI
Impact 4.18.5: Construction of the Project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires. (Potentially significant)	**Mitigation Measure 4.18.5a:** The City shall designate and ensure, through the enforcement of contractual obligations, that during construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. The City shall keep these areas clear of combustible materials in order to maintain a firebreak. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws. **Mitigation Measure 4.18.5b:** Construction crews shall be required to carry sufficient fire suppression equipment to ensure that any fire resulting from construction activities is immediately extinguished. All off-road equipment using internal combustion engines shall be equipped with spark arrestors.	LTS
Impact 4.18.6: The implementation of the WWTP Expansion Project could present additional vector concerns. (Less than significant)	None required.	LTS
Impact 4.18.7: The use of reclaimed wastewater effluent carries the potential for human contact. (Less than significant)	None required.	LTS
Population and Housing		
Impact 4.19.1 The Proposed Project would displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere. (No impact)	None required.	LTS
Land Use and Zoning		
Impact 4.20.1: The Project would be consistent with applicable land use goals, policies, and objectives of the City's and Merced County's General Plans. (Less than significant)	None required.	LTS

TABLE ES-2 (CONTINUED)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation **
Impact 4.20.2: Implementation of the Project would create land uses that are incompatible with current and planned land uses adjacent to Project facilities. (Less than significant)	None required.	LTS
Impact 4.20.3: Construction of the Project would not create an obstruction that could physically divide an established community. (No impact)	None required.	LTS
Impact 4.20.4: Implementation of the Project would not conflict with a Williamson Act contract or adjacent agricultural zoning. (No impact)	None required.	LTS
Impact 4.20.5: Construction of the Project could impact farmland and/or adjacent agricultural operations. Additionally, routine maintenance over the long term could potentially conflict with these operations. (Less than significant)	**Mitigation Measure 4.20.5:** The City shall consult with all affected landowners where the proposed expansion area would encroach onto productive farmland. As part of the easement acquisition process, the City and affected landowners shall negotiate an agreed-upon compensation for the loss of any existing pasture and/or row crops currently in production. During these consultations, the City shall also, in conjunction with landowners' input, identify areas within the expansion area that could be left in agricultural production. Compensation for the loss of crops and associated revenues will be up to the provisions of law.	NI

Notes: LTS = Less than significant; SU = Significant and unavoidable; NI = No impact

CHAPTER 1
Introduction

The City of Merced (City) has proposed installing new facilities at its wastewater treatment plant (WWTP) that would improve its effluent quality, operational reliability and increase its rated treatment capacity. The City of Merced Wastewater Treatment Plant Expansion Project (Project) consists of acquiring land adjacent to the WWTP, constructing and installing new equipment, modifying and increasing the footprint of the current WWTP layout, and changing the location of the effluent discharge.

The City will be the lead agency for purposes of complying with the requirements of the California Environmental Quality Act (CEQA). In this role, the City has determined that preparation of an environmental impact report (EIR) is appropriate to address the environmental consequences of implementing the Project and alternatives. It is intended that this Draft EIR provide the public and interested agencies with information identifying the potential environmental effects, both beneficial and adverse, on the local and regional environment.

The format and content of this document complies with the requirements of the *Environmental Review Process Guidelines for State Revolving Fund Loan* developed by the State Water Resources Control Board (SWRCB, 2004). These guidelines provide direction for preparing a CEQA document that satisfies the "CEQA-Plus" requirements contained in this guidance. Compliance with this guidance enables the document to simultaneously comply with requirements of the National Environmental Policy Act. The "CEQA-Plus" requirements specifically call for coordination and compliance with key federal regulations regarding protection and management of federal endangered species, cultural resources, and air quality conformance.

As appropriate, this Draft EIR identifies measures to minimize identified significant environmental effects of the Project, and describes a reasonable range of alternatives that would avoid or reduce any significant adverse effects of the Project (CEQA Guidelines Section 15121(a)). The City, as well as other regulatory authorities with jurisdiction over components of the Project, will use information provided in this Draft EIR, as a component of the total administrative record, to approve or deny implementation of the Project.

1.1 Opportunities for Public and Agency Comment

1.1.1 Initial Study and Notice of Preparation

In accordance with Sections 15063 and 15082 of the CEQA Guidelines, the City prepared an Initial Study (IS) and Notice of Preparation (NOP) for an EIR and published it on October 28, 2005. The IS/NOP was circulated for a 30-day period to solicit comments from the public, local, state, and federal agencies, and other interested parties regarding environmental issues to be addressed in the Draft EIR. Appendix A to this Draft EIR presents the IS/NOP materials released for public review. To date, seven comment letters have been received in response to the IS/NOP. These letters are presented in Appendix B to this Draft EIR.

1.1.2 Draft EIR

Upon completion of the Draft EIR, the public and interested agencies will be provided 45 days to submit comments on the adequacy of the document and its findings and conclusions. During this period, the City will conduct a public meeting to solicit and receive oral comments on the document.

In addition to submitting the Draft EIR to the Office of Planning Research and distributing a Notice of Availability, the City will place a notice advertising the availability of the document for public review in a newspaper with regional distribution.

1.1.3 Final EIR

Upon completion of the Draft EIR review period, the Final EIR will be prepared. It will contain corrections, changes, and revisions to the Draft EIR; comments on the Draft EIR and the responses to those comments; letters documenting agency consultation; and a mitigation monitoring and reporting program. The City will then hold a public meeting to consider certification of the Final EIR as complete, prior to making a decision on whether to implement the Project. The public will have opportunity to provide comments to the City at the public hearing.

1.1.4 Document 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 it. Submittal of the Notice of Completion with the Office of Planning and Research marks the beginning of the 51-day[1] public review period. During this period, the City will hold a public hearing on the Draft EIR and receive written comments at the following address:

[1] State Revolving Fund guidance requires an additional six days for delivery of the document to interested parties; resulting in a 51-day comment period, as compared to the 45-day period required by CEQA.

Mr. Bill King
Merced Planning and Permitting Division
City of Merced
678 West 18th Street
Merced, CA 95340

The Draft EIR will also be available on the City's website at <http://ci.merced.ca.us/>. Copies of the Draft EIR will be available for public review at the following locations:

Merced County Library
2100 O Street
Merced, CA 95340

William J George Library
401 Lesher Drive
Merced, CA 95340

County of Merced, Gustine Branch Library
2115 Wardrobe Avenue
Merced, CA 95340

1.2 Terminology Used in the Draft EIR

This Draft EIR uses the following terminology to describe environmental effects of the Project.

- **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 Draft EIR include those set forth in the CEQA Guidelines or that can be discerned from the CEQA Guidelines; criteria based on factual or scientific information; criteria based on the regulatory standards of local, state, and federal agencies; and criteria based on the goals and policies identified in the City of Merced and Merced County General Plans.

- **Beneficial Impact:** A Project impact is considered beneficial if it will result in the improvement of a physical condition in the environment (no mitigation required).

- **Less-than-Significant Impact:** A Project impact is considered less than significant when it does not reach the specified threshold of significance and would, therefore, cause no substantial change in the environment (no mitigation required).

- **Potentially Significant Impact:** A potentially significant impact is an environmental effect that may cause a substantial adverse change in the environment; however, additional information regarding the extent of the impact is needed to make the determination of significance. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures and/or Project alternatives are identified, when feasible, to reduce these effects to the environment.

- **Significant Impact:** A Project impact is considered significant if it results in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of Project effects in the context of the specified significance criteria. Mitigation measures and/or Project alternatives to reduce these effects to the environment are identified, when feasible.

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

- **Cumulative Significant Impact:** A cumulative impact can result when a change in the environment results from the incremental impact of the Project when added to other related past, present, or reasonably foreseeable future projects. Significant cumulative impacts may result from individually minor but collectively significant projects. Mitigation measures for the significant cumulative impacts are identified, when feasible.

The EIR also identifies feasible mitigation measures that avoid or substantially reduce the Project's significant environmental effects (CEQA Guidelines Section 15126.4). The CEQA Guidelines (Section 15370) defines mitigation as:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

1.3 EIR Organization

This Draft EIR is organized into the following chapters consistent with the outline and guidance provided in *Environmental Review Process Guidelines for State Revolving Fund Loan* developed by the State Water Resources Control Board (SWRCB, 2004).

- **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 background and overall EIR process, opportunities for public comment and contents of the document.

- **Chapter 2, Project Description.** Chapter 2 describes the Project background, outlines the goals and objectives of the Project, and summarizes the major components of the current WWTP and the proposed facilities for its expansion.

- **Chapter 3, Environmental Setting.** Chapter 3 describes the current environmental setting for each environmental issue area.

- **Chapter 4, Environmental Analysis.** Chapter 4 discusses the environmental impacts associated with the construction and operation of the proposed WWTP expansion and identifies mitigation measures for potential significant impacts.

- **Chapter 5, Project Alternatives.** Chapter 5 describes alternatives to the Project at a level of detail consistent with CEQA requirements.

- **Chapter 6, Growth-Inducing Impacts.** Chapter 6 discusses the potential for the Project to induce urban growth and development. Secondary effects of growth are also discussed in this chapter.

- **Chapter 7, Other Statutory Considerations.** Chapter 7 discusses several issues required by CEQA, including a summary of alternatives, discussions of potential cumulative impacts, growth-inducing impacts, significant unavoidable impacts on the environment, and significant irreversible environmental changes.

- **Chapter 8, Report Preparers and Organizations and Persons Consulted.** Chapter 8 provides the names of the authors and agencies or individuals consulted during the preparation of the Draft EIR.

- **Chapter 9, Acronyms.** This chapter provides a list of abbreviations and acronyms that are used throughout the Draft EIR.

- **Chapter 10, References.** This chapter provides a list of reference materials and persons consulted during the preparation of the Draft EIR.

- **Appendices.** Appendices consist of materials that expand upon the content of the above-listed chapters.

CHAPTER 2
Project Description

2.1 Project Overview

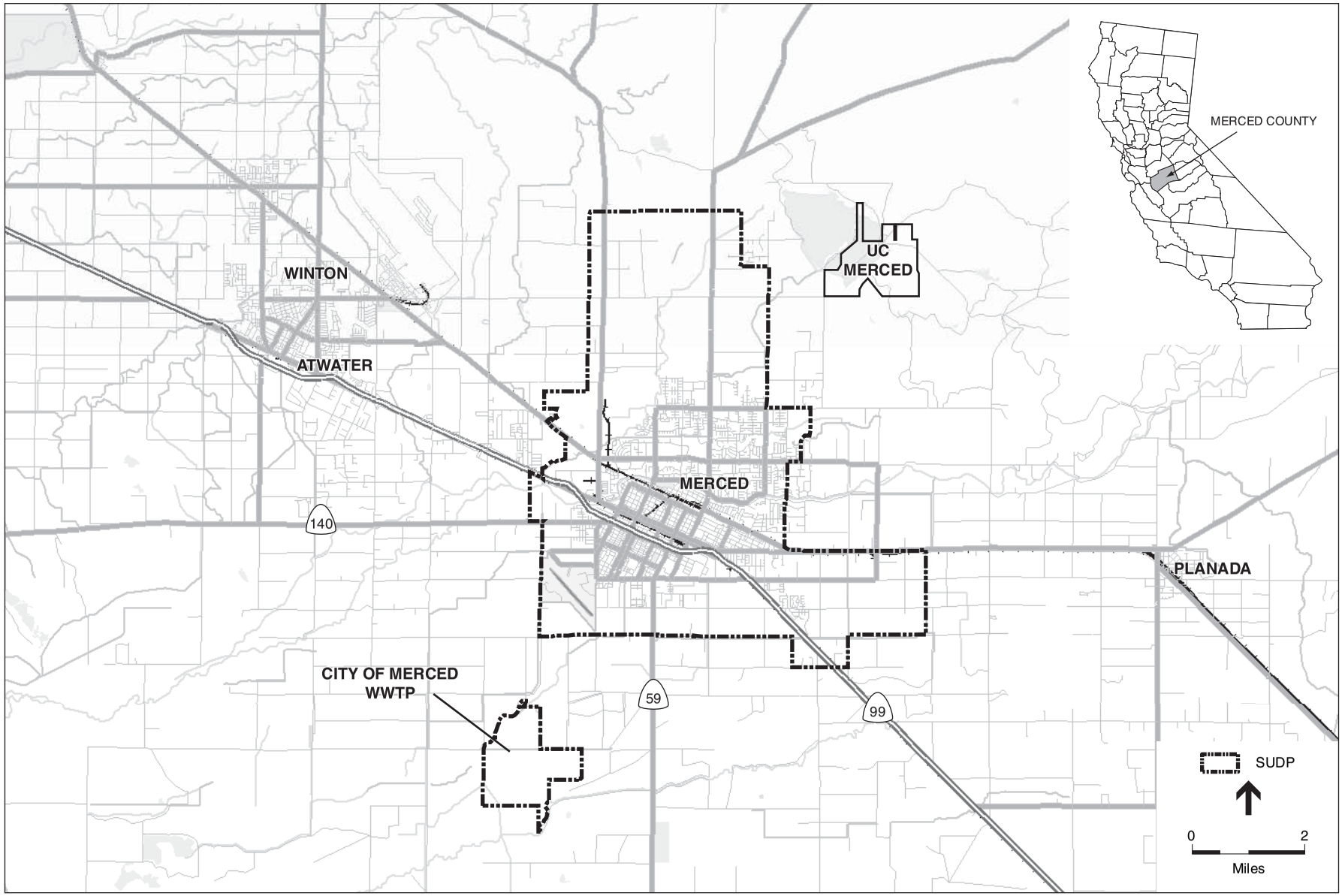
The City of Merced (City) is proposing to upgrade and expand the capacity of its wastewater treatment plant (WWTP) facilities to accommodate planned wastewater loads generated within its Specific Urban Development Plan (SUDP) area and the adjacent University of California Merced Long Range Development Plan (LRDP) area, and to comply with current and anticipated effluent quality regulatory limits. The Wastewater Treatment Plant Expansion Project (Project) would initially increase the capacity of the WWTP from the currently permitted 10 million gallons per day (mgd) to 11.5 mgd without any substantive improvements to the treatment facilities. Following this initial upgrade a series of improvements would be made to the WWTP enabling the capacity of the treatment system to be rated at either 12 or 16 mgd by adding a series of tertiary-treatment facility improvements. Ultimately, the Project would reach a capacity of 20 mgd with additional improvements as needed to meet future wastewater loads.

2.2 Project Location

The City of Merced's WWTP is located within the city limits at the south end of Gove Road and about 1.5 miles south of the main area enclosed by the city limits (U.S. Geological Survey 7.5-minute Atwater Quadrangle, T8S, R13E (MDB&M)). Figure 2-1 shows the relative location of the WWTP in relation to the City urban area. The current WWTP facilities occupy about 11.3 acres of the 1,335-acre City-owned property (see Figure 2-2).

The Merced Municipal Airport is approximately two miles north of the WWTP site (see Figure 2-1). Hartley Slough flows along the western perimeter of the WWTP property, while Miles and Owens Creeks laterally bisect the property. Duck Slough borders the southern perimeter.

The lands immediately south of the main part (mechanistic part) of the WWTP support the disposal of industrial food processing wastes, which is administered by the City but operated in accordance with a separate waste discharge permit issued by the Central Valley Regional Water Quality Control Board (RWQCB).



SOURCE: ESRI, 2005; City of Merced; and ESA, 2005

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-1
Regional Location Map

SOURCE: GlobeXplorer, 2001; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-2
City of Merced WWTP Property and Project Area

2.3 Project Background

Major portions of the WWTP were constructed in the late 1970s. Since that time, it has undergone a series of improvements, starting in 1974, continuing through 1980, and occurring again in 1994 and 2003. The City prepared an environmental impact report (EIR) in 1994 that addressed the construction and operation of WWTP improvements and expansion of wastewater treatment capacity (City of Merced, 1994). This document analyzed the environmental consequences of discharging up to 20 mgd of treated effluent and concluded that the implementation of the WWTP improvements and expansion of treatment capacity would result in the significant and unavoidable loss of local agricultural lands. The EIR concluded that all other potential environmental impacts could be mitigated to less-than-significant levels.

Most recently, the City approved the installation of additional blowers at the WWTP to improve aeration reliability. These new facilities were addressed in separate California Environmental Quality Act (CEQA) documentation prepared in 2005 (City of Merced, 2005; Environmental Review #05-27). The City is currently permitted to discharge up to 10 mgd of secondary treated effluent from the WWTP to Hartley Slough.

2.3.1 Changes to Community Plans and Wastewater Characteristics

Several circumstances in the City and County of Merced have changed, necessitating the expansion of the WWTP. These changes include the adoption of the 1997 Specific Urban Development Plan Update (City of Merced, 1997a) and the 2001 University of California-Merced (UC-Merced) Long-Range Development Plan (LRDP) (University of California, 2001). In addition, the City is currently proceeding in preparing an update to its 1997 SUDP.

These adopted plans propose continued future population growth within the City and the adjacent UC-Merced campus. Growth projections contained in the 1997 SUDP anticipate that build-out will generate an estimated 17.1 mgd of wastewater flows, while the flow from the UC-Merced LRDP is estimated at 2.25 mgd. Additionally, new growth areas that may be identified and included in the City's ongoing SUDP Update would generate additional wastewater loads requiring treatment at the City's WWTP.

The City is also expecting that waste discharge requirements will become more stringent and further restrict the allowable contaminants in the WWTP effluent. In order to meet these anticipated requirements, additional treatment methods will need to be installed and use of other systems, such as chlorine disinfection systems, will need to be terminated. These improvements are required to comply with anticipated regulatory limits and will need to be installed regardless if any WWTP capacity improvements are implemented.

2.3.2 Description of Current WWTP Facilities

The WWTP consists of influent screens, grit removal channels, raw sewage pumps, primary clarifiers, aeration basins, secondary clarifiers, chlorine disinfection, dechlorination, and an outfall channel connecting to Hartley Slough. Biosolids-handling facilities at the WWTP include dissolved air flotation thickening, anaerobic digestion, and biosolids-drying beds. **Table 2-1** identifies the major facilities that comprise the WWTP.

Major Components of the WWTP

The WWTP has three reactor basins and three secondary clarifiers, capable of treating 15 mgd. The City assumes that only two of the three reactor basins and clarifiers would be reliably available, comprising a firm average dry weather flow capacity of 10 mgd. The full capacity of the aeration basins cannot be used until the recently approved additional aeration capacity is installed (ECO:LOGIC, 2005), and the discharge permit from the RWQCB is revised.

TABLE 2-1
MAJOR COMPONENTS OF THE CITY OF MERCED WWTP

Unit	Number of Units	Size/Comments
Primary Treatment		
Mechanical Screens	2	
Grit Removal	2	
Primary Clarifiers	1	85-foot diameter
	1	95-foot diameter
Secondary Treatment		
Reactor Basins	3	1.2-million gallons
Secondary Clarifiers	3	110-foot diameter
Aeration Blowers	4[a]	22,210 standard cubic feet per minute (total)
Effluent Disinfection		
Disinfection System	3	Hypochloride/ thiosulfide chlorination/ dechlorination system
Effluent Disposal		
Surface Discharge to Hartley Slough	1	Open channel to Hartley Slough
Organic Sludge Digestion		
Primary Digesters	2	80-foot diameter
Primary/Secondary Digester	1	80-foot diameter
Ponds/Lagoons		
Sludge Lagoons	6	42 acres
Emergency Storage Basins	2	162 million gallons
Solids Dewatering		
Dissolved Air Flotation Thickener	1	35-foot diameter

[a] There are three aeration blowers; one is scheduled for construction in summer 2006.

Although there are three secondary clarifiers, limitations on the return activated biosolids (RAS) pumping facility preclude using the full capacity of these clarifiers. The RAS pumping system was designed to serve only two of the clarifiers at a time and has a reliable capacity of 10 mgd.

Waste activated biosolids are thickened in dissolved air flotation thickeners and then combined with primary biosolids and digested in anaerobic digesters. The digested biosolids are currently

pumped to onsite unlined drying beds. These beds allow the digested biosolids to be solar-dried. One to three times per year, the solar-dried biosolids are applied to the City's 580-acre farmland site, south of the WWTP facilities. There is no mechanical biosolids dewatering system operating at the WWTP (ECO:LOGIC, 2005).

Operations

The WWTP currently provides a secondary level of wastewater treatment and discharges the treated effluent to Hartley Slough and the Merced Wildlife Management Area. The secondary wastewater treatment process consists of the following steps: (1) inflow to the WWTP is sent to the primary clarifier, where settleable solids are separated from the waste stream; (2) the wastewater is then sent to aeration basins, where microorganisms decompose organic material; and (3) the treated wastewater is then sent to a secondary clarifier, where final solids settling and clarification occurs. The treated wastewater is then disinfected with sodium hypochlorite prior to its discharge from the WWTP into Hartley Slough. Biosolids are either applied to the City's 580 industrial wastewater management area or are hauled offsite to a permitted landfill.

Current Effluent Quality

The most stringent operating conditions determine the reliable capacity of the WWTP, including peak hourly and monthly flows, loads (influent strength), and colder temperatures. A key factor considered in successful wastewater treatment is the operation of the aeration basins and their ability to reduce biological oxygen demand of the wastewater. The biological oxygen demand concentration is an important water quality parameter that is regulated by the Central Valley RWQCB. Other water quality parameters regularly monitored by the City are listed in **Table 2-2**.

TABLE 2-2
CURRENT WASTEWATER TREATMENT PLANT
EFFLUENT QUALITY

Constituent	Units	Average Daily Discharge*	Maximum Daily Discharge
Flow	mgd	8.5	11.32
Chlorine (Total Residual)	mg/L	<0.01	0.94
Biochemical Oxygen Demand	mg/L	3.54	8.0
Chemical Oxygen Demand	mg/L	31.2	106
Temperature (Winter)	degrees F	68.54	73.94
Temperature (Summer)	degrees F	79.664	82.76
Fecal Coliforms	MPN	19.4	900
Oil and Grease	mg/L	<1.0	16.0
Phosphorus (total)	mg/L	2.0	3.0
Total Kjeldahl Nitrogen	mg/L	1.2	3.1
Ammonia	mg/L	0.28	5.43
Nitrate + Nitrite (as N)	mg/L	11.3	18.0
Total Suspended Solids	mg/L	6.84	30.5
pH (Minimum)	pH units	--	7.7
pH (Maximum)	pH units	--	8.1
Dissolved Oxygen	mg/L	4.8	8.38
Total Dissolved Solids	mg/L	427	597

Source: ECO:LOGIC, 2005

* Peak Month

Note: mgd = million gallons per day; mg/L = milligrams per liter; F = Fahrenheit; MPN = Most Probable Number

Current Permits and Approvals

The WWTP is subject to the regulatory authority of Waste Discharge Requirements (WDRs) and a National Pollutant Discharge Elimination System (NPDES) permit issued by the Central Valley RWQCB. The WWTP operations are currently regulated by WDR 5-00-246 (NPDES No. CA00792198), issued in 2000. Standards imposed by WDR 5-00-246 are listed in Table 2-3.

The WWTP is also currently operating under Mandatory Penalty Complaint No. R5-2004-0537 in response to permit violations for total coliform and total residual chlorine, Group I and Group II pollutants, respectively (CVRWQCB, 2004).

TABLE 2-3
REGIONAL WATER QUALITY CONTROL BOARD EFFLUENT LIMITATIONS
UNDER WASTE DISCHARGE REQUIREMENT 5-00-246

Constituents	Units	Monthly Average	Weekly Average	4-day Average	7-day Median	Daily Maximum
Average Flow	mgd	--	--	--	--	10
Peak-Hour Wet Weather Flow	mgd	--	--	--	--	23
Biochemical Oxygen Demand[1]	mg/L	30[2]	45[2]	--	--	90[2]
	lb/day	2,501[3]	3,752[3]	--	--	7,503[3]
Total Suspended Solids	mg/L	30[2]	45[2]	--	--	90[2]
	lb/day	2,501[3]	3,752[3]	--	--	7,503[3]
Oil and Grease	mg/L	10	--	--	--	15
	lb/day	834	--	--	--	1,251
Settleable Solids	ml/L	0.2	--	--	--	1.0
Chlorine Residual	mg/L	0.1	--	--	--	0.5
Total Coliform	MPN[4]/100 ml	--	--	--	23	240
Ammonia (as N)	mg/L	2.3	--	5.0	--	20.0
	lb/day	190[3]	--	420[3]	--	1,670[3]

SOURCE: RWQCB, 2000

[1] Five-day biochemical oxygen demand at 20 degrees Celsius
[2] To be ascertained by a flow proportional 24-hour composite sample
[3] Value based upon a design capacity of 10 mgd (*x* mg/L x 8.34 x 10 mgd = lb/day), where *x* is the maximum concentration allowable.
[4] Most probable number

Note: mgd = million gallons per day; mg/L = milligrams per liter; lb/day = pounds per day

Other receiving water limits imposed on the WWTP are based upon water quality objectives contained in the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (CVRWQCB, 1998). These limitations specify that the WWTP discharge shall not cause the following conditions to occur in the receiving surface water (i.e., Hartley Slough and the Merced Wildlife Mitigation Area):

- Concentrations of dissolved oxygen to fall below 5.0 milligrams per liter (mg/L)
- Oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
- Chlorine to be detected in concentrations equal to or greater than 0.01 mg/L

- Normal ambient pH to fall below 6.5 or exceed 8.5. The monthly average pH change shall not exceed 0.5. In calculating the monthly average pH change, the discharger may omit values of pH change recorded on days when upstream receiving water pH exceeds 8.5.

- Normal ambient temperature to increase more than 5 degrees Celsius.

- Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental physiological response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels that are harmful to human health.

- Where three toxicity tests result in exceeding 1.0 Chronic Toxicity Units (TUc) when TUc equals the ratio of 100/Highest Concentration with No Observable Effect, as determined in accordance with the procedures outlined in EPA 600/4-91/002 *Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Water to Freshwater Organisms* and EPA 505/2-90-001 (Technical Support Document for Water Quality-Based Toxic Control). Consistent chronic toxicity is defined as three consecutive tests that exceed 1.0 TUc.

- Neither the WWTP operation nor its discharges to land or to the Merced Wildlife Mitigation Area, alone or in combination with other sources, shall cause or threaten to cause degradation of area groundwater.

2.4 Project Objectives

The City has two primary objectives for implementing the Project. The first objective is to install sufficient WWTP capacity to meet wastewater loads generated by planned population growth and development within the City's existing service area, the adjacent UC Merced campus, and new growth areas that are identified and made part of the City's SUDP area . The second objective includes installing additional levels of wastewater treatment sufficient to meet current and future effluent quality regulatory limits by replacing and adding to aged facilities and implementing improved wastewater treatment technologies and processes.

2.5 Description of the Project

2.5.1 Planned Wastewater Treatment Capacity

The WWTP currently provides secondary level treatment, disinfection, and discharge to Hartley Slough. The WWTP has a permitted capacity to discharge 10 mgd. The WWTP site can readily accommodate the addition of new treatment facilities to serve a future population capable of generating up to 20 mgd. In addition, the new National Pollution Discharge Elimination System (NPDES) permit is scheduled to be renewed by the California Regional Water Quality Control Board in December 2006. To comply with expected conditions of the new permit, several facility upgrades including tertiary filtration, UV disinfection, effluent re-aeration, as well as solids dewatering and stabilization are anticipated.

The City has completed engineering studies (ECO:LOGIC, 2005) concluding that the WWTP treatment capacity can be increased to 11.5 mgd with installation of additional blowers to enhance WWTP aeration capacity. The installation and operation of the additional blowers were addressed in a previously completed CEQA document (City of Merced 2005) and their installation is underway with a scheduled completion date set for late 2006. The 11.5 mgd of secondary treatment capacity would be available immediately upon issuance of a new NPDES permit and certification of this EIR.

While constructing treatment process upgrades, the City will also expand the treatment capacity to serve planned population growth and development in the City SUDP and UC-Merced LRDP. Full development of the City SUDP is expected to increase wastewater flow to 17.1 mgd by about 2025 and the development of the UC-Merced LRDP would generate about 2.25 mgd, resulting in a combined wastewater volume of about 19.35 mgd.

The City is currently assessing the degree and timing of near-term population growth and development in order to determine the size of the first WWTP capacity expansion increment beyond 11.5 mgd. If the City continues to experience high growth rates, it will expand treatment capacity from 11.5 to 16 mgd, followed by a subsequent phase from 16 to 20 mgd treatment capacity. If near-term population growth and development is found to be occurring at a slower rate, the City may elect to construct an initial expansion phase of 12 mgd of treatment capacity, followed by subsequent 16 and 20 mgd treatment capacity phases.

The 12, 16 and 20 mgd treatment capacities would be available with the construction of facilities described in Table 2-4.

TABLE 2-4
PROPOSED FACILITY IMPROVEMENTS

Improvements	Description
12mgd Capacity	
Tertiary pump station	New tertiary pump station for pumping secondary effluent to filters
Equalization basin	New 7-million-gallon basin to equalize peak hourly flows
Rapid mix & flocculation basin	New basin used to chemical condition the secondary effluent prior to filtration
Tertiary filters	Six cloth disk filter units
Ultraviolet disinfection	Three low pressure high intensity lamp ultra-violet channels for pathogen removal
Reaeration basin	New reaeration basin to maintain dissolved oxygen levels above 5 milligrams per liter
Outfall pipe to Hartley Slough	New 54-inch pipe directly to Hartley Slough
Stormwater drain pump station	Two stormwater pump stations that pump stormwater to first flush basin and then back to plant headworks for treatment
Chemical storage	Chemical tanks for coagulants and pH adjustment
Chemical building	New chemical building housing chemical metering pumps and electrical switchgear
Solids dewatering building	New building housing three centrifuges and a truck loading station for biosolids dewatering
Digested biosolids holding tank	New 80-foot tank for digested biosolids prior to dewatering
Active solar dryers	Nine greenhouses to dry biosolids to above 50 percent solids prior to disposal
Emergency generator	Expansion of the plant's generator system for emergency power

TABLE 2-4
PROPOSED FACILITY IMPROVEMENTS

Improvements	Description
16mgd Capacity	
Aeration basin #4	Addition of a fourth 1.25 million-gallon aeration basin
Blower building No .2	New blower building housing 3 new aeration blowers
Activated biosolids pump station	New return biosolids pump station for secondary clarifiers No. 3 and 4
Secondary clarifier No. 4	Addition of a fourth 110-foot-diameter secondary clarifier
Dissolved air flotation thickener	New dissolved air flotation thickener for thickening waste solids prior to digestion
Gas flare	New gas flare for digester gas
Primary digester	New 80-foot-diameter primary digester
Digester control building	New building for digester feed pumps and heat exchangers
Laboratory and administration building	New water/wastewater laboratory and offices for plant staff located near plant entrance
20 mgd Capacity	
Head works	Addition of one mechanical screen
Influent pump station	Addition of one submersible pump
Primary clarifier No. 4	Addition of a fourth 95-foot-diameter primary clarifier
Aeration basin No. 5	Addition of a fifth 1.25-million gallon aeration basin
Secondary clarifier No. 5	Addition of a fifth 110-foot-diameter secondary clarifier
Tertiary filtration	Construction of two additional cloth disk filter units
Ultra-violet (UV) disinfection	Construction of an additional UV channel
Effluent cooling	Use of additional surface aerators or cooling towers
Primary digester	Construction of a fourth primary digester

Note: Bolded items represent facilities included if the City elects to construct an initial upgrade and expansion project to 12 mgd.

Source: ECO:LOGIC, 2005

2.5.2 Facility Improvements

The City is currently conducting engineering studies and preparing plans to provide reliable wastewater treatment capacity that is capable of serving planned future wastewater loads and that will meet anticipated NPDES and WDRs that will be imposed. Specifically, it is expected that the more stringent WDRs will be instituted even if the Project is not implemented. The Project would include a series of improvements to immediately achieve a rated capacity of either 12 or 16 mgd and, ultimately, a capacity of 20 mgd. Table 2-4 lists the improvements to be installed as part of the Project. Figure 2-3 depicts the proposed layout of the current and planned facilities that comprise the WWTP.

As part of the Project, the City proposes constructing facilities that will expand the WWTP's wastewater treatment capacity, including a new head works and influent pump station to replace the 30-year old pump station. The facilities would be covered to reduce potential odors. Other improvements include a new septage/debris receiving station, an additional primary clarifier and aeration basin, a secondary clarifier, a new blower building, a return biosolids pump station, and a new digester.

Wastewater treatment improvements included in the Project are: (1) denitrification sufficient to comply with a 10 mg/L nitrate-nitrogen limitation, (2) coagulation, filtration, and ultra-violet (UV) disinfection for the production of pathogen-free effluent containing no chlorine disinfection by-products, (3) effluent reaeration, and (4) centrifuge dewatering and active solar-drying for production of Class A Biosolids.[1]

To accommodate the new facilities, the Project would acquire about 46 acres of land immediately north and east of the WWTP and develop this area for installing the proposed WWTP facilities. Approximately 20-acres of the acquired land would be used specifically for the expansion of the WWTP's new head works, a combined administrative/laboratory building, and access to portions of the incoming City sewer. The remaining 22-acres would be used as an odor buffer and to enable access to adjacent facilities for maintenance purposes. Additional land to the northwest of the WWTP may be acquired or made available through agreements with existing landowners for the disposal of Class A biosolids. Two small parcels of lands, composed of about 4 acres, are needed for WWTP entrance improvements.

New levees to provide 100-year flood protection would be constructed within the expansion area around the northern end of the WWTP. These levees would be similar to the levees found at the WWTP and would range from 5 to 7 feet high with a crest width of about 15 feet to enable vehicle access. As part of the levee's construction, the Paden Drain and Hartley Laterals would be rerouted to Hartley Slough, east of the proposed access road. The proposed expansion area is illustrated in Figure 2-4.

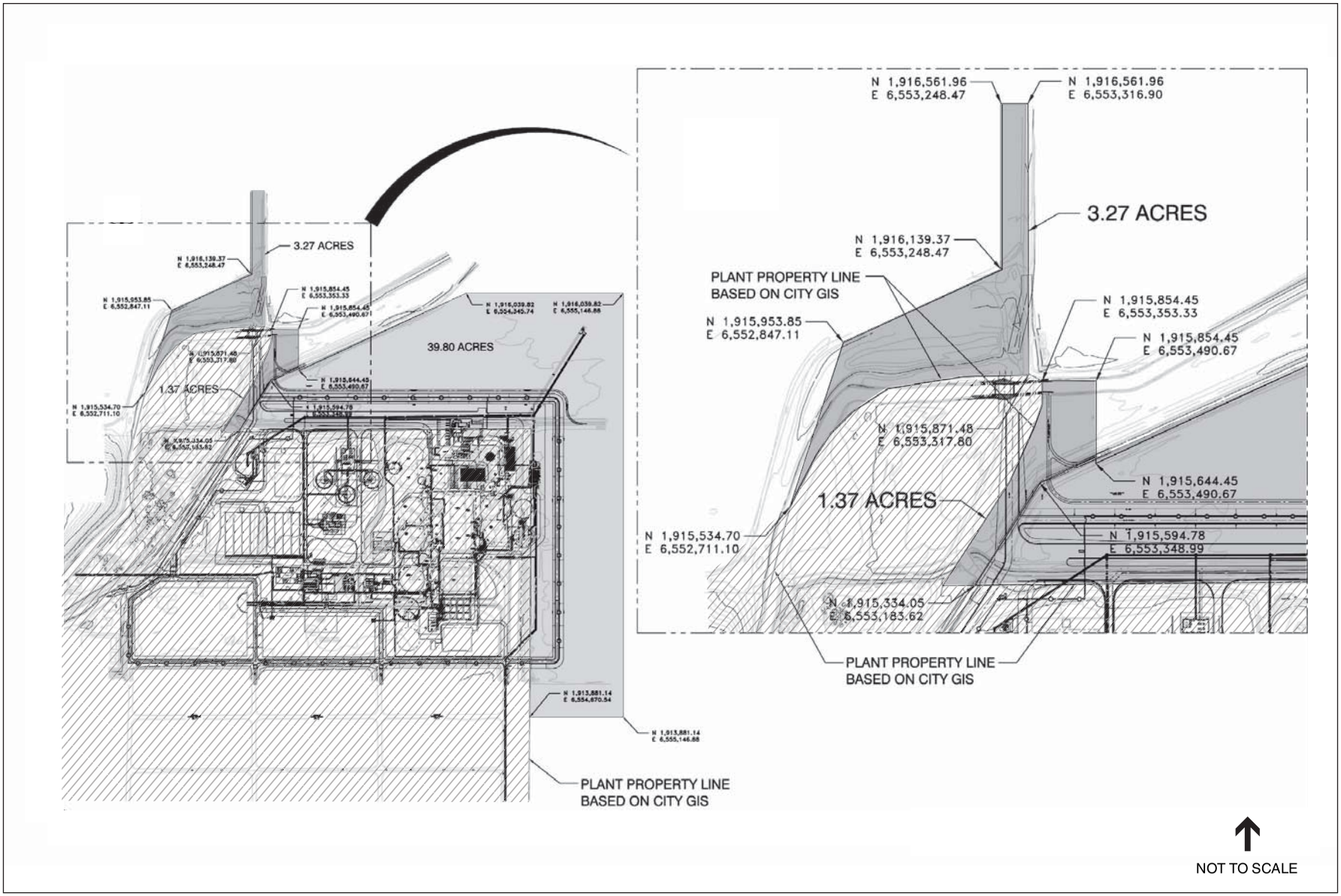
[1] To achieve Class A certification, biosolids must undergo heating, composting, digestion or increased pH that reduces pathogens to below detectable levels. Once these goals are achieved, Class A biosolids can be land applied without any pathogen-related restrictions at the site and marketed to the public for agricultural uses including application to lawns and gardens

SOURCE: ECO:LOGIC, 2006; City of Merced; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-3

Proposed WWTP Facilities



SOURCE: ECO:LOGIC, 2006; City of Merced; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-4

City Land Purchase for WWTP Expansion

2.5.3 Treatment Process Improvements

Secondary Treatment Improvements

Secondary treatment improvements to the WWTP consist of possibly reconfiguring the current reactor basins, constructing Reactor Basin 4, constructing a new RAS pump station to serve Secondary Clarifiers 3 and 4, and constructing Secondary Clarifier 4. Additional aeration capacity beyond the recently approved blowers would also be installed.

Tertiary Treatment Improvements

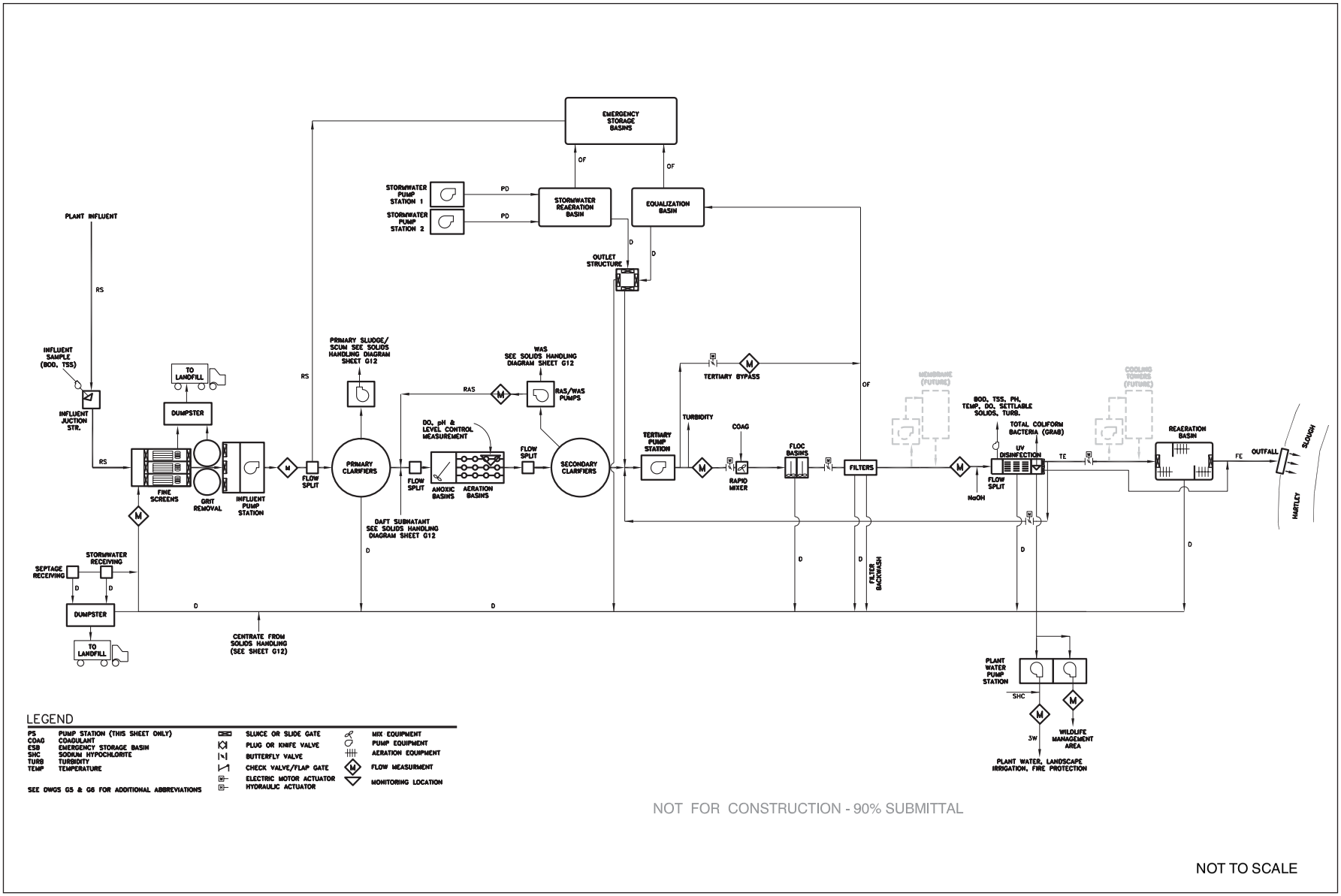
Tertiary treatment improvements to the WWTP include the addition of cloth-media "disk" filters and replacing the chlorine disinfection system with a UV light disinfection system. This filtration technology would produce acceptable quality tertiary effluent consistent with California Department of Health Services' "Title 22" pathogen-free reuse criteria. Prior to discharge, a re-aeration basin would aerate the final effluent so that its dissolved oxygen level would be maintained at or above 5 mg/L. A general treatment schematic is illustrated in Figure 2-5.

Biosolids Management and Handling Improvements

The Project would implement improved treatment and handling of biosolids at the WWTP. Such improvement would include additional biosolids thickening with a new dissolved air flotation thickener, expanded anaerobic digestion facilities, new centrifuge dewatering, and new drying and stabilization to Class A quality solids using active solar dryers. These improvements would be operational by 2008.

A general schematic showing the biosolids treatment process is presented in Figure 2-6. The active solar dryers would be used to dry, stabilize, and temporarily store biosolids prior to offsite hauling. The use of the unlined drying beds would be ended. At 12 mgd, the WWTP would produce an average 14,800 pounds per day (lb/day) of solids on an annual basis, while at 16 mgd, the WWTP would produce an average of 19,700 pounds per day (lb/day) of solids on an annual basis. At 20 mgd, the WWTP would produce an annual average of about 24,600 lb/day. Biosolids are currently applied to 580-acres of City-owned agricultural areas south of the WWTP. This operation is regulated by the RWQCB under Order No. 97-034. If solids were disposed offsite, these quantities of biosolids would generate about 214 haul trips per year at 12 mgd,284 haul trips per year at 16 mgd and about 355 haul trips per year at 20 mgd.

Approximately 580 acres of the industrial food processing waste disposal facility, located south of Miles Creek and within the City's property, would continue to be used for the application of treated biosolids. In late 2005, the food processor stopped its operations in its Merced facility. As a result, the City could apply additional biosolids on the City-owned lands and remain below loading rates stipulated in the WDR Order No. 97-034. Optionally, the biosolids could be applied as a Class A soil amendment on adjacent agricultural properties. For purposes of this document, it is assumed that biosolids could be applied to agricultural areas within two miles of the WWTP or trucked to Synagro. Application to offsite areas would be in compliance with the Merced County biosolids disposal ordinance (Merced County, 2006) and 40 Code of Federal Regulations, Part 503.

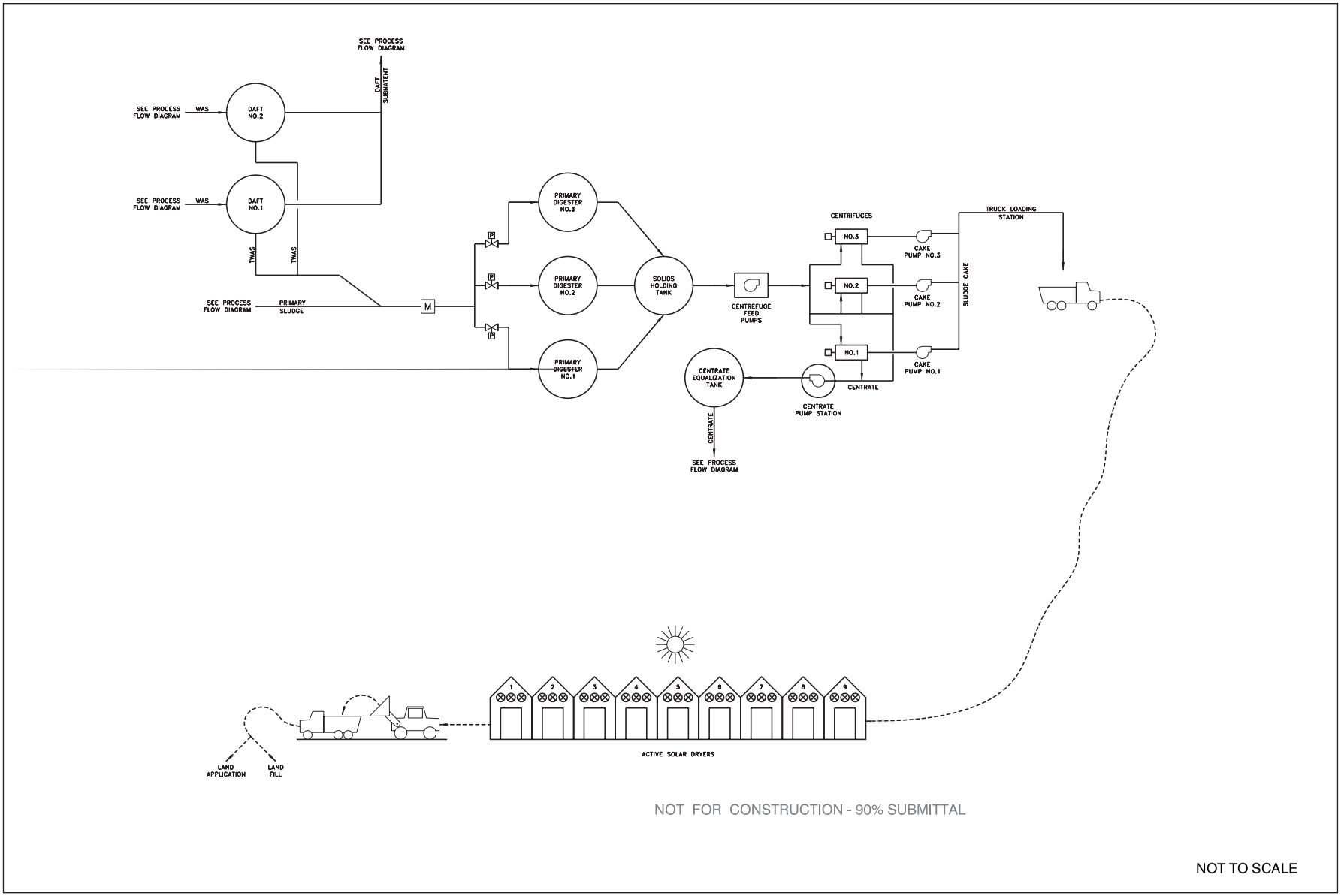


SOURCE: ECO:LOGIC, 2006; City of Merced; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-5

Process Flow Diagram



SOURCE: ECO:LOGIC, 2006; City of Merced; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-6

Biosolids Treatment Diagram

2.5.4 Effluent Discharge

As part of the Project, a new outfall structure would be constructed in Hartley Slough about 3,000 feet upstream of the current WWTP effluent discharge. The structure would be a 54-inch pipe with a bar screen outlet to prevent unauthorized access into the pipe. As proposed, a single pipeline would be buried roughly 8 to 10 feet below the ground surface and extend just over 1,000 feet. A general schematic of the outfall structure is provided in Figure 2-7.

2.5.5 Other Improvements

Other WWTP improvements include installing a separate gated entry for septage haulers, landscaping improvements, levee improvements to provide 100-year flood protection of WWTP facilities, rerouting agricultural drain features, expanding the emergency generator building, and adding a second standby generator to provide power to the new facilities. In addition, the Project includes constructing a new laboratory building and administration building.

As part of the Project, use of about one-half of the outfall channel would be ended and filled in place. The north-south portion of the outfall channel near the WWTP facility would continue to be used to convey treated effluent to the Merced Wildlife Management Area. The fill material is anticipated to originate from a combination of onsite and offsite locations.

No additional offsite improvements to the City sewer system would be required with the implementation of the Project. Existing sewer line capacities are sufficient to convey flows to the WWTP. Where new urban development takes place, sewer facilities will be installed to serve those areas. The installation of these new sewer lines would be discussed as part of future CEQA documents addressing these developments.

2.5.6 Proposed Effluent Quality

With the proposed improvements, the WWTP would utilize improved nitrification/denitrification processes followed by a tertiary treatment process. The Project would continue to discharge treated effluent into Hartley Slough, with a change of location as described above; however, disinfection would be accomplished by UV light exposure instead of chlorine disinfection. The Project would also produce Class A-quality biosolids. The Project would achieve an effluent quality[2] of 10 mg/L biological oxygen demand, 10 mg/L total dissolved solids, and 10 mg/L nitrate as N at the rated capacities of 12 mgd, 16 mgd, and 20 mgd .

2.5.7 Construction Methods

Construction of the proposed treatment facilities would include grading currently unimproved property, dewatering, excavation and soil removal, transporting and installing equipment, and constructing process units. The construction would occur with periodic activity peaks, requiring brief periods of significant effort followed by longer periods of reduced activities.

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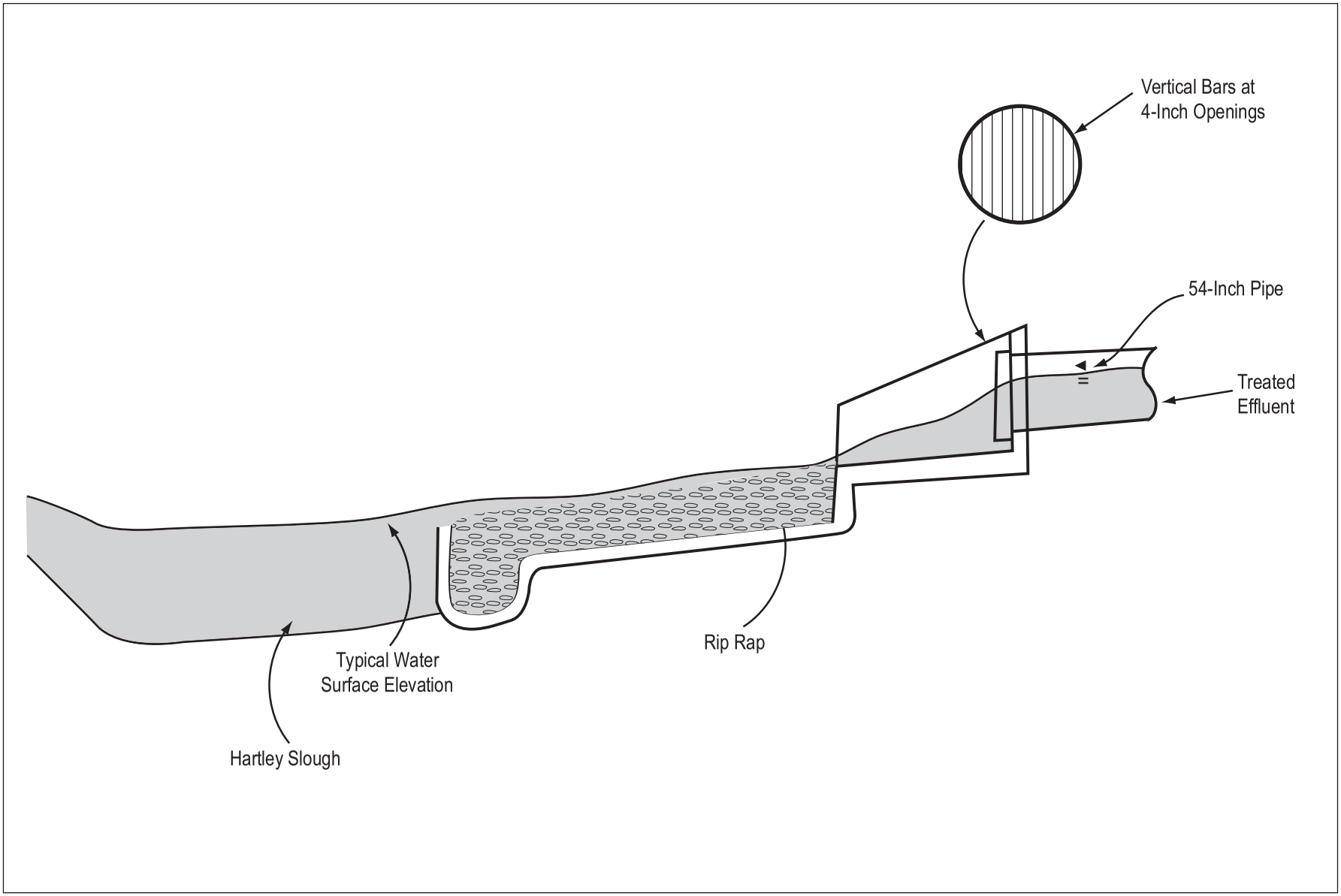
2 Effluent quality measured at the point of discharge; before mixing with receiving waters occurs.



SOURCE: ECO:LOGIC Engineering, 2006; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-7

Site View of Proposed Effluent Outfall Facilities into Hartley Slough

Construction of the Project is scheduled to begin in the mid-2007. Upon completion of the construction of additional facilities and improvements in mid-2010, the WWTP would raise its operational capacity from 11.5 mgd to either 12 or 16 mgd. Actual rates of development will determine when the subsequent 20 mgd phase would be warranted. A general construction schedule is provided in Figure 2-8.

Final construction scheduling would be completed during engineering and contractor bidding, which may result in variations to the planned construction schedule. Typical construction activities involved in the construction of wastewater treatment plant upgrades include:

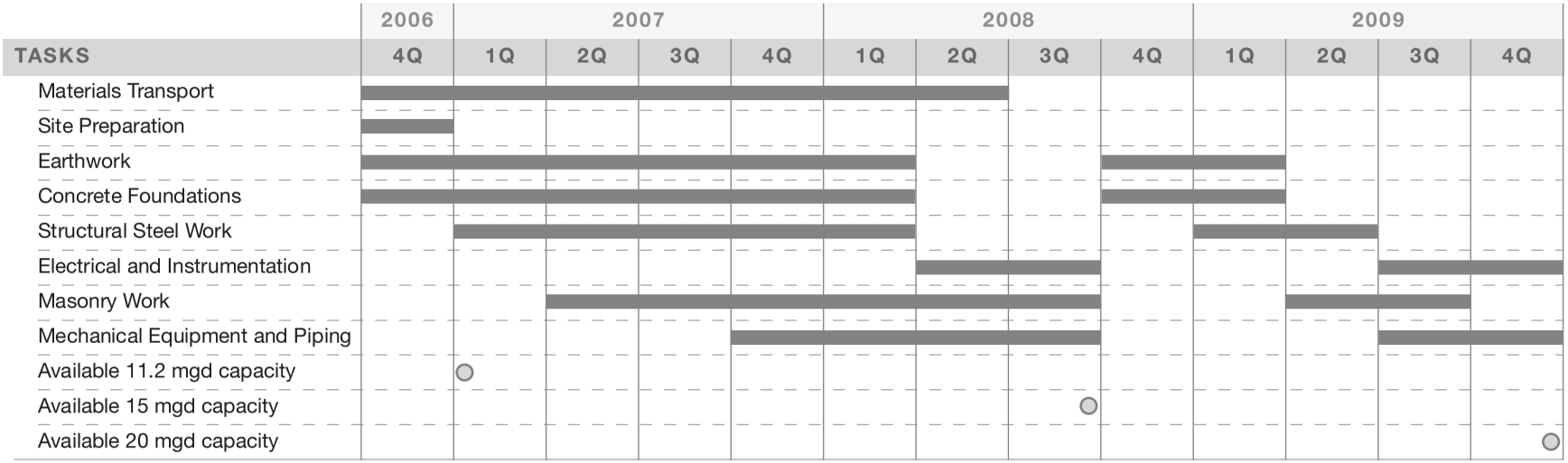
- Materials transport
- Site preparation (tree and brush removal, and structure demolition, if necessary)
- Earthwork (grading, excavation, backfill)
- Concrete foundations (forming, rebar placement, and concrete delivery and placement)
- Structural steel work (assembly and welding)
- Electrical/instrumentation work
- Masonry construction
- Installation of mechanical equipment and piping

It has been assumed that construction of the WWTP treatment upgrades could occur simultaneously with pipeline installation, with the most intense construction activities occurring during late 2007 into fall 2008. In order to characterize and analyze potential construction impacts, the City has identified maximum crew size, truck trips, and worker trips, based on expected excavation volumes and quantities of imported materials. To support these activities, the possible main pieces of equipment used during construction may include:

- track-mounted excavators
- backhoes
- graders
- crane
- scrapers
- compactors
- end and bottom dump trucks
- front-end loaders
- water trucks
- paver and roller
- flat-bed delivery trucks
- forklifts
- concrete trucks
- compressors/jack hammers

Materials Transport and Employee Trip Generation

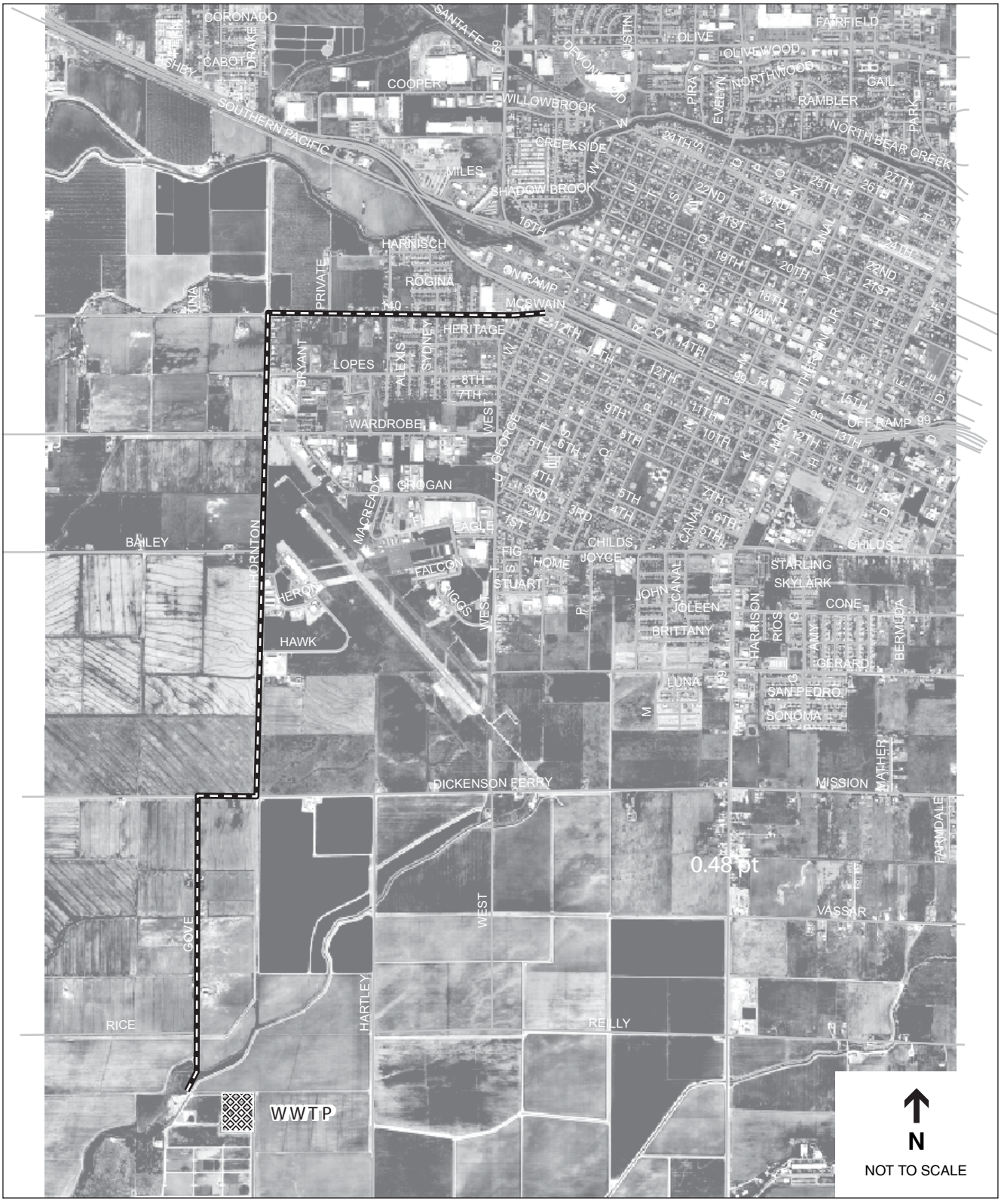
Excavated material would mostly remain onsite and would be used for backfill after process unit and yard piping installation. Additional truck trips would be necessary to deliver materials, equipment, and asphalt-concrete to the site. During peak excavation and earthwork activities, the Project could generate up to 100 round-trip truck trips per day. However, average daily truck trips would be less and range from about 30 to 50 round trips per day during much of construction. Roadways that would be used by construction traffic include Gove Road, Dickenson Ferry Road, Thornton Road, and State Routes 99 and 140. The proposed truck haul route is depicted in Figure 2-9.



SOURCE: ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-8
Construction Schedule



SOURCE: ECO:Logic Engineering, 2006; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 2-9

Construction and Operational Haul Routes

The typical crew size for each construction phase would be 5 to 10 people, plus inspectors. It is expected that up to four construction crews could be present during the most intense construction periods. Work hours would be governed by permits issued by regulatory agencies, but these are not expected to be restrictive because the area contains few residences.

During Project operations, the expanded WWTP would generate up to 355 truck trips per year associated with the transfer and disposal of biosolids at the WWTP. This number of truck trips would more than double the truck trips currently associated with biosolids disposal from the WWTP. Up to three trips per day could be generated by biosolids disposal truck trips.

Additional WWTP operators would generate about six new daily commuter trips to and from the WWTP.

Installation of the Outfall Pipeline

A majority of the new outfall pipeline would be installed in an open trench using conventional cut and cover construction techniques in upland areas. The trench would be braced with a trench box, solid shoring, or speed shoring, depending on the soil conditions encountered, or trench side slopes laid back to satisfy safety requirements. The active work area along the open trench, including equipment and materials staging areas, would require a width of up to 60 feet, but may be reduced to reflect the available right-of-way. Trench width would range from 15 to 20 feet, and trench depth would average 8 to 10 feet. The rate of work is estimated to average 50 feet per day per crew along the entire route, and the overall active work zone on any given workday would average 100 to 200 feet in length. The key steps in the construction process are:

- Surface preparation
- Trench shoring
- Excavation
- Pipeline installation
- Trench backfilling
- Surface restoration

In order to reduce potential impacts to the levee and wetland margins of Hartley Slough during the installation of the outfall structure, equipment would be restricted to wide-track or amphibious equipment designed to reduce bearing weight. Alternatively, crane mats would be required if larger excavation equipment (track-mounted excavator) is required. Staging areas for storage of pipe, construction equipment, and other materials would be placed at locations that would minimize hauling distances and long-term disruption.

The pipeline would be encased in concrete in sensitive areas (such as the outfall), where it would be difficult to access the pipe to repair minor leaks, or where a leak could cause considerable damage before being repaired.

2.6 Project Approvals and Planning Considerations

As the lead agency for purposes of CEQA compliance, the City would certify completion of the EIR for the Project and, based on consideration of this document, would determine whether to approve or disapprove the Project. Other permits and approvals that may be required for the Project are listed in Table 2-5. Agencies with jurisdiction over those permits or approvals would consider the information provided in the EIR in determining under what conditions to issue permits or approvals.

TABLE 2-5
REGULATORY REQUIREMENTS, PERMITS, AND AUTHORIZATIONS FOR PROJECT FACILITIES

Agency	Type of Approval
Federal Agencies	
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permit
U.S. Fish and Wildlife Service	Federal Endangered Species Act compliance (Section 7 consultation)
State	
California Department of Fish and Game	State Endangered Species Act compliance Section 1600 *et seq.* Streambed Alteration Agreement
Central Valley Regional Water Quality Control Board	Waste Discharge Requirements
	National Pollutant Discharge Elimination System General Permit for Stormwater Discharge Associated with Construction Activities
	Clean Water Act Section 401 Water Quality Certification
	General Order for Dewatering and Other Low Threat Discharge to Surface Waters Permit
State Historic Preservation Office	Historic Preservation Act Section 106
Local	
San Joaquin Valley Air Pollution Control District	Authority to Construct, San Joaquin Valley Air Pollution Control District Regulation VIII-Fugitive Dust Control, Rule 8010
	Permit to Operate
Merced County	County Lands and Right-of-Way Encroachment Permit
Merced Irrigation District	Joint Use and Construction Agreements

As part of Project construction and operation, the City is obligated to implement certain actions as required by applicable rules, standards, regulations and law. These actions will be incorporated into Project design and operations procedure because their implementation is not optional or discretionary. The implementation of these actions will act to minimize potential environmental effects and are acknowledged as part of the analysis of potential environmental impacts discussed in Chapter 4 of this document. Mitigation measures identified in this document to minimize potential environmental impacts are considered as additional measures when the mandated actions are not sufficient to reduce the impacts to a level that is less than significant.

Table 2-6 lists the actions that will be implemented as part of the Project, as mandated by current rules, standards, regulations, or law.

TABLE 2-6
ACTIONS TO BE IMPLEMENTED AS PART OF PROJECT CONSTRUCTION AND OPERATION

Action	Applicable Rule, Standard, Regulation or Law
Maintain Effluent and Receiving Water Quality	Waste Discharge Requirements assigned by the Central Valley Regional Water Quality Control Board
Compliance With Acceptable Biosolids Disposal Methods	40 Code of Federal Regulations, Part 503
Comply With Acceptable Recycled Wastewater Distribution and Reuse Requirements	California Code of Regulations Title 22, Division 4, Chapter 3
Implement Fugitive Dust Control Measures	Regulation VIII of the San Joaquin Valley Air Pollution Control District
Relocation of agricultural drain features owned and operated by the Merced Irrigation District	Comply with Joint Use and Construction Agreements entered into with Merced Irrigation District
Implement Dust Control Measures and Other Actions to Control Emissions of Nitrogen Oxides and Reactive Organic Gases	Rule 9510 Indirect Source Review of the San Joaquin Valley Air Pollution Control District

CHAPTER 3
Environmental Setting

This chapter describes the environmental setting for the City of Merced Wastewater Treatment Plant Expansion Project (Project). California Environmental Quality Act (CEQA) Guidelines Section 15125(a) requires an environmental impact report (EIR) to describe the physical environmental conditions of the Project area when the Notice of Preparation is published. This environmental setting constitutes the baseline physical conditions by which the City of Merced (City) will determine whether a potential environmental impact is significant.

3.1 Relationship of Project to Other Planning

This section describes the Project's relationship to and consistency with other applicable plans that may affect land use, water use and water quality, air resources, and public services such as the transportation system. These plans include those prepared by federal, state, and local authorities with jurisdiction over resources or lands in the vicinity of the wastewater treatment plant (WWTP) and its service area.

3.1.1 Water Quality Control Plans

Basin Plan

The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the federal Clean Water Act. The Central Valley Regional Water Quality Control Board (CVRWQCB) has adopted the Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins, which identifies the current and potential beneficial uses for surface and groundwater within the Central Valley region (CVRWQCB, 1998). The Basin Plan also contains water quality objectives that are intended to protect the specified beneficial uses. Together, the beneficial use of a water body and the corresponding water quality objective adopted to protect that use comprise the "water quality standard" for purposes of regulation under the National Pollutant Discharge Elimination System permitting program.

Beneficial uses applied to the surface waters of the San Joaquin River identified in the Basin Plan include municipal and domestic supply, agricultural irrigation, agricultural stock watering, industry process supply, water contact recreation, canoeing and rafting, other non-contact water recreation, warm freshwater habitat, warm fish migration habitat, and cold fish migration habitat, warm spawning habitat, and wildlife habitat. The beneficial uses for Hartley Slough are not specified in the Basin Plan. However, the Basin Plan states that the beneficial uses of any

specifically identified water body generally apply to its tributary streams. Therefore, beneficial uses applied to the San Joaquin River would also apply to Hartley Slough, even though Hartley Slough is an effluent dominated agricultural drain.

Water quality objectives for surface waters in the region have been set for bacteria, bioaccumulation, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, sulfide, tastes and odors, temperature, toxicity, and turbidity.

As noted in Chapter 2, the City's WWTP currently discharges treated effluent that historically exceeded Basin Plan objectives for biochemical oxygen demand, dissolved oxygen, residual chlorine, nitrate, temperature, and pathogens. Proposed WWTP improvements are intended to bring the WWTP into compliance with applicable Basin Plan objectives and waste discharge requirements (WDRs) that may be assigned to the facility.

Watershed Management Plan

No watershed management plan has been prepared for the Merced Hydrologic Area, which includes the Project area. However, general watershed management priorities have been established for the San Joaquin River Hydrologic Basin, which includes the Merced Hydrologic Area, and are guided by the State Water Resources Control Board's (SWRCB) five-year Strategic Plan. A key component of the Strategic Plan is a watershed management approach for water quality protection; commonly referred to as the Watershed Management Initiative (CVRWQCB, 2002).

Under that watershed management approach, the CVRWQCB's overall goal for the San Joaquin River Basin is to implement point and nonpoint source programs in a manner that complements the activities and goals of other stakeholders in order to achieve water quality improvement and promote restoration of water resources. The Project would involve treatment upgrades at the Merced WWTP to reliably improve the quality of effluent it discharges. These upgrades would be consistent with the CVRWQCB's priorities associated with point source control efforts within the San Joaquin River Basin. The Project would not conflict with an adopted watershed management plan.

Area-Wide Wastewater Treatment Plan

No area-wide wastewater treatment plan has been prepared for the Merced area. Wastewater infrastructure needs have been identified as a critical barrier to accommodate the population's housing demands. As a consequence, the San Joaquin Valley Wastewater Task Force (Task Force) was convened in December 2000 for the purpose of identifying wastewater infrastructure needs of the San Joaquin Valley and strategizing potential solutions to these needs.

Through a grant-funded venture with the Merced County Association of Governments, the Task Force authored the August 2001 San Joaquin Valley Wastewater Needs White Paper. The paper gives an overview of Central Valley communities' challenges in balancing compliance with water quality regulations versus the environmental benefits and the economic costs of doing so, describes the history and decisions that have made these regulations important, and explains some of the unresolved issues.

3.1.2 Local Plans

All cities and counties in California are required by law to adopt a General Plan that establishes goals, policies, and implementation measures for guiding long-term development, protection from environmental hazards, neighborhood preservation, conservation of identified natural resources, and accommodating urban development (Government Code Sections 65100 *et seq.*).

The principal means of implementing the goals and policies presented in the General Plan is the corresponding zoning ordinance, which identifies use zones in the jurisdiction, the land uses allowed on a given site, and the standards for each allowed use according to zone. Local zoning ordinances are required by state law to be consistent with the General Plan.

The Project would be developed on lands mainly under the City's ownership and jurisdiction. However, the WWTP expansion area to the north and east of the WWTP would occur on lands within Merced County's (County) jurisdiction. These lands would be acquired by the City. The following discussion addresses the consistency of the Project with applicable General Plan goals and policies.

City of Merced General Plan

The City of Merced General Plan provides the goals and policy framework for providing wastewater services. Because County lands surround the project site, City polices governing land use compatibility are not applicable for these areas. Therefore, this consistency evaluation addresses whether the Project is consistent with the City's goals and policies related to the provision of public services and, more specifically, the provision of wastewater service.

The City is in the process of updating its General Plan. This process is expected to take until early 2008 and is expected to be complete after approval of this Project. Because the updated General Plan has yet to be adopted, the Project's consistency must be evaluated against the currently adopted General Plan Vision 2015 (City of Merced, 1997).

The planned population and development and service areas are defined by the Specific Urban Development Plan (SUDP) boundary. Figure 3-1 shows land use designations within the SUDP.

Goals contained in the Public Facilities Element of the General Plan support the improvement of the City's infrastructure and encourage the efficient and cost-effective delivery of public services. The following policies are provided in the Public Facilities and Services Elements as they relate to the Project.

- Policy P-1.1 Provide adequate public infrastructure and services to meet the needs of future development

- Policy P-1.2 Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of infrastructure and services.

- Policy P-1.3 Require new developments to provide or pay for its fair share of public facility and infrastructure improvements.
- Policy P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for projected future needs
- Policy P-4.2 Consider the use of reclaimed water to reduce non-potable water demands whenever practical
- Policy 5.1 Provide effective storm drainage facilities for future development.

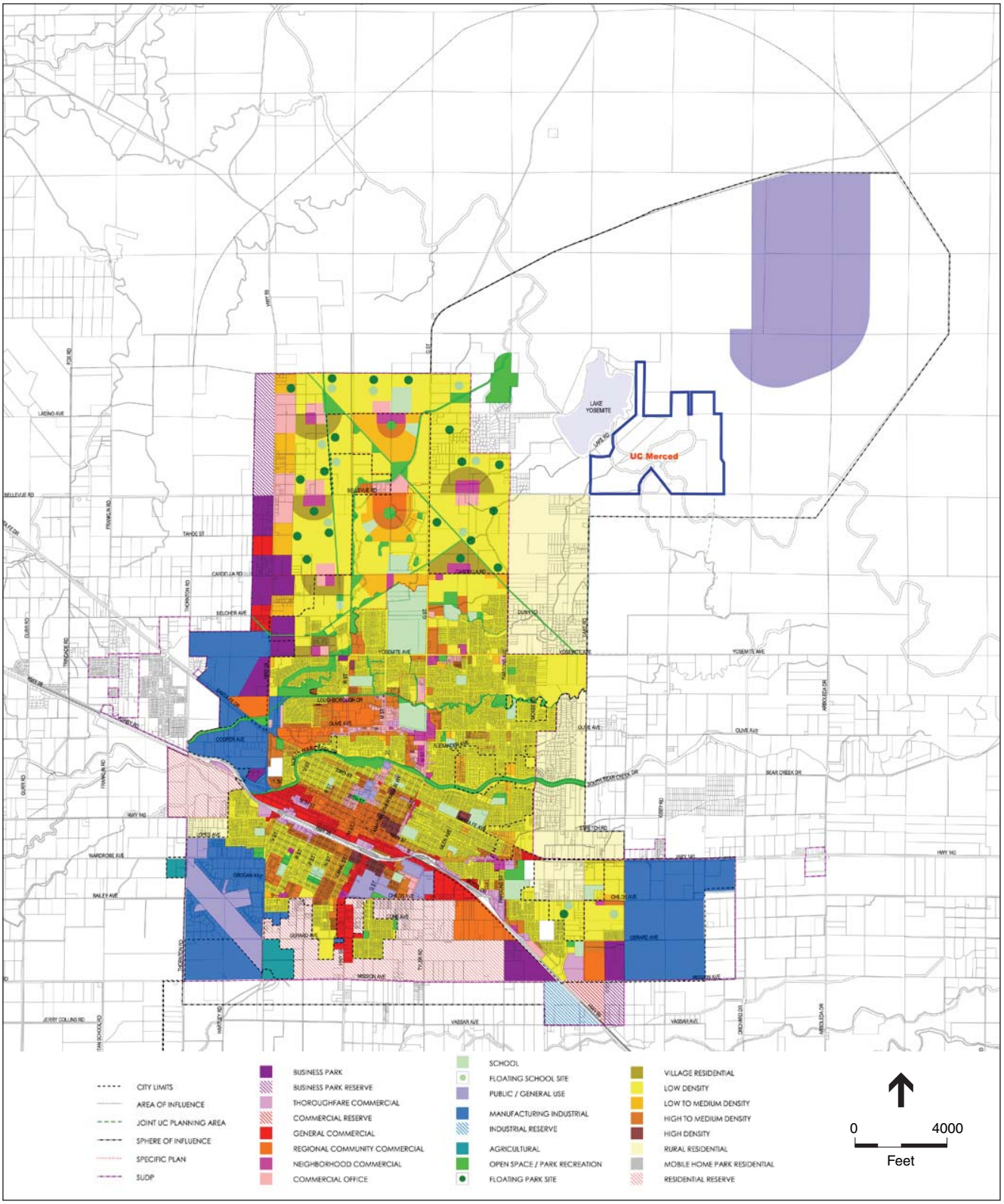
Merced County General Plan

The Merced County Year 2000 General Plan governs land use activities in unincorporated portions of Merced County, including lands located adjacent to the WWTP (Merced County, 2000). General Plan policies most relevant to the Project are contained in the Land Use and Agriculture Elements. The Land Use Element contains land use planning designations and describes the allowable uses for each designation. Much of the land base surrounding the City's property is designated for agricultural uses, according to the General Plan's Land Use Diagram (Merced County, 1990).

The Agricultural land use designation recognizes the value and importance of agriculture by acting to preclude incompatible urban development within agricultural areas. This designation establishes agriculture as the primary use but allows dwelling units, limited agriculture-related commercial services, agriculture-related light industrial uses, and other uses that, by their unique nature, are not compatible with urban uses, provided they do not conflict with the primary use. The Agriculture designation is also consistent with areas that the General Plan has identified as suitable for open space or recreational use and for ranchettes.

Agricultural land use goals and polices contained in the Merced County General Plan focus on avoiding the placement of urban-type land uses, which may be disruptive to the agricultural economy, near agriculturally zoned lands. Current activities at the WWTP are not disruptive to adjacent agricultural uses. The City's effluent discharge currently supports downstream agriculture by providing a consistent supply of irrigation water.

The Agricultural Element also emphasizes on reducing the interference urban land uses may have on agricultural lands and avoiding the placement of urban-type land uses that may result in the further conversion of farmland to nonagricultural uses. A supporting General Plan policy states, "Conversion of agricultural land into urban uses shall be allowed only where a clear and immediate need can be demonstrated …." In this instance, the City has a clear and immediate need to provide additional wastewater service capacity to serve planned development within the City and the University of California-Merced (UC-Merced) campus. While the expansion of the WWTP is intended to meet future wastewater loads, the City must proceed immediately with project development to ensure sufficient WWTP capacity is available as future demand arises. As shown in Chapter 2, Project Description, the City anticipates making available 15 mgd of WWTP capacity by mid-2008 and 20 mgd of WWTP capacity by the end of 2009. Therefore, to achieve these dates, expansion of the WWTP capacity must proceed as shown on Figure 2-8.



SOURCE: Merced County Association of Governments; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 3-1
Land Use Designations

Local Agency Formation Commission

The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000, as amended, established procedures for local government changes of organization, including city incorporations, annexations to a city or special district, and city and special district consolidations. LAFCOs have numerous powers under the Act, but those of primary concern are the power to act on local agency boundary changes and to adopt spheres of influence for local agencies. Among the purposes of LAFCOs are the discouragement of urban sprawl and the encouragement of the orderly formation and development of local agencies.

The expansion of the WWTP will require the City to acquire unincorporated lands that are presently within the jurisdiction of the County. These lands will not be annexed into the City. There are not plans to annex these lands to the City.

UC-Merced Long-Range Development Plan

The 2002 Long-Range Development Plan (LRDP) provides guidance for development of the campus of the University of California-Merced (UC-Merced) beyond the year 2028 (UC-Merced, 2002). The population that would be supported by the LRDP equals about 31,200 students and staff at full development of the campus. Figure 3-1 illustrates the UC-Merced campus planning area.

The area encompassed within the planning area totals over 7,000 acres. About 2,000 acres of the total lands will be developed into the main campus (910 acres), campus land reserve (340 acres), and campus natural reserve (750 acres). About 5,000 acres will remain in conservation easements as trust properties managed by the university.

As part of preparing and adopting the LRDP, UC-Merced prepared an EIR addressing the implementation of the LRDP and, more specifically, the first phase of campus development. The Phase 1 Plan involves the construction of the first set of buildings for the opening of the UC-Merced campus in 2004 and the provision of adequate space for envisioned programs until 2008. The Phase 1 academic core, upon opening, consists of a science and engineering building, a classroom building, and a library/information technology center.

Initial campus housing consists of 161 units located to the southwest of the academic facilities. Necessary utilities including a central plant and road infrastructure has also been constructed. Additional student housing and a campus support building at the southeastern portion of the site is being constructed at this time while a second science and engineering building will be constructed in 2007 and a social science and management building will be constructed in 2008.

The LRDP and associated EIR proposed that wastewater flows generated from the UC-Merced campus would be treated at the City's WWTP. The campus sewer has been connected to the City system. The sewer has sufficient capacity to serve Phase 1and future phased additions of the campus (UC-Merced, 2002).

3.1.3 Regional Transportation Plan

Merced County Association of Governments (MCAG) is a Joint Powers Authority consisting of Merced County and the six incorporated cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced. MCAG is Merced County's designated Regional Transportation Planning Agency, responsible for preparing and administering state and federal transportation plans for Merced County.

The Regional Transportation Plan (RTP) specifies the policies, projects, and programs necessary over a 25-year period to maintain, manage, and improve the region's transportation systems. The RTP is required to be developed as per California Government Code Section 65080 *et seq.*, of Chapter 2.5 and the U.S. Code, Title 23, Sections 134 and 135 *et seq*. The RTP provides a comprehensive long-range view of transportation needs and opportunities for Merced County. It establishes goals and objectives for the future system and identifies the actions necessary to achieve these goals. Finally, it describes a funding strategy and options for implementing the actions. The RTP is required to balance priorities with expected funding. Based on actions outlined in Chapter 2, Project Description, the Project is not expected to conflict with the implementation of RTP, but rather, contribute to its implementation by accommodating planned growth and urban development. This issue is discussed further in Chapter 6, Growth-Inducing Impacts.

The 2004 RTP and associated EIR identified Scenario C-2 as the preferred scenario for regional transportation development (MCAG, 2004a and b). Scenario C2 proposes the greatest investment in regional transportation improvements, including several new highway facilities and provides more financial resources for local street and road maintenance. This scenario improves transit to 30-minute frequencies in cities and minimizes future traffic congestion by providing additional road capacity. Scenario C-2 assumed that development and growth would continue corresponding to existing general plans. Because the Project would not induce population growth or development beyond the level specified in the City's General Plan or UC-Merced LRDP, or necessitate any additional roadway improvements not anticipated in the RTP, the Project would be consistent with the RTP. Further, as provided in Chapter 4.0, the Project would include mitigation to maintain existing roadway pavement conditions consistent with the goals of the RTP.

3.1.4 Regional Housing Allocation Plans

MCAG is mandated by California Government Code Section 65584 to determine current and projected regional housing needs for January 2001 through June 2008. It is also required to determine each local jurisdiction's share to satisfy the regional need for housing. Jurisdictions would then decide how they would address this need through the process of updating the Housing Elements of their respective General Plans.

The Regional Housing Needs Plan is a key tool for MCAG member jurisdictions to plan for growth anticipated through 2008; it does not necessarily encourage or promote growth, but rather allows communities to anticipate and, therefore, more effectively direct growth in ways that enhance the quality of life and improve access to jobs, transportation, and housing.

Because the Project would have no effect on housing allocations in Merced; much of the plan's content is not applicable to actions associated with the Project. Rather, the City has an adopted Housing Element, which includes amendments through June 24, 2004, to address housing allocation needs in Merced through 2015. Nonetheless, the Project would help to ensure that the necessary public facilities, in terms of sanitary sewer service, would be available to support housing allocation goals identified in the City's Housing Element.

3.1.5 Air Quality Management Plans

The federal Clean Air Act (CAA) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). Amendments to the CAA have added requirements for states containing areas that violate national air quality standards to revise their SIPs and incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them.

The U.S. Environmental Protection Agency (USEPA) is responsible for reviewing all state SIPs to determine if they conform to the mandates of the CAA, as amended, and will achieve air quality goals when implemented. If the USEPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the non-attainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated time frames can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

The following are the current air quality plans that apply to the Project:

- *1998 Carbon Monoxide State Implementation Plan (SIP).* With the USEPA's redesignation of 10 urban areas in California (including four urban areas in the San Joaquin Valley Air Basin [SJVAB]) from non-attainment to attainment for carbon monoxide in 1998, the South Coast Air Basin is the only basin in the state currently considered non-attainment for this pollutant. The 1998 Carbon Monoxide SIP revision modifies the carbon monoxide maintenance plan for the 10 areas, including the urban areas of the SJVAB.

- *The Federal Ozone Attainment Demonstration Plan (adopted November 14, 1994 and amended 2001).* This plan established a regulatory framework to bring the SJVAB into compliance with the national standards for ozone and satisfied a required triennial review for state standards. This plan did not achieve its goal of meeting the national standards for ozone by 1999 (SJVAPCD, 1994).

- *2000 Ozone Rate of Progress Report (adopted April 20, 2000, and amended April 27, 2000).* This report demonstrates that target levels of emissions reductions mandated by the CAA for 1997 to 1999 (9 percent) and for 1990 to 1999 (24 percent) were achieved (SJVAPCD, 2000).

- *Triennial Progress Report and Plan Revisions 1997–1999*. This report states that all areas of the SJVAB have attained the state carbon monoxide standard and focuses on attainment of the state ozone standard, in light of the basin's "severe non-attainment" status under the California Health and Safety Code. The report reviews previously adopted and implemented Best Available Retrofit Control Technology measures and includes an adoption and implementation schedule for new measures to achieve additional emission reductions. Planned measures include new controls on stationary, mobile, and indirect sources, and plan revisions. This report was adopted March 15, 2001 (SJVAPCD, 2001a).

- *2001 Amendment to the 1994 Ozone Attainment Demonstration Plan*. These amendments to the 1994 plan commit the San Joaquin Valley Air Pollution Control District (SJVAPCD) to revise, add, or delete various Regulation IV rules pertaining to the use and storage of coatings and solvents and specific stationary sources (SJVAPCD, 2001b).

- *2002 and 2005 Ozone Rate of Progress Plan, (adopted May 16, 2002)*. In December 2001, the USEPA reclassified the SJVAB from serious to severe non-attainment for the national 1-hour ozone standard. The severe classification triggered a requirement for the SJVAPCD to prepare plans that demonstrate annual reductions of ozone precursors and attainment of the standard by 2005. The district has determined that it cannot reach attainment in 2005. This plan demonstrates rates of progress in emissions reductions in volatile organic compounds at the mandated average rate of 3 percent per year, based on three-year periods (i.e., 9 percent between 2000 and 2002 and an additional 9 percent between 2003 and 2005). The plan also satisfies the requirement of the CAA that non-attainment areas adopt all reasonably available control measures as expeditiously as possible.

- *2003 PM_{10} Plan: San Joaquin Valley Plan to Attain Federal Standards for Particulate Matter 10 Microns and Smaller.* This plan was adopted by the SJVAPCD Governing Board on June 19, 2003, and submitted to the California Air Resources Board (CARB), which also has approved and submitted it to the USEPA. The USEPA has not yet approved the plan. The USEPA must approve, disapprove, partially approve, or conditionally approve the plan within a year of finding the plan complete. The 2003 PM_{10} plan demonstrates attainment of the national PM_{10} standard at all monitoring stations within the air basin by 2010. It supersedes the SJVAPCD's previous plan, the *1997 PM_{10} Attainment Demonstration Plan*, which failed to meet the national standard by the 2001 target date and was withdrawn by the SJVAPCD.

- *PM_{10} Attainment Demonstration Plan Progress Report 1997-1990*. August 17, 2000. This report describes progress achieved by the SJVAPCD implementing the 1997 PM_{10} plan, including actions pertaining to stationary, area and mobile sources, research programs and revisions to Regulation VIII (Fugitive PM_{10} Prohibitions) that were then in progress.

The SJVAPCD's primary means of implementing the air quality plans listed above is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by its permit authority over such sources and through its review and planning activities. In 2001, the 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 (BACM).

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 PM_{10} Attainment Demonstration Plan. The PM_{10} Attainment Demonstration Plan emphasizes reducing fugitive dust as a means of achieving attainment of the federal standards for PM_{10}.

The SJVAB currently does not meet the federal standard for ozone and is classified as a "serious" non-attainment area. Ozone at levels above the federal standard adversely affects public health, diminishes the production and quality of many agricultural crops, reduces visibility, degrades man-made materials, and damages native and ornamental vegetation. The San Joaquin Valley has also been classified as a non-attainment for particulate matter 10 microns or greater (PM_{10}).

The SJVAPCD is responsible for developing and adopting measures and methods for controlling ozone levels. Its Ozone Attainment Demonstration Plan identifies all possible control measures necessary to make attainment. This plan uses a computer model to simulate future air quality in the San Joaquin Valley while reflecting the effects of measures proposed to curb pollution. Within this plan are transportation emission budgets for each county.

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 an expeditious attainment of such standards. The SJVAPCD 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]

3.1.6 Habitat Conservation Plans

No Habitat Conservation Plan (HCP) or Natural Communities Conservation Plan (NCCP) has been adopted for the Project site or surrounding lands. Therefore, the Project would not directly conflict with any adopted HCP or NCCP.

In December 2001, the Merced County Board of Supervisors ordered that an NCCP and HCP be developed for eastern Merced County. The planning area included eastern Merced County from State Route (SR) 99 to the Stanislaus, Mariposa, and Madera County lines and included incorporated areas (Merced County, 2006).

The HCP/NCCP planning area includes portions of the WWTP service area. As a condition of the biological opinion issued by the U.S. Fish and Wildlife Service (USFWS) for the construction of the UC-Merced campus, the USFWS required that "the University should coordinate with the USFWS, California Department of Fish and Game [CDFG], the County, and private landowners to continue to participate in the development of an NCCP/HCP consistent with the Planning

[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* (40 CFR, Part 93.)

Agreement." After no progress since the late summer of 2002, the County stopped the preparation of the Merced HCP/NCCP in early 2004 (CDFG, 2005). Therefore, there is no NCCP/HCP that would cover private development within the WWTP service area.

3.1.7 Regional Land Use Plans

No regional land use plan has been adopted for the Project site or surrounding lands. For this reason, the Project would not conflict with an adopted regional land use plan.

3.2 Topography of the Region

The Project area is located at the eastern edge of the San Joaquin Valley, which is a broad plain lying between the Sierra Nevada foothills and the Coastal Range. The Project area is located in the midway portion of the valley, as traveled from north to south, and is relatively flat. Based on U.S. Geologic Survey topographic maps, elevations ranging from about 135 to over 150 feet above mean sea level (msl) are found in the vicinity of the WWTP.

The landscape slopes in a southwesterly direction**,** corresponding to the direction of surface water drainages located in the area. Because of natural topography and human grading, slopes have generally less than 1 percent gradient over most of the area.

3.3 Land Use and Zoning

Urban land uses are generally situated to the east and north of the WWTP in Merced and along SR 59 and SR 99. The newly developing UC-Merced campus is a new focal point for urban development located northeast of the City.

Land use within the vicinity of the WWTP is characteristic of rural portions of the central San Joaquin Valley and unincorporated sections of Merced County. Irrigated pasture, row crops, various agriculture-related structures, livestock and dairy operations, and scattered rural residences dominate the area surrounding the WWTP. All adjacent areas are zoned General Agriculture (Zone A1).

An abandoned landfill borders the northwestern corner of the City's property. The WWTP facilities are located at the northern end of the City's property. A series of sludge drying-beds and emergency stormwater ponds are located in the north-central portion of the property. A 450-acre industrial waste application area, located south of Miles Creek, has been used for the application of biosolids and food processing wastes. Immediately south, two large pond features comprise the Merced Wildlife Area. The City's General Plan designates the WWTP property as Public (P).

Figure 3-1 shows planned land uses within the City SUDP and the UC-Merced campus planning area.

3.4 Geology of the Region

The Project area is located in the Great Valley geomorphic province, a nearly flat alluvial plain extending from the Tehachapi Mountains in the south to the Klamath Mountains in the north, and from the Sierra Nevada Batholiths in the east to the Coastal Ranges in the west (Hackel, 1966). The valley is approximately 450 miles long and has an average width of 50 miles. Elevations across the alluvial plain generally range from a few feet below msl to about 400 feet above msl.

The San Joaquin Valley is a deep basin filled with a thick sequence of Jurassic to Holocene (last 10,000 years) alluvial deposits that had eroded from the eastern Sierra Nevada and the western Coastal Ranges. The sediments are transported to the valley primarily by tributaries of the San Joaquin River. A slight downslope gradient allows the valley to drain north into the Sacramento-San Joaquin Delta (Delta). Alluvial deposits, consisting of unconsolidated and semi-consolidated lake, terrace, and playa deposits from the Pleistocene epoch, form the central plain of the valley. Tertiary and Cretaceous outcrops border the central plain of the valley (Wagner et al., 1990).

The immediate Project area is underlain by what is commonly referred to as the Modesto Formation (Wagner et al., 1990). The Modesto Formation consists of Holocene and Pleistocene-aged (last 1.6 million years) alluvial deposits. The alluvium is typically interbedded with layers of gravel, sand, silt, and clay ranging in thickness from 100 to 300 feet (USGS, 1973).

3.4.1 Seismic Hazards

According to the Fault Activity Map of California (Jennings, 1994), the nearest faults to the site with historic displacement (activity within the last 200 years) are the Calaveras, San Andreas, and Hayward faults, located approximately 54, 58, and 78 miles away, respectively, from the western edge of the Project area. Portions of the Greenville fault zone also have been rated as being active within the last 200 years; these portions are approximately 72 miles northwest of the area. A major earthquake on any of these faults could induce ground shaking in the project area.

The only fault known in Merced County is the Ortigalita fault, located in the western quarter of Merced County, dissecting the Coast Ranges in a northwesterly direction. This fault has not been active in historic times. Table 3-1 provides a list of the active and potentially active faults in the vicinity of the Project area.

There are no active or potentially active faults within the boundaries of the WWTP or the surrounding area. As such, the Project would not be subject to fault rupture or any special development standards associated with Alquist-Priolo Earthquake Fault Zoning Act (formerly Alquist-Priolo Special Studies Zone) requirements.

3.4.2 Soils and Erosion Potential

The Modesto Formation and the Riverbank Formation, both of Pleistocene origin, underlie most of the Project area. Soil units within the area occur on slopes between 0 and 1 percent and some are slightly to moderately saline-alkali. Table 3-2 lists specific characteristics of Project area

soils. In general, the soils within the project area are well-drained; have slow to moderate permeability, slow runoff, and little or no erosion hazard. A clay hardpan is found from 4 to 12 feet below the surface.

TABLE 3-1
KNOWN FAULTS IN THE VICINITY OF THE WASTEWATER TREATMENT PLANT SITE

Fault Zone	Location Relative to Merced	Recency of Faulting[a]	Historical Seismicity[b]	Maximum Moment Magnitude[c]
San Andreas (Peninsula and Santa Cruz segments)	58 miles west	Historic	M 7.1: 1989 M 8.25: 1906 M 7.0: 1838 Many <M 6	7.3
Hayward	78 miles west-northwest	Historic	M 6.8: 1868 M 7.0: 1838 Many <M 4.5	6.9
Calaveras	54 miles west	Historic	M 6.1: 1984 M 5.9: 1979 Many <M 6.5	6.8
Concord–Green Valley	96 miles northwest	Historic	Active Creep[d]	6.9
Marsh-Greenville	72 miles northwest	Historic	5.8	6.9
Nunez (Coalinga area)	68 miles south	Historic	M 5.2-5.9: 1983	N/A
Ortigalita	33 miles west-southwest	Holocene	N/A	6.9

SOURCES: Jennings, 1994; Peterson et al., 1996.

[a] Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 10,000 years; Quaternary: evidence of displacement during the last 1.6 million years; Pre-Quaternary: no recognized displacement during the last 1.6 million years (but not necessarily inactive).

[b] Richter magnitude (M) and year for recent and/or large events.

[c] The Maximum Moment Magnitude is an estimate of the size of a characteristic earthquake capable of occurring on a particular fault. Moment magnitude is related to the physical size of a fault rupture and movement across a fault. 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 event. Richter magnitude estimations can be generally higher than moment magnitude estimations.

[d] Slow fault movement that occurs over time without producing an earthquake.

N/A = Not applicable and/or not available.

3.5 Climate

Geography plays a significant role in weather patterns throughout California's Central Valley. The Central Valley, which extends from south of Bakersfield to north of Redding, is bounded by the Sierra Nevada on the east, the Coast Range on the west, the Tehachapi Mountains on the south, and the Cascade Range on the north. These mountain ranges tend to buffer the valley from the marine weather systems that originate over the Pacific and are drawn inland by the jet stream. The only breach in this barrier is the Carquinez Straits, which exposes the midsection of the valley to the Pacific Coast marine weather regimen. The San Joaquin Valley is noticeably affected by this marine influence, which moderates climatic extremes on the northern end. This is especially evident on summer evenings when cooling occurs as a result of the penetration of sea breezes.

The climate of the San Joaquin Valley is characterized by mild, wet winters and warm to hot, dry summers. The major climatic controls are (1) the Pacific high-pressure system over the eastern Pacific Ocean, (2) the Pacific Ocean, and (3) the local topography. The formation of a high pressure area over the Great Basin Region to the east also affects the area, although primarily in the winter.

TABLE 3-2
SOILS OF THE WASTEWATER TREATMENT PLANT SITE

Soil Series and Natural Resource Conservation Service Map Unit	Description	Erosion Potential	Prime Farmland
Lewis clay (0–1 percent slopes, slightly saline-alkali) Map Unit LgA	Imperfect drainage, very slow permeability, low water capacity, very slow to ponded runoff, little or no erosion hazard	Low	Yes
Lewis silty clay loam (0–1 percent slopes, slightly saline-alkali) Map Unit LoA and PpA	Imperfect drainage, moderately permeable in uppermost few inches and very slowly permeable below, low water capacity, very slow to ponded runoff, little or no erosion hazard	Low	Yes
Landlow clay (0 to 1 percent slopes, slightly saline-alkali) Map unit LbA	Imperfect drainage, very slow permeability, high water holding capacity, ponded to very slow runoff, ponds easily	Low	No
Landlow silt loam (0 to 1 percent slopes, slightly saline-alkali) Map unit LdA	Imperfect drainage, slowly permeable, high water holding capacity, ponded to very slow runoff, ponds easily	Low	No
Landlow silty clay loam (0 to 1 percent slopes) Map unit LeA and LfA	Imperfect drainage, upper layers are slowly permeable to the hardpan, high water holding capacity, ponded to very slow runoff, ponds easily	Low	No
Burchell silty clay loam (0 to 1 percent slopes, moderately saline-alkali) Map unit BrA and BpA	Imperfect drainage, moderate permeability, high water holding capacity, very slow runoff, intermittently ponded, no erosion hazard	Yes	No/Yes
Marguerite loam (0 to 1 percent slopes) Map unit MeA	Well-drained, moderately permeable, high water-holding capacity, surface runoff is slow, little or no erosion hazard	Low	Yes
Wyman clay loam (0–1 percent slopes, deep over hardpan) Map Unit WnA	Well-drained, moderate to low permeability, high water capacity, slow runoff, no erosion hazard	Low	Yes

SOURCE: Soil Conservation Service, 1991.

The Project is located in the northern portion of the San Joaquin Valley. In the summer, the area is characterized by warm to hot, dry days and cool nights with clear skies and no rainfall. In the winter, the area experiences mild temperatures and occasional rains, with frequent heavy fogs. About 30 days of fog is normal from December through January. On an annual basis, predominant winds are from the northwest; during the winter, drainage of cold air from the Sierra Nevada results in easterly winds.

Temperatures in the vicinity of the Project site (Merced Municipal Airport, 1961–1990) vary seasonally. The annual average monthly temperature is 61.7°F. The hottest month is July, with an average temperature of 78.6°F. The coldest month, December, averages 44.8°F. Monthly average temperatures range from 35.3°F to 96.9°F (NOAA, 1992).

Precipitation occurs mainly from November through April and is generally associated with the passage of Pacific-frontal winter storm systems. Any rainfall during the summer is usually light and associated with isolated showers or thundershowers. The annual average precipitation at the Merced Municipal Airport is 12.01 inches. The precipitation is seasonal, with nearly 90 percent of the area's rainfall occurring between November and April. January and February are the wettest months on average, receiving nearly 35 percent of the annual rainfall. Table 3-3 summarizes monthly average temperatures and precipitation.

TABLE 3-3
AVERAGE MONTHLY TEMPERATURE AND PRECIPITATION DATA, 1962-1990

	Normal Temperatures		
Month	Maximum (°F)	Minimum (°F)	Precipitation (Inches)
January	54.5	35.7	2.07
February	62.3	38.7	2.06
March	67.4	41.4	2.00
April	74.9	44.4	1.06
May	83.7	50.4	0.28
June	91.4	56.1	0.06
July	96.9	60.2	0.03
August	95.2	59.0	0.04
September	90.0	54.8	0.20
October	80.5	47.5	0.65
November	65.3	40.4	1.86
December	54.3	35.3	1.70
Annual Average	76.4	47.0	12.01

SOURCE: NOAA, 1992.

3.6 Air Quality

3.6.1 Air Basin

The City's WWTP is located within the SJVAB. Airflow in the SJVAB is primarily influenced by marine air that enters through the Carquinez Straits where the Delta empties into San Francisco Bay. 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 (SJVUAPCD, 2002). Frequent transport of pollutants into the SJVAB from upwind sources also contributes to poor air quality.

Wind speed and direction play an important role in dispersion and transport of air pollutants. During the summer, winds usually originate out of the north end of the San Joaquin Valley and flow in a south-southeasterly direction through the valley and Tehachapi Pass and into the neighboring Southeast Desert Air Basin. During the winter, winds occasionally originate from the south end of the valley and flow in a north-northwesterly direction. Also, during the winter, the valley 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 (SJVUAPCD, 2002).

The vertical dispersion of air pollutants in the San Joaquin Valley 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 termed an *inversion*. Air above and below an inversion does not mix because of differences in air density. Inversions in the valley can restrict air pollutant dispersal.

Merced County's major air quality problems occur from late spring through early winter. From May to October, high ozone levels are a recurring problem due to the region's intense heat and

sunlight. Pollution problems also occur from October through January due to frequent strong temperature inversions, which trap pollutants near the earth's surface. These stagnant air conditions can last for weeks at a time. During these periods, carbon monoxide levels rise. The presence of visibility-reducing particulates are a problem much of the year. Dust from spring winds and agricultural operations, including agricultural burning, account for most of the area's particulates.

3.6.2 Pollutants Affecting Regional Air Quality

The air pollutants of interest to the regulatory agencies for their potential adverse impacts on the environment and sensitive receptors are described below.

Criteria Air Pollutants

Ozone

Ozone, the main component of photochemical smog, is primarily a summer and fall pollution problem. Ozone is not emitted directly into the air but is formed through a complex series of chemical reactions involving other compounds that are directly emitted. Ozone problems are the cumulative result of regional development patterns rather than the result of a few significant emission sources. Mobile sources are the major source of ozone precursor emissions within the northern region of the SJVAB (SJVAPCD, 2003b). Short-term exposure to ozone can irritate the eyes and cause constriction of breathing passages. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide

Ambient carbon monoxide concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area, some distance from vehicular sources. Although the SJVAPCD has been successful in achieving carbon monoxide standards, localized carbon monoxide concentrations warrant concern (SJVAPCD, 2002a).

Respirable Particulate Matter (PM_{10} and $PM_{2.5}$)

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter.) PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Traffic generates PM_{10} and $PM_{2.5}$ emissions through entrainment of dust and dirt particles that settle onto roadways and parking lots. PM_{10} and $PM_{2.5}$ also is emitted by burning wood in residential wood stoves and fireplaces and open agricultural burning. The primary classes of PM_{10} and $PM_{2.5}$ sources in the SJVAPCD include geological material, ammonium nitrate, burning, motor vehicle exhaust, and sulfates. Geological material is the largest contributor annually, while ammonium nitrate constitutes the largest fraction during winter (SJVAPCD, 2003a).

Other Criteria Pollutants

The standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), sulfates, and lead are being met in the SJVAB (CARB, 2003a). However, nitrogen dioxide is an ozone precursor and thus contributes to the formation of a non-attainment criteria pollutant. Automobiles and industrial operations are the main sources of nitrogen dioxide. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility.

Toxic Air Contaminants

Non-criteria air pollutants or toxic air contaminants (TACs) include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Diesel particulate matter (DPM) is the most complex of diesel emissions. The basic fractions of DPM are elemental carbon, heavy hydrocarbons derived from the fuel and lubricating oil, and hydrated sulfuric acid derived from the fuel sulfur. Ambient exposures to diesel particulates in California are significant fractions of total TAC levels in California. TACs are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) injuries or illnesses.

Odor

Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or national air quality regulations, the SJVAPCD has no rules or standards related to odor emissions, other than its nuisance rule. Control actions related to odors are based on citizen complaints to local government agencies including the SJVAPCD. The SJVAPCD uses screening distances to determine the potential for odor impacts from various land uses.

3.6.3 Air Quality Standards

Regulation of air pollution is achieved through both national and state ambient air quality standards and through emissions limits on individual sources of air pollutants. Local air quality management districts and air pollution control districts are responsible for demonstrating attainment with state air quality standards through the adoption and enforcement of Attainment Plans.

Federal Standards

The CAA requires the USEPA to identify National Ambient Air Quality Standards (NAAQS; or national standards) to protect public health and welfare. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter (PM_{10} and $PM_{2.5}$), and lead. These pollutants are referred to as "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth

in the CAA. California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard. Table 3-4 presents current national and state ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant.

Pursuant to the 1990 CAA Amendments, the USEPA classifies air basins (or portions thereof) as "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the NAAQS had been achieved. Table 3-5 shows the current attainment status of the Project area. In summary, the Project area is non-attainment for state and federal ozone, PM_{10}, and $PM_{2.5}$ standards.

The CAA requires each state to prepare an air quality control plan referred to as the SIP. The amendments to the CAA added requirements for states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them.

The USEPA has responsibility to review all state SIPs to determine if they conform to the mandates of the federal CAA and will achieve air quality goals when implemented. If the USEPA determines a SIP to be inadequate, it may prepare an FIP for the non-attainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated time frames can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Regulation of TACs, termed Hazardous Air Pollutants (HAPs) under federal regulations, is achieved through federal, state, and local controls on individual sources. The SJVAPCD regulates TACs in its Policies 1905 and 1910 and in Regulation VII. The SJVAPCD recognizes all TACs as defined by the state. The SJVAPCD recognizes federal maximum achievable control technology standards for HAPs in District Rule 4002. The 1977 CAA Amendments required the USEPA to identify national emission standards for HAPs to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals.

TABLE 3-4
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour 8 hours	0.09 ppm 0.070 ppm[b]	0.12 ppm[a] 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NOx) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial and industrial mobile equipment.
Carbon Monoxide	1 hour 8 hours	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1 hour Annual Avg.	0.25 ppm ---	--- 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 hour 24 hours Annual Avg.	0.25 ppm 0.04 ppm ---	--- 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants; destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM_{10})	24 hours Annual Avg.	50 µg/m^3 20 µg/m^3	150 µg/m^3 50 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 hours Annual Avg.	--- 12 µg/m^3	65 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also formed from photochemical reactions of other pollutants, including ROG, NOx, and sulfur oxides.
Lead	Monthly Quarterly	1.5 µg/m^3 ---	--- 1.5 µg/m^3	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.

SOURCES: CARB, 2001, 2005a.

NOTE: ppm = parts per million; µg/m^3 = micrograms per cubic meter.

[a] On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-hour ozone non-attainment. Early Action Compact Areas are those that do not yet have an effective date for their 8-hour designations.

[b] This concentration was approved by the California Air Resources Board on April 28, 2005, and is expected to become effective in early 2006.

TABLE 3-5
SAN JOAQUIN VALLEY ATTAINMENT STATUS

Pollutant	Federal Standards	State Standards
Ozone – one hour	No Federal Standard[1]	Non-attainment/Severe
Ozone – eight hour	Non-attainment/Serious	No State Standard
PM_{10}	Non-attainment/Serious	Non-attainment
$PM_{2.5}$	Non-attainment	Non-attainment[2]
Carbon monoxide – Merced County	Unclassified/Attainment	Unclassified
Nitrogen dioxide	Unclassified/Attainment	Attainment
Sulfur dioxide - Merced County	Unclassified	Attainment
Lead (particulate)	No Designation	Attainment
Hydrogen sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility-reducing particles	No Federal Standard	Unclassified

SOURCES: <www.valleyair.org/aqinfo/attainment.htm> (November 2005), and <www.arb.ca.gov/desig/adm/adm.htm>

[1] Federal One Hour Ozone National Ambient Air Quality Standards was revoked on June 15, 2005

[2] Non-attainment per the California Air Resources Board's website: <www.arb.ca.gov/desig/adm/s4_pm25.pdf>

State Standards

The CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional air pollution control districts and air quality management districts. CARB regulates local air quality indirectly by establishing state ambient air quality standards and vehicle emissions and fuel standards, and by conducting research, planning, and coordinating activities.

California has adopted ambient standards that are more stringent than the federal standards for some criteria air pollutants (e.g., PM_{10} daily and annual average standards), the California Ambient Air Quality Standards (CAAQS), pursuant to California Health and Safety Code [39606(b)]. In July 2003, new annual standards adopted by CARB for PM_{10} and $PM_{2.5}$ took effect. The annual PM_{10} standard was revised from 30 to 20 micrograms per cubic meter ($\mu g/m^3$), and the annual $PM_{2.5}$ standard was revised from 15 to 12 $\mu g/m^3$. The state standards are shown in Table 3-4.

Under the California Clean Air Act (CCAA), patterned after the federal CAA, areas have been designated as attainment or non-attainment with respect to the state standards (see Table 3-4). The project area is non-attainment for particulates (PM_{10} and $PM_{2.5}$) and ozone. The state must verify compliance with the SJVAPCD's plan for achieving attainment before inclusion in the SIP. Once the SIP is complete, the USEPA must verify the SIP's compliance with the federal CAA. If USEPA determines the SIP to be inadequate in verifying compliance, the USEPA may prepare a FIP, as described earlier in this section.

California state law defines TACS as air pollutants having carcinogenic effects. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) HAPs adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; AB 2588 does not regulate air toxics emissions.

TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings. Depending on the risk levels, emitting facilities are required to implement varying levels of risk reduction measures. SJVAPCD implements AB 2588, and is responsible for prioritizing facilities that emit air toxics (SJVAPCD, 2002c).

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

Local Standards

The SJVAPCD is the primary local agency responsible for protecting human health and property from the harmful effects of air pollution in the SJVAB and has jurisdiction over most stationary source air quality matters in the SJVAB, including the New Source Performance Standards program. The SJVAPCD includes all of Merced, San Joaquin, Stanislaus, Madera, Fresno, Kings, and Tulare Counties, and the San Joaquin Valley portion of Kern County.

The SJVAPCD is responsible for developing attainment plans for the SJVAB, for inclusion in California's SIP, as well as establishing and enforcing air pollution control rules and regulations. The attainment plans must demonstrate compliance with federal and state ambient air quality standards, and must first be approved by CARB before inclusion into the SIP. The SJVAPCD regulates, permits, and inspects stationary sources of air pollution. Among these sources are industrial facilities, gasoline stations, auto body shops, municipal solid waste landfills, and dry cleaners.

While the State is responsible for emission standards and controlling actual tailpipe emissions from motor vehicles, the SJVAPCD is required to regulate emissions associated with stationary sources such as agricultural burning and industrial operations. The SJVAPCD also works with eight local transportation planning agencies to implement transportation control measures, and to recommend mitigation measures for new growth and development designed to reduce the number of cars on the road. The SJVAPCD promotes the use of cleaner fuels, and funds a number of public and private agency projects that provide innovative approaches to reducing air pollution from motor vehicles.

The WWTP site is located in the City of Merced within the SJVAB. The SJVAB is designated severe non-attainment for the federal 1-hour ozone standard and serious non-attainment for the federal PM_{10} standard. In April 2004, the USEPA approved the SJVAPCD's appeal to downgrade its federal 1-hour ozone non-attainment status from severe to extreme. While all criteria pollutants

are a concern of the SJVAPCD, and a project is considered significant if it violates any of the state air quality standards, ozone precursors, PM_{10} emissions, and toxic air contaminants are emphasized in the review of applications for an Authority to Construct/Permit to Operate. Federal and state air quality laws also require regions designated as non-attainment to prepare plans that either demonstrates how the region will attain the standard or that demonstrate reasonable improvement in air quality conditions. As noted, the SJVAPCD is responsible for developing attainment plans for the SJVAB, for inclusion into California's SIP.

The SJVAPCD's primary means of implementing the above air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by the SJVAPCD's permit authority over such sources and through its review and planning activities. In 2001, the 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 PM_{10} Attainment Demonstration Plan. The PM_{10} Attainment Demonstration Plan emphasizes reducing fugitive dust as a means of achieving attainment of the federal standards for PM_{10}.

The SJVAPCD limits emissions of, and public exposure to, toxic air contaminants through a number of programs to include the risk reduction program. District Rules 1905, Risk Management Policy for Permitting New and Modified Sources and 1910, Toxic Best Available Control Technology for New and Modified Diesel Internal Combustion Engines, provide guidelines on permitting sources that emit TACs (also referred to interchangeably by the District as HAPs).

Additional SJVAPCD Rules applicable to the Project are described below:

- District Rule 2201 (New and Modified Stationary Source Review Rule). This rule applies to all new stationary sources and all modifications of existing stationary sources that are subject to the SJVAPCD permit requirements and after construction emit or may emit one or more affected pollutants.
- District Regulation VIII (Fugitive PM_{10} Prohibitions). Regulation VIII (Rules 8011-8081) is a series of rules designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction, road construction, bulk materials storage, landfill operations, etc. The Dust Control Plan threshold applies to projects that are 5.0 or more acres in size for non-residential sites.

  Regulation VIII specifically addresses the following activities:

  - Rule 8011: General Requirements
  - Rule 8021: Construction, Demolition, Excavation, Extraction and other Earthmoving Activities
  - Rule 8031: Bulk Materials
  - Rule 8041: Carryout and Trackout
  - Rule 8051: Open Areas

  - Rule 8061: Paved and Unpaved Roads
  - Rule 8071: Unpaved Vehicle/Equipment Traffic Areas
- District Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). If asphalt paving will be used, then paving operations on this project will be subject to Rule 4841. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt, and emulsified asphalt for paving and maintenance operations.
- District Rule 4102 (Nuisance). This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and subject to SJVAPCD enforcement action.
- District Rule 4311 (Flares). This rule applies to any major source that owns and operates flares.
- District Rule 4625 (Wastewater Separators). This rule applies to wastewater separators, which are any device or equipment used to remove oil and associated chemicals from water, or any device, such as a flocculation tank, clarifier, etc. that removes petroleum-derived compounds from wastewater.

On December 15, 2005, SJVAPCD Rule 9510 Indirect Source Review (ISR) was adopted to fulfill the SJVAPCD's emission reduction commitments in the PM_{10} and Ozone Attainment Plans. Rule 9510 requires the submittal of an Air Impact Assessment (AIA) application no later than applying for a final discretionary approval with the public agency. The assessment will be the information necessary to calculate both construction and operational emissions of a development project.

Section 6.0 of the Rule outlines general mitigation requirements for developments that include reduction in construction emissions of 20 percent of the total construction nitrogen oxide emissions, and 45 percent of the total construction PM_{10} exhaust emissions. Section 6.0 of the Rule also requires the Project to reduce operational nitrogen oxide emissions by 33.3 percent and operational PM_{10} emissions by 50 percent.

3.6.4 Existing Air Quality

The CARB and the SJVAPCD regional air quality monitoring network provide information on ambient concentrations of non-attainment criteria air pollutants. The closest monitoring stations to the WWTP and the only ones in Merced County are located on South Coffee Avenue (monitors ozone) and on M Street (monitors PM_{10} and $PM_{2.5}$) in the City of Merced. The next closest carbon monoxide monitoring site is in Turlock (in Stanislaus County), approximately 40 miles to the northeast. Table 3-6 presents a five-year summary of air quality data collected at the monitoring stations for ozone and particulate matter, the two pollutants for which the SJVAB remains "non-attainment." Table 3.6 also includes a comparison of monitored air pollutant concentrations with the state and national ambient air quality standards.

TABLE 3-6
AIR QUALITY DATA SUMMARY (2001–2005) FOR THE CITY OF MERCED AREA

Pollutant	Standard[c]	Monitoring Data				
		2001	2002	2003	2004	2005
Ozone[a]						
Highest 1-Hour Average (ppm)[d] Highest 1-Hour Average, ppm[c]		**0.113**	**0.138**	**0.122**	**0.114**	**0.100**
Days over State Standard Exceedances[d]	0.09	26	55	54	14	6
Days over National Standard	0.12	0	2	0	0	0
Highest 1-Hour Average (ppm)[d] Highest 1-Hour Average, ppm[c]		**0.105**	**0.125**	**0.110**	**0.109**	**0.093**
Days over National Standard Exceedances[d]	0.08	29	56	54	15	3
Particulate Matter (PM_{10})[b]						
Highest 24-hour average ($\mu g/m^3$)[d] Highest 8-hour average, ppm[c]		**113**	**85**	**75**	**57**	55
Est. Days over State Standard[e] Exceedances	50	N/A	85	44	12	N/A
Est. Days over National Standard[e]	150	0	0	0	0	0
State Annual Average ($\mu g/m^3$)[d, f]	20	**33**	**34**	**33**	**29**	N/A
Fine Particulate Matter ($PM_{2.5}$)[b]						
Highest 24-hour average ($\mu g/m^3$)[d] Highest 8-hour average, ppm[c]		**80**	**66**	**47**	**53**	N/A
Est. Days over National Standard[e]	65	1	1	0	0	N/A
National Annual Average ($\mu g/m^3$)[d, g]	15	14.5	**18.8**	**15.7**	**15.2**	N/A

SOURCE: CARB, 2006

NOTE: Values in **bold** exceed applicable standard.

NA = Not Available.

[a] Samples collected at Merced-S. Coffee Avenue.
[b] Samples collected at Merced-2334 M Street.
[c] Generally, state standards are not to be exceeded and national standards are not to be exceeded by more than once per year.
[d] ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter.
[e] Particulate matter is not measured every day of the year. Estimated days over the standard are based on 365 days per year.
[f] State annual average, which is the geometric mean of all measurements; in July 2003 the averaging method was revised from geometric to arithmetic mean.
[g] National annual average, which is the arithmetic mean of the four arithmetic quarterly averages.

3.7 Major Botanical Features and Important Fish and Wildlife

Biological resources were identified using pertinent literature, database queries, and reconnaissance field surveys of the Project site on August 3, November 15–17, and December 6, 2005. Wildlife habitats and plant communities were mapped using aerial photograph interpretation and verification on the ground in November 2005.

The wildlife habitats identified in this section generally follow those described in CDFG's *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988), which generally correlate with plant communities. Plant communities are assemblages of plants found growing together (Daubenmire, 1968) and are defined by the presence and composition of dominant plant species. Where appropriate wildlife habitat descriptions were not available, general plant

community types are provided. **Figure 3-2** shows the locations of the major habitats and plant communities identified at the Project site. **Appendix D** contains a list of plant species, including common and scientific names, observed onsite.

Annual Grassland

Approximately 24.1 acres of annual grassland occur adjacent to a segment of Hartley Slough in the Project study area (**Figure 3-2**). This area was formerly used as a peach pit disposal site and standing dead peach trees occur sporadically along the eastern edge of this plant community. Thick deposits of peach pits are present in some areas. Dominant plant species include soft chess, foxtail barley, ripgut brome, common tarweed, and scattered big saltbush shrubs also occur. More ruderal areas are dominated by non-native forbs including shortpod mustard, milk thistle, perennial pepperweed, and prickly lettuce. In low-lying areas of the floodplain of Hartley Slough, the vegetation is generally taller and more diverse with an assemblage of native perennial species including salt grass, creeping wildrye, Baltic rush, and alkali heath. These stands of native perennials are interspersed with annual grasses including soft chess, foxtail barley, and ripgut brome. The grassland area also has occasional bare depressions edged by rabbitsfoot grass, rusty molly, and salt grass. A small stand of mature Goodding's willow trees with an understory of annual grasses, milkthistle, and dense, homogenous stands of perennial pepperweed occur within the floodplain as well.

Field mice (*Peromyscus maniculatus*), California vole (*Microtus californicus*), and a variety of birds such as northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), and goldfinches were noted using the annual grassland habitat.

Alkali Scrub

Approximately 48.0 acres of alkali scrub occur in the former peach pit disposal site and standing dead peach trees are scattered throughout this plant community (Figure 3-2). After the area was no longer used as a disposal site, the CDFG planted it with big saltbush and Arizona cypress to create wildlife habitat. This plant community is characterized by dense thickets of big saltbush shrubs with little to no understory. Cover ranges from continuous to intermittent. Associated shrub and small tree species include peach trees, coyote brush, and blue elderberry. Canopy openings between shrubs are dominated by homogenous stands of poison hemlock or annual grassland. In grassland openings, grasses such as soft chess, foxtail barley, and salt grass are prevalent along with perennial herbaceous species such as shortpod mustard, milkthistle, and common tarweed. A few Goodding's willows and Arizona cypress occur within this plant community as well. An area approximately 15 feet wide, between the edge of this vegetation and access roads, has been recently disked and lacks vegetative cover.

SOURCE: GlobeXplorer, 2002; and ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 3-2

Habitats and Plant Communities

Wildlife species using this alkali scrub habitat include coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus audubonii*), feral cat (*Felis domesticus*), and several bird species including western scrub jay (*Aphelocoma californica*), white-crowned sparrow (*Zonotrichia leucophrys*), Lincoln's sparrow (*Melospiza lincolnii*), and loggerhead shrike (*Lanius ludovicianus*).

Eucalyptus

Approximately 20.6 acres of eucalyptus occur in the Project study area (**Figure 3-2**). This habitat is characterized by a closed canopy of mature blue gum trees with a sparse understory of annual grasses and non-native forbs. Understory components include blue gum saplings, milkthistle, prickly lettuce, poison hemlock, and grasses including salt grass, ripgut brome, and foxtail barley. The northern portion of this habitat was recently burned and lacks an understory. The remaining understory appears to have been mowed sometime during the growing season. This area is being cleared and approximately one-third of the original stand has been removed.

Wildlife species using this habitat are mainly bird species which feed, roost, and nest in the eucalyptus trees. Several red-tailed hawks (*Buteo jamaicensis*) were observed in the trees.

Fresh Emergent Wetland

Approximately 8.0 acres of fresh emergent marsh occur at the Project study area within the ordinary high water mark of Hartley Slough (**Figure 3-2**). Common plant species observed in this habitat included common tule, broad-leaved cattail, stinging nettle, common water smartweed, and common rush. This type of vegetation is also currently established within the agricultural drainage ditches in the study area; however, these features are periodically maintained to remove vegetation. Therefore, the establishment of this plant community in ditches is ephemeral in nature and not a permanent feature.

Wildlife using the fresh emergent marsh largely includes wading birds and waterfowl species such as great blue heron, great egret, American coot (*Fulica americana*), and mallard (*Anas platyrhynchos*). Several black-crown night herons (*Nycticorax nycticorax*) were observed roosting in the tule growth. Red-winged blackbirds (*Agelaius phoeniceus*), and aquatic reptiles and amphibians such as garter snake (*Thamnophis* sp.), pond turtle (*Clemmys marmorata*), and frogs (*Rana* sp.) also use this habitat.

Seasonal Wetland

Approximately 2.7 acres of low-lying floodplain adjacent to Hartley Slough support a nearly continuous cover of seasonal wetland vegetation (**Figure 3-2**). The basin lies between the levee berm of Hartley Slough and the elevated adjacent annual grassland and alkali scrub habitats. This floodplain acts as a detention basin for over-the-bank flows during severe storms. The vegetation within the basin ranges from dense homogenous stands of perennial pepperweed to mixed stands of perennial pepperweed, common tule, and narrow-leaved milkweed and areas dominated by

Baltic rush, common tarweed and rabbitsfoot grass. A few mature edible fig trees and scattered areas of bare ground also occur in this wetland feature.

Seasonal wetlands may support a variety of wildlife. A diversity of birds, invertebrates, some amphibian, and few reptiles may use ponded areas for food, cover, and/or breeding. Given the abundance of tall vegetation in the seasonal wetland habitat in the Project study area, species such as red-winged blackbird and northern harrier are likely to be seen.

Riverine

Hartley Slough is a perennial drainage channel that is characterized by both open water and fresh emergent marsh habitat (**Figure 3-2**). While the total average channel width is approximately 30 feet within the Project study area, the area of open water is only approximately 15 feet due to the fresh emergent marsh along the edge of the slough. Therefore, approximately 2.1acres (6,048 linear feet) of open water habitat occurs in Hartley Slough in the Project study area. This steep-sided channel flows in a southwesterly direction. One beaver dam was observed in Hartley Slough, and the presence of this feature likely contributes to the upstream establishment of emergent wetland species within the channel.

Informal surveys for aquatic macroinvertebrates were conducted in Hartley Slough on August 8, and December 6, 2005 to characterize the general aquatic populations, diversity, and structure in the waterway upstream and downstream of the WWTP effluent discharge. Three sampling locations were used: (1) where Gove Road crosses Hartley Slough, near the entrance to the WWTP; (2) upstream from the confluence of Miles Creek and Hartley Slough; and (3) downstream from the confluence of Miles Creek and Hartley Slough. Generally, species diversity and abundance of macroinvertebrates appeared to increase from upstream to downstream sampling locations. Invertebrates collected included mayflies, water boatmen, damselflies and dragonflies, and various midges, all of which are important indicators of water quality. Chironomid midges and water boatmen were the most abundant taxa in the samples. In general, the results indicate that Hartley Slough supports a diverse population of macroinvertebrates indicative of non-degraded water quality, both upstream and downstream of the existing effluent discharge.

Several common carp (*Cyprinus carpio carpio*), mosquitofish (*Gambusia affinis*), and Sacramento pikeminnow (*Ptychocheilus grandis*) have been observed in the slough and channels at the Project study area. Garter snakes may also use this habitat. Great-horned owls have been observed roosting in the fig trees on the edge of the seasonal wetland habitat.

Developed Habitats

Approximately 113.5 acres of the Project study area are developed and include the WWTP facilities, paved and unpaved roads, and parking lots (**Figure 3-2)**. The majority of the developed are is composed of sludge drying beds located south of the WWTP. The roads are sparsely to densely vegetated along the edges by ruderal species including poison hemlock, prickly lettuce,

Johnson grass, and everlasting cudweed. Landscaped areas within WWTP facilities include a solid groundcover of iceplant, a row of oleander shrubs, scattered ornamental pines, and lawn.

Diversity of wildlife species in developed areas is typically low and limited to those species that are associated with human activity, including rock pigeon (*Columba livia*), American crow, house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). Several California ground squirrels (*Spermophilus beecheyi*) were observed along the edge of the iceplant where the ground slopes down into a basin. Several ground squirrel burrows were noted in this area and along the roads as well.

Ruderal

Approximately 7.7 acres of ruderal habitat occur throughout the Project study area (**Figure 3-2**). Ruderal areas are generally in disturbed or maintained areas and are characterized by a predominance of invasive non-native plant species. Dominant species are generally tall-growing invasive species such as poison hemlock, perennial pepperweed, prickly lettuce, and shortpod mustard interspersed with annual grasses such as Italian ryegrass, foxtail barley, and soft chess. The ruderal area between the alkali scrub and eucalyptus stand appears to have been recently mowed and the dominant species include fiddle dock (*Rumex pulcher*), prickly lettuce, and milkthistle. Scattered big saltbush shrubs and blue elderberry are also present. This area has a large brush pile surrounded by dense stand of milkthistle. The ruderal area adjacent to the landfill is characterized by a dense stand of milkthistle and shortpod mustard with some downed eucalyptus trees and debris piles. Areas closer to Hartley Slough are dominated by Italian ryegrass and poison hemlock. The ruderal area in the northernmost portion of Project study area has a few mature Goodding's willow trees with open grassy areas dominated by wild oats, Italian ryegrass, common tarweed, milkthistle, and shortpod mustard. This area appears to be an illegal dump and a significant quantity of trash is scattered about in this area.

Wildlife species that use ruderal habitat are varied and may include American crow (*Corvus brachyrhynchos*), morning dove (*Zenaida macroura*), lizards, and several species of songbirds and burrowing owl that forage in the weedy vegetation.

Disked Field

Approximately 35.0 acres of disked fields occur in the Project study area (**Figures 3-2**). During the site visit, it was noted that these fields had been disked sometime during the growing season and lacked vegetation. Disked fields in the northeastern portion of the project area, adjacent and outside of the current WWTP footprint, are in current agricultural production and had been recently disked. Other areas within the WWTP site had been disked to prevent vegetation overgrowth. In these areas, the vegetation cover ranges from 10 to 60 percent and includes ruderal species such as poison hemlock, Bermuda grass and amaranth. The disked field immediately south-southwest of the existing WWTP plant facilities serves as an emergency overflow retention pond that is rarely needed. The eastern half of this field is characterized by a mostly continuous cover of Italian ryegrass with associated species such as cheeseweed, goosefoot, fiddle dock, and mustard; the center of this area has a few large bare areas. The western half of this field has approximately

45 percent vegetation cover with dominants including Johnson grass, field bindweed, cheeseweed, goosefoot, and common knotweed.

Frequently-disked fields typically provide foraging habitat for wildlife species such as great-egret (*Ardea alba*), great-blue heron (*Ardea herodus*), northern harrier, red-tailed hawk, killdeer (*Charadrius vociferus*), white-tailed kite (*Elanus leucurus*), and burrowing owl.

Landfill

Approximately 3.7 acres of the Project study area is a previous landfill that has been capped and is currently used for surface debris storage (**Figure 3-2**). The area is lined by a gravel base and is characterized by numerous piles of concrete and asphalt rubble. Some vegetation has become established both within the landfill area and along its edges. Established vegetation is dominated by ruderal species including milkthistle, blue gum saplings, yellow starthistle, Italian ryegrass, prickly lettuce, wild oats, foxtail barley, and shortpod mustard. Fence lizards and a feral cat were observed in this area.

Drains and Channels

WWTP Effluent Channel

The effluent channel along the eastern and southern border of the Project study area is a maintained open water channel, which solely carries the treated effluent discharge from the WWTP to Hartley Slough (**Figure 3-2**). Approximately 3.8 acres (8,217 linear feet) of this effluent channel occur in the Project study area. The eastern segment of this channel is slightly wider than the southern segment; its average width is approximately 20 feet. The banks of the effluent channel are maintained and very little vegetation is established. Approximately 80 percent of the channel banks along the eastern segment are bare soil. Where vegetation is present, the dominant plants are generally ruderal species including slender willow herb and prickly lettuce. Portions of the banks of the southern segment of the channel are lined with concrete rubble with only approximately 10 percent vegetation cover. Johnson grass, slender willowherb, common water smartweed, and water cress were observed the southern segment.

Agricultural Ditches

Approximately 1.3 acres (7,756 linear feet) of agricultural drainage ditches occur in the Project study area **(Figure 3-2)**. These ditches are periodically maintained; however, accounts of existing vegetation are provided below for descriptive purposes.

Ditch D-1 extends along Gove Road in the northern portion of the Project study area. Approximately 0.1 acre (548 linear feet) of this feature occurs in the Project study area. The ditch averages 5 feet in width. The channel has continuous cover of dense emergent vegetation both within the channel and on the channel banks. Dominant species include Johnson grass, slender willow herb, panicgrass, common water smartweed.

Ditch D-2 (Hartley Lateral), which is confluent with Hartley Slough, is approximately 0.4 acre (1,714 linear feet) and ranges in cover of fresh emergent marsh vegetation. The ditch's average

width is 10 feet. The northern segment of this ditch is maintained and supports a sparse cover of emergent marsh vegetation along its lower banks. Dominant plant species include broad-leaved cattails, panicgrass, mustard, and common monkeyflower. The channel's upper banks are dominated by the ruderal species field sow thistle. In the middle segment, vegetation cover is dense and dominant species within the channel and on the channel banks include common tule, common water smartweed, and common rush. In its southern extent, where the ditch flows through a stand of blue gum eucalyptus, emergent vegetation is sparse and primarily restricted to channel banks. Dominant species in this segment of the drainage include common rush, tall flatsedge, dallis grass, Goodding's willow saplings, and common tule.

Ditch D-3 (Paden Drain), which is also confluent with Hartley Slough, is approximately 10 feet wide in the Project study area and varies in the amount of emergent vegetation cover along its extent. Approximately 0.5 acre (2,205 linear feet) of this feature occurs in the Project study area. In the channel segment adjacent to the landfill, the ditch has approximately 50 percent cover of emergent marsh vegetation. The dominant emergent species within this segment of the channel include common tule, common rush, and broad-leaved cattail. The upper channel banks are lined by scattered mature riparian trees including Oregon ash, Goodding's willow, and edible fig with an almost continuous understory of poison hemlock and milkthistle. The segment of this drainage that parallels the existing WWTP facility has been recently maintained and supports little emergent vegetation. Only the lowest portion of the channel banks has vegetation cover consisting primarily of tall flatsedge and mustard.

Ditch D-4 is approximately 5 feet wide in the Project study area and varies in the density and amount of emergent vegetation cover throughout its extent. Approximately 0.4 acre (3,289 linear feet) of this feature occurs in the Project study area. The ditch generally supports sparse emergent vegetation in its northern extent and continuous cover of emergent vegetation in its southern extent near its confluence with Miles Creek. The drier northern segment has tall flatsedge established within the channel and ruderal species such as prickly lettuce on the channel banks. The wetter southern segment is characterized by dense emergent vegetation both within the channel and on the channel banks including common water smartweed, tall flatsedge, slender willowherb, mugwort, and Johnson grass.

3.8 Threatened or Endangered Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as deserving special consideration. Some of these species receive specific legal protection pursuant to federal 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 because of their federal or state designation or other regulatory status as follows:

- Listed species or candidates for listing, in accordance with the Federal Endangered Species Act
- Listed species in accordance with the California Endangered Species Act, or fully protected species in California as designated by the CDFG
- Species identified as Species of Concern by CDFG or USFWS
- Species protected by the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act
- Species included in the California Natural Diversity Database (CNDDB)
- Species that meet the definition of "Rare" in accordance with CEQA Section 15380

A list of regionally occurring special-status plant and animal species was compiled (Appendix C) based on a review of pertinent literature and sources. For each species, range and habitat requirements were assessed and compared to the habitats present at the Project study area. Based on this review, the Project study area has potential habitat for 10 special-status plant species and 17 special-status wildlife species. Those special-status species which have a medium or high potential to occur on the Project study area are listed in Table 3-7 (see Appendix C for definitions of "Potential for Occurrence"). Figure 3-3 depicts habitat for several special-status species whose habitat requirements do not overlap with plant communities mapped in Figure 3-2.

3.9 Critical Habitats

Of the federally-listed species listed in Table 3-7, critical habitat is designated for several species, including the valley elderberry longhorn beetle (FR 45:52803), and conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Hoover's spurge, and Colusa grass (FR 68:46683). However, the WWTP site is not located within designated critical habitat for these species. The critical habitat of the valley elderberry longhorn beetle only occurs on the American River in the vicinity of Sacramento, California. The closest vernal pool crustacean and plant critical habitat is about 17 miles east of the WWTP site in eastern Merced County; while other identified habitat is found about 10 miles northeast of the WWTP near the UC-Merced campus.

3.10 Wetlands and Other Waters of the U.S.

A wetland delineation of the WWTP site was conducted in accordance with the U.S. Army Corps of Engineers' (Corps) Wetlands Delineation Manual (Environmental Laboratory, 1987). This delineation has not yet been verified by the Corps, but it is the professional opinion of the delineators that not all of the ditches or channels are jurisdictional waters of the United States. A total of 13.7 acres of jurisdictional waters of the United States were found to occur within the WWTP site consisting of 10.7 acres of wetlands and 3.0 acres of other waters of the United States.

TABLE 3-7
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN PROJECT AREA

Scientific Name Common Name	Listing Status (Federal/ State/CNPS)	Blooming Period	General Habitat	Potential for Occurrence
Plants				
Atriplex cordulata Heartscale	FSC/--/1B	April - October	Alkali scrub, alkali seasonal wetlands and grassland. Often found in sandy soils of alkaline flats and scalds in the Central Valley; up to 1,200 feet in elevation	Medium: Potential habitat in alkali scrub, seasonal wetland, and grassland.
Atriplex depressa Brittlescale	FSC/--/1B	May - October	Alkali scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools with alkaline and clay soils; up to 1,100 feet in elevation	Medium: Potential habitat in alkali scrub, seasonal wetland, and grassland.
Atriplex minuscula Lesser saltscale	FSC/--/1B	May - October	Alkali scrub, playas, and valley and foothill grassland with sandy, alkaline soils; up to 650 feet in elevation	Medium: Potential habitat in alkali scrub and grassland.
Atriplex subtilis Subtle orache	SLC/--/1B	June - October	Valley and foothill grassland; up to 350 feet in elevation	Medium: Potential habitat present in the grassland.
Cordylanthus mollis ssp. *hispidus* Hispid bird's-beak	FSC/--/1B	June - September	Meadows and seeps, playas, and valley and foothill grassland with alkaline soils; up to 500 feet in elevation	Medium: Potential habitat in grassland and seasonal wetland.
Delphinium recurvatum Recurved larkspur	FSC/--/1B	March - May	Alkali scrub, cismontane woodland, and valley and foothill grassland with alkaline soils; up to 2,500 feet in elevation	Medium: Potential habitat in alkali scrub and grassland.
Navarretia nigelliformis ssp. *radians* Shining navarretia	--/--/1B	May - July	Cismontane woodland, valley and foothill grassland, and vernal pools; up to 3,300 feet in elevation	Medium: Potential habitat in grassland.
Navarretia prostrata Prostrate navarretia	FSC/--/1B	April - July	Coastal scrub, valley and foothill grassland with alkaline soils, and vernal pools or mesic areas; up to 2,500 feet in elevation	Medium: Potential habitat in grassland and seasonal wetland.
Phacelia ciliata var. *opaca* Merced phacelia	FSC/--/1B	February – May	Valley and foothill grassland, often associated with adobe or clay soils of valley floors, open hills, or alkaline flats; up to 500 feet in elevation	Medium: Potential habitat in annual grassland.
Sagittaria sanfordii Sanford's arrowhead (=Valley sagittaria)	FSC/--/1B	May - October	Marshes and swamps, assorted shallow freshwater features; up to 2,000 feet in elevation	Medium: Potential habitat present in Hartley Slough.
Invertebrates				
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT/--/--		Breeds and forages exclusively on blue elderberry shrubs (*Sambucus mexicana*) below 3,000 feet in elevation.	High: May occur in the 30 elderberry shrubs detected onsite during 2005 surveys.

TABLE 3-7
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN PROJECT AREA

Scientific Name Common Name	Listing Status (Federal/ State/CNPS)	Blooming Period	General Habitat	Potential for Occurrence
Reptiles				
Emys (=Clemmys) marmorata Western pond turtle	FSC/CSC/--		Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying.	Medium: May occur in Hartley Slough or adjacent effluent conveyance ditch.
Gambelia (=Crotaphytus) sila) sila Blunt-nosed leopard lizard	FE/SE, CFP/--		Occurs in open valley and foothill grasslands, valley saltbush scrub, and alkali playa communities of the San Joaquin Valley, Carrizo Plain, and Cuyama Valley. Uses small mammal burrows for refuge.	Medium: May occur in alkali scrub.
Thamnophis gigas Giant garter snake	FT/ST/--		Freshwater marsh, low gradient streams, drainage canals, and irrigation ditches; uplands within about 200 feet of aquatic habitat.	Medium: May occur in Hartley slough or within adjacent Miles Creek.
Birds				
Agelaius tricolor Tricolored blackbird	FSC/CSC/-- (nesting colony)		Largely endemic to California, most numerous in the Central Valley and nearby vicinity. Requires open water, protected nesting substrate, and foraging grounds within vicinity of the nesting colony.	High: May breed or forage in Project area. Observed in Project vicinity (CDFG unpublished data).
Athene cunicularia Burrowing owl	FSC/CSC/-- (burrow sites)		Open, dry annual or perennial grasslands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals.	Medium: May breed or forage in irrigation ditches and agricultural fields surrounding the Project area.
Buteo regalis Ferruginous hawk	FSC/CSC/-- (wintering)		Uncommon wintering species throughout the Central Valley. Forages for rodents over open country.	Medium: May occur in winter in grasslands and agricultural lands in Project area and its vicinity.
Buteo swainsoni Swainson's hawk	FSC/ST/-- (nesting)		Forages in grasslands and open agricultural fields. Breeds in oak savanna and riparian areas.	High: May breed or forage in Project area. CNDDB (2005) documents 7 active nests within 10 miles of Project area. Nearest recently active nest is 4.5 miles from Project area.
Charadrius montanus Mountain plover	FSC/CSC/-- (wintering)		Winters in barren agricultural fields and grasslands with sparse vegetation between September and March.	Medium: May occur in agricultural fields surrounding the Project area.

TABLE 3-7
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN PROJECT AREA

Scientific Name Common Name	Listing Status (Federal/ State/CNPS)	Blooming Period	General Habitat	Potential for Occurrence
Elanus leucurus White-tailed kite	FSC/CFP/-- (nesting)		Nests in dense oak, willow, or other tree stands near open grasslands, meadows, farmlands, and emergent wetlands for foraging.	High: May breed or forage in eucalyptus and agricultural fields surrounding Project area. Observed during November 2005 reconnaissance survey.
Grus canadensis tabida Greater sandhill crane	--/ST, CFP/-- (nesting, wintering)		Winters in the Central Valley within annual and perennial grasslands, croplands, and freshwater emergent wetlands.	High: May occur in winter on Project area in annual grassland and agricultural lands. Observed during November 2005 reconnaissance survey.
Lanius ludovicianus Loggerhead shrike	FSC/CSC/-- (nesting)		Nests in dense shrub or tree foliage; forages in scrub, open woodlands, grasslands, and croplands.	High: May breed or forage in Project area. Observed during November 2005 reconnaissance survey.
Mammals				
Dipodomys heermanni dixoni Merced kangaroo rat	FSC/--/--		Subspecies of Heerman's kangaroo rat. In annual grassland, coastal scrub, mixed and montane chaparral, and open/sparse valley foothill woodland.	Medium: Potential habitat in annual grassland in Project area.
Perognathus inornatus inornatus San Joaquin pocket mouse	FSC/--/--		Typically found in grasslands and blue oak savanna; needs friable soils.	Medium: Potential habitat in annual grassland in Project Area.
Taxidea taxus American badger	--/CSC/--		Occurs in a wide variety of open forest, shrub, and grassland habitats that have friable soils for digging.	Medium: Potential habitat in annual grassland in Project area.
Vulpes macrotis mutica San Joaquin kit fox	FE/ST/--		Annual grasslands or grassy open stages with scattered shrubby vegetation. Requires suitable prey base and loose-textured soils for burrowing.	High: Known to occur in western San Joaquin Valley near Project area. CNDDB (2005) documents five occurrences within 10 miles of Project Area.

Approximately 8.0 acres of fresh emergent marsh (bulrush vegetation series) occur within Hartley Slough (**Figure 3-2**) at the Project study area. These wetlands are seasonally to permanently flooded, depending on the frequency of flow and water levels within the slough, and are characterized by erect, rooted herbaceous hydrophytes. These emergent wetlands are within the channel bed and along the channel's lower banks.

SOURCE: GlobeXplorer, 2002; and ESA, 2006

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Figure 3-3

Special-Status Species Habitats

Emergent marsh extends along the lower bank within the channels ordinary high water mark. The width of emergent marsh varies from a few feet to approximately 20 feet. The dominant marsh species is the common tule; associated species include broad-leaved cattail, common rush, and stinging nettle. The Hartley Slough's upper banks are dominated by non-native invasive species, including poison hemlock and perennial pepperweed. While the slough lacks a riparian corridor, scattered trees and shrubs have established along its edge including Goodding's willow, blue gum, edible fig, tobacco tree, and northern California black walnut hybrid.

One segment of channel has a closed canopy overstory of blue gum eucalyptus with lower channel banks dominated by common rush and tall flatsedge and upper banks dominated by salt grass. The small segment of Harley Slough in the northernmost portion of the Project study area on the west side of Gove Road has a dense swath of emergent vegetation along its southern bank that is approximately 15 feet wide and dominated by common tule with occasional broad-leaved cattail and stinging nettle. However, the northern bank appears to be maintained and generally lacks emergent vegetation. The sparse vegetation on the northern bank includes common tarweed, shortpod mustard, and milkthistle; small scattered common tule is present. The slough channel on the east side of Gove Road is well maintained and has little instream vegetation. This segment has pockets of common tule within the channel, but the channel banks are dominated by ruderal species including Johnson grass, common water smartweed, slender willowherb, and dallis grass.

Approximately 2.7 acres of seasonal wetland occur at the Project study area (Figure 3-2). One seasonal wetland feature occurs in the floodplain of Hartley Slough within a low-lying basin that likely retains overbank flow from Hartley Slough. Plant species observed in this habitat are described in Appendix C.

A total of approximately 3.0 acres (10,015 linear feet) of other waters of the United States were identified in the Project study area including Hartley Slough and three agricultural ditches (Figure 3-2). These features are described in detail in Appendix C.

3.11 Designated Wild and Scenic Rivers

No designated wild and scenic rivers occur in the Project area or would be affected by expansion of the WWTP.

3.12 Water Resources

3.12.1 Surface Water Features

The WWTP site is located within the 2,665-square-mile Merced Hydrologic Area (USGS Cataloging Unit 1804-0001), part of the San Joaquin River Basin. The basin covers 15,880 square miles, with its major river systems consisting of the San Joaquin River and its larger tributaries, the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers (CVRWQCB, 1998). Within this basin, both groundwater and surface water (streams and

reservoirs) are significant water sources for both urban and agricultural users. The San Joaquin River drains to the Delta and subsequently empties into San Francisco Bay.

Surface waters within the immediate vicinity of the WWTP site drain into Hartley Slough. Hartley Slough borders the western perimeter of the WWTP site and flows in a southwesterly direction to Owens Creek; eventually flowing to Deep Slough and the San Joaquin River. Flows in Hartley Slough are influenced by irrigation return flows, stormwater runoff, WWTP treated effluent, and groundwater base flows.

During the summer, water levels within Hartley Slough near the WWTP are at their highest because of a surface water diversion/impoundment downstream of the WWTP. The channel retains some natural features (e.g., riparian vegetation, bank) along the City's property. However, north of Gove Road Bridge, Hartley Slough is channelized and regularly maintained. To the City's knowledge, no flow data are available for Hartley Slough; however, it is thought that the City's effluent discharge is a major contributor during much of the year.

The natural drainage pattern of surface waterways within the vicinity of the WWTP has been highly modified by the installation of an extensive agricultural drain system. As a consequence, surface water in the immediate area travels though a network of canals, laterals, and drains operated by Merced Irrigation District. These canals vary from unimproved dirt ditches to concrete-lined canals. The modified hydrologic regime through this system provides water for a variety of beneficial uses including agriculture, municipal and industrial, and recreation uses.

The existing WWTP site has two main drain systems. One drain system conveys stormwater, basin, and plant drainage from the WWTP facilities to the existing influent box, near the headworks. The second drain system pumps drainage water from the reactor basins, secondary clarifiers, and chlorine contact basin to the emergency retention pond, located to south of the WWTP.

3.12.2 Groundwater Resources

The WWTP overlies a portion of the Merced Groundwater Subbasin, which is part of the larger San Joaquin Groundwater Basin that extends north and south through the Central Valley. The Basin consists of unconsolidated sediments derived from the Coast Ranges and the Sierra Nevada (DWR, 2004). Groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. The California Department of Water Resources (DWR) (2000) data show two groundwater depressions south and southeast of the City of Merced during 1999 likely associated with groundwater pumping (DWR, 2004).

The Merced Subbasin contains three water-bearing zones: an unconfined/semi-confined aquifer, located in alluvial deposits, at depths up to 50 feet; at depths between 100 feet and a confined aquifer located in alluvium that is separated from the previous aquifer by a layer of Corcoran Clay, at a depth of 100 to 200 feet; Mehrten formation, 200 to 1,000 feet which is the source of the City's domestic water supply, and a saline groundwater zone located beneath the fresh water deposits in the older marine sediments and rocks (DWR, 2004).

Groundwater levels in the vicinity of the WWTP tend to be relatively shallow. Well data obtained from DWR (Well No. 08S13E09R001M) indicate that generally, depths to groundwater across the Project site average from less than 2 feet to greater than 12 feet below the ground surface (DWR, 2005).

The groundwater in the Merced Subbasin is characterized by calcium-magnesium bicarbonate at the basin interior, sodium bicarbonate to the west, and calcium-sodium bicarbonate to the south. Levels of total dissolved solids range from 100 to 3,600 mg/L, with a typical range of 200 to 400 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 46 wells ranging from 150 to 424 mg/L, with an average value of 231 mg/L. For 10 wells, values for the electrical conductivity range from 260 to 410 micromhos per centimeter (µmhos/cm), with an average value of 291 µmhos/cm. Available water quality data for the subbasin indicate that there are localized areas of high hardness, iron, nitrate, and chloride. (DWR, 2004)

Eleven groundwater monitoring wells are located on the City's WWTP property and extend from the existing sludge drying beds south to the Merced Wildlife Management Area. Local monitoring data collected from 1999 through 2003 are summarized in Appendix E-1 and provide the average, minimum, and maximum concentrations detected for a variety of constituents at each of the 11 monitoring wells. In summary, the data for monitoring wells MW-5, MW-6, and MW-7 show elevated levels of selected constituents within the vicinity of the unlined drying beds. Constituents that exhibit the highest elevated concentrations when compared to offsite wells (e.g., MW-11 that is northeast of the WWTP site) included heavy metals (arsenic, copper, iron, manganese, nickel, and selenium), specific conductance, total dissolved solids, and total organic carbon.

3.12.3 Receiving Water Quality

Hartley Slough

Hartley Slough is identified as an effluent-dominated water body (SWRCB, 2000). Prior to the construction of the existing WWTP and discharge of irrigation-return flows from agricultural areas, Hartley Slough consisted of an ephemeral surface water feature that conveyed surface runoff during rain events and was generally dry during the summer. With the introduction of irrigated agriculture, Hartley Slough began to experience higher flows during the summer irrigation season when it became dominated by irrigation return flows (agricultural drainage). With the addition of effluent discharges from the existing WWTP, flows within Hartley Slough were further augmented resulting in year-round flows downstream of the existing WWTP outfall.

The City routinely monitors surface water quality within Hartley Slough, upstream and downstream of the existing effluent discharge for pH, dissolved oxygen, turbidity, and temperature. Table 3-8 presents the City's 2001-2004 data for these parameters. The tendency is for dissolved oxygen, turbidity, and pH decrease and water temperature increases downstream from the WWTP's effluent discharge. Table 2-2 summarizes average daily discharges from the WWTP.

TABLE 3-8
WATER QUALITY OF HARTLEY SLOUGH
UPSTREAM AND DOWNSTREAM FROM WWTP EFFLUENT DISCHARGE

	pH		Water Temperature (°F)		Turbidity (NTU)		Dissolved Oxygen (mg/L)	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
2001								
Jan	7.9	7.2	47	51	80	92	7.6	7.0
Feb	7.9	7.4	53	57	40	27	8.0	8.5
Mar	7.8	7.4	60	60	41	50	7.9	7.4
Apr	7.8	7.5	61	61	20	37	8.3	7.8
May	7.8	7.5	71	70	113	52	7.9	7.1
Jun	7.9	7.5	70	68	45	45	9.0	7.1
Jul	7.8	7.5	71	71	56	65	8.1	6.1
Aug	7.6	7.5	72	71	58	64	7.5	5.7
Sep	8.0	7.6	69	69	40	42	7.2	6.1
Oct	7.9	7.5	64	65	47	43	7.8	6.3
Nov	7.6	7.5	56	61	98	101	6.8	4.4
Dec	7.7	7.4	51	55	47	14	6.9	7.5
2002								
Jan	7.8	7.4	48	53	24	19	8.7	7.4
Feb	8.0	7.1	50	54	12	10	8.2	7.2
Mar	7.8	7.3	54	59	120	117	8.5	9.1
Apr	7.5	7.1	62	63	79	20	6.8	6.2
May	7.5	7.4	65	65	30	84	7.5	5.3
Jun	7.6	7.3	73	72	84	71	8.2	6.9
Jul	7.8	7.3	74	73	112	78	7.0	6.5
Aug	7.5	7.3	70	71	68	82	6.3	6.0
Sep	7.4	7.3	70	71	87	52	6.4	6.4
Oct	7.3	7.2	62	65	46	28	4.1	7.3
Nov	7.7	7.4	56	62	49	21	4.5	6.4
Dec	7.8	7.6	48	52	19	35	8.9	9.1
2003								
Jan	8.2	7.5	52	58	20	14	9.6	8.1
Feb	7.8	7.5	53	56	40	9	8.5	7.8
Mar	7.8	7.5	56	60	39	19	7.8	7.7
Apr	7.5	7.5	61	62	40	20	5.2	5.9
May	7.5	7.5	69	70	43	32	5.9	6.4
Jun	7.9	7.5	71	71	63	53	6.6	6.2
Jul	7.6	7.4	7.4	7.4	63	58	6.3	5.3
Aug	7.6	7.5	72	74	78	62	5.4	5.8
Sep	7.7	7.5	71	72	116	44	7.3	7.4
Oct	7.6	7.5	66	72	49	16	4.3	7.0
Nov	7.7	7.4	54	54	28	9	5.1	7.9
Dec	7.4	7.4	50	54	27	12	4.3	7.0
2004								
Jan	7.8	7.6	49	59	89	30	5.3	7.9
Feb	7.4	7.4	52	59	68	41	6.8	6.7
Mar	7.5	7.6	60	65	42	24	5.1	7.2
Apr	7.4	7.4	65	70	40	23	6.4	7.0
May	7.7	7,6	67	71	141	69	7.1	7.5
Jun	7.6	7.6	70	71	112	75	7.1	5.7
Jul	7.6	7.4	73	74	121	93	7.2	5.7
Aug	7.4	7.2	70	72	132	79	7.1	5.6
Sep	7.6	7.4	65	69	99	48	6.3	5.6
Oct	7.5	7.5	63	66	106	165	5,9	6.2

Source: ECO:LOGIC, 2006

Notes:
°F = degrees Fahrenheit
NTU = nephelometric turbidity unit
Mg/L = milligram per liter

Water quality data from Hartley Slough show exceedances of the City's WDRs for dissolved oxygen, pH, and temperature. Turbidity concentrations in Hartley Slough do not exceed WDRs, but rather indicate high turbidity level upstream of the City's current discharge point. Documented exceedances of the current WDRs for the City's WWTP are attributed to: (1) large variations in pH upstream of the City's effluent channel and (2) low dissolved oxygen levels and elevated temperatures in the City's effluent.

In addition to regularly monitored water quality parameters, the City has conducted composite sampling for the 126 Priority Pollutants. Data are provided in Appendix E-2. As discussed in Chapter 2.0, Project Description, the City is currently operating under a Mandatory Penalty Complaint for violations of its WDRs for residual chlorine and total coliform bacteria. Additionally, four contaminants, including cyanide, chloroform, dichlorobromomethane, and dibromochloromethane, have been detected in the receiving waters and attributed to the use of chlorine as an effluent disinfectant. The latter three contaminants are commonly referred to as disinfection by-products and are identified as constituents of concern for the Delta by CALFED.

During 2003 and 2004, the City performed toxicity testing of its effluent. The CVRWQCB directed the City to use laboratory water for chronic bioassays involving effluent blending because Hartley Sough water was found to be more toxic than the effluent to the sensitive species used in the bioassays. Current background toxicity of Hartley Slough should not be considered an appropriate basis for planning and analysis of present and future effluent discharges (ECO:LOGIC, 2006).

Impaired Water Body Designation

The SWRCB, in compliance with the Section 303(d) of the Clean Water Act (33 USC 1313(d)) prepared and the USEPA approved a 2002 list of "impaired" water bodies for California. The list includes a priority schedule for the development of total maximum daily loads (TMDLs) for each contaminant or "stressor" affecting the water body. Hartley Slough and Owens Creek are not identified as impaired water bodies according to the list and the TMDL Priority Schedule. However, downstream of the WWTP, the San Joaquin River is identified as an impaired water body for the following contaminants: boron, chlorpyrifos, DDT (dichlorodiphenyltrichloro ethane), diazinon, electrical conductivity, Group A pesticides, mercury, and unknown toxicity (USEPA, 2003).

Beneficial Uses of Hartley Slough

Hartley Slough water quality is currently suitable for a variety of beneficial uses including agricultural irrigation and warm freshwater habitat. As noted in Section 3.7, macroinvertebrate species observed in Hartley Slough, both upstream and downstream of the WWTP effluent discharge, indicate conditions suitable for supporting macroinvertebrate species.

3.12.4 Water Supplies for the Service Area

The area surrounding the WWTP site is served solely by Merced Irrigation District (MID) for agricultural water supplies. Domestic water supplies are obtained from local wells.

3.13 Agricultural Land

3.13.1 Local Farmlands

The Important Farmland map for Merced County produced by the California Department of Conservation's Farmland Mapping and Monitoring Program indicates that a vast majority of the land surrounding the WWTP is classified as Farmland of Statewide Importance or Prime Farmland (CDOC, 2002).[2] Smaller areas of Unique Farmland are also scattered throughout the Project area. Table 3-9 provides farmland conversion statistics for the Project area from 1998–2000. Data provided for Merced County indicate that approximately 4,929 acres of agricultural land were lost to non-agricultural use as of 2002 (CDOC, 2002).

TABLE 3-9
FARMLAND CONVERSION IN MERCED COUNTY, 2000 AND 2002

	Total Acres Inventoried		
Land Use Category	**2000**	**2002**	**Acreage Change**
Prime Farmland	287,160	286,054	-1,106
Farmland of Statewide Importance	157,936	158,405	+469
Unique Farmland	96,355	100,749	+4,394
Farmland of Local Importance	47,621	41,772	-5,849
Grazing Land	581,729	578,892	-2,837
Agricultural Land Subtotal	**1,170,801**	**1,165,872**	**-4,929**

SOURCE: CDOC, 2002

3.13.2 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 land owners 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 than their potential market value.

[2] Four categories of farmland, Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, are considered valuable.

Lands within the proposed WWTP expansion area are not covered by Williamson Act contracts. A majority of the agricultural properties to the west and south of the WWTP property are covered under active Williamson Act contracts.

3.13.3 County Agricultural Zoning

Lands included within the proposed WWTP expansion area and those surrounding the remainder of the City's property are currently designated by Merced County as A-1, General Agricultural use. Section 18.02.020 of Merced County's zoning code outlines allowable land uses and permit requirements for the A-1 zone.

3.13.4 Present Use

The proposed WWTP expansion area and the surrounding lands are currently in agricultural use.

3.14 Cultural Resources

This description provides a brief overview of the prehistory, ethnography, and history of the WWTP site and the surrounding region.

3.14.1 Prehistory

Although the Great Central Valley may have been inhabited by humans as early as 10,000 years ago, the evidence of early human use is mostly buried by alluvial deposits that have accumulated during the last several thousand years. The greatest exception to this has been the prolific discoveries at Tulare Lake,[3] which has yielded evidence of the earliest occupation of California. Nonetheless, later periods are better understood because there is more representation in the archaeological record.

3.14.2 Ethnographic Background

This portion of Merced County was originally inhabited by the Northern Valley Yokuts. Because of the early decimation of the aboriginal populations in the San Joaquin Valley, most information regarding this group is gleaned from the translated accounts of Spanish military and missionaries. A summary of these sources has been compiled by Wallace (1978), and it is on his work that this discussion is based.

Northern Valley Yokuts territory is defined roughly by the crest of the Diablo Range on the west, and the foothills of the Sierra Nevada on the east. The southern boundary is located approximately where the San Joaquin River bends northward; the northern boundary is roughly

[3] An example of the pluvial lakes and marshes (now dry) that covered much of the California interior during the late-Pleistocene and early Holocene (or between about 1 million and 10,000 years ago).

half way between the Calaveras and Mokelumne Rivers. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, perhaps being pushed out of the foothills approximately 500 years ago.

Population estimates for the Northern Valley Yokuts vary from 11,000 to more than 31,000 individuals. Populations were concentrated along waterways and on the more hospitable east side of the San Joaquin River. Villages, or clusters of villages, made up "miniature tribes" (tribelets) lead by headmen. The number of tribelets is estimated at 30 to 40; each tribe spoke their own dialect of the Yokuts language. Combined with the Southern Valley Yokuts and the Foothill Yokuts dialects, these tongues 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.

Most Northern Valley Yokuts groups had their first contact with Europeans in the early 1800s, when the Spanish began exploring the interior of California. The gradual erosion of the Yokuts culture began during the mission period. 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 pushed out of the way and out of their existing territories. Settlement in the San Joaquin Valley applied further pressure to the native groups and altered the landforms and waterways of the valley. Many Yokuts resorted to wage labor on farms and ranches. Others were settled on land set aside for them on the Fresno and Tule River Reserves.

3.14.3 Historic Setting

After an epoch of exploration and colonization by the Spanish, Russians, and, later, Mexicans, the missionization of the indigenous population and the development of presidios and civilian ranchos and pueblos throughout California created unprecedented landscape and social change. The burgeoning secular influence on the political affairs of California in the 19th century led to the sale of lands to non-Hispanics by the early 1830s.

The land south of Sacramento, by 1850, was dominated by Mariposa County, encompassing 30,000-square miles and all of present-day Merced, Madera, Fresno, Kings, Tulare, and Kern Counties. The statewide trends toward greater secularization and Gold-Rush inspired settlement were also a boon for Mariposa County. Present-day Merced County would be organized in 1855. Gabriel Moraga's 1806 expedition originally passed through the county and named the Merced River (*El Rio de Nuestra Senora de la Merced*); later, trappers and explorers, such as John C. Fremont and Jedediah Strong Smith passed through (Marschner, 2000).

The majority of Merced County was settled within three ranchos: *Rancho San Luis Gonzaga, Rancho Panocha de San Juan y Los Carrisalitos,* and *Rancho Sanjon de Santa Rita.* The largest and most interesting is *Rancho San Luis Gonzaga,* which was owned by Juan Perez Pacheco and extended into Santa Clara County. A well-worn trail used by the Yokuts in their trade with coastal Indians served as the main trail between the San Joaquin Valley and the Santa Clara Valley for miners and cattle ranchers. This trail is known as Pacheco Pass today.

Merced County did not truly grow into the agriculturally dominate county it is today until Henry Miller and the Miller and Lux cattle operations became established in the 1860s.

3.14.4 Existing Cultural Resource Conditions

No archaeological deposits were identified during the site survey. No potentially historic buildings or structures exist within the City's WWTP property or surrounding area.

3.15 Coastal Zone Jurisdiction

The Project is located in the interior of California and is not within the jurisdiction of any federal or state Coastal Zone Management Program.

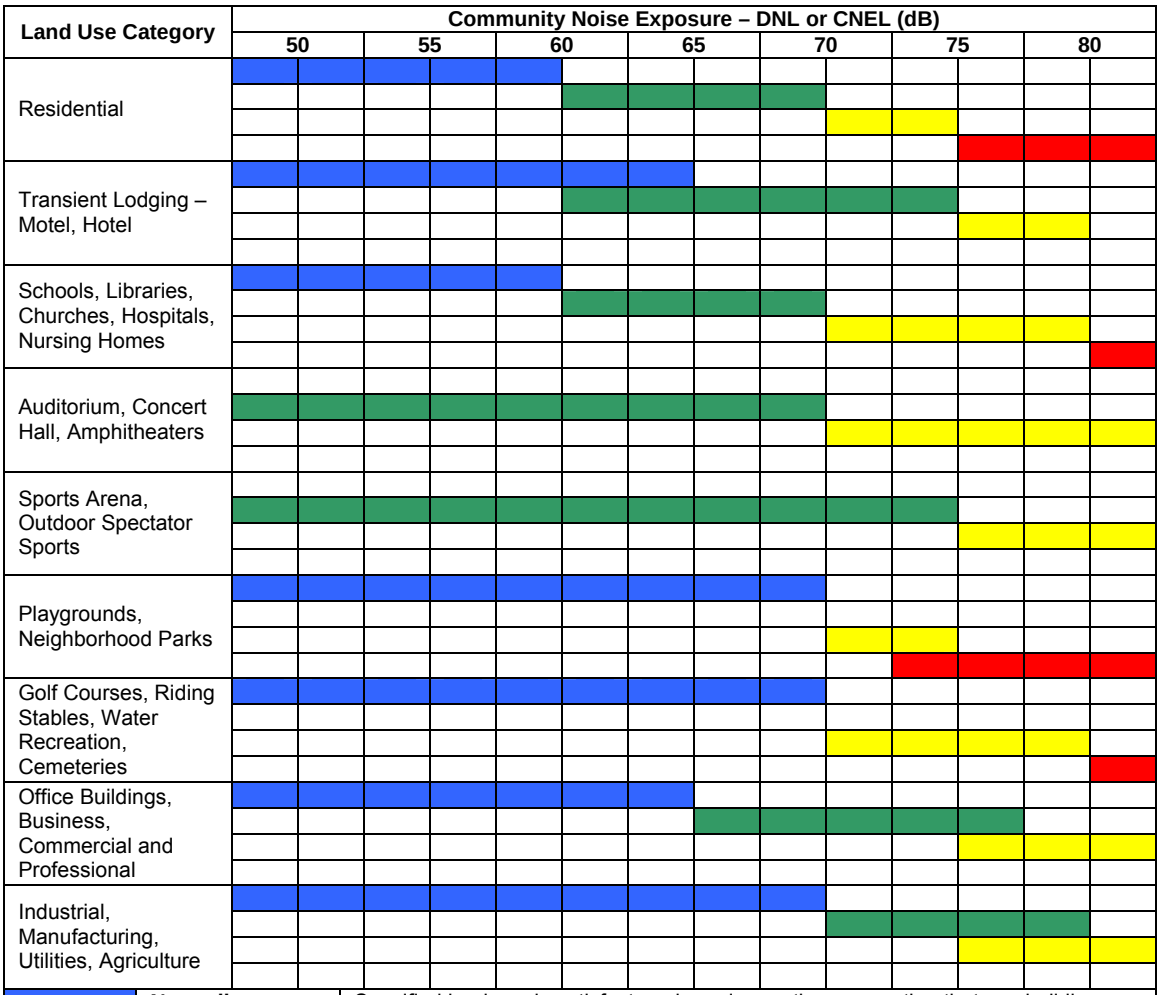
3.16 Floodplain Delineated by FEMA

The Federal Emergency Management Agency designates flood hazard and frequency for cities and counties on its Flood Insurance Rate Maps. Map 06047C042E was developed for the area surrounding the WWTP and indicates that the area is classified as Zone A or areas subject to 100-year flooding (FEMA, 1995). Flood flows would be expected to originate from Hartley Slough, Miles Creek, and Owens Creek. The exception is the WWTP, which is protected by a perimeter levee that rises approximately 6 to 10 feet above the surrounding landscape. The WWTP site is classified as Zone X, which corresponds to areas outside the 100-year floodplain.

3.17 Noise

Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain.

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, corresponding to human sensitivity to various sound frequencies. Some representative noise sources and their corresponding A-weighted noise levels (A-weighted decibels [dBA]) are shown on Figure 3-4. All of the noise levels reported herein are A-weighted unless otherwise stated.



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: City of Merced, 1997

Notes: DNL = 24-hour day and night A-weighed noise exposure level; CNEL = Community Noise Equivalent Level; dB = decibels

Figure 3-4
Land Use Compatibility
for Community Noise Environment

3.17.1 Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 3-4 are representative of measured noise at a given instant; however, they rarely persist consistently over a long period of time. In comparison, community noise varies continuously over a period of time. 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. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources such as aircraft flyovers, vehicle, sirens, etc., which are readily identifiable to the individual. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

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 that 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.

DNL: 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 p.m. and 7 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noise.

CNEL: similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5 dBA "penalty" for the evening hours between 7 p.m. and 10 p.m. in addition to a 10 dBA penalty between the hours of 10 p.m. and 7 a.m.

3.17.2 Effects of Noise on People

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

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

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

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 1998):

- It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA.

- A change in level of 5 dBA is a readily perceptible increase in noise level.

- A 10 dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Noise levels are measured on a logarithmic scale, instead of a linear scale. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than the noise generated by just one of the noise sources (e.g., a noise source of 60 dBA plus another noise source of 60 dBA generate a composite noise level of 63 dBA). To apply this formula to a specific noise source, in areas where existing levels are dominated by traffic, a doubling in the volume of the traffic will increase ambient noise levels by 3 dBA. Similarly, a doubling in the use of heavy equipment, such as use of two landfill dozer/compactors where formerly one was used, would also increase ambient noise levels by 3 dBA. A 3 dBA increase is the smallest change in noise level detectable to the average person. A change in ambient sound of 5 dBA can start to create concern among neighbors.

3.17.2 Noise Attenuation

Stationary "point" sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles (a "line" source), would typically attenuate at a

lower rate, approximately 3 to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans, 1998). Noise from large construction sites (or a landfill with heavy equipment moving dirt and solid waste daily and trucks entering and exiting the main gate daily-activities similar to construction sites) would have characteristics of both "point" and "line" sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

3.17.3 Local Regulations

In California, local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. General Plans identify general principles intended to guide and influence development plans. They recognize that different types of land uses have different sensitivities toward to noise; residential areas are considered to be the most sensitive type of land use to noise and industrial/commercial areas the least sensitive. Noise Ordinances set forth the specific standards and procedures for addressing particular noise sources and activities.

City of Merced General Plan

The Noise Element contained in the City's General Plan (City of Merced, 1997) prescribes noise exposure limits for individual land uses with lower noise limits for noise-sensitive land uses. Figure 3-4 includes these community noise exposure limits.

Merced County General Plan

Merced County has established noise compatibility standards for residential land uses in the Noise Element of the *Merced County Year 2000 General Plan* (Merced County, 1990). The General Plan establishes acceptable interior and exterior residential noise levels from roadway, rail, and air traffic and acceptable daytime and nighttime noise levels from other sources (Table 3-10).

TABLE 3-10
MERCED COUNTY GENERAL PLAN
LAND USE COMPATIBILITY STANDARDS FOR RESIDENTIAL LAND USES

Noise Source	Standard	
Traffic on public roadways, railroad line operations, and aircraft in flight	*Exterior* 65 dB Ldn/CNEL	*Interior* 45 dB Ldn/CNEL
Other Sources	*Daytime (7 a.m. – 10 p.m.)* Hourly Leq of 55 dBA and a maximum level of 75 dBA	*Nighttime (10 p.m. – 7 a.m.)* Hourly Leq of 45 dBA and a maximum level of 65 dBA

SOURCE: Merced County, 1990

Merced County Noise Ordinance

The County of Merced has adopted a sound level limitation in Section 10.60.030 of Chapter 10 of the Merced County Code that restricts the sound level when measured at or within the property line of the receiving property (Merced County, 2004) (Table 3-11).

TABLE 3-11
MERCED COUNTY ORDINANCE SOUND LEVEL LIMITATIONS

Residential Property	Non-Residential Property
Daytime (7 a.m. – 10 p.m.) Not to exceed background sound level by 10 dBA *Nighttime (10 p.m .– 7 a.m.)* Not to exceed background sound level by 5 dBA	
If the background sound level cannot be determined: 65 dBA DNL or 75 dBA Lmax	70 dBA DNL or 80 dBA Lmax

SOURCE: Merced County, 2004

This ordinance does not apply to noise from construction activity provided that all construction in or adjacent to urban areas is limited to between 7 a.m. and 6 p.m. and all construction equipment is properly muffled and maintained.

3.17.4 Sensitive Receptors and Existing Noise Environment

Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, and nursing homes generally are more sensitive to noise than are commercial and industrial land uses. Sensitive receptors in the vicinity of the Merced WWTP are scattered along Gove Road and Thornton Road.

The ambient noise environment in the vicinity of the Merced WWTP may be generally characterized as quiet. Existing noise sources in the immediate vicinity of WWTP site are limited to vehicles driving to and from the existing facility and the existing WWTP, operational noise from WWTP equipment, and equipment and vehicles involved in agricultural production on adjacent properties.

In order to characterize ambient noise conditions in the Project vicinity, short-term noise measurements were taken in the Project vicinity. Noise sampling results are presented in Table 3-12.

TABLE 3-12
SOUND LEVEL MEASUREMENTS IN THE VICINITY OF THE PROJECT SITE

Location	Leq (dBA)	Noise Sources
1. Entrance gate to the wastewater treatment plant	45	Vehicle traffic
2. Wastewater treatment plant–50 feet from clarifier	59	Clarifier equipment noise
3. Northeast corner intersection – Hornton Road and Dickenson	65	Traffic noise on Hornton and Dickenson

SOURCE: ESA, 2006

3.18 Visual and Recreation Resources

3.18.1 Visual Resources

The lands surrounding the WWTP site are in agricultural land uses and have been modified for agricultural production. As a result, the terrain is very flat and most native trees and vegetation have been removed. The WWTP site lies to the east of Hartley Slough, a natural waterway that MID operates as a drainage channel. The banks of the slough are vegetated with tall, dry grass and weeds. The surrounding land uses are predominately agriculture and open space, with the exception of a pistol-firing range located at the northwestern section of the City's property. The surrounding rural area contains very few residences or other structures.

Structures at the WWTP site consist of buildings and treatment facilities clustered in the northeast corner of the City's property (Figure 3-5). Other significant features of the site, lying south of the WWTP's structural components, include ponds (i.e., emergency retention pond and sludge drying beds), land application areas for sludge, and wetlands ponds. A small grove of eucalyptus trees stands near the western border of the WWTP site. With the exception of a vacant area in the northwest corner, the rest of the property, including the land application area and ponds, is covered with a variety of low-lying vegetation. Because of the level topography and flat terrain, views from one side of the property to the other are generally unobstructed.

There are no unique visual features in the area or scenic vistas. No roadways are designated as scenic in accordance with existing visual protection programs.

3.18.2 Recreation Resources

The WWTP site is composed of wastewater treatment facilities, storage ponds, and adjacent open space lands. The City has historically allowed public hunters and enthusiasts to enter the WWTP site to access the adjacent Merced Wildlife Management Area (MWMA). Public access is currently restricted to maintain WWTP site security.

View of the WWTP facilities and surrounding lands.

SOURCE: ESA, 2006

City of Merced Wastewater Treatment Plant Improvement Project . 205087

Figure 3-5
Site Photograph

The MWMA lies on 385 acres of native pastureland that had been subject to seasonal flooding from Owens Creek. The City established the MWMA in 1978 to mitigate for the loss of wetland habitat as a consequence of establishing its industrial food wastewater disposal site, which is immediately north of the MWMA. The MWMA is composed of two large enclosed pond features and a small wetland area. Surface waters within the MWMA are maintained through the discharge of 1.2 mgd (or 1,300 acre-feet per year) of treated effluent from the WWTP. The CDFG manages the MWMA. The CDFG reports that, as of November 2000, the MWMA has become outstanding habitat for migratory waterfowl and wetland-associated species and that its construction and operation meets or exceeds the City's mitigation requirements. CDFG regulates and supervises public access to the MWMA. During the hunting season, the CDFG limits public access to around 10 people three days a week. Since 1978, the MWMA has received over 4,000 hunt days.

3.19 Solid Waste and Energy

3.19.1 Solid Waste

Regional Solid Waste Facilities

Two active solid waste landfill facilities are located within the unincorporated areas of Merced County, the Highway 59 Landfill on the north side and the Billy Wright Landfill on the west side of the County. The Highway 59 Landfill is projected to have a remaining useful life, with expansion, of 25 years. The Billy Wright Landfill has, with limited expansion, a 14-year life expectancy. In addition, there is one private disposal facility, the Flintkote County Disposal Site, located at SR 59 and the Merced River. This site is restricted to concrete and earth material disposal.

Onsite Solid Waste Disposal

The current solids treatment and handling facilities include a dissolved air flotation thickener for secondary sludge, primary anaerobic digesters, secondary digester, and earthen solar drying beds. One to three times per year, the solar dried biosolids are land-applied to the City's 580-acre industrial farmland site or hauled offsite to the Forward Landfill in Manteca (ECO:LOGIC, 2005).

3.19.2 Energy

The project area is currently served by MID using a 12.47 kilovolt (KV) service connection. A 1,500 kilowatt backup generator is retained on site in the event of local power outages. The WWTP's electrical system supplies 1,563 kilovolt-ampere (KVA) at 12.47 KV peak running loads.

The expansion will bring an additional 3,812 KVA for a peak 5.37 KVA load. An additional 1,875 KW generator will be need to be installed on-site to provide sufficient backup power for the expanded WWTP (ECO:LOGIC, 2005).

3.20 Traffic and Circulation

The local and regional roadways in the vicinity of the WWTP are described in the following discussion.

3.20.1 Regional Highways and Roadways

SR 99 is the primary regional transportation facility in the Merced area. SR 99 provides access to Sacramento to the north and Fresno and Bakersfield to the south. Through Merced, SR 99 is a four-lane freeway, with an average traffic volume in the range of 35,000 to 40,000 vehicles per day.

SR 59 is a north-south facility extending from SR 152 (near Los Banos) to Snelling, a community located north of the City of Merced on the Merced River. SR 59 is a two-lane rural highway through Merced, serving between 14,000 and 16,000 vehicles per day. SR 59 is located about 3.5 miles east of the WWTP. SR 59 is a significant interregional route of statewide importance and carries most of the truck-transported agricultural goods produced in or transported through the Merced area. The current biosolids hauling route is depicted in Figure 2-9.

SR 140 is a two-lane, east-west conventional highway providing regional access to Yosemite National Park to the east and extending west past SR 99 and Interstate 5.

The local roadway system consists of roads under the jurisdiction of the City of Merced or Merced County Public Works Department, including Thornton Road, Dickenson Ferry Road, and Gove Road. Thornton and Dickenson Ferry Roads are mainly rural collector/minor arterial roads that are used by mostly agricultural vehicles traveling to or from SR 59 and SR 140. Gove Road is a local road used by WWTP staff and the residents who live along its route.

3.20.2 Level of Service

Level of service (LOS) is a general measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. The LOS grades, as contained in the Transportation Research Board's (TRB) 1985 Highway Capacity Manual. , are generally defined as follows:

- LOS A represents free-flow travel with an excellent level of comfort and convenience and the freedom to maneuver.
- LOS B has stable operating conditions, but the presence of other road users causes a noticeable, though slight, reduction in comfort, convenience, and maneuvering freedom.
- LOS C has stable operating conditions, but the operation of individual users is significantly affected by the interaction with others in the traffic stream.

- LOS D represents high-density, but stable flow. Users experience severe restriction in speed and freedom to maneuver, with poor levels of comfort and convenience.

- LOS E represents operating conditions at or near capacity. Speeds are reduced to a low but relatively uniform value. Freedom to maneuver is difficult with users experiencing frustration and poor comfort and convenience. Unstable operation is frequent, and minor disturbances in traffic flow can cause breakdown conditions.

- LOS F is used to define forced or breakdown conditions. This condition exists wherever the volume of traffic exceeds the capacity of the roadway. Long queues can form behind these bottleneck points with queued traffic traveling in a stop-and-go fashion.

The level of service on highways is derived from the traffic speed and the rate of vehicular flow, taking into account variables such as annual average daily traffic, roadway capacity, grade, environment (urban versus rural), and other considerations as appropriate. Caltrans' goal is an LOS C on rural state highways and an LOS D on urban state highways. The MCAG's goal is LOS D on all regional highways.

The LOS standard in the current Merced County General Plan is LOS C or better for all roadways. Merced County uses the criteria established in the current edition of the *Highway Capacity Manual* published by the Transportation Research Board to evaluate level of service. Several cities in the county also have LOS C as a standard for all of the roadways.

3.20.3 Roadway Traffic Conditions

The three principal state routes in the Project area presently operate at acceptable service levels of LOS C or better. SR 99 operates mostly at LOS B through the study area, except between SR 140 and SR 59, where it operates at LOS C (MCAG, 2004). These highways and their average daily trips (ADTs) are provided in Table 3-13.

TABLE 3-13
AVERAGE DAILY TRAFFIC IN PROJECT VICINITY

Roadway	Average Daily Traffic
SR 59 (Mission Avenue to SR 99)	8,500 – 14,200
SR 99 (Madera County line to SR 140)	37,000 – 39,500
SR 99 (SR 140 to Atwater Blvd)	49,000 – 55,000
SR 140 (Kniebes Road [Gustine] to SR 99 in Merced)	3,400 – 5,400

SOURCE: MCAG RTP, 2004

Almost all major arterials in the study area currently operate at LOS C or better (City of Merced, 1997). The number of average daily trips for Dickenson Ferry Road, Thornton Road, and Gove Road is not available. However, due to their roadway designations by the County and other regulatory agencies, ADTs for these roadways have been estimated. The capacity of extended lengths of a two-lane arterial under base conditions is 3,200 passenger cars per hour (pc/h), total,

both directions. The capacity of a single direction of a two-lane arterial is 1,700 pc/h (Mannering, et al., 2004). The County estimates that typical traffic volumes on a major collector roadway are anywhere from 3,800 to 20,000 ADT and that typical traffic volumes on local roads are anywhere from 0 to 3,000 ADT. Therefore, it can be assumed that Dickenson Ferry Road, Thornton Road, and Gove Road contain traffic volumes consistent with these volumes.

3.21 Public Health and Safety

3.21.1 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. Numerous materials used in business, commerce, manufacturing, and households are considered hazardous because of their chemical and physical properties. The California Code of Regulations (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 (22 CCR 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 22 CCR 66261.20–24, 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 (examples of toxic substances include pesticides, heavy metal ions, etc.).

- Acute and chronic are terms most often used to describe toxicity. Acute toxicity is an adverse effect expressed by, or mortality of, an organism after the brief exposure to a chemical agent (Hodgson and Levi, 1987) (chemical agent, toxic substance, and toxic material are terms often used interchangeably). A substance is designated hazardous because of its hazardous properties. A chemical agent can either be hazardous or non-hazardous. For example, a chemical agent such as water is typically considered non-hazardous. The brief exposure can either be a single dosage or exposure over a short period of time. An acute toxic response is one that generally occurs shortly after exposure to a chemical agent, usually less than two weeks (Hodgson and Levi, 1987). Chronic toxicity is an expression of an adverse effect manifested over a long time period (oftentimes the life span of the exposed organism or individual) of uptake of small quantities of a chemical agent. The dose is small enough that acute effects are

not expressed. Toxic responses associated with chronic toxicity range from carcinogenesis (cancer) to behavioral changes (Hodgson and Levi, 1987).

- Ignitable substances are hazardous because of their ability to burn. (Gasoline and methane gases are examples of ignitable substances.)

- Corrosive materials can cause severe burns or damage materials. (Examples include chlorine gas, sulfur dioxide gas, strong acids, and strong bases.)

- Reactive materials may cause explosions or generate toxic gases. (Dynamite and pressurized gases are examples of reactive materials.)

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 hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

Hazardous materials stored at the WWTP are described in Table 3-14. The hazards potentially associated with these materials include fire, explosion, and acute toxic effects from an accidental release to the air of chlorine or sulfur dioxide gas. Information of the location, type, quantity stored, and health risks of hazardous materials is presented in the Business Plan for the WWTP that was prepared in accordance with Section 25500 *et seq.* of the California Health and Safety Code. This information is made available to firefighters, health officials, public safety officers, regulatory agencies, planners, and other interested individuals to prevent or mitigate health and safety risks to individuals and the environment from the release or threatened release of hazardous materials.

Chlorine

Chlorine, a greenish-yellow gas with an irritating odor, is a potent irritant of the eyes, mucous membranes, and skin. Exposure to low levels in the air can cause mild irritation of mucous membranes and eyes. Progressively higher concentrations produce throat irritation and cough. High concentrations in the air, up to 1,000 parts per million (ppm), are fatal after a few breaths. Acute, nonfatal exposures are also associated with long-term pulmonary injury (Hathaway et al., 1991). Chlorine is shipped and stored as a liquefied gas under pressure in steel cylinders, ton containers, tank trucks, or railroad tank cars. Chlorine is stored in 2,000-pound (lb) containers at the plant's open-air chemical storage building. New containers are delivered to the plant by flatbed truck and placed into the building using an overhead hoist. The plant currently has two 2,000-lb/day chlorinators for the disinfection of wastewater. A leak of liquid chlorine resulting from damage to a container during the transfer of new chlorine containers to the chemical storage building presents the most risk from a sudden release of chlorine into the air.

TABLE 3-14
HAZARDOUS MATERIALS STORED AT THE MERCED WASTEWATER TREATMENT PLANT

Material	Average Daily Amount	Location	Form of Material
Chlorine		Chlorination Building	Compressed gas
Sulfur dioxide		Chlorination Building	Compressed gas
Carbon dioxide	0.4 cubic feet	Maintenance Building/Electricians Bench north end	Compressed gas
Helium		Laboratory	Compressed gas
Hydrogen		Laboratory	Compressed gas
Unleaded gasoline	530 gallons	Aboveground storage tank south end of Maintenance Building	Hydrocarbon fuel
No. 2 diesel	3500 gallons	Aboveground storage tanks north side of Electricians Building & north side of Digester Building, portable fuel tank land application	Hydrocarbon fuel
Stoddard solvent		Flammables room, north end of Maintenance Building	Hydrocarbon solvent
Calcium thiosulfate solution	200 gallons	North side of Secondary Clarifier #1	Liquid
Chevron Delo 400 motor oil	55 gallons	Flammables room north end of Maintenance Building	Liquid
Chevron GST oil 68	40 gallons	Flammables room north end of Maintenance Building	Liquid
Chevron NL gear compound 220	5 gallons	Flammables room north end of Maintenance Building	Liquid
Mobil DTE oil AA	75 gallons	Flammables room north end of Maintenance Building	Liquid
Super HD motor oil SF-CD	220 gallons	Flammables room north end of Maintenance Building	Liquid
Digester gas	50,000 cubic feet	Primary, Secondary and abandoned digester & evacuator	Compressed gas
Sodium hypochlorite	700 gallons	South end of Secondary Clarifier	Liquid
Used motor oil	110 gallons	Breezeway enclosure, south end of Maintenance Building	Mineral oil-based lubricants

Sulfur Dioxide

Sulfur dioxide is a colorless gas that is severely irritating to the eyes, mucous membranes, and skin. Exposure to sulfur dioxide primarily produces effects in the upper respiratory tract, causing irritation to the eyes, nose and throat, nasal discharge, choking and coughing, and resistance to breathing. Sulfur dioxide is stored and shipped as a liquefied gas in ton containers, cylinders, or railroad tank cars (Compressed Gas Association, 1990). Sulfur dioxide is stored at the plant's chemical storage building in 2,000-pound (ton) containers. New containers are delivered to the plant via flatbed truck and placed into the building using an overhead hoist. The plant currently has a single 1,900-lb/day sulfonator for the dechlorination of disinfected wastewater. As with chlorine, the transfer of new sulfur dioxide containers to the chemical storage building poses the greatest risk of a sudden release of sulfur dioxide into the air.

Petroleum Hydrocarbon Fuels, Solvents, and Lubricants

Petroleum hydrocarbon fuels at the plant are unleaded gasoline and No. 2 diesel fuel which are stored in underground tanks. A small quantity of Stoddard solvent is stored at the plant for use as a cleaning solvent. Several types of petroleum hydrocarbon lubricants are also used at the plant; however, these all are mineral oil-based and are discussed as a group.

Gasoline, a clear, volatile liquid with an aromatic odor, is an irritant to the eyes and mucous membranes, and a central nervous system depressant. Long-term exposure has produced and increased incidence of kidney lesions, including tumors, in male rats but not in females or other species of laboratory animals. No. 2 diesel is a colorless to brown liquid with a kerosene-like odor. Diesel is also a central nervous system depressant. Chronic dermal exposure may also result in dermatitis, erythema (reddening of the skin), and eczematous lesions (USAF, 1990). Stoddard solvent is a colorless, aromatic liquid used as a degreaser and paint thinner. It is a mild central nervous system depressant and mucous membrane irritant. Mineral oil-based lubricants currently in use generally are of low toxicity. The principal adverse effect is oil acne resulting from repeated dermal exposures (USAF, 1990). The principal risks associated with these substances are fire and explosion hazards from gasoline leaks during fueling operations and contamination of groundwater used as a drinking water supply via leaks from underground storage tanks.

Digester Gas

Digester gas is produced from the anaerobic digestion of sewage sludge, and consists of 65 percent methane, 30 percent carbon dioxide, and 5 percent hydrogen sulfide. The digester gas system consists of the gas handling and safety equipment, hot water boiler, engine, generator, gas holding cover on the secondary digester, and gas mixing equipment. The digester gas is used to heat the secondary digester. Fire and explosion hazards are the potential risks associated with the release of methane. Hydrogen sulfide is a gas with characteristic “rotten egg” odor detectable at very low concentrations in air. Hydrogen sulfide is hazardous at concentrations exceeding 150 parts per million (ppm) in air due to olfactory fatigue (the odor cannot be detected at higher concentrations in air). Prolonged exposure to concentrations of 250 ppm in air is associated with pulmonary edema. A concentration of 1,000 ppm can be rapidly fatal due to respiratory arrest. The principal risks associated with accidental releases of digester gas are fire and explosion (methane) and overexposure to hydrogen sulfide, particularly if confined space entry is performed to make repairs.

Laboratory Gases (Carbon Dioxide, Helium, and Hydrogen)

Carbon dioxide, helium and hydrogen, stored in compressed gas cylinders, are used in the operation of analytical instruments in the laboratory. Carbon dioxide and helium are asphyxiates that displace atmospheric oxygen if released into poorly ventilated or unventilated spaces in high concentrations. Hydrogen gas represents a fire and explosion hazard. Standard techniques developed for the handling of compressed gas cylinders reduce the hazards associated with these gases.

Hazard Prevention and Mitigation

The current procedures for preventing or mitigating public health impacts associated with releases of hazardous materials are discussed in the WWTP Business Plan. These procedures include:

- Notification in the event of an emergency. This identifies plant personnel as contact persons and describes procedures for contacting responsible agencies. Merced County is on the 911 system.

- Emergency response. This describes evacuation procedures and identifies evacuation routes.

- Medical assistance plan. This identifies the locations of emergency phone numbers and describes procedures for transporting injured individuals to emergency care.

- Mitigation procedures. This includes cleanup of spills of petroleum products, and procedures for managing releases of digester gas, and releases of compressed gases.

- Spill prevention procedures. This includes monitoring of the liquid levels in underground tanks, use of chlorine leak detectors and flammable gas meters, specifies daily inspection of chlorine storage and digester areas and describes handling procedures for steel drums and compressed gas cylinders.

- Abatement plant. This describes procedures for spill control, identifies that a repair kit and self-contained breathing apparatus sets (SCBA) are available on site, specifies the capability of the maintenance crew to repair digester gas piping, and identifies the location of fire extinguishers.

- Employee certification and training. New employee training includes training in the handling of hazardous materials, emergency medical procedures and use of fire extinguishers. New employees are issued a safety manual for the WWTP. Refresher training includes weekly safety meetings, monthly training in use of SCBAs, and practice in repair of a ton container, performed quarterly. Specialized training in handling chlorine, confined space entry, and CPR is provided through the California Water Pollution Control Association.

Fire protection and hazardous materials response are provided primarily by the City of Merced Fire Department. The closest fire station is located 2.5 miles from the plant, providing a 4- to 6-minute response time. The Business Plan identifies the location of hydrants at the plant. In the event of a serious emergency, such as a rupture of a ton container of chlorine, 911 would be used to activate the emergency response system. Responding agencies in such an event would include the State Office of Emergency Services, the Merced County Health Department, the Highway Patrol, and the chlorine supplier (All-Pure Chemical, Tracy, CA). The Business Plan concludes that because of the distance of the facility from SR 59 and the prevailing wind direction (northwest to southeast), residents and roadways in the vicinity of the plant are unlikely to be threatened in the event of a chlorine or sulfur dioxide leak. However, should an emergency occur during a southerly wind pattern, plant operating personnel will provide first-line evacuation notice to residents on Gove and Dickenson Ferry Roads (City of Merced, 2004). A wind sock mounted on the north wall of the chlorine building is used to observe wind direction.

Hazard, Risk, and Exposure

Under the framework of hazardous materials and associated potential impacts to public health and safety, a hazardous material would have an inherent toxicological risk. A toxicological risk is a probabilistic measure that some adverse effect (chronic or acute) would result from a given exposure to a chemical agent. Toxicological risk is a probability or an estimated frequency of occurrence that an adverse effect would be experienced. For instance, a lifetime risk of cancer of 1.0×10^{-6} (or one in one million) is simply a statement of probability. It should not be interpreted to mean one individual in one million individuals would contract cancer; simply the probability for a single exposed individual is 1.0×10^{-6}.

A hazard describes a potential adverse effect or effects of a given chemical agent (e.g., cancer). A statement of toxicological risk, therefore, is presented in terms of a probability that an adverse effect or outcome inherent to a given chemical agent would occur as a consequence of a given unit of exposure (Amdur et al., 1991).

The means by which an individual is exposed to a chemical agent is classically defined through the four basic exposure pathways: inhalation, ingestion, bodily contact, and injection. These pathways are further defined below.

- Inhalation (breathing the hazardous agent) is the primary route of exposure for toxic fumes or vapors and is the primary exposure pathway at a distance from the source.
- Ingestion (swallowing the hazardous agent) is the primary route of exposure for contaminated food or water.
- Direct bodily contact (exposure to a hazardous agent through a splash or touching) requires immediate proximity to the hazardous agent. Direct bodily contact with hazardous fumes or vapors can also occur over a distance.
- Injection (exposure to a hazardous agent through the skin via a puncture from a needle or contaminated object) requires immediate proximity to the hazardous agent and usually occurs from improper handling or improper packing of hazardous agents.

The pathway by which an individual is exposed to a specific chemical agent can have a major effect on risk. For instance, a chemical agent may be toxic when ingested, but not when touched.

CHAPTER 4
Environmental Analysis

This chapter discusses the potential environmental impacts of implementing the City of Merced (City) Wastewater Treatment Plant (WWTP) Expansion Project (Project) and identifies proposed mitigation measures, where appropriate, that would avoid, reduce, or otherwise minimize these effects to less-than-significant levels. In cases where no mitigation is available or where the specified mitigation would not reduce the impact to a less-than-significant level, this fact is noted.

According to the California Environmental Quality Act (CEQA) Guidelines Section 15382, a significant effect on the environment means "… a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project." For each category of physical condition evaluated in this environmental impact report (EIR), thresholds of significance have been developed using criteria discussed in the CEQA Guidelines; criteria based on factual or scientific information; criteria based on regulatory standards of local, state, and federal agencies; and criteria based on goals, objectives, and policies identified in applicable city, county, and regional plans.

Impact significance thresholds are defined for each environmental topic. These thresholds are based on criteria presented in Appendix G of the CEQA Guidelines. Where it was concluded that specific criteria were not applicable or relevant to evaluating the effect of the Project or the alternatives on the environment, they were eliminated from the discussion.

In determining the significance of the Project's impacts, each impact is identified as potentially significant, significant, cumulatively significant, significant and unavoidable, or less than significant. The cumulative effect and growth-inducing analysis in this EIR is based on the implementation of the Project in combination with other identified projects that may generate similar effects. An analysis of cumulative and growth-inducing effects of the Project is provided in Chapter 6, Growth-Inducing Impacts, and Chapter 7, Other Statutory Considerations, respectively. Chapter 5, Project Alternatives, includes an impact summary of the alternatives evaluated in addition to the No Project Alternative.

Mitigation measures identified in this report are characterized in one of three categories: (1) measures necessary to reduce the identified impact below a level of significance; (2) measures recommended to reduce the magnitude of a significant impact, but not below a level of significance; and (3) measures recommended to reduce the magnitude of a less-than-significant impact.

4.1 Water Quantity

4.1.1 Significance Criteria

The Project would result in a significant impact on water quantity if it would:

- Substantially alter the drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on- or offsite

- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

- 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 rate of pre-existing nearby wells would drop to a level that would not support current land uses or planned uses for which permits have been granted).

4.1.2 Methodology

This section identifies hydrologic and groundwater issues that may be affected by the Project. The impact analysis focuses on foreseeable changes to the existing conditions described in Chapter 3, Environmental Setting, in the context of the significance criteria presented above. The discussion of hydrological impacts in this analysis is separated into surface water hydrology and groundwater hydrology to clearly differentiate potentially foreseeable effects that could result from the Project.

4.1.3 Impacts and Mitigation Measures

Impact 4.1.1: The change in point of discharge to Hartley Slough and increase in treated effluent flow would result in substantial adverse effects to the physical character and channel hydrology of Hartley Slough. (Potentially Significant)

The expanded WWTP would incrementally increase effluent flows from the current 8.5 million gallons per day (mgd) to 20 mgd. This rate of discharge would increase the average effluent flows in Hartley Slough from 13 cubic feet per second (cfs) to about 31 cfs (ECO:LOGIC, 2005). At 11.5, 12, or 16 mgd, the WWTP effluent would discharge at a rates of 17.7, 18.5, or 24.7 cfs, respectively. These increased flows may alter the physical character of Hartley Slough, causing stream channel scouring along creek banks and bottom. These effects are considered potentially significant.

The Project would also include the relocation of the WWTP's effluent discharge to a location approximately 3,000 feet upstream of the effluent channel. This change would not reduce flows in

Hartley Slough since the new discharge location would be upstream from the current point of discharge on Hartley Slough. Further, the new outfall would be gravity-fed with energy dissipaters installed at its base to reduce the erosive potential of the effluent discharged to Hartley Slough. These outfall design features, in conjunction with the proposed incremental capacity increases and maintenance of riparian and bank-side vegetation, would minimize potential increases in scouring along the banks of Hartley Slough downstream of the new outfall.

The increased flow in Hartley Slough may also alter the distribution and composition of emergent vegetation within the stream channel. The ultimate composition and distribution of the vegetation may also be influenced by frequency of inundation by downstream diversion facilities that create backwater conditions in this portion of Hartley Slough. The degree of change to the channel morphology and stream character downstream of the new outfall would largely be dependent on the velocity of the increased flows and the frequency of inundation as a result of backwaters caused by downstream diversion structures. In the absence of detailed hydraulic modeling, this analysis assumes that the increase in effluent volume would lead to increased streambank exposure within Hartley Slough. This increased exposure would likely result in the mobilization of more sediment along the banks, especially finer sediments, as a consequence of an increased duration of bankfull discharge conditions. In this context, the Project could result in significant alteration to Hartley Slough, to the extent that substantial sedimentation would occur. This impact would be reduced to a less-than-significant level through the implementation of the following prescribed mitigation.

Mitigation Measure

> **Measure 4.1.1:** The City shall develop and implement a monitoring program to determine if incremental increases in the WWTP's effluent discharge are inducing excessive stream channel erosion on Hartley Slough downstream of the effluent discharge to the location of the existing agricultural water diversion facility. If observed, bank stabilization practices and other best management practices (BMPs) to control erosion shall be implemented. Measures could include, but are not limited to, placing riprap and planting stabilizing vegetation. If no substantial stream channel erosion is observed, the program may be terminated.
>
> **Impact Significance After Mitigation:** Less than significant.

Impact 4.1.2: The expanded WWTP would result in increased surface runoff resulting from new impervious surfaces, which could impact Hartley Slough. (Less than Significant)

Stormwater runoff from the expanded facilities would either drain to the existing WWTP storm drainage system because of its proximity to the north side of the WWTP or to a new drain pump station located west of the proposed re-aeration basin (the current chlorine contact basins). The new pump station would have a capacity of 1.99 mgd (or 1,400 gallons per minute). Most of the stormwater, basin drains, and plant drain flows would flow via gravity to the new pump station. The new drain pump station would pump flow through a 12-inch force-main from the sludge drying beds to a manhole near the influent junction box where the new and existing drainage

systems would combine. A new 24-inch gravity line would convey flow from the manhole to the new head works for treatment (ECO:LOGIC, 2005). The combined capacities of the two drainage systems would be sufficient to accommodate a 20-year, 24-hour rainfall event. Stormwater flows in excess of these pipe capacities would be routed to a new emergency retention pond and conveyed back to the new head works when sufficient capacity becomes available. These design features would ensure that the stormwater from the expanded WWTP would not become a source of polluted runoff to offsite areas (e.g., Hartley Slough) and would minimize to Hartley Slough the physical effects resulting from increased runoff from the WWTP. With these design features installed, this impact is less than significant.

Mitigation. None required.

Impact 4.1.3: Implementation of the Project would deplete local groundwater supplies or interfere substantially with groundwater recharge. (Less than Significant)

No new wells that could place additional water supply demands on the local aquifer are proposed as part of the Project. However, it is recognized that dewatering operations during Project construction could result in localized, temporary lowering of the water table in the vicinity of the WWTP site. Groundwater elevations within the Project area are relatively shallow, requiring pumping activities, especially in areas close to Hartley Slough. Drawdown resulting from the dewatering of shallow groundwater would be minimal and temporary in nature, with recharge occurring relatively quickly. No nearby agricultural or domestic production wells would be affected by dewatering operations during Project construction, as these wells generally draw groundwater from deeper depths

The Project would result in minimal increases in impervious surface area (e.g., structures and asphalt) beyond existing conditions and these new surfaces would be located away from Hartley Slough. Consequently, the Project is not expected to substantially interfere with local groundwater recharge. In light of these Project characteristics, impacts to groundwater resources are considered less than significant.

Mitigation: None required.

4.2 Water Quality

4.2.1 Significance Criteria

The Project would result in a significant impact on water quality if it would:

- Violate any water quality standards or waste discharge requirements

- Substantially alter the drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on- or offsite

- Otherwise substantially degrade water quality

4.2.2 Methodology

This section identifies surface and groundwater quality issues that would be affected by the Project. The impact analysis focuses on foreseeable changes to the existing conditions described in Chapter 3, Environmental Setting, in the context of the significance criteria presented above. Significance determinations were based on a review of applicable water quality standards contained in the City's Waste Discharge Requirements (WDRs) for the current configuration of the WWTP, the Basin Plan for the Sacramento River and San Joaquin River, the California Toxics Rule, and applicable total maximum daily loads (TMDL) documentation for the San Joaquin River.

4.2.3 Impacts and Mitigation Measures

Impact 4.2.1: Construction of the Project would result in increased erosion and degrade water quality in Hartley Slough and downstream waterways. (Potentially Significant)

Construction of the Project would involve earthmoving activities such as excavation, grading, cut/fill, channel alteration, and soil stockpiling. The Project site is located on upland areas tributary to Hartley Slough, with two in-channel construction locations associated with the bridge replacement on Gove Road, a new WWTP entrance, and a new outfall. Project construction would result in soil erosion and subsequent discharge of suspended sediments to adjacent surface water or drainage channels. Accelerated erosion and deposition in waterways would degrade water quality by increasing channel sedimentation and suspended sediment levels (turbidity) and by adversely affecting associated aquatic and riparian habitats. Additionally, sedimentation to local drainage facilities would result in reduced storm flow capacities, resulting in localized ponding or flooding during storm events. Finally, dewatering of excavations would have the potential to affect surface waters if the discharge occurs without appropriate control measures for sediment, oil and grease, etc.

Stormwater management practices of diverting runoff to existing stormwater retention facilities and settling ponds would help to reduce available pathways for substantial erosion. Erosion control measures would be designed to handle runoff from a 20-year, 24-hour intensity storm event, consistent with City requirements. In addition to these considerations, the disturbance area associated with construction of the Project facilities is expected to require coverage under the State of California's National Pollutant Discharge Elimination System (NPDES) General Construction Permit (Order No. 99-08-DWQ). Coverage under the General Construction Permit would require the City to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP is required to address all Project construction-related activities

(e.g., grading and foundation construction) and requires approval from the Regional Water Quality Control Board (RWQCB) before construction begins.

In addition, as part of the Project's construction, dewatering operations would occur during the installation of the outfall pipeline and facility foundations. Dewatering activities may increase turbidity or mobilize previously undocumented groundwater contaminants. It is the City's intent that the extraction of surface and/or groundwater during dewatering operations would be conducted in accordance with Central Valley RWQCB General Order No. 5-00-175 (NPDES General Permit No. CA G995001). This General Order covers waste discharge requirements for dewatering and other low-threat discharges to surface water; however, the City is uncertain whether the volume of water to be extracted would be under the volumetric threshold of 0.25 mgd. In the context of all the activities that could potentially affect water quality during Project construction, the implementation of Mitigation Measures 4.2.1a and 4.2.1b would reduce these potential impacts to a less-than-significant level.

Mitigation Measures

Measure 4.2.1a: An Integrated Water Pollution Control Program shall be developed and implemented to manage and control potential erosion and water quality degradation that would occur during Project construction. Additionally, the program shall describe monitoring during construction activities, dewatering operations, in-water construction activities, and specific BMPs to avoid or minimize impacts to water quality.

The program shall be approved by the City before construction begins and shall be made conditions of performance with the City's contractor selected to build the Project. The program shall incorporate control measures in the following categories:

- Soil stabilization practices
- Sediment and runoff control practices
- Monitoring protocols
- Non-storm water management and waste management and disposal control practices
- Construction dewatering
- Hazardous materials management

Once approved by the City, the contractor shall be responsible throughout the duration of Project construction for installing, constructing, inspecting, and maintaining the control measures included in the program.

Measure 4.2.1b: The City will monitor groundwater that is collected during groundwater dewatering and, if it exceeds applicable surface water quality standards, will convey it into a water treatment system, where it will undergo treatment prior to its discharge to Hartley Slough. The water treatment system may use either temporary mobile treatment equipment or the WWTP. Either system would need to have applicable capability (i.e., activated carbon filtration or other suitable treatment technology) to treat and/or remove water quality constituents that exceed applicable surface water criteria.

Impact Significance After Mitigation. Less than significant.

Impact 4.2.2: The discharge of treated wastewater from the expanded WWTP would exceed water quality objectives identified in the Basin Plan and limits expressed in existing waste discharge requirements. (Potentially Significant)

Tertiary treatment upgrades would be constructed in accordance with the Central Valley RWQCB's Order 5-00-246. Proposed effluent quality is presented in Table 4-1. As shown, the Project would produce effluent quality that is equal to or better than the existing WWTP. Proposed effluent discharges would be lower in biological oxygen demand, total suspended solids, settleable solids, and total coliforms. The Project would eliminate the discharge of chlorine residuals and reduce total coliform bacteria to below permit limits for which the City is currently under a Mandatory Penalty Complaint No. R5-2004-0537.

However, as shown in Table 4-1 and noted in Chapter 3, Environmental Setting, effluent discharged from the Project into Hartley Slough would continue to result in receiving water temperature changes that exceed an annual average of 5°F, when compared to upstream ambient water temperatures. This exceedance is not consistent with Basin Plan objectives (CVRWQCB, 2004) for the beneficial use of cold-water habitat. As reflected in historic data (Appendix E), incidents of increased temperatures in the receiving water primarily occur during cooler months (October through March). When the ambient water temperatures have increased by more than 5°F, the receiving water temperatures typically are less than 70°F.

TABLE 4-1
EFFECTS OF WASTEWATER TREATMENT PLANT EXPANSION PROJECT ON WATER QUALITY

Water Quality Constituent	Existing Effluent Quality[1]	Proposed Effluent Quality
Biochemical oxygen demand, mg/L [2]	30	10 (4)
Total suspended solids, mg/L [2]	30	10 (4)
Settleable solids, ml/L [2]	0.2	0.1
Total coliforms, MPN/100 mL[2]	23	2.2
Chlorine residual, mg/L [2]	0.1	---
Grease and oil, mg/L [2]	10.0	10.0
Ammonia, mg/L [2]	2.3	2.3
Dissolved oxygen, mg/L [3]	Multiple samples below 5 mg/L specified as Basin Plan Objective	Within Basin Plan Objective
pH [3]	6.6 -7.6	6.5 - 8.5
Temperature [3]	Multiple samples exceeding 5°F of ambient temperature over averaging period	May exceed 5°F of ambient temperature over averaging period
Turbidity, NTU [3]	Multiple samples exceeding Basin Plan Objective	Within Basin Plan Objective

SOURCE: ECO:LOGIC, 2005

[1] Data from 2000 – 2004 operation
[2] As measured within WWTP treatment process
[3] As measured at downstream surface water monitoring
[4] Effluent quality at the point of discharge; before mixing with receiving water.

Notes: mg/L = milligram per liter; NTU = nephelometric turbidity unit; ml/L = milliliter per liter; MPN/100 mL = most probable number per 100 milliliters

Currently, no treatment processes have been proposed to minimize potential receiving water temperatures increase that exceed 5°F, as calculated when the averaging period is less than one year. Current engineering studies conclude that some level of effluent cooling would occur within the equalization basins prior to discharge to Hartley Slough. However, the degree of cooling may not be sufficient to achieve consistency with Basin Plan objectives during the winter months.

The equalization ponds have an estimated capacity to store up to 200 million gallons of treated effluent. Operating at a 12 mgd rate, the ponds could store effluent for up about 16 days; while at 20 mgd, the ponds could store effluent for 10 days. Further detailed study is needed to determine if this retention time is sufficient to achieve sufficient effluent cooling. If not sufficiently cooled, discharges would cause receiving water temperature increases inconsistent with Basin Plan objectives. This represents a potentially significant impact.

Mitigation Measure

Measure 4.2.2. The City shall assess and install a suitable effluent cooling system to comply with temperature receiving water objectives as identified in the Basin Plan (CVRWQCB, 1998). The selected system for effluent cooling, including use of the equalization basins, or installing mechanical chillers or cooling towers, would be sized to provide sufficient cooling to maintain effluent temperature within 5°F of the average annual ambient water temperature. The cooling system shall be constructed within the boundaries of the expanded WWTP site and not generate additional adverse effects to biological resources, wetlands, or sensitive habitats; would not pose a visual nuisance; or would not create obtrusive noise or other emissions. Cooling technologies will initially be sized for the 16 mgd capacity, with a provision to add additional units to accommodate the ultimate 20 mgd capacity.

Impact Significance After Mitigation: Less than significant.

Impact 4.2.3: The Project would eliminate chlorine disinfection from the wastewater treatment process, and as a result, several disinfection by-products would no longer be formed in the treated effluent. (Beneficial)

Under Section 303(c)(2)(B) of the Clean Water Act, states are required to adopt numeric criteria for the priority toxic pollutants listed under section 307(a) if those pollutants could be reasonably expected to interfere with the designated uses of state waters. The numeric criteria are referred to as the California Toxics Rule (CTR), which identifies maximum contaminant levels for 126 pollutants; commonly referred to as Priority Pollutants. The City routinely tests for the 126 Priority Pollutants within its wastewater effluent; consistent with its waste discharge requirements (WDRs) and NPDES Permit.

TABLE 4-2
DISINFECTION BY-PRODUCTS ASSOCIATED WITH CHLORINE DISINFECTION

Disinfection By-Product	Maximum Observed Concentration
Chloroform, µg/L	52
Dichlorobromomethane, µg/L	19
Dibromochloromethane, µg/L	4

SOURCE: ECO:LOGIC, 2005

µg/L = micrograms per liter

The City's WWTP is currently operating under Mandatory Penalty Complaint No. R5-2004-0537 in response to exceeding permitted limits for total coliform bacteria and total residual chlorine (CVRWQCB, 2004). As shown in Table 4-2, the historic use of chlorine in the City's disinfection process has resulted in the production of disinfection by-products. These constituents can cause fish mortality at the concentrations detected.

With the addition of UV disinfection, the quality of the wastewater effluent would be improved when compared to the existing conditions because of the proposed tertiary treatment upgrades and the removal of the chlorine disinfection process (Table 4-1). These improvements would rectify historic discharges of total coliform bacteria, total residual chlorine standards, and the chlorine disinfection by-products listed in Table 4-2. Specifically, the elimination of chlorine disinfection processes would eliminate the production of disinfection by-products that have historically been discharged as part of the WWTP effluent. Based on the WWTP improvements included as part of the project, the impact of the Project is considered beneficial.

Mitigation: None required.

Impact 4.2.4: The Project would continue to discharge in the treated effluent other Criteria Pollutants, Non-Priority Pollutants, and 303(d) Listed Contaminants at levels consistent with the California Toxics Rule and other applicable water quality standards. (Less than Significant)

Table 4-3 lists Criteria Pollutants that are currently and would continue to be discharged in the WWTP effluent. The anticipated concentrations of these pollutants would be within levels consistent with the California Toxics Rule and/or other applicable surface water quality standards. The installation of these improvements would not have significant adverse environmental effects.

As shown in Table 4-3, the Project would improve effluent quality to meet the limits specified. In particular, the concentrations of lead and aluminum would be reduced below current concentrations using tertiary filtration and source controls. As a result, the Project would not result in further degradation of surface water quality for the listed contaminants when compared to existing conditions.

TABLE 4-3
OTHER REGULATED EFFLUENT CONTAMINANTS AND FUTURE CONCENTRATION LIMITS

Constituent	Existing Effluent Concentration	Proposed Effluent Limit
Copper, µg/L	3.5	Calc'd (~4.1)
Lead, µg/L	1.5	Calc'd (~0.93)
Aluminum, µg/L	100	87
Barium, µg/L	100	100
Sodium, µg/L	No data	69
Mercury, µg/L (lb/day)	0.0086	0.050 (0.0006)
Diazinon, µg/L	ND	0.056
Selenium, µg/L (lb/day)	ND	5 (0.13)
Boron, µg/L (lb/day)	No data	700 (13)
Electrical conductivity, µmhos/cm	No data	700

SOURCE: ECO:LOGIC, 2005

Notes: µg/L = micrograms per liter; µmhos/cm = micromhos per centimeter; lb/day = pounds per day; calc'd = calculated

This impact is less than significant.

Mitigation: None required.

Impact 4.2.5: Expansion of the WWTP would increase the discharged salt load to downstream surface waters. (Less than Significant)

The WWTP is located in the San Joaquin River drainage area, upstream of Salt Slough in the San Joaquin River TMDL study area. During water years 1977 through 1997, the total mean annual salt and boron load in the lower San Joaquin River was 1.1 million tons and 975 tons, respectively. The sub-watershed draining the Merced area during this period contributed an average of about 100,000 tons of salt and 66 tons of boron per year to the lower San Joaquin River. This represents about 9 percent of the lower San Joaquin River's total salt load and 7 percent of its total boron load. Generally, salt and boron loads are associated with high flow events (CVRWQCB, 2004).

The WWTP currently discharges approximately 4,300 tons of salt annually, based on an effluent flow rate of 7.1 mgd (CVRWQCB, 2004). However, because the effluent is often intercepted and diverted for irrigation just downstream of the WWTP, the Salt and Boron TMDL Report acknowledges that the WWTP currently has no direct discharge of salt and boron to the lower San Joaquin River.

Because the WWTP would increase its effluent discharge up to 20 mgd, it is reasonably foreseeable that some portion of the increased discharge could reach the lower San Joaquin River. Table 4-4 presents the existing and proposed mean monthly municipal and industrial salt loads that would be discharged from the Project. Total dissolved solids (TDS) is often used as a measure of salinity.

TABLE 4-4
EXISTING AND ESTIMATED SALT LOADS FROM THE WASTEWATER TREATMENT PLANT

	Mean Monthly Flow (Acre-Feet)	Mean Flow Weighted Average TDS (mg/L)	Mean Monthly Municipal and Industrial Salt Load (Tons/Month)
Current Discharge	782	480	451
20 mgd Discharge	1,841	463	1,158

SOURCE: CVRWQCB, 2004; ECO:LOGIC, 2005; ESA, 2006

Notes: mgd = million gallons per day; mg/L = milligrams per liter; TDS = total dissolved solids

The CVRWQCB Salt and Boron TMDL Technical Report indicates that the WWTP watershed has a total salt load of 100,000 tons per year, of which 78,000 tons per year constitutes the background load and the remaining 22,000 tons per year are attributable to controllable sources (e.g., loads from agriculture, managed wetlands, groundwater and municipal sources). The total salt load derived from this subarea equates to roughly 2 percent of the total lower San Joaquin River basin mass salt load. The total boron load from this subarea is also about 2 percent of the

total lower San Joaquin River basin mass boron load. The TMDL Report notes that most of the controllable salt and boron loading to the lower San Joaquin River watershed comes from non-point sources rather than point sources, such as the WWTP (CVRWQCB, 2004).

If it is assumed that all of the additional effluent generated by the WWTP at 20 mgd actually reached the lower San Joaquin River on a year-round basis, the total salt load in the WWTP effluent would equal about 8.4 percent of the total load originating from the WWTP watershed and 0.8 percent of the total load in the lower San Joaquin River. Similar proportions would apply for boron. Because of downstream diversions for agricultural use, much of the treated effluent would continue to be applied as irrigation supplies and consumed through evapotranspiration and would not reach the lower San Joaquin River.

Regardless of the potential load that may reach the lower San Joaquin River, these quantities are considered relatively minor and are identified as a low-priority management objective by the RWQCB (CVRWQCB, 2004).

In contrast to the Cities of Modesto and Turlock, whose wastewater effluent reaches the lower San Joaquin River, no waste load allocations have been assigned to the WWTP. Because the CVRWQCB has not established specific waste load allocations for the City's WWTP, a significance determination based on actual quantification is not possible. Further, in the context of the low quantities of salt and boron originating from the WWTP, infrequent connection to the lower San Joaquin River, and a low management priority, the increased salt and boron loadings resulting from the Project would not conflict with achieving the water quality objectives established for the upper San Joaquin River. For these reasons, the impact is considered less than significant.

Mitigation: None required.

Impact 4.2.6: The application of biosolids to lands within and surrounding the City's WWTP property would degrade local groundwater quality. (Less than Significant)

The City currently applies Class B solar dried biosolids to the 580-acre industrial wastewater treatment site south of the WWTP facilities. With the Project, the City would implement improved treatment and handling of biosolids, including improving biosolids thickening with the addition of a new dissolved air flotation thickener, expanded anaerobic digestion facilities, new centrifuge dewatering, and new drying and stabilization to Class A quality solids using active solar dryers, consistent with 40 CFR, Part 503.

The active solar dryers would be used to dry, stabilize, and temporarily store biosolids prior to their being used in areas on-site or hauled offsite. The unlined drying beds currently in use would be abandoned. At 16 mgd, the WWTP would produce approximately 19,700 pounds of solids per day. At 20 mgd, it would produce about 24,667 pounds per day. About 580 acres of the industrial food processing waste disposal facility would continue to be used for the application of treated biosolids. This use would continue to be in compliance with WDR Order No. 97-034 through 2007.

Biosolids would also be disked into areas within the WWTP site. The unlined drying beds currently in use would be converted to fields where biosolids could be disked into soils. Emergency storage basins could also be used for disking biosolids.

The disposal of Class A Biosolids to lands under the City's jurisdiction would comply with 40 CFR, Part 503 or its revisions. The City will ensure that biosolid applications meet the following requirements:

A. The discharge of biosolids to surface waters or surface water drainage courses, wetlands, vernal pools, or significant habitat area will be prohibited.

B. The discharge of irrigation tailwater, stormwater, or other field runoff to surface water following biosolids application will be prohibited for 30 days.

C. Land application of biosolids within any designated floodway or flowage easements designated by the State Reclamation Board or floodways shown on Federal Emergency Management Agency (FEMA) maps will be prohibited.

D. Sludge application rates shall not exceed agronomic rates, or any rates that cause specific constituents to exceed single, annual, or lifetime application limits, based on all of the following: (1) 40 CFR 503, Criteria for Standards for the Use or Disposal of Sewage Sludge or its revisions; (2) Central Valley RWQCB laws and regulations; (3) soil cation exchange rates at the application site; (4) nitrogen demand of the crop; and (5) phytotoxicity of the crop.

E. Biosolids shall be land-spread within 24 hours of their arrival at the site and incorporated into the soil within 24 hours thereafter.

F. Staging areas and sludge application shall be at least:

    1. 25 feet from property lines.

    2. 500 feet from domestic or public water supply wells (wellhead protection area); occupied dwellings; and schools, hospitals, or similar facilities.

    3. 50 feet from non-domestic water supply wells.

    4. 50 feet from public roads.

    5. 100 feet from surface waters, including, but not limited to, creeks, ponds, lakes, vernal pools, marshes, or floodways.

G. Biosolids shall not be applied to soils where the depth to groundwater is less than 5 feet from the soil surface.

H. Biosolids shall not be applied to water-saturated ground or incorporated into its soil during periods of rainfall, when the ground is frozen, or when wind speeds at the site exceed 20 miles per hour. This wind speed requirement may be waived if the sludge or soil has adequate moisture content as determined by the City. In addition, the application and incorporation of sludge shall comply with the local air district regulations including, but not limited to, PM_{10} (particulate matter with a diameter of 10 microns or less) and fugitive dust rules, if applicable.

I. Sludge applications shall be limited to once per crop.

For the purpose of this analysis, it was assumed that the application of Class A biosolids as a soil amendment could also occur on adjacent agricultural properties within a two-mile radius of the WWTP. The application of biosolids to offsite areas would be conducted consistent with Merced County Sludge Disposal Ordinance No. 9.52 or, if the ordinance were not applicable, the provisions prescribed in 40 CFR, Part 503. With the implementation of the prescribed requirements, this impact would be less than significant.

Mitigation: None required.

Impact 4.2.7: Land application of disinfected tertiary treated water would result in the degradation of groundwater quality, and the over-application of disinfected tertiary water could result in direct runoff to surface water. (Less than Significant)

The disinfected tertiary-treated wastewater effluent from the expanded WWTP will meet Title 22 requirements. The WWTP improvements have been designed to produce effluent quality that would comply with the effluent limits anticipated in future WDRs and NPDES permit. Implementation of the Project would result in enabling seasonal irrigation of agricultural lands with disinfected tertiary wastewater. Under the Title 22 reuse standards, all surface runoff from irrigation using treated wastewater must be confined to the water use area, unless the runoff is authorized.

Typical water quality concerns regarding the use of reclaimed water include trace metals, TDS, and nitrates. In the context of these potential contaminants, the release of reclaimed water from future agricultural reuse areas would be inconsistent with allowable practices and regulations.

In the near term, treated wastewater or reclaimed water would be applied only to City-owned land, which includes the 580-acre industrial wastewater management area and the 96 acres of emergency ponds. Over the longer term, the use of land areas for the application of reclaimed water is less defined. However, the City does envision that applications could occur on nearby agricultural lands after the necessary infrastructure is in place.

The City would comply with an approved Title 22 Engineering Report to the Department of Health Services to allow this activity. As a performance standard, the engineering report is required to demonstrate that, at a minimum, uses of reclaimed water do not cause or contribute to:

- Conditions of pollution or nuisance, as defined in Section 13050 of the California Water Code
- Exceedances of any regional, state, or federal numeric or narrative water quality standard

All new users of reclaimed water shall operate reuse facilities in accordance with the engineering report and identify, for the City's approval, the area to be irrigated, the crop(s) to be irrigated, the proposed irrigation rate, and a justification of this irrigation rate, based on the agronomic rate of the crop(s) in question.

The City would also prepare an antidegradation analysis for each discrete discharge area. This analysis would address potential effects on groundwater quality from the discharge, as well as the cumulative effect, considering current farming practices and other waste sources. The analysis would provide the basis for implementing actions to prevent groundwater contamination or exceed applicable water quality standards.

Mitigation: None required.

4.3 Air Quality

4.3.1 Significance Criteria

A project may be deemed to have a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan(s);
- 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 that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people (specifically, more than one confirmed complaint per year averaged over a three-year period, or three unconfirmed complaints per year averaged over a three-year period).

Additionally, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has established thresholds of significance for construction impacts, project operations, and cumulative impacts.

For construction impacts, the pollutant of greatest concern to the district is PM_{10}.[1] The SJVAPCD recommends that significance be based on a consideration of the control measures to be implemented during project construction (SJVAPCD, 2002). Compliance with Regulation VIII, Rule 8011, and implementation of appropriate mitigation measures to control emissions of particulate matter are considered to be sufficient to render a project's construction-related impacts less than significant. The SJVAPCD *Guide for Assessing and Mitigating Air Quality Impacts* contains a list of feasible control measures for construction-related PM_{10} emissions.

The SJVAPCD's guide also includes significance criteria for evaluating operational-phase emissions from direct and indirect sources associated with a project. Direct sources associated with a project emit air pollutants directly into the environment, such as smokestack emissions. Stationary sources (such as generators) that comply, or that would comply, with SJVAPCD rules and regulations are generally not considered to have a significant air quality impact. Indirect sources include motor vehicle traffic associated with a project and do not include stationary sources covered under permits to operate from the SJVAPCD. For this analysis, the Project would be considered to have a significant effect on the environment if it would exceed the following thresholds:

- Cause a net increase in pollutant emissions of reactive organic gases (ROG) or nitrogen oxides (NO_x) exceeding 10 tons per year.

- Cause a violation of state carbon monoxide (CO) concentration standards. The level of significance of carbon monoxide emissions from mobiles sources is determined by modeling the ambient concentration under project conditions and comparing the resultant 1- and 8-hour concentrations to the respective state carbon monoxide standards of 20.0 and 9.0 parts per million.

- Cause "visible dust emissions"[2] due to onsite operations and thereby violate SJVAPCD Regulation VIII.

The operation of any project with the potential to expose sensitive receptors to substantial levels of toxic air contaminants (TACs) would be deemed to have a potentially significant impact. More specifically, proposed development projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Cancer risk for the Maximally Exposed Individual[3] increases by at least 10 in one million.

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[1] Construction equipment also emits carbon monoxide and ozone precursors, but the SJVAPCD has determined that these emissions would cause a significant air quality impact only in the case of a very large or very intense construction project (SJVAPCD, 2002).

[2] Visible dust is defined by the SJVAPCD as "visible dust of such opacity as to obscure an observer's view to a degree equal to or greater than an opacity of 40 percent, for a period or periods aggregating more than three minutes in any one hour."

[3] Maximally Exposed Individual represents the worst-case risk estimate, based on a theoretical person continuously exposed for 70 years at the point of highest compound concentration in air.

- Ground-level concentrations of non-carcinogenic TACs would result in a Hazard Index[4] greater than 1 for the Maximally Exposed Individual.

These standards are typically applied to the results of a health risk assessment through a detailed air dispersion modeling effort that uses the U.S. Environmental Protection Agency's (USEPA) Industrial Source Complex-3 or AERMOD model.

Lastly, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Impacts of local pollutants are cumulatively significant when the analysis shows that the combined emissions from the project and other existing and planned projects will exceed air quality standards.

4.3.2 Methodology

The following air quality analysis identifies the types of emissions sources that would be associated with the Project and evaluates their significance. Taking into account such factors as the types and amounts of the different pollutants that would be emitted, the duration of the impact, and the applicable significance criteria. The emissions estimates take into account such factors as fuel types and expected usage rates for different pieces of construction equipment.

Project-related air quality impacts fall into two categories: short-term construction-related impacts and long-term operations-related impacts. Short-term construction activities would primarily result in the generation of ROG, NO_x, and PM_{10}. Short-term construction emissions were calculated with the URBEMIS 2002 Air Pollution Emission Model version 8.7 based on assumptions provided by the SJVAPCD for construction phasing and equipment operation. Long-term operational emission sources include the WWTP facilities, haul truck trips, and the nominal vehicle emissions associated with routine inspection and maintenance of the expanded WWTP. Long-term vehicular criteria pollutant emissions (truck and worker trips) were calculated using the California Air Resources Board's (CARB) EMFAC2002 emissions model (CARB, 2003), and the long-term expanded WWTP facility emissions were estimated by scaling with respect to currently permitted emissions.

On-road motor vehicle emissions for the existing and 20 mgd WWTP levels of operation were estimated, using the CARB EMFAC2002 emission factors and the trip generation information provided in Chapter 2, Project Description. Operational emissions associated with the WWTP and equipment were calculated, based on the current SJVAPCD permits for the permitted 10 mgd WWTP operations and estimated emissions from the 20 mgd WWTP operation.

The permitted 10 mgd WWTP operations were selected to represent existing conditions because the City has obtained all permits and has complied with requirements of CEQA for operating the WWTP at this rated capacity. Because the analysis does not compare the increase in future

[4] The Hazard Index is ratio of a hazardous air pollutant concentration divided by its Reference Concentration, or safe exposure level. If this "hazard index" exceeds one, people are exposed to levels of hazardous air pollutants that may pose noncancer health risks.

operational emission with the 10 mgd WWTP, use of the 10 mgd WWTP provides a conservative estimate of emissions from the WWTP.

The 20 mgd WWTP level of operations was analyzed first to determine if the maximum planned WWTP capacity would have a significant impact; if not, then reduced WWTP capacities would not need to be further addressed.

A dispersion modeling analysis was performed to model TAC emissions associated with the long-term operation of the expanded WWTP. TAC emission sources were quantified, based on the following: additional haul trips associated with biosolids transport, an additional 1,500-kilowatt emergency generator, increases in processing rates at the WWTP, the replacement of the candle flare with an enclosed flare, and the addition of two digestor gas boilers. The Industrial Source Complex-3 model was used to estimate the ambient TAC concentrations that would result from the Project and the associated incremental cancer risk (i.e., the change in cancer risk from the baseline to the future Project conditions).

4.3.3 Impacts and Mitigation Measures

Impact 4.3.1: Construction activities associated with development of the Project would generate short-term emissions of criteria pollutants, including suspended and respirable particulate matter (PM_{10}) and equipment exhaust emissions. (Potentially Significant)

Construction-related emissions arise from a variety of activities including (1) grading, excavation, road building, and other earth-moving activities; (2) travel by construction equipment and employee vehicles, especially on unpaved surfaces; (3) exhaust from construction equipment; (4) architectural coatings; and (5) asphalt paving. These activities would last through 2011, with the most construction activity occurring during 2007.

PM_{10} emissions from construction would vary greatly from day to day, depending on the level of activity, the equipment being operated, silt content of the soil, and the prevailing weather. Larger-diameter dust particles (i.e., greater than 30 microns) generally fall out of the atmosphere within several hundred feet of construction sites and represent more of a soiling nuisance than a health hazard. Smaller-diameter particles (e.g., PM_{10}) are associated with adverse health effects and generally remain airborne until removed from the atmosphere by moisture. Therefore, unmitigated construction dust emissions could result in significant local effects. The SJVAPCD recommends that the determination of significance with respect to construction impacts be based not on quantification of emissions and a comparison to thresholds (SJVAPCD, 2002b), but upon the inclusion of feasible control measures for PM10 and compliance with Regulation VIII, Rule 8011of the SJVAPCD's rules and regulations. To comply with Rule 8011, the City would be required to implement provisions of a dust control plan, subject to a review by and the approval of the SJVAPCD.

Compliance with the requirements of Rule 8011 and the implementation of the measures defined in the dust control plan, which requires the integration of optional control measures, would reduce the impacts associated with PM_{10} to a less-than-significant level.

Construction equipment and construction-worker commute vehicles would also generate criteria air pollutant emissions. ROG and NO_x emissions from these sources would incrementally add to the regional atmospheric loading of ozone precursors during construction. For the evaluation of construction impacts, the SJVAPCD does not require a detailed quantification of construction emissions unless the project's indirect source emissions are expected to increase pollutant emissions of ROG or NOx in excess of 10 tons per year (see SJVAPCD Rule 9510). Since Project construction would exceed this threshold in conjunction with SRF requirements for a federal General Conformity analysis, construction emissions were quantified for the project and are provided in Table 4-5.

TABLE 4-5
CONSTRUCTION EMISSIONS ESTIMATES

	Significance Thresholds (Tons per Year)		Unmitigated Construction Emissions[1] (Tons per Year) for the Worst-Case Year (2nd Quarter 2007 Through 1st Quarter 2008)			
Pollutant	**SJVAPCD**	**Federal Conformity**	**Construction - Off-road Equipment[3]**	**Construction - On-road Traffic[4]**	**Total Construction Emissions**	**Significant (Yes/No)?**
ROG/VOC	10	50	5	1	6	No
NO_x	10	50	**36**	3	**39**	Yes
PM_{10}	NA[2]	70	16	1	17	NA
Carbon Monoxide	NA[2]	NA	44	11	55	NA

[1] Values in **bold** exceed the applicable SJVAPCD significance threshold.
[2] NA = Not Available. The SJVAPCD has not established significance thresholds for carbon monoxide or PM_{10}.
[3] Construction equipment emissions were calculated using URBEMIS2002 version 8.7. The types and numbers of equipment entered into the URBEMIS model were determined using the SJVAPCD Recommended Construction Fleet spreadsheet. Please see Appendix F for additional details.
[4] Construction related on-road vehicle emissions were determined using the EMFAC2002 emission factors for truck and construction worker trips. Please see Appendix F for additional details.

Notes: ROG = reactive organic gases; VOC = volatile organic compounds; NO_x = nitrogen oxides; PM_{10} = particulate matter with a diameter of 10 microns or less.

SOURCE: ESA, 2006.

As shown in Table 4-5, Project construction would result in an exceedance of the SJVAPCD and federal conformity thresholds for NO_x emissions. As a result of this exceedance, the City is mandated to comply with the SJVAPCD's Rule 9510, which requires NO_x construction-related emissions reductions of 20 percent, and the payment of fees (as calculated in Rule 9510) to offset NO_x construction emissions that exceed the allowable thresholds. The following measures are examples of actions able to achieve the 20 percent reduction.

- Require construction equipment used at the site to be equipped with catalysts/ particulate traps to reduce particulate emissions. These catalysts/traps require the use of ultra-low sulfur diesel fuel (15 parts per million). Currently, CARB has verified a limited number of these devices for installation in several diesel engine families to reduce their particulate emissions. At the time bids are made, the contractors must show that the construction equipment used is equipped with particulate filters and/or catalysts or prove why it is infeasible.

- Use alternative-fueled construction equipment.
- Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).
- Require that all diesel engines on the premises be shut off when not in use to reduce the emissions from idling.

Even with a 20 percent reduction in NO_x, Project construction would still generate about 50 tons of NO_x emissions per year. At this level of NO_x emissions, the Project would be consistent with federal general air quality conformity thresholds, but would continue to exceed SJVAPCD thresholds. Therefore, even with compliance with Rule 9510 NO_x reductions, the remaining NO_x emission impact would be continue to be significant.

Mitigation Measure

Measure 4.3.1: The City shall submit fees, consistent with the Rule 9510 offset program, to fund further reductions in regional NO_x emission, enabling the SJVAPCD to implement other programs and actions to reduce NOx emissions in the region.

Impact Significance After Mitigation: Less than significant.

Impact 4.3.2: The Project would result in an increase in operational emissions of criteria air pollutants (ROG, NOx and PM_{10}) and other TACs from on-road motor vehicle traffic traveling to and from the Project area and onsite area sources associated with the Project. (Less than Significant)

Over the operational life of the expanded WWTP, the Project would generate both criteria air pollutants (e.g., NO_x) and TACs. For the purposes of discussion, the analysis of operational impacts to local and regional air quality is divided into criteria air pollutants and TACs. The analysis for each is provided under the associated subheadings below.

Criteria Air Pollutants

Over the long term, Project-related motor vehicle trips and WWTP facility operations would result in an increase in criteria air pollutants. As shown in Table 4-6, criteria air pollutant emissions from current vehicle trips and the 10 mgd WWTP, were subtracted from motor vehicle and WWTP pollutant levels associated with the 20 mgd WWTP operations.

TABLE 4-6
ON-ROAD MOTOR VEHICLE AND WASTEWATER TREATMENT PLANT FACILITY EMISSIONS

	Criteria Air Pollutant Emissions [b] (Tons per Year)			
Scenario	**ROG or VOC**	**NO_x**	**PM_{10}**	**Carbon Monoxide**
20 mgd WWTP – Year 2010 - Motor Vehicle Emissions[a]	0.05	0.1	0.2	1.3
20 mgd WWTP Facility Emissions	7.3	15	0.6	35.6
Existing (10 mgd) – Year 2006 – Motor Vehicle[a]	0.06	0.1	0.2	1.5
Existing (10 mgd) Facility Emissions	9.6	11.9	0.5	32.4
Significance	**Not Significant**	**Not Significant**	**Not Significant**	**Not Significant**

a In order to estimate the worse-case incremental increase in emissions, the existing condition models the haul truck disposal of biosolids onsite (i.e., short trip length), whereas in 2007 and beyond (without the Project), the trucks would haul biosolids to the Forward Landfill in Manteca for disposal. Additional details are included in Appendix F.

b On-road motor vehicle emissions estimates were generated, using EMFAC 2002 emission factors for the year 2006 for the existing scenario, and year 2010 for the 20 mgd WWTP operational rate. WWTP facility and equipment emissions were calculated, based on SJVAPCD permits for the 10 mgd facility and a permit application for a 15 mgd facility. Information in these permits was then used to determine emissions from the 20 mgd facility. Additional details are included in Appendix F.

c SJVAPCD threshold of significance is 10 tons per year of ROG/VOC or NO_x. The Federal Conformity thresholds of significance are 50 tons per year of ROG/VOC or NO_x and 70 tons/year of PM_{10}.

NOTE: **Bold** values exceed applicable standard; ROG = reactive organic gases; NO_x = nitrogen oxides; VOC = volatile organic gases; mgd = million gallons per day; WWTP = wastewater treatment plant; PM_{10} = particulate matter with a diameter of 10 microns or less.

SOURCE: ESA, 2006.

Based on the estimates shown in Table 4-6, the Project's contribution to criteria air pollutant emissions would be below the SJVAPCD and federal conformity significance thresholds for ROG, NO_x and PM_{10} when operating at 20 mgd. Correspondingly, operation of the WWTP at reduced capacities would emit lower volumes of criteria air pollutants. Based on this finding, operation of the WWTP at 12, 16 or 20 mgd would result in less-than-significant long-term air quality impacts.

Toxic Air Containments

The principal issues related to health risks from the project pertain to emissions of TACs from the WWTP, flare, and digester gas boilers and the exhaust from the diesel trucks and emergency generator. The incremental risk was determined for these sources of TACs in order to obtain an estimated total incremental carcinogenic health risk. The TACs of interest include, but not limited to, chloroform, diesel particulate matter (DPM), formaldehyde, benzene, ammonia, and some metals.

Using the toxic potency unit risk factor, as established by Office of Environmental Health Hazard Assessment, the maximum carcinogenic risk of the Project over a 70-year lifetime of exposure from nearby sources is estimated at less than seven cancer cases in a million (at the maximum potentially exposed individual), assuming no reductions in emissions in the future from regulations related to DPM emissions. This level of risk is less that the SJVAPCD's significance threshold of 10 cancer cases per million for a 70-year exposure.

A majority of the potential health risk is attributed to chloroform from the WWTP and DPM emissions from new haul truck trips. However, given projected decreases in DPM emissions as a result of new regulations (approximately 85 percent reductions), the 70-year average lifetime cancer risk for the Project is estimated to be less than the risk associated with current conditions.

In addition, the maximum annual average concentration of DPM from nearby sources is much less than the non-carcinogenic lifetime exposure adjustment (LEA)[5] of 5 $\mu g/m^3$, thus leading to a hazard index of 0.01 as compared to a significance threshold of 1.0. Thus, the impacts of DPM as a result of the Project would be less than significant and minor when compared to current and future cancer risks from exposure to other TAC sources in California.

Four primary factors associated with the Project provide a direct connection to this less-than-significant determination:

- The replacement of the candle flare with an enclosed flare would result in a taller emission source with a greater VOC control efficiency.
- The addition of an ultra-violet light disinfection system in place of the existing chlorine disinfection system would eliminate chloroform emissions.
- The enclosure provided by the new headworks would result in decreased release of VOCs.
- Lastly, phased improvements to haul trucks engines and performance, as mandated by state law, would result in reductions in DPM emissions.

Based these findings, the operational impacts of the expanded WWTP in relation to the generation of TACs are considered less than significant.

Mitigation: None required.

Impact 4.3.3: The Project could create objectionable odors affecting a substantial number of people. (Less than Significant)

The SJVAPCD Guide requires that odor impacts be screened, based on the distance of an emitting facility to nearby sensitive receptors. Wastewater treatment facilities have an odor screening distance of two miles. The closest residence to the Project is north of the Project site on Gove Road at a distance of approximately 1,900 feet. Although there are receptors in the screening distance of the existing and proposed WWTP, the SJVAPCD had not received any past or current formal complaints, as of mid-2006, regarding odors from the operation of the WWTP (SJVAPCD, 2006). The Project would also update the existing head works facility, which is expected to result in a reduction in odors, as well as acquiring lands north and east of the WWTP

[5] The LEA at residential receptors is 1.0.

to facilitate establishing an odor buffer around the site. Therefore, odor impacts would be less than significant.

Mitigation: None required.

4.4 Geology

4.4.1 Significance Criteria

Implementation of the Project would result in significant geological impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - 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 (Refer to Division of Mines and Geology Special Publication 42.)
  - Strong seismic ground shaking
  - Seismic-related ground failure, including liquefaction
  - Landslides
- 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 offsite landslide, lateral spreading, subsidence, liquefaction or collapse;

4.4.2 Methodology

The impact assessment uses a qualitative analysis to address soil resources, geologic hazards and primary and secondary effects of earthquakes. Geologic and seismic hazards that, as a result of the implementation of the Project, would expose people to injury and infrastructure to damage were considered in terms of an adverse impact to public safety. Available information sources were used to characterize the seismic risk and geologic hazards in the vicinity of the WWTP.

The Project features were evaluated in terms of the identified levels of significance and whether the impacts were considered less than significant or significant. Potential water quality impacts caused by erosion and resulting sedimentation are described and addressed in Section 4.2, Water Quality. Section 4.2 also provides an analysis of local impacts to groundwater quality in response to the City's biosolids disposal program.

4.4.3 Impacts and Mitigation Measures

Impact 4.4.1: In the event of a major earthquake in the region, seismic ground shaking could cause collapse or structural damage to the WWTP and associated facilities. Structural damage to Project components resulting from substantial displacement along various fault sources could indirectly result in significant injury to people and disruption of major services (e.g., sanitary sewer). (Less than Significant)

Most structures, including buildings, roads, bridges, paved areas, containment facilities, and buried pipelines, are potentially subject to damage from earthquakes. Ground shaking is an unavoidable hazard for facilities in the San Francisco Bay and San Joaquin/Sacramento Valley region. 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. Ground shaking within the Project area could cause significant damage to structures if they are not constructed in accordance with California Building Code (CBC) requirements for Seismic Zone 3.

New facilities associated with the Project would likely be subject to the effects of at least one major earthquake during the Project's operational life. Based on calculations preformed by the City's geotechnical engineer, the peak ground acceleration (PGA) with a 10 percent probability of exceedance in 100 years is 0.22 g (BSK, 2005). This level of seismic shaking is less than that of areas along the coast, which are expected to experience a much higher PGA. Nonetheless, damage to the structural elements of the Project and to the machinery or injuries to workers from a seismic event could result in a temporary cessation of facility operations. Structural damage to new pipelines and pipe joints, due to their buried nature, would be expected to be less than the damage to aboveground structures.

These hazards are unavoidable, but measures to reduce the hazard to an acceptable level of risk would be implemented as part of the Project. Per Title 24 CCR, the City is required to have a licensed geotechnical engineer perform a geotechnical investigation for each structural component of the Project. These procedures are consistent with Policies 2.1c and 2.1g of the City's General Plan. The recommendations of the investigation would be integrated in the structural design of the Project. Additionally, the Project would be constructed in accordance with applicable (2001) CBC regulations for areas in Seismic Risk Zone 3. The implementation of these required measures would reduce the potential for injury and the length of service interruptions during and after a seismic event and ensure a less-than-significant impact.

Mitigation: None required.

Impact 4.4.2: The Project area could be subjected to geologic hazards, including liquefaction, differential settlement, total settlement, and minor slumping along Hartley Slough. (Less than Significant)

Seismic hazards related to ground shaking could occur in the Project area. Liquefaction of localized unconsolidated sand deposits in areas of high groundwater could result in lateral spreading and

settlement of soils beneath the pipeline and associated above-grade structures (e.g., aeration facility). However, based on the subsurface investigation conducted by the City's geotechnical engineer, the potential for liquefaction is considered low (BSK, 2005). Nonetheless, there remains a small risk of seismically induced ground settlement of non-saturated soils, which could result in breakage of pipes and underground power conduits.

As previously indicated in the discussion of Impact 4.4.1, hazards associated with ground shaking are considered unavoidable; however, compliance with the requirements in Title 24 CCR would reduce the level of these hazards to an acceptable level of risk. Pending final design of the expanded WWTP, a licensed geotechnical engineer would confirm the relative susceptibility of the proposed structures to liquefaction, total settlement, and/or differential settlement. The recommendations of the final geotechnical report would be integrated into the structural design of each component and would reduce the potential for injury and the length of service interruptions during and after a seismic event. For these reason, the impact is considered less than significant.

Mitigation: None required.

4.5 Soils

4.5.1 Significance Criteria

Implementation of the Project would result in significant soil resource impact if it would:

- Be located on expansive soil creating substantial risks to life or property.
- Contain corrosive qualities that could threaten the structural integrity of structures or subsurface construction.

4.5.2 Impacts and Mitigation Measures

Impact 4.5.1: The presence of expansive and corrosive soils could result in structural damage to the proposed pipeline and associated facilities. (Less than Significant)

Typically, soils that exhibit expansive characteristics comprise the upper five feet of the surface. The effects of expansive soils could damage foundations of aboveground structures, paved roads and streets, and concrete slabs. Expansion and contraction of these soils, depending on the season and the amount of surface water infiltration, could exert enough pressure on structures to result in cracking, settlement, and uplift. The City's geotechnical engineer has identified moderately expansive native soil materials onsite (BSK, 2005). The main limitations of these expansive soil materials are difficulties in achieving efficient compaction and reduced load capacity during excavation. Standard engineering recommendations are included in the project's geotechnical report and would be implemented as part of the facility's construction to mitigate these hazards.

Similarly, the geotechnical investigation identified shallow groundwater across the Project site, which could be potentially corrosive to buried structures (BSK, 2005). However, through the incorporation of standardized engineering practices, corrective recommendations are included in the geotechnical report to address this issue. With this understanding, any impacts associated with expansive and/or corrosive soil materials would be solved through standardized engineering practices and the resulting impact is considered less than significant.

Mitigation: None required.

4.6 Vegetation

4.6.1 Significance Criteria

Based on CEQA Guidelines Section 15065 and Appendix G, as well as professional judgment, the Project would result in a significant impact on the environment if it would:

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Threaten to eliminate a plant community.

4.6.2 Methodology

This analysis is based upon field reconnaissance of the Project study area, literature searches, and database queries. The sources of reference data reviewed for this assessment included the following:

- California Natural Diversity Database (CNDDB), Rarefind 3 computer program for the following USGS quadrangles: Sandy Mush, Arena, Atwater, El Nido, Bliss Ranch, Merced, Turner Ranch, Delta Ranch, and Santa Rita Bridge (CNDDB, 2005)
- CDFG, *State and Federally Listed Endangered, Threatened, and Rare Plants of California, July 2005* (CDFG, 2005b)
- CDFG, *Vascular Plants, Bryophytes, and Lichens List, July 2005* (CDFG, 2005c)
- California Native Plant Society (CNPS), Electronic Inventory computer program for the following 7.5-minute USGS quadrangles: Sandy Mush, Arena, Atwater, El Nido, Bliss Ranch, Merced, Turner Ranch, Delta Ranch, and Santa Rita Bridge (CNPS, 2005)
- U.S. Fish and Wildlife Service (USFWS), Plant Species of Concern (USFWS, 2005b)
- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles: Sandy Mush, California (USGS, 1963) and Atwater, California (USGS, 1987)

The impact analysis focuses on foreseeable changes to the baseline condition in the context of the significance criteria presented above. In conducting the following impact analysis, three principal components of the Guidelines outlined above were considered:

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

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

4.6.3 Impacts and Mitigation Measures

Impact 4.6.1: Construction and/or operation of the Project would conflict with local policies or ordinances for protecting biological resources. (Potentially Significant)

Project development could potentially impact habitat for native, rare, and threatened species. Construction activities may cause soil erosion, which could potentially affect surface water quality. These impacts would be inconsistent with the following City's open space policies as stated in the Merced Vision 2015 General Plan (Merced County, 1990): OS-1.1 (Identify and preserve wildlife habitat which support rare, endangered, or threatened species) and OS-1.2 (Preserve and enhance creeks in their natural state throughout the planning area) Also refer to the discussion of potential impact presented in Section 4.13.1 and 4.13.2.

Mitigation Measures

Implementation of **Mitigation Measure 4.2.1a** will reduce potential impacts from soil erosion to less than significant.

Measure 4.6.1a: The City shall avoid spreading invasive plants that could impact biological resources in the Project area. The City will ensure that all fill material brought onto the Project area from offsite shall be from weed-free sources. The upland filled areas and upland areas disturbed by grading and excavation activities will be revegetated with appropriate native species to discourage the colonization of invasive plants in the Project study area.

All seed for revegetation shall consist of 100 percent native plant species. The seed mix shall be premixed and packaged by a commercial seed supplier, labeled in accordance with the California Agricultural Code; shall be delivered to the site in original, unopened containers, and shall bear a dated guaranteed analysis.

Measure 4.6.1b: The City shall avoid unnecessary disturbance to native vegetation. In order to avoid and minimize potential impacts from trampling established vegetation communities, construction activities will be limited to designated staging areas, construction footprints, and construction easements. These areas shall be reseeded with native plants (as prescribed in Mitigation Measure 4.6.1a).

Impact Significance After Mitigation: Less than significant.

Impact 4.6.2: The Project would jeopardize or eliminate plant and wildlife habitats. (Less than Significant)

Excluding already developed areas, the Project would temporarily alter 3.4 acres of various habitats and permanently displace 30.0 acres of various vegetation and habitats. Table 4-7 identifies the acreage of plant communities that would be affected. None of these communities is unique or limited to the Project area.

TABLE 4-7
VEGETATION AND HABITATS AFFECTED
BY WASTEWATER TREATMENT PLANT EXPANSION

(Perhaps title could be changed to Undeveloped Habitats and several categories below deleted)

Habitat	Total in Project Area	Permanently Affected	Temporarily Affected
Annual Grassland	24.1	--	--
Alkali Scrub	48.0	--	--
Eucalyptus	20.6	0.4	0.5
Fresh Emergent Wetland	8.0	0.03	0.10
Seasonal Wetland	2.7	0.02	--
Riverine	2.1	--	--
Drains and Channels	5.1	3.1	0.1
Ruderal	7.7	0.4	0.2
Disked Field	35.0	26.0	2.4
Landfill	3.75	--	--
Subtotal	**157.0**	**30.0**	**3.4**
Developed Area	113.5	39.2	18.3
Total	**270.6**	**69.1**	**21.7**

SOURCE: ESA, 2006

Vegetation and habitats that are regulated by statute (i.e., waters of the U.S. and riparian lands) are discussed separately in Section 4.14 of this document. In addition, vegetation and habitats that may support special-status species are addressed in Section 4.13 of this document. Both of these discussions present mitigation for potential significant impacts that may result from Project implementation.

The remaining vegetation and habitat identified in Table 4-7 is common and abundant in this region of California. Potential impacts to these vegetative communities and habitats are not considered to be significant.

Mitigation: None required.

4.7 Fish and Wildlife

4.7.1 Significance Criteria

Based on CEQA Guidelines Section 15065 and Appendix G, as well as professional judgment, the Project would result in a significant impact on the environment if it would:

- Interfere substantially with the movement of any native resident or migratory fish 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;
- 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 a fish or wildlife population to drop below self-sustaining levels; or
- Threaten to eliminate an animal community.

4.7.2 Methodology

This analysis is based upon field reconnaissance of the Project study area, literature searches, and database queries. The sources of reference data reviewed for this assessment included the following:

- CNDDB, Rarefind 3 computer program for the following USGS quadrangles: Sandy Mush, Arena, Atwater, El Nido, Bliss Ranch, Merced, Turner Ranch, Delta Ranch, and Santa Rita Bridge (CNDDB, 2005)
- CDFG, State and Federally Listed Endangered and Threatened Animals of California, July 2005 (CDFG, 2005a)
- USFWS, List of Federal Endangered and Threatened Species that may be Affected by Projects in the "Sandy Mush and Atwater" 7 ½ Minute Quadrangles (USFWS, 2005a)

- USGS 7.5-minute topographic quadrangles: Sandy Mush, California (USGS, 1963) and Atwater, California (USGS, 1987)

The impact analysis focuses on foreseeable changes to the baseline condition in the context of the significance criteria presented above. In conducting the following impact analysis, three principal components of the CEQA Guidelines outlined above were considered:

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

The evaluation of the significance of the following impacts considered the interrelationship of these three components. For example, a relatively small magnitude impact to a state or federally listed species would be considered significant because the species is rare and is believed to be susceptible to disturbance. Conversely, an animal community such as the common raccoon is not necessarily rare or sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to result in a significant impact.

4.7.3 Impacts and Mitigation Measures

Impact 4.7.1: The expansion of the WWTP would impede or interfere with the regional movement or migration of wildlife species in the area. (No Impact)

The Project would not create a physical barrier or impediment that would impede or interfere with the movement or migration of wildlife species, including terrestrial, aquatic, or avian species because no new facilities would be constructed that have the capacity to interrupt or impede the movement or migration of wildlife in the area. Major physical improvements to the WWTP would be limited to treatment facilities located onsite, levees of moderate height, and road access to the WWTP property. None of these improvements would interfere with wildlife movement or migration.

Mitigation: None required.

Impact 4.7.2: Expansion of the WWTP would create new ponds or water bodies that would attract waterfowl. (No Impact)

The Project would not create new ponds or surface water bodies that would attract waterfowl or other avian species. The Project would not alter existing ponds or treated effluent supplies that maintain the Merced Wildlife Management Area.

Mitigation: None required.

Impact 4.7.3: Proposed improvements to the WWTP treatment process would increase effluent volume and produce higher quality effluent, and thus, changes to Hartley Slough aquatic species could occur as effluent quantity increases and quality improves. (Less than Significant)

The Project would increase the effluent discharge to Hartley Slough to almost double the current amount. This increase may affect fish and other aquatic species. Based on the macroinvertebrate sampling results from August and December 2005, it appears that conditions immediately upstream of the current outfall in Hartley Slough are rated as "good" or as having some organic pollution, as determined by Hilsenhoff's Field Biotic Index (Fox, 2005). Immediately downstream of the current outfall, the Field Biotic Index rating is only "fair," which suggests a fairly significant amount of organic constituents in the surface water. A possible explanation for the difference between these two ratings may reflect the effluent outfall contributions.

Currently, the secondary-treated effluent is discharged into Hartley Slough. With implementation of the Project, the effluent discharged would be higher quality tertiary-treated effluent. See Section 4.2, Water Quality, for more details on water quality impacts. Although the volume of flow would increase in the slough, the water velocity is not likely to significantly increase because of downstream hydraulic controls (see Section 4.1, Water Quantity). The tertiary-treated effluent should be of higher quality than that of the secondary-treated effluent, increasing the water quality within Hartley Slough when compared to the existing conditions.

The populations of various aquatic macroinvertebrates in Hartley Slough may change in composition and density. Those species that prefer higher dissolved oxygen and lower organic constituents are expected to increase in abundance while others that prefer lower dissolved oxygen and higher organic constituents may decline.

The anticipated beneficial changes in water quality would not have an adverse impact on aquatic species and habitats. A new species mix is expected to become established corresponding to the improved water quality as influenced by the WWTP discharge.

Mitigation: None required.

4.8 Aesthetics

4.8.1 Significance Criteria

The Project would result in a significant impact to aesthetic resources if it would:

- Have a substantial adverse effect on a scenic vista
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway

- Substantially degrade the visual character or quality of the site and its surroundings
- Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area

4.8.2 Methodology

This analysis for visual resources used three key steps: (1) identifying the visual character and quality; (2) identifying the type, exposure, and sensitivity of viewers; and (3) identifying the potential change in visual resources. All three of these elements were considered when determining the level of visual impact resulting from the Project. The actual impacts of the Project would be determined based on changes to the baseline conditions in the context of the applied significance criteria.

4.8.3 Impacts and Mitigation Measures

Impact 4.8.1: The Project would adversely affect a scenic vista or scenic resources within a state scenic highway or a city scenic corridor. (No Impact)

The Project area does not include any vistas or roadways designated as scenic by the state or local General Plans (City of Merced, 1997; County of Merced, 2000). The Project area is generally flat and the only visible topographic features from the Project site are the distant Sierra Nevada, which begin approximately 30 miles east and the Coast Range, which are over 40 miles west. In addition, Project construction would not obstruct a public view, scenic vista, or significant feature, or create an aesthetically offensive public view. Therefore, the Project would have no impact on a scenic vista or roadway.

Mitigation: None required.

Impact 4.8.2: The Project would modify the visual character of the Project area. (Less than Significant)

The Project would involve the construction of facilities for expanding water treatment capacity. To accommodate the new facilities, the Project would acquire 46 acres of land immediately north and east of the WWTP and develop and utilize 20 acres for WWTP purposes. This land would be used for the expansion of the WWTP's new headworks and for odor control. New levees similar to the levees found at the WWTP would also be constructed around the WWTP facilities.

The visual setting of the immediate area consists of paved and dirt roadways, irrigated pasture Travelers and residents near the Project site would be able to view the construction of the expanded facilities. However, these views would generally be of short duration, until construction is completed and the site is restored.

The area is characterized by low to moderate visual interest, with the WWTP being the dominant feature in the area; therefore, changes to the visual character would be minimal. The potential impact on visual character is considered less than significant.

Mitigation: None required.

Impact 4.8.3: The Project would create new sources of daytime glare and/or nighttime illumination. (Potentially Significant)

The Project would include the installation of additional permanent lighting fixtures (e.g., security lights) for the expanded WWTP facilities. In addition, it is plausible that construction operations during evening hours could employ mobile lighting equipment that would generate limited nighttime illumination. However, because there are no sensitive receptors in the vicinity of the WWTP, no significant impacts are expected from such temporary lighting equipment. Additionally, mobile lighting equipment would be directed toward the construction site and away from any residences or public roadways. Therefore, temporary impacts of nighttime illumination for the Project are considered less than significant with the implementation of Mitigation Measure 4.8.3.

During construction, daytime glare may increase with the introduction of equipment and construction materials that may add to glare on the WWTP site. This increase would be temporary and limited to the construction period and minor because of the degree of equipment and materials onsite associated with the ongoing operation of the WWTP. The Project would have a less-than-significant impact on daytime glare at the WWTP site.

Mitigation Measure

> **Measure 4.8.3:** The City shall install security lighting with directional shields to concentrate lighting toward the Project site. The nighttime security and associated parking lighting fixtures will be equipped with directional shields that aim light downward and away from adjacent properties and public roadways. In addition, lighting fixtures will be placed to concentrate light onsite to avoid spillover onto adjacent properties and public roadways.
>
> **Impact Significance After Mitigation:** Less than significant.

4.9 Noise

4.9.1 Significance Criteria

The Project would result in a significant impact if it would:

- Expose persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance or in the applicable standards of other agencies

- Expose persons to or generate excessive groundborne vibration or groundborne noise levels

- Result in a substantial permanent increase in ambient noise levels in the Project vicinity substantially above levels existing without the Project and in excess of standards established in the local General Plan or noise ordinance or in the applicable standards of other agencies

- Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity substantially above levels existing without the Project and in excess of standards established in the local General Plan or noise ordinance or in the applicable standards of other agencies

Additionally, as described in Tables 3-9 and 3-10 of this document, the Merced County General Plan and Noise Ordinance specify the following significance criteria for changes in noise from Project operations:

- A resulting noise level at any residential receptor property line that exceeds 55 dBA Leq in the daytime (7 a.m. to 10 p.m.) or 45 dBA Leq in the nighttime (10 p.m. to 7 a.m.)

- A resulting offsite noise level that exceeds the background noise level by 10 dBA in the daytime (7 a.m. to 10 p.m.) or by 5 dBA in the nighttime (10 p.m. to 7 a.m.)

4.9.2 Impacts and Mitigation Measures

Impact 4.9.1: Project construction would temporarily increase noise levels at nearby sensitive receptor locations. (Potentially Significant)

Construction activity noise levels at and near the WWTP would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. Table 4-8 shows typical noise levels during different construction stages and those produced by various types of construction equipment.

Construction of the Project could generate significant noise, corresponding to the particular phase of building construction and the noise-generating equipment used during construction. The closest sensitive receptor to the Project site is to the north on Gove Road. Other sensitive receptors in the Project area would be exposed to construction noise at incrementally lower levels.

Noise from construction activities generally attenuates at a rate of 6 to 7.5 dBA per doubling of distance. The residence north of the Project site on Gove Road would be approximately 1,900 feet from Project construction. Assuming an attenuation rate of 6 dBA per doubling of distance, this residence would experience noise levels of 57 dBA Leq during excavation and finishing activities, the loudest of the construction phases that would occur. Back-up beepers associated with trucks and equipment used for material loading and unloading at the Project site would generate significantly increased noise levels over the ambient noise environment. Construction noise would be greater than the noise levels at the sensitive receptor on Gove Road.

TABLE 4-8
TYPICAL NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AND CONSTRUCTION EQUIPMENT

Construction Phase	Noise Level[a] (dBA, Leq)	Construction Equipment	Noise Level[a] (dBA, Leq at 50 Feet)
Ground clearing	84	Dump truck	88
Excavation	89	Portable air compressor	81
Foundations	78	Concrete mixer (truck)	85
Erection	85	Scraper	88
Finishing	89	Jackhammer	88
		Dozer	87
		Paver	89
		Generator	76
		Backhoe	85

[a] Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

Construction activities associated with the Project would be temporary in nature and related noise impacts would be short term. However, although construction activities would occur when a majority of people are at work, retired persons, people who work at home, and homemakers could be significantly affected by noise when construction activities occur in the immediate vicinity. In addition, construction-related material haul trips and vehicle traffic to and from construction sites would raise ambient noise levels along construction haul routes. Compliance with the Merced County Noise Regulations (Tables 3-9 and 3-10) and implementation of Measure 4.9.1 would reduce impacts to less than significant.

Mitigation Measure

Measure 4.9.1: The applicant shall implement the following measures:

- Construction activities shall be limited to between 7 a.m. and 10 p.m. Monday through Saturday to avoid noise-sensitive hours of the day. Construction activities shall be prohibited on Sundays and holidays.

- Construction equipment noise shall be minimized by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.

- Construction contractors shall locate fixed construction equipment (such as compressors and generators) and construction staging areas as far as possible from nearby residences.

Impact Significance After Mitigation: Less than significant.

Impact 4.9.2: Project operational activities associated with traffic and WWTP equipment operation could increase ambient noise levels at nearby land uses. (Less than Significant)

Operational activities associated with the Project that would generate noise include maintenance vehicle circulation and the operation of certain mechanical equipment such as stationary pumps, fans, and generators.

Operational vehicle trips in the vicinity of the WWTP would increase as a result of additional WWTP operator vehicle trips, delivery of materials and chemicals to the WWTP, and disposal of biosolids at nearby agricultural disposal areas. As discussed in Chapter 2, Project Description, local trips would increase up to 10 trips per day, consisting of about six WWTP operator commuting trips and three biosolid truck disposal trips. An additional trip for delivery of materials is also anticipated. This increase in trips would not generate a substantial increase in noise along local roadways.

Operation of stationary pumps, fans, and any other mechanical equipment would be the primary noise sources at the expanded WWTP. This equipment would be enclosed, shielded, or located within the WWTP interior to minimize noise increase at the WWTP property boundary and not exceed ambient noise increases by more than 5 dBA. The resulting noise impact associated with WWTP operations would be less than significant.

Mitigation: None required.

4.10 Recreation

4.10.1 Significance Criteria

The Project would result in a significant impact to recreational resources if it would:

- Increase the use of neighborhood and 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 that might have an adverse physical effect on the environment

4.10.2 Methodology

The approach used to analyze the Project's recreational impacts was to identify the changes to recreational resources expected to result from Project implementation and to evaluate the significance of such changes when weighed against the environmental baseline.

4.10.3 Impacts and Mitigation Measures

Impact 4.10.1: The Project would result in an increase in visitor use of neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (No Impact)

The expansion of the WWTP would create a limited amount of additional job opportunities, aside from temporary construction jobs, and would not attract outside visitors to the Project area. Additionally, and as described further in Chapter 6, Growth-Inducing Impacts, no unplanned growth would occur from Project implementation. For these reasons, the Project would not directly increase the use of parks or other recreational facilities such that physical deterioration of the facility would occur or be accelerated. Therefore, no impact would occur. Indirect effects of the Proposed Project are discussed in Chapter 6.

Mitigation: None required.

Impact 4.10.2: The Project would substantially disrupt or conflict with the use of recreational facilities to the extent that it would affect the recreational value of such facilities. (No Impact)

Access to the Merced Wildlife Management Area, which lies south of the WWTP and is part of the Merced National Wildlife Refuge, would be maintained to allow permitted hunting within the wildlife area. Provisions are planned as part of the design for the expanded WWTP to enable continued public access to the refuge using Gove Road past the WWTP site. Therefore, impacts to recreational facilities are considered less than significant.

Mitigation: None required.

4.11 Open Space

4.11.1 Significance Criteria

The Project would be considered to have a significant impact on open space if it would result in any of the following:

- Loss of open space that supports or maintains protected environmental resources, such as special-status species habitat, important farmland, or other important resource

- Conflicts with applicable policy for managing open space or other open space maintenance agreement or easement

- Loss of open space that acts as a buffer and results in a conflict between adjacent land uses

4.11.2 Methodology

The analysis of the Project's open space impacts is based on the above significance criteria in the context of the Project area. The approach used to analyze the impacts of the Project on open space was to compare the changes resulting from Project implementation with the environmental baseline.

4.11.3 Impacts and Mitigation Measures

Impact 4.11.1: The Project would displace about 20 acres of open space currently in an agricultural land use. (Potentially Significant)

As shown on Figure 2-4, the expansion of the WWTP would extend north and east of the WWTP site boundaries and encompass about 20 acres of agricultural land. The land would be occupied by new WWTP facilities and the levee protecting the site from flooding. The loss of 20 acres of Important Farmland, as noted in Section 4.14, Environmentally Sensitive Areas, would be a potentially significant impact. This loss is considered significant and unavoidable, even with measures to acquire and protect equal acreage in an agricultural land use.

Mitigation Measure

Measure 4.11.1: Implementation of Mitigation Measure 4.14.1 will reduce potential impacts from loss of agricultural lands.

Impact Significance After Mitigation: Significant and unavoidable.

Impact 4.11.2: The Project would conflict with an existing policy for managing open space or other agreement/easement for open space protection. (No Impact)

The Project would not conflict with an existing policy for managing open space or other agreement or easement for open space protection. No specific open space areas have been designated or are being managed in the immediate vicinity of the WWTP site. No impact would occur to open space management.

Mitigation: None required.

Impact 4.11.3: The Project would result in the loss of open space that acts as a buffer and could result in a conflict between adjacent land uses. (No Impact)

The open space land that would be made part of the WWTP site does not act as a buffer between conflicting land uses. All land uses surrounding the WWTP site consist of agricultural production uses. The Project would have no impact on displacing open space that acts as a buffer between conflicting land uses.

Mitigation: None required.

4.12 Cultural Resources

4.12.1 Significance Criteria

The Project would be considered to have a significant impact on cultural resources if it would result in any of the following:

- A substantial adverse change in the significance of a historical resource that is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources, or a local register of historic resources
- A substantial adverse change in the significance of a unique archaeological resource
- Disturbance or destruction of a unique paleontological resource or site or unique geologic feature
- Disturbance of any human remains, including those interred outside formal cemeteries

4.12.2 Methodology

A cultural resources records search of all pertinent survey and site data was conducted at the Central California Information Center, California State University, Stanislaus, on December 19, 2005 (CCIC # 6034I). The records were accessed by reviewing the USGS 7.5-minute quadrangle maps for Atwater, El Nido, Merced, and Sandy Mush and included the Project area and the land within a one-quarter-mile radius around the Project site. Other sources that were reviewed included the Directory of Properties in the Historic Property Data File for Sacramento County, the National Register of Historic Places, the California Register of Historic Resources, the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992).

The Native American Heritage Commission (NAHC) was contacted by an ESA archaeologist on January 24, 2006, and asked to provide information on locations of importance to Native Americans in the Project area and a list of Native Americans who should be contacted. The NAHC provided a list of three Native American organizations. A letter sent to the three organizations provided information about the Project and requested information on locations of importance to Native Americans. No responses have been received to date.

An archaeological field inspection of the Project area was conducted in January 2006 by a registered professional archaeologist. The surface of the Project area was inspected by using systematic survey transects spaced between 15 and 30 meters apart in areas of good surface visibility and a cursory survey in paved or otherwise covered portions of the Project site. The pavement and heavy vegetation cover reduced the visibility of the surface over large portions of the Project site. Areas of visible surface, especially along the river bank, were examined for evidence of archaeological remains such as artifacts, bone, features, or culturally modified soil horizons.

Available literature and records were reviewed to determine the potential to encounter paleontological remains at the WWTP site, vicinity, or general area. Records reviewed included online records of the University of California's Museum of Paleontology.

4.12.3 Impacts and Mitigation Measures

Impact 4.12.1: The Project would cause adverse effects to unknown historical resources, including unique archaeological resources. (Potentially Significant)

No cultural resources have been identified within the Project area as a result of any cultural resource surveys. Additionally, a thorough investigation of the site by a qualified archeologist also yielded no evidence of cultural resources. However, this does not conclusively demonstrate the absence of subsurface cultural resources on the Project site. Traditional foot survey methods are constrained by variations in the natural landscape, such as grass and brush cover and agricultural tilling that can obscure surface evidence. Grading and other construction-related activities could cause significant impacts to the scientific value of the historical resources, unique archaeological resources, or traditional cultural properties that may be in the Project area. With the implementation of Mitigation Measure 4.12.1, this impact would be less than significant.

Mitigation Measure

> **Measure 4.12.1:** In the event of the accidental discovery of cultural resources, such as structural features or unusual amounts of bone or shell, artifacts, human remains, architectural remains (such as bricks or other foundation elements), or historic archaeological artifacts (such as antique glass bottles, ceramics, etc.), work will be suspended and City staff will be contacted.
>
> A qualified cultural resource specialist will be retained and will perform any necessary investigations to determine the significance of the find. The City will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources.

In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts to historical resources or unique archaeological resources, the Project proponent will determine whether avoidance is feasible in light of the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the Project site while the mitigation for historical resources or unique archaeological resources is carried out.

In addition, pursuant to Sections 5097.97 and 5097.98 of the California Public Resources Code and Section 7050.5 of the California Health and Safety Code, in the event of the discovery of human remains, all work will be halted and the County Coroner will be immediately notified. If the remains are determined to be Native American, their treatment and disposition will adhere to the NAHC guidelines.

Impact Significance After Mitigation: Less than significant.

Impact 4.12.2: The Project would cause adverse effects on unknown paleontological resources. (Potentially Significant)

The Project area contains mostly recent (Holocene) alluvial floodplain soils and surface deposits underlain by bedrock layers, which may yield deposits of ancient marine shell and other highly common accumulations of ancient life found in certain bedrock layers. However, these areas are less likely to harbor paleontological resources that would qualify as significant, in terms of scientific importance, for the purposes of CEQA (CEQA Guidelines 15064.5(a)(3)).

Available records indicate that paleontological resources are associated with deposits and materials laid during Quaternary period. Resources have been found along active river channels, such as the Merced River, which has eroded downward to the older geologic materials and exposed fossil remnants (UCMP, 2006). There are no similar water features present in the Project area.

Nevertheless, significant fossil discoveries can be made, even in areas designated as having a low potential for such resources and could result from deeper excavation activities related to the Project. Excavation activities associated with the Project may extend to depth of 10 to 12 feet below the ground surface and can have a deleterious effect on such resources. This impact would be reduced to a less-than-significant level with the incorporation of Mitigation Measure 4.12.2.

Mitigation Measure

Measure 4.12.2: The City shall notify a qualified paleontologist of unanticipated discoveries, in order to document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in Section 15064.5 of the CEQA Guidelines. In the event a fossil is discovered during construction, activities that could potentially affect the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist, in accordance with Society of Vertebrate Paleontology standards. The paleontologist will notify City to determine procedures to be followed before construction is allowed to resume at the location of the find. If the City

determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the Project on the qualities that make the resource important, and the plan will be implemented. The plan will be submitted to the City for review and approval.

Impact Significance After Mitigation: Less than significant.

4.13 Threatened and Endangered Species

4.13.1 Significance Criteria

Based on CEQA Guidelines Section 15065 and Appendix G, as well as professional judgment, the Project 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; or

- Substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

4.13.2 Methodology

This analysis is based upon field reconnaissance of the Project study area, literature searches, and database queries. The sources of reference data reviewed for this assessment included the following:

- CNDDB, Rarefind 3 computer program for the following USGS quadrangles: Sandy Mush, Arena, Atwater, El Nido, Bliss Ranch, Merced, Turner Ranch, Delta Ranch, and Santa Rita Bridge (CNDDB, 2005)

- CDFG, State and Federally Listed Endangered and Threatened Animals of California, July 2005 (CDFG, 2005a)

- CDFG, State and Federally Listed Endangered, Threatened, and Rare Plants of California, July 2005 (CDFG, 2005b)

- CDFG, Vascular Plants, Bryophytes, and Lichens List, July 2005 (CDFG, 2005c)

- CNPS, Electronic Inventory computer program for the following 7.5-minute USGS quadrangles: Sandy Mush, Arena, Atwater, El Nido, Bliss Ranch, Merced, Turner Ranch, Delta Ranch, and Santa Rita Bridge (CNPS, 2005)

- USFWS, List of Federal Endangered and Threatened Species that may be Affected by Projects in the "Sandy Mush and Atwater" 7.5-minute quadrangles (USFWS, 2005a)

- USFWS, Plant Species of Concern (USFWS, 2005b)
- USGS 7.5-minute topographic quadrangles: Sandy Mush, California (USGS, 1963) and Atwater, California (USGS, 1987)

Appendix G to this EIR presents a biological assessment addressing potential effects of the project on federally designated species consistent with the requirements of Section 7 of the federal Endangered Species Act.

4.13.3 Impacts and Mitigation Measures

Impact 4.13.1: Construction of the Proposed Project could result in impacts to the following special-status species: valley elderberry longhorn beetle, blunt-nosed leopard lizard, giant garter snake, Swainson's hawk, greater sandhill crane, and San Joaquin kit fox. (Potentially Significant)

The Project study area provides potential habitat for several threatened and endangered animal species, including valley elderberry longhorn beetle, blunt-nosed leopard lizard, giant garter snake, Swainson's hawk, greater sandhill crane, and San Joaquin kit fox. Construction and/or operation of the Project may affect these species and their habitats by incidentally taking a species, potentially jeopardizing the viability of a population, loss of habitat, harassment, interference with movement/migration, or disruption of reproductive activities.

Impact 4.13.1a: Valley Elderberry Longhorn Beetle. Surveys of the Project study area identified 30 elderberry shrubs (*Sambucus mexicana*) that meet the definition of valley elderberry longhorn beetle (VELB) habitat (Figure 3.3-2, Appendix D). The USFWS describes direct and indirect impacts as activities occurring within 20 feet and 100 feet, respectively, of the dripline of elderberry shrubs meeting the definition of VELB habitat (i.e., elderberry shrubs measuring at least one inch in diameter at ground level). The majority of the elderberry shrubs are located in the alkali scrub, grassland, and ruderal plant communities in the wildlife and former peach pit disposal area in the western portion of the Project area (Figure 3-3). One elderberry shrub is located along an access road north of the firing range in the eucalyptus grove. As currently planned, construction of the proposed Project would require the removal of the one shrub located in the eucalyptus grove. This shrub contains five stems greater than 1 inch (but less than 3 inches) in diameter, does not have beetle exit holes, and is within historically riparian habitat. Without mitigation, this is considered to be a significant impact.

Mitigation Measures

> **Measure 4.13.1a:** The one elderberry shrub that cannot be avoided by the project shall be transplanted following USFWS (1999) guidelines. Transplanting this shrub meets the definition of "take" of a federally-listed species and will require coordination with and approval from the USFWS. Transplanting shall only occur when the shrub is dormant (approximately November through the first two weeks in February) and shall follow the procedures described in USFWS (1999) as updated. The area that the shrub is transplanted to shall also be planted with at least 10 additional elderberry cutting or seedlings, and at least five associated native species (Gooding's willow and black walnut), and shall be

protected in perpetuity by the City per USFWS (1999). Obtaining USFWS approval to "take" this shrub could take up to one year to complete the necessary consultation and review process.

Impact Significance After Mitigation: Less than significant.

Impact 4.13.1b: Blunt-Nosed Leopard Lizard. Habitat for the blunt-nosed leopard lizard (alkali scrub and non-native annual grasslands) occurs in the former peach pit disposal area in the western portion of the Project study area. Blunt-nosed leopard lizards use open, sparsely vegetated habitats and are threatened by disturbance, destruction, and fragmentation of their habitat. When displaced, they may not be able to survive in adjacent habitat if it is unsuitable for colonization. Due to the heavy use of this area prior to its revegetation with alkali scrub plants, its isolation from other suitable habitat (e.g., the Sandy Mush Road Essential Habitat Area, over five miles south west of the Project), and the dense vegetation cover present in the area, the habitat is unlikely to be occupied by this species. Additionally, no Project construction would occur in the alkali or grassland habitat of this area. Therefore, for this species, the Project would result in a less-than-significant impact.

Mitigation: None required.

Impact.4.13.1c: Giant Garter Snake. Construction activities would occur within potential giant garter snake aquatic and upland habitat and would result in 1.96 acres of temporary and 1.23 acres of permanent habitat loss (refer to Table 4-9). (Potentially Significant)

The Project study area was assessed for giant garter snake habitat during the field surveys. Suitable habitat exists in Hartley Slough, Miles Creek, the agricultural ditches (Ditches 1, 2, 3, and a portion of 4), and their respective adjacent uplands, up to 200 feet from the bank (Figure 3-3). Approximately 9.0 acres of aquatic and 34.5 acres of upland habitat exist in the Project area for giant garter snake. Construction of the new roadway over Hartley Slough at the WWTP entrance and the new effluent outfall, the filling of the southern portion of the effluent channel, the rerouting of Hartley Lateral and Paden Drain, and subsequent dewatering of a portion of Hartley Lateral would involve work within potential giant garter snake aquatic and upland habitat and would result in 2.03 acres of temporary and 1.24 acres of permanent habitat loss (Table 4-9).

In addition, inadvertent construction of the Project would result in temporary habitat degradation and, potentially, direct take. Permanent loss includes temporary impacts that span more than two seasons (one season is May 1 to October 1). Without mitigation, this is considered to be a potentially significant impact.

TABLE 4-9
IMPACT AND MITIGATION FOR LOSS OF GIANT GARTER SNAKE HABITAT

Habitat Type	Duration of Loss	Acres Affected	Mitigation Ratio	Mitigated Acres Replaced
Aquatic	Permanent	0.54	3:1	1.62
Upland	Permanent	0.70	3:1	2.10
Aquatic	Temporary	0.21	n/a	Restore
Upland	Temporary	1.82	n/a	Restore

Source: ESA, 2006

Mitigation Measure

Measure 4.13.1c: The following mitigation measure shall be implemented to reduce Project impacts on giant garter snake:

A. All construction activity within giant garter snake habitat shall be conducted between May 1 and October 1. This is the active period for giant garter snakes and the potential for direct impacts are reduced because snakes are actively moving and avoiding danger. More danger is posed to snakes during their inactive period, because they are occupying underground burrows or crevices and are more susceptible to direct effects, especially during excavation. Between October 2 and April 30, the City or its biological consultant will contact the USFWS's Sacramento Office to determine if additional measures are necessary to minimize and avoid take.

B. Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

C. Construction personnel shall participate in a worker environmental awareness program. Under this program, workers shall be informed about the presence of giant garter snakes and habitat associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of the Federal Endangered Species Act (FESA). This instruction shall be conducted by a qualified biologist[6] prior to construction activities. Proof of this instruction shall be submitted to the City.

D. Within 24 hours before construction activities begin in areas of giant garter snake habitat, a qualified biologist shall inspect the site. The biologist will provide the City with a field report form documenting the monitoring efforts within 24 hours of commencement of construction activities. The monitoring biologist shall be available thereafter; if a snake is encountered during construction activities, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities will be allowed to move away from construction activities on their own. Capture and

6 A qualified biologist is one who has previously received authorization by USFWS to conduct the activities described in this section.

relocation of trapped or injured individuals shall only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)(1)(A) of FESA. The biologist shall be required to report any incidental take to the City immediately by telephone and by written letter within one working day. The project area shall be reinspected whenever a lapse in construction activity of two weeks or more has occurred.

E. Clearing of wetland vegetation will be confined to the minimal area necessary to excavate toe of bank for riprap or fill placement. Channel excavation for removal of accumulated sediments will be accomplished by using equipment located on and operated from top of bank, with minimal disturbance of vegetation.

F. Movement of heavy equipment to and from the project site shall be restricted to established roadways to minimize habitat disturbance. Preserved giant garter snake habitat shall be designated as Environmentally Sensitive Areas and shall be flagged by a qualified biologist and avoided by all construction personnel.

G. After completion of construction activities, any temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-Project conditions.

H. Affected giant garter snake habitat shall be replaced or restored in kind at a 3:1 ratio (see Table 4-9). This table assumes that temporary impacts will only last one season.

I. All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres (see Table 4-9).

J. Restored habitat shall receive one year of monitoring with a photo documentation report due to the City one year from implementation of the restoration with pre- and post-Project area photos.

K. Monitoring of replacement habitat with a photo-documentation report shall be conducted for five years and submitted to the City annually.

The calculations of acres lost assumes no impacts to land north of the access road paralleling the north bank of the southern reach of the effluent channel; disturbance during only one season; and the revegetation of all temporarily disturbed areas.

Impact Significance After Mitigation: Less than significant.

Impact 4.13.1d: <u>Swainson's Hawk</u>. A relatively small amount of potential foraging habitat would be lost to Project construction; however, nesting pairs of Swainson's hawks in the Project study area could be adversely affected by construction activities. (Potentially significant)

The Project study area provides potential nesting and foraging habitat for Swainson's hawk. Given the abundance of available foraging habitat in the Project vicinity, the approximately 26 acres of potential foraging habitat lost to Project construction is unlikely to affect the success

of Swainson's hawk that may nest in the area (the nearest documented historic nest site is located about three miles from the WWTP site). However, based on CDFG Guidelines, the loss of foraging habitat resulting from WWTP expansion is considered a potentially significant impact.

According to the CNDDB, the nearest reported active nesting sites have been found within 4.5 miles of the WWTP study area, however, nesting habitat is present in and near the WWTP site. Nesting pairs of Swainson's hawks in the Project study area may be adversely affected by construction activities. Failure of a Swainson's hawk nest due to Project construction would be considered a potentially significant impact.

Mitigation Measure

Measure 4.13.1d: In order to avoid impacts to nesting Swainson's hawk, pre-construction surveys shall be conducted by a qualified biologist[7] during the bird and raptor breeding season (March 1 to August 15), before the start of any construction activities. Similar to Mitigation Measure 4.13.2d the City shall have a qualified biologist to conduct surveys in habitat suitable for nesting raptors. For Swainson's hawk, however, the survey area includes one-half-mile from any construction activity, in accordance with CDFG guidance. Surveys may be combined with general raptor surveys as detailed in Measure 4.13.2d and shall follow the same survey schedule.

If nesting Swainson's hawk is detected within the survey area, the City shall maintain a one-half-mile buffer around the nests of Swainson's hawk. No construction activities shall be allowed within this buffer during active nesting. Buffers shall be marked in the field with stakes and flagging at all potential access points to the buffer. Buffers shall remain in place until the nest is no longer active, as determined by a qualified biologist. If a buffer distance needs to be reduced, a qualified biologist will determine if the reduction is appropriate, and what the reduced buffer distance will be. A reduction in buffer distance must be approved by the City, who may consult with CDFG. If the buffer is reduced, a qualified biologist shall be retained to monitor the nest during construction activity occurring within one-half-mile of the nest. The biologist shall inform the City's construction manager immediately if construction activities within the half mile buffer threaten to cause the adults to abandon the nest. The biologist shall submit the locations of nests detected during the surveys to the CNDDB.

The City will mitigate for the loss of Swainson's hawk foraging habitat consistent with CDFG requirements for lands within 5 miles of an active nest.

Impact Significance After Mitigation: Less than significant.

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7 A qualified biologist must be skilled in identifying Swainson's hawk in the field and have at least three years of experience conducting raptor surveys.

Impact 4.13.1e: Greater Sandhill Crane. Construction activities could cause the loss of foraging habitat for wintering greater sandhill crane within the Project study area. (Less than Significant)

The Project study area and agricultural fields located in surrounding vicinity may provide foraging habitat for wintering greater sandhill crane. Given the abundance of available open habitat surrounding the Project study area, the loss of about 26 acres foraging habitat to construction within the Project study area is relatively small and unlikely to affect these wintering species. Therefore, this loss of foraging habitat is considered less than significant.

Mitigation: None required.

Impact 4.13.1.f: San Joaquin Kit Fox. The Project would impact potential San Joaquin kit fox denning habitat in the grasslands and alkali scrub in the western portion of the Project study area or to the open areas within and surrounding the Project study area that may serve as movement or linkage habitat for San Joaquin kit fox. (No Impact)

The Project study area may provide denning habitat for San Joaquin kit fox in the grasslands and alkali scrub in the western portion of the Project study area. However, the immediate WWTP facility area is fenced, thereby precluding the use of this area as denning habitat for this species. With the exception of the proposed outfall, no construction would occur the western portion of the Project study area ,and therefore, the Project would not have a significant impact on San Joaquin kit fox denning habitat.

The open areas within and surrounding the Project study area, including the sludge lagoons and adjacent spreading fields and agricultural fields, may serve as movement corridors or linkage habitat for San Joaquin kit fox as well. However, since the operations at the WWTP would not significantly change the use of the landscape, movement of San Joaquin kit fox would not be impeded and the Project would have no impact on linkage habitat for San Joaquin kit fox.

Mitigation: None required.

Impact 4.13.2: The Project study area provides habitat for several species of concern. The species with potential to occur are western pond turtle, tricolored blackbird, burrowing owl, ferruginous hawk, mountain plover, white-tailed kite, loggerhead shrike, Merced kangaroo rat, San Joaquin pocket mouse, and American badger. Construction and/or operation of the proposed Project may temporarily or permanently impact fish and wildlife species or substantially reduce their habitats. (Potentially Significant)

Impact 4.13.2a: Tricolored Blackbird. The tricolored blackbird is reported by the CNDDB within less than five miles from the Project site and a breeding colony has been documented about 2.5 miles from the WWTP (Leeman, 2004). This species typically nests in freshwater emergent vegetation but may also nest in upland ruderal areas and certain agricultural crops.

Construction activities may affect nesting tricolored blackbird, potentially reducing reproductive success. Without mitigation, this is considered a significant impact.

> **Measure 4.13.2a:** In order to avoid impacts to nesting tricolored blackbirds, pre-construction surveys shall be conducted in potential breeding habitat within 500 feet of construction by a qualified biologist[8] during the breeding season (March 1 to July 15), before the start of any construction activities. The City shall have a qualified biologist to conduct surveys in habitat suitable for tricolored colonies. Any construction within the Project study area shall avoid active tricolored blackbird colonies by a 500-foot buffer. If warranted by site conditions (as evaluated and documented by a qualified biologist), this buffer may be reduced with the approval of the City, which may consult with CDFG.
>
> **Impact Significance After Mitigation:** Less than significant.

Impact 4.13.2b: Western Pond Turtle. The western pond turtle is reported by the CNDDB within five miles of the Project site. Construction within aquatic habitats in the Project study area may result in direct mortality of western pond turtle, as well as basking habitat for western pond turtle. Emergent vegetation in the Project study area is mostly tule and cattail, which, due to the fast-growing nature of this vegetation, its abundance in the Project study area, and the relatively small areas disturbed, would likely recolonize disturbed areas very quickly. Therefore, Project construction may result in temporary loss of emergent vegetation within aquatic habitat. This impact is considered less than significant. Unnecessary loss of western pond turtle individuals would be considered a significant impact.

Construction of the outfall in Hartley Slough would permanently remove about 0.1 acre of aquatic habitat. Relative to the availability of aquatic habitat, the loss of this habitat would be considered less than significant for this species.

Mitigation Measure

> **Measure 4.13.2b:** To avoid mortality of or western pond turtle during construction, a qualified biologist[9] shall be onsite during any canal or surface water dewatering activities. This biologist shall remove any stranded western pond turtles and shall release them to Hartley Slough.
>
> **Impact Significance After Mitigation:** Less than significant.

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8 A qualified biologist must be skilled in identifying tricolored blackbirds in the field and have at least three years of experience conducting avian surveys.

9 A qualified biologist must be skilled in identifying western pond turtles and hold appropriate authority from CDFG to relocate turtles.

Impact 4.13.2c: Burrowing Owl**.** A habitat assessment and a focused non-breeding season field survey were conducted for burrowing owl within the Project study area. Several areas within the Project study area have potential to support burrowing owls. These areas are along the banks of Ditch 3, in the earthen slope along the eastern edge of the WWTP, along the banks of the sludge lagoons and the first east-west access road south of the WWTP, and along the banks of the effluent channel flowing west toward the confluence with Hartley Slough. Although the presence of burrowing owls was not documented during the habitat assessment and non-breeding season survey, there is potential for nesting pairs to occupy the available habitat during the breeding season. If burrowing owl is found to occupy the Project study area, then construction activities may result in direct habitat loss, take, or cause abandonment of the nest. Without mitigation, this is considered a significant impact.

Mitigation Measure

Measure 4.13.2c: The following mitigation will be implemented to avoid potential impacts from Project construction activities:

A. A pre-construction survey of suitable habitat and buffers will be conducted within 30 days prior to construction to ensure no additional burrowing owls have established territories since the initial surveys. If ground-disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site shall be resurveyed.

B. No disturbance shall occur within 75 meters (about 250 feet) of an occupied burrow during the breeding season (February 1 to August 31) or within 50 meters (about 160 feet) during the non-breeding season.

C. Foraging habitat contiguous with occupied burrow sites shall be permanently preserved, where feasible, at a ratio of 6.5 acres per pair of breeding or single unpaired resident burrowing owl; this is equivalent to a 100-meter (about 300-foot) foraging radius around the burrow. The protected habitat shall be adjacent to occupied burrowing owl habitat and its configuration shall be approved by a qualified biologist.[10]

D. When destruction of occupied burrows is unavoidable, existing unsuitable burrows shall be enhanced (enlarged or cleared of debris) or new burrows shall be created by installing artificial burrows at a ratio of 2:1 on the protected site, in consultation with CDFG.

E. If owls must be moved away from the disturbance area, passive relocation during the non-breeding season with one-way doors shall be used. Owls shall be excluded from burrows in the immediate impact zone and within a 50-meter (about 160-foot) buffer zone by installing one-way doors in burrow entrances. One-way doors shall be left in place 48 hours to insure owls have left the burrow before excavation. Two natural or artificial burrows shall be provided for each burrow in the Project study area that will

[10] A qualified biologist must be skilled in identifying burrowing owl and their habitat in the field, be familiar with their breeding and non-breeding behavior and general life history, and have at least three years of experience conducting burrowing owl surveys.

be rendered biologically unsuitable. The Project study area shall be monitored daily for one week to confirm owl use of the new burrows before excavating burrows in the immediate impact zone. Burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe shall be inserted into the tunnels that become established prior to excavation to maintain an escape route for any animals within the burrow. Relocation shall be performed in consultation with CDFG and conducted by a biologist with appropriate authority to implement this measure.

Impact Significance After Mitigation: Less than significant.

Impact 4.13.2d: White-Tailed Kite, Loggerhead Shrike, and Other Non-Listed Birds**.** The Project area provides suitable nesting and foraging habitat for white-tailed kite, loggerhead shrike, and other birds. Given the abundance of available foraging habitat in the Project vicinity, the approximately 26 acres of potential foraging habitat lost to Project construction is unlikely to affect the success of these birds. Therefore, the loss of foraging habitat is considered less than significant. However, nesting pairs of white-tailed kite, loggerhead shrike, and other birds in the Project study area may be adversely affected by construction activities. Failure of a raptor nest (protected under Fish and Game Code Section 3503) due to Project construction would be a significant impact.

Mitigation Measure

- **Measure 4.13.2d:** In order to avoid impacts to nesting raptors, pre-construction surveys shall be conducted 30-days prior to the start of construction by a qualified biologist[11] during the raptor breeding season (March 1 to August 15),. The City shall have a qualified biologist conduct three surveys in habitat suitable for nesting raptors and other birds within 500 feet of any construction activities. These surveys shall be conducted by a qualified biologist with demonstrated bird and raptor nest-searching experience.

If nesting raptors are detected within the survey area, the City shall maintain a 500-foot buffer around the nest. No construction activities shall be allowed in these buffers. Buffers shall be marked in the field with stakes and flagging at all potential access points to the buffer. Buffers shall remain in place until the nest is no longer active, as determined by a qualified biologist. If warranted by site conditions (as evaluated and documented by a qualified biologist), this buffer may be reduced with the approval of the City, which may consult with CDFG. The biologist shall submit the locations of nests detected during the surveys to the CNDDB.

Impact Significance After Mitigation: Less than significant.

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[11] A qualified biologist must be skilled in identifying avian species, including raptors, in the field and have at least three years of experience conducting such surveys.

Impact 4.13.2e: Ferruginous Hawk, Mountain Plover, Merced Kangaroo Rat, San Joaquin Pocket Mouse, and American Badger**.** The Project area and surrounding Project vicinity may provide foraging habitat for wintering ferruginous hawk and mountain plover. Given the abundance of available open habitat surrounding the Project study area, the loss of foraging habitat to construction within the Project study area is relatively small and unlikely to affect these wintering species. Therefore, the loss of this foraging habitat is considered less than significant.

Potential year-round habitat exists in the Project area for Merced kangaroo rat, San Joaquin pocket mouse, and American badger. These species have potential to occur in the grassland and scrub habitat within the peach-pit disposal and wildlife area in the western portion of the Project study area, adjacent to Hartley Slough. No construction activities would occur in this area. Therefore, with respect to these species, the Project would have no impact.

Mitigation: None required.

Table 4-10 portrays the sensitive periods when construction would potentially pose an impact to the species identified in Section 4.13 of this document. It should be noted that this portrayal is considered to be a worst case scenario and several of these periods could be eliminated with appropriate field investigations.

4.14 Environmentally Sensitive Areas

4.14.1 Significance Criteria

The Project would result in a significant impact on environmentally sensitive areas if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- 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;
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan;
- Place structures within a 100-year flood hazard area that would impede or redirect flood flows; or
- Cause the loss of a critical habitat.

TABLE 4-10
ENVIRONMENTAL MITIGATION RESTRICTIONS ON WWTP EXPANSION

Mitigation	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	COMMENTS
Giant Garter snake	Limited to waterways and adjacent uplands, except effluent channel.									Limited to waterways and adjacent uplands, except effluent channel.			USFWS may permit construction in Oct-Apr with monitoring
Swainson's Hawk			Restricts disturbing activities within ½ mile of active nest										Presence of active nests not likely; Can be eliminated with survey demonstrating no effect
Raptors and Other Birds			Restricts disturbing activities within 500-feet of active nest										Presence of active nests not likely; Can be eliminated with survey demonstrating no effect
Tri Colored Blackbird			Restricts disturbing activities within 500-feet of active nest										Presence of active nests not likely; Can be eliminated with survey demonstrating no effect
Burrowing Owl Non-Breeding	.							Burrows limited to roadway and levee embankments. Restricts construction within 160-feet of active burrow.					Winter 2005 survey showed no burrowing owls present; Spring 2006 could eliminate concern.
Burrowing Owl Breeding			Restricts construction within 500-feet of active burrow.										Winter 2005 survey showed no burrowing owls present; Spring 2006 could eliminate concern.
Valley Elderberry Long-horn Beetle											One elderberry plant affected by outfall relocation		Period for transplanting elderberry shrub in green.

The Project is not located in a coastal zone and, therefore, would not conflict with coastal zone management activities. No designated wild and scenic rivers occur in the Project area or would be affected by expansion of the WWTP.

4.14.2 Methodology

This analysis included a review of sensitive habitats and jurisdictional waters of the United States that occur at the WWTP site and vicinity. Resources were identified using pertinent literature, database queries, and reconnaissance field surveys of the Project site on August 3, November 15–17, and December 6, 2005. The U.S. Geological Survey (USGS) 7.5-minute quadrangles for Sandy Mush and Atwater were reviewed to determine critical habitat in the project area (USFWS, 2005a).

4.14.3 Impacts and Mitigation Measures

Impact 4.14.1: Project implementation would result in the conversion of economically viable prime farmland and farmland of statewide importance to non-agricultural uses. (Potentially Significant)

As described in Chapter 3, Environmental Setting, agricultural lands within the proposed WWTP expansion area meet the qualifications for Prime Farmland and Farmland of Statewide Importance (DOC, 2002). The Project would involve the placement of a new levee, administrative building and laboratory, and new head works within the proposed expansion area with the remaining area serving a buffer lands and available for agricultural use following construction. Given that roughly half of the expansion area is classified as prime farmland or farmland of statewide importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, the permanent conversion of these lands to non-agricultural use is considered significant.

In 2002, there were approximately 286,054 acres of Prime Farmland and 158,405 acres of Farmland of Statewide Importance within the total of 1,165,872 acres of agricultural land in Merced County. Therefore, the conversion of roughly 10 acres of each farmland class (20 acres total) would be minimal in the context of the entire County's agricultural land base, but substantial enough to warrant a significant-impact determination.

Minimizing the impact would require reducing the footprint of the WWTP facilities with a corresponding reduction in important farmland converted. The WWTP expansion area has been designed to minimize or avoid conversion of both farmland and sensitive habitat. The permanent addition of up to 46 acres to the WWTP facility would occupy up to 20 acres of the 42-acre parcel. While this preserves 22 acres of important farmland, the conversion of 20 acres remains a significant impact. The other 4 acres being added to the WWTP are not in an existing agricultural use.

Mitigation Measure

Measure 4.14.1: The 22 acres of farmland within the WWTP expansion area, not required for the WWTP facility, shall remain in an agricultural land use. The City shall pay into a recognized trust fund that will acquire agricultural conservation easements to compensate for the conversion of 20 acres of farmland within the WWTP expansion area. 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 WWTP.

With the implementation of Mitigation Measure 4.14.1, the impact to the remaining 22 acres would be reduced to a less-than-significant level. However, offsite 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 Project or replace the resources lost because they would not reduce the overall net loss of farmland by the WWTP. Therefore, the direct impact and permanent conversion of important farmlands as a result of the expanded WWTP would be significant unavoidable.

Impact Significance After Mitigation: Significant and unavoidable.

Impact 4.14.2: Project construction and/or operation would affect federally protected wetlands, as defined by Section 404 of the Clean Water Act, by removal, filling, hydraulic interruption, or other disturbance. (Potentially Significant)

"Waters of the United States," including wetlands and "other waters" (e.g., streams), are regulated under Section 404 of the Clean Water Act. A Department of Army permit from the Corps is required for impacts to jurisdictional waters of the U.S. For purposes of this analysis, maximum conservative impact estimates were made for permanent impacts, following the criteria and assumptions provided below. As Project design is finalized and specifically required construction easements identified, the conservative impact estimates would likely decrease from those described herein. Impacts to waters of the U.S. were found to occur to occur in areas within the Project development footprint shown on Figure 2-3 and the southern segment of the effluent channel.

Hartley Slough

Hartley Slough waters and a very limited amount of fringing wetland (0.05 acre) would be affected by Project implementation including construction of a new bridge at the WWTP entrance, removal of the existing bridge, the intertie of rerouted Paden Drain and Hartley Lateral into the slough, and a new effluent outfall (Figure 2-3). In association with these activities, minimal temporary and permanent impacts would occur to wetlands, which narrowly fringe the banks (within the ordinary high water) of the slough in the affected areas. Construction of the project elements listed above would affect approximately 84 linear feet of Hartley Slough.

Most of the work associated with Hartley Slough would occur along the streambanks (e.g., bridge abutments, outfall installation). It is assumed that impacts within the channel would occur no more than 10 feet away from the channel bank, and would be associated solely with the new bridge and outfall, which would comprise the 84 linear feet of bank. The new bridge (44 linear

feet) would affect both banks of Hartley Sough while the outfall structure (40 feet) would only affect only one bank. Based on the assumption of a 10-foot width of maximum impacts to open water/channel bed, this would amount to about 0.03 acre.

Effluent Channel

The southern length (5,000 feet; 2.57 acres) of the effluent channel would be filled, since the effluent would no longer be routed to Hartley Slough via this channel. Due to the water needs of the wildlife management area south of the WWTP, the eastern portion of the effluent channel would not be filled. Pending verification of the completed wetland delineation by the Corps, the effluent channel is not expected to be considered jurisdictional under the Clean Water Act, because the channel is an operational facility of the WWTP and flows only from the channel into the slough and not from the slough into the channel. Therefore, the effluent channel is considered non-jurisdictional, and its filling would not likely be subject to regulation under Section 404 of the Clean Water Act.

Ditches

Ditches within the Project study area are considered non-wetland "other waters."

The ditches that underlie the Project development footprint, including those that would have portions rerouted (Paden Drain and Hartley Lateral), and the northernmost approximately 600 feet of the effluent channel would be affected by the Project. As Project design elements are further clarified, there may be less impacts to ditches than that described herein.

Table 4-11 lists permanent impacts to waters of the U.S. that would result from the Project. Without mitigation, these would be significant impacts. This impact analysis assumed that the effluent channel is a non-jurisdictional feature. The analysis also assumed a worst-case disturbance area.

TABLE 4-11
IMPACTS TO WETLANDS AND OTHER WATERS IN THE PROJECT STUDY AREA

Type of Impact	Affected Area Acres (Linear Feet))
Wetland (Permanent)	0.05 (n/a)
Other Waters (Permanent)	0.55 (2,818)
Total	0.60 (2,818)

SOURCE: ESA, 2006

Mitigation Measures

Measure 4.14.2a: Permanent impacts to jurisdictional waters of the U.S. would be mitigated at a minimum 1 for 1 ratio consistent with the regulatory guidance of the Corps and/or other regulatory agencies.

Compensatory mitigation may include the purchase of mitigation credits at a Corps-approved wetland mitigation bank, or through other options consistent with the Section 404 regulatory program including "in-lieu-fee" mitigation in which the applicant provides funds to an in-lieu-fee sponsor such as the National Fish and Wildlife Foundation, or onsite mitigation, which would consist of creating wetland habitat and providing assurances and monitoring to ensure success in perpetuity.

Measure 4.14.2b: Construction activities shall avoid and minimize adverse impacts to jurisdictional waters of the U.S. to the maximum practicable extent.

Areas used for staging and temporary stockpiling during Project construction shall be prohibited from being within such waters including wetlands and shall be clearly defined on final construction plans. Storage of equipment and/or debris shall not occur within 25 feet of jurisdictional waters. Work within jurisdictional waters including trenching and bridge construction shall occur during low-flow or dry periods. Standard and appropriate BMPs including use of silt fences and/or straw bales shall be utilized to prevent incidental discharge of material into jurisdictional waters.

Impact Significance After Mitigation: Less than significant.

Impact 4.14.3: Project construction and/or operation could impact sensitive natural communities identified by CDFG or USFWS. (No Impact)

No CDFG or USFWS sensitive natural communities exist within the Project study area; however, the CNDDB identifies Northern Claypan Vernal Pool, a sensitive community, within the vicinity of the Project area. The nearest Northern Claypan Vernal Pool is located approximately one-half mile south of the Project study area. Construction of the Project would not affect any Northern Claypan Vernal Pool. Therefore, the Project would have no impact on CDFG or USFWS sensitive natural communities.

Mitigation: None required**.**

Impact 4.14.4: The Project would conflict with an adopted HCP, NCCP, or other approved local, regional, or state plan for conservation of habitat. (No Impact).

No Habitat Conservation Plan (HCP) or Natural Communities Conservation Plan (NCCP) has been adopted for the Project site or surrounding lands. Therefore, the Project would not directly conflict with any adopted HCP or NCCP. As a result, no impact would occur.

Mitigation: None required.

Impact 4.14.5: Project construction on floodplains could impede floodwaters or expose structures to significant losses. (Less than Significant)

The proposed WWTP facilities would be located within a FEMA-designated 100-year floodplain. New levees similar to the levees found at the WWTP would be constructed and would range from 5 to 7 feet high with a crest width of about 15 feet to allow vehicle access. This construction could raise flood water elevation by displacing floodwaters. The project would result in intruding onto 25 acres of floodplain. This intrusion equals about 0.01 percent of the 290,000-acre floodplain in this portion of Merced County. As a result, this minor intrusion would have a minimal effect on floodwater elevation or the areal extent of flooding.

Currently, the administrative and treatment facilities, including the biosolids drying beds are protected from the 100-year flood. As part of the Project, the City would continue to provide adequate flood protection features to avoid flooding roadways and the treatment facilities. The levees would be designed with flood diversion features capable of directing 100-year flood waters into Hartley Slough. The City would be required to submit a Letter of Map Revision to FEMA to update the 100-year floodplain base flood elevation in the affected areas. With the implementation of measures, the project would have a less-than-significant impact on the environment.

Mitigation: None required.

Impact 4.14.6: Project construction could cause the loss of critical habitats. (No Impact)

No critical habitat is designated for those species with potential to occur in or in the vicinity of the Project study area. Therefore, the Project would have no impact on critical habitats.

Mitigation: None required.

4.15 Solid Waste and Energy

4.15.1 Significance Criteria

The Project would result in a significant environmental impact if it would:

- Be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs
- Fail to comply with federal, state, and local statutes and regulations related to solid waste
- Use substantial amounts of fuel or energy
- Create a substantial increase in demand upon existing sources of energy, require the development of new energy sources, or require construction of additional facilities for energy generation or distribution to meet the increased demand, the development and construction of which could cause significant environmental impacts

4.15.2 Impacts and Mitigation Measures

Impact 4.15.1: Project construction and operation wastes would be disposed of in a landfill without sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (Less than Significant)

Construction-related waste would be disposed of at one of the County's licensed landfills that has adequate capacity to accommodate the growth of the County and possesses sufficient capacity to accommodate the Project's construction solid waste. Either the Highway 59 Landfill or the Billy Wright Landfill would be used and have a remaining useful life, with expansion, of 25 years and 14 years, respectively.

Solid waste generation, during operation of the Project would increase corresponding to the number of on-site personnel and associated activities. It is estimated that solid waste generation may double existing production levels. Solid waste would continue to be disposed of off-site and managed by the City. Biosolids handling and treatment is discussed in Chapter 2, Project Description, and after being treated and dried, the biosolids would be land-applied as agricultural fertilizer. This impact is considered to be less than significant.

Mitigation: None required.

Impact 4.15.2: Project construction would conflict with federal, state, and local solid waste management statutes and regulations. (Less than Significant)

Construction of the expanded WWTP would generate substantial amounts of construction debris, especially during the construction of the structural foundations, and to a lesser extent, during the relocation of existing facilities. Some materials excavated during Project grading would be used as fill materials for the new levees and the effluent channel. Once collected, non-reusable solid wastes generated during construction (including recyclable materials) would be taken to the nearest Materials Recovery Facility/transfer station with non-recyclables being transferred to Merced County (Highway 59) Landfill. The Highway 59 Landfill site currently operates as a Class III landfill with Class II surface impoundments.

This management of solid wastes generated during WWTP expansion would be consistent with applicable statutes and regulations. The potential impact is considered less than significant.

Mitigation: None required.

Impact 4.15.3: Project operation would use substantial amounts of energy, which in turn could create a substantial increase in demand upon existing sources of energy or require construction of additional facilities for energy generation or distribution to meet the increased demand. (Potentially Significant)

The WWTP's electrical system supplies 1,563 kilovolt-amperes (KVA) (75 A at 12.47 kV) at peak running loads. With the plant's expansion, peak running loads would include an additional 3,812 KVA (183 A at 12.47 kV), for a total expansion utility service peak loading of 5,375 KVA (258 A at 12.47 kV). The main switchgear has adequate capacity for the proposed additional loads, but the MID service transformer incoming electric transmission line would need to be

upgraded to serve the WWTP. MID would need to confirm if the electric transmission line would have to be upgraded. The need to upgrade or construct new energy distribution facilities is considered a potentially significant impact.

The expanded WWTP would not create an energy demand that cannot be served by MID. The Project would not create conditions that require construction of additional facilities for energy generation.

Mitigation Measure

> **Measure 4.15.3:** The City will consult with MID to determine the appropriate energy facility upgrades needed to supply the expanded WWTP and in turn will obtain a would-serve letter from MID for energy supplies.
>
> **Impact Significance After Mitigation:** Less than significant.

4.16 Transportation and Circulation

4.16.1 Significance Criteria

The Project would result in a significant transportation/circulation impact if it would:

- Cause an increase in traffic which is substantial in relation 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)
- Construction activity significantly impedes access to adjacent uses, including emergency vehicle access.
- Construction activity poses a traffic safety hazard to motor vehicles, bicyclists, or pedestrians.
- The movement of heavy vehicles causes substantial damage or wear of public roadways.
- Construction activities substantially affect local transit service.
- Construction substantially affects parking supplies.

4.16.2 Methodology

This impact analysis provides an assessment of the Project's construction and operational effect to the current traffic volumes and capacity of the local roadway system, which traverse both City and County jurisdiction.

The impacts associated with project-induced traffic were calculated from estimated construction equipment and materials deliveries, crew sizes, and the intensity and duration of construction activities.

A construction scenario involving simultaneous construction activities was assumed and includes pipeline trenching (one crew), cut and fill operations (one crew), and foundation and building construction (two crews) using the same access roadways. As described in Chapter 2, these crews could generate up to 88 daily vehicle trips. In addition, up to 50 average daily trucks trips are anticipated during construction, with the exception of mid-2007, where the average number of daily truck trips could be as high as 100. The anticipated truck haul route is illustrated on Figure 2-9.

4.16.3 Impacts and Mitigation Measures

Impact 4.16.1: Project construction would substantially increase the number of daily vehicle trips on local roadways that provide access to the WWTP, in relation to existing traffic and roadway capacity. (Potentially Significant)

Vehicle trip generation associated with Project construction would consist of two components:

- Vehicle trips by construction crews
- Truck trips associated with hauling construction equipment, materials, and waste

During a maximum construction day, up to 100 daily truck trips would occur along with ingress and egress of the 44 construction employees. During the most active part of the construction period, WWTP employees and biosolids hauling trips would be comparable to existing conditions. Truck haul-related construction trips would be dispersed throughout the day and, to the extent feasible, would be planned to avoid peak traffic hours.

It is estimated that up to 44 new peak-hour construction employee trips could occur, along with up to 10 construction haul truck trips and existing biosolids haul trips and WWTP employees. This would equate to a maximum increase during a peak hour of 55 trips associated with construction of the Project. This volume of traffic equals about 3 percent of the estimated roadway capacity for two-lane arterials.

Because the affected roadways currently operate at an acceptable LOS, the temporary increase of traffic on local roadways equaling a 3 percent increase during peak-hour conditions is not considered substantial and not expected to result in increased traffic congestion, impede vehicle movement, pose a hazard to roadway use, or interfere with emergency vehicle access. However, because project construction would last for several years and would occur on roadways planned for extensive realignment (SR 140), the combination of construction activities and new vehicle trips associated with continued build-out within the SUDP area, could result in future traffic impacts that could be potentially significant. With the implementation of the prescribed mitigation, these impacts would be considered less than significant.

Mitigation Measures

Measure 4.16.1a: Prior to the start of Project construction, a Traffic Control Plan that addresses vehicle movement along Project-affected roadways and intersections shall be prepared. This plan shall designate haul routes for the Project in consultation with Caltrans and Merced County Department of Transportation. The plan should include the following measures:

- Maintaining the maximum amount of travel lane capacity during non-construction periods.
- If larger construction equipment or articulated trucks will have difficulty maneuvering at haul route-affected intersections, provide a flagman for traffic control at the access road on an as-needed basis.
- Truck routes shall avoid known congested intersections and roadways during peak traffic periods. Alternative truck routing and/or rescheduling truck trips to off-peak periods shall be included.

Measure 4.16.1b: The City shall arrange for a 24-hour telephone hotline to address public questions and complaints during Project construction.

Measure 4.16.1c: Heavy trucks and other construction transport vehicles shall avoid the busiest commute hours (7 to 8 a.m. and 5 to 6 p.m. on weekdays) on highly congested roadways in the Merced community.

Impact Significance After Mitigation: Less than significant

Impact 4.16.2: Project operation would substantially increase the number of daily vehicle trips on local roadways that provide access to the WWTP, in relation to existing traffic and roadway capacity. (Potentially Significant)

The additional quantities of biosolids generated as a result of the WWTP's increased operational capacity would generate a total need for 355 trucks trips year at 20 mgd; an increase from the current 150 trucks trips year. On average, these trips would equate about three new daily truck trips above existing conditions.

In addition, 6 new employee trips are expected as the WWTP reaches the 20 mgd level of operations. These new truck and employee vehicle trips would add to the traffic volumes on nearby roadways after 2008.

The total number of new trips associated with Project operations would be 34 trips in the peak hour in 2012 (assuming 25 peak hour construction employee trips, six new permanent employee trips, and three biosolid hauling trips). This volume of traffic equals about 2 percent of the capacity of local two-lane roadways. This increase is not considered substantial, but in combination with other planned road improvement projects and new vehicle trips generated by local development, project-generated traffic could contribute to increased traffic congestion,

impede vehicle movement, pose a hazard to roadway use, or interfere with emergency vehicle access. The impact would be reduced to a less-than-significant level through the implementation of the prescribed mitigation.

Mitigation Measures

Measure 4.16.2: Implement Mitigation Measures 4.16.1a and 4.16.1c.

Impact Significance After Mitigation: Less than significant

Impact 4.16.3: Project construction would affect general and emergency traffic access to the WWTP, the adjacent shooting range, and the Merced Wildlife Management Area. (Less than Significant)

Construction of the Project would require construction vehicles to enter and leave construction staging areas and access roads to the Project site. During the construction of the new access road, access disruptions would be limited to the south end of Gove Road. At certain times, construction vehicles may temporarily block local traffic as they maneuver in and out of the access point on Gove Road. Occasional short-term delays of up to 15 minutes may occur. This impact would be less than significant.

Mitigation: None required.

Impact 4,16.4: Project construction would result in significant disruptions to transit service. (Less than Significant)

No transit routes are routed along Gove Road. Local transit services utilized by residents located along the truck route illustrated in Figure 2-9 would be still be available to current riders and would largely be unaffected by the Project. Impacts to transit service are considered less than significant.

Mitigation: None required.

Impact 4.16.5: Project construction would generate a need for construction crew parking. (No Impact)

The Project would generate a need for parking for construction workers. Assuming each worker drives alone to each day's work location, a total of 88 temporary parking spaces would be needed. Given the extensive area available for onsite parking, no offsite parking would be required. Since the Project would not result in the loss of available parking area, no impact is expected.

Mitigation: None required.

Impact 4.16.6: Project construction would increase wear and tear on the access routes used by construction vehicles to access the Project work site. (Potentially Significant)

The use of large trucks to transport equipment and material to and from the Project site could affect access road conditions by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and the existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The potential impacts are expected to be negligible on those roads. Rural streets are generally not built with a pavement thickness that will withstand substantial traffic volumes. This impact is considered potentially significant.

Mitigation Measure

> **Measure 4.16.6:** Prior to construction, the City's shall assess current road conditions for the Project construction haul routes including the local access roads and identify post-construction road restoration requirements. An agreement shall be entered into by the County prior to construction that details suitable post-construction road restoration improvements. The City shall fund roadway repairs or rehabilitation as necessary such that post-construction requirements are met.
>
> **Impact Significance After Mitigation:** Less than significant.

4.17 Public Services

4.17.1 Significance Criteria

The Project would result in a significant impact on public services if it would result in substantial adverse physical impacts associated with the provision of, or the 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 these public services: fire protection, police protection, schools, parks, or other public facilities.

4.17.2 Impacts and Mitigation Measures

The Project would not require the construction of other new or expanded governmental service facilities. Project features discussed in Chapter 2, Project Description, would not generate additional demands for public services that would require new or altered facilities, including police and fire protection. No impact to public services would occur.

The Project would not generate new commercial or residential demand, which could affect service ratios, response times, or other performance objectives. No additional growth beyond that planned in the City's adopted General Plan would occur as a result of the Project, and therefore, the additional demand accommodated by the Project would not adversely impact schools, parks, or other public facilities. Therefore, no direct significant impacts to public services would occur.

Chapter 6, Growth-Inducing Impacts, addresses the potential growth-inducing effects of the Project. As discussed, increasing the WWTP capacity would remove an obstacle to population growth and development, enabling the continued build-out of the City SUDP and the UC-Merced LRDP. As noted in this discussion, continued build-out of these plans could place greater demand on public services in the respective planning areas.

4.18 Public Health and Safety

4.18.1 Significance Criteria

A project would be considered to have a significant adverse impact on the environment if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Interfere with safe operations of a nearby airport of result in a safety hazard for people residing or working in the project area, due to its proximity to an airport;
- Be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code §65962.5 and, as a result, create a significant hazard to the public or the environment;
- 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.

4.18.2 Methodology

The presence of hazardous materials in the Project area was determined through preliminary record searches and examination of readily available information. Although hazardous materials exist at the WWTP, the low quantities used and the City's current compliance with applicable State and Federal hazardous materials laws and regulations which function to minimize potential impacts associated with these existing hazardous materials. In addition, the WWTP is not located on the DTSC Hazardous Waste and Substances Site List (Cortese List). Therefore, the impacts

discussed below focus on construction activities and the potential for accidental spill and/or release of hazardous materials during construction or transport that could affect public health and safety.

4.18.3 Impacts and Mitigation Measures

Impact 4.18.1: Construction of the Project may expose construction workers, the general public, and the environment to pre-existing hazardous materials contamination. (Potentially Significant)

The Project would require extensive excavation and disturbance of surface soils. Past historic land uses may have resulted in the contamination of soil and/or groundwater. Construction activities inherent to the Project could encounter areas of unrecorded contamination associated with past land uses (e.g., industrial waste). Dewatering of contaminated groundwater from trenches and excavations could expose individuals and the environment to hazardous levels of contaminants. Similarly, body contact with contaminated soil could lead to inadvertent exposure. This impact is considered potentially significant.

Mitigation Measures

Measure 4.18.1a: If contaminated soil and/or groundwater or suspected contamination were encountered during Project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. A contingency plan to dispose of any contaminated soil or groundwater should be developed through consultation with the appropriate regulatory agencies. If dewatering were to occur during Project construction, the RWQCB should be consulted for any special requirements such as containing the water until it can be sampled and analyzed to ensure that no contaminants are in the groundwater that could be released into the MID drainage system.

Hazardous materials associated with construction equipment, such as fuels, oils, antifreeze, coolants, and other substances could adversely affect water quality if released to surface waters. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality. In addition, hazardous materials associated with construction equipment could adversely affect surface and groundwater quality if spilled or stored improperly. Without mitigation, construction of the Project could result in potentially significant impacts.

Measure 4.18.1b: Implement Measure 4.2.1b.

Impact Significance After Mitigation: Less than significant

Impact 4.18.2: During construction, there is a risk of exposure to hazardous materials such as fuel and other chemicals used for excavation and construction activities. (Potentially Significant)

During excavation and construction activities, it is anticipated that limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, and hydraulic fluid would be handled on the construction site. Various contractors for fueling and maintenance purposes could use temporary bulk above ground storage tanks as well as storage sheds/trailers. The potential for an accidental release exists during handling and transfer from one container to another. Depending on the relative hazard of the hazardous material, if a significant spill were to occur, the accidental release could pose a hazard both to construction employees and the environment. Although typical construction management practices limit and often eliminate the impact of such accidental releases, there is a possibility of a spill or a release with the temporary onsite storage of hazardous materials. This impact is considered potentially significant. Implementation of the prescribed mitigation would reduce the impact to a less-than-significant level.

Mitigation Measure

Measure 4.18.2: Prepare a Spill Prevention and Containment Plan. The City shall ensure, through the enforcement of contractual obligations, that contractors transport, store, and handle construction-related hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the Department of Transportation, California RWQCB, the local fire departments, and the local environmental health department.

Recommendations shall include as appropriate transporting and storing materials in appropriate and approved containers, maintaining required clearances, and handling materials using applicable federal, state, and/or local regulatory agency protocols. In addition, all precautions required by the RWQCB-issued NPDES construction activity stormwater permits would be taken to ensure that no hazardous materials enter any nearby waterways.

In the event of a spill, the City shall ensure, through the enforcement of contractual obligations, that all contractors immediately control the source of any leak and immediately contain any spill using appropriate spill containment and countermeasures. If required by the local fire departments, the local environmental health department, or any other regulatory agency, contaminated media shall be collected and disposed of at an offsite facility approved to accept such media.

Impact Significance After Mitigation: Less than significant.

Impact 4.18.3: The Project could interfere with an emergency response or evacuation plan. (Less than Significant)

The Project is not expected to involve any activities that would interfere with emergency response plans or evacuation plans in place through the California OES, the City, or the County. Project construction could temporarily interfere with emergency vehicle access to the WWTP for periods up to 15 minutes when the south end of Gove Road is being reconstructed. This impact is considered to be less than significant.

Mitigation: None required.

Impact 4.18.4: Construction of the Project would not interfere with safe operations of the Merced Municipal Airport or result in a safety hazard for people residing or working in the Project area, due to its proximity to the airport. (No Impact)

The Merced Municipal Airport lies two miles northwest of the WWTP. As stated in Chapter 2, Project Description, expanding the rated capacity of the WWTP would involve constructing numerous facilities and the new effluent outfall pipeline. Construction of the Project would be located more than two miles from the airport. Construction trucks would travel on routes close to the airport runways; however; haul trips are not expected to interfere with airport operations. As a result, no impact would occur.

Mitigation: None required.

Impact 4.18.5: Construction of the Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. (Potentially Significant)

The Project is located in a rural area where the risk of wildland fire is considered to be low to moderate. During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. Any construction equipment that normally includes a spark arrester would be equipped with an arrester in good working order. Nonetheless, the potential exists for construction equipment and vehicles to come in contact with heavily vegetated areas on the site, thereby igniting dry vegetation.

Mitigation Measures

> **Measure 4.18.5a:** The City shall designate and ensure through the enforcement of contractual obligations, that during construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. The City shall keep these areas clear of combustible materials in order to maintain a firebreak. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws.
>
> **Measure 4.18.5b:** Construction crews shall be required to carry sufficient fire suppression equipment to ensure that any fire resulting from construction activities is immediately extinguished. All off-road equipment using internal combustion engines shall be equipped with spark arrestors.
>
> **Impact Significance After Mitigation:** Less than significant.

Impact 4.18.6: The implementation of the WWTP Expansion Project could present additional vector concerns. (Less than Significant)

WWTPs are commonly identified as a vector control problem due to the presence of various treatment ponds, which provide suitable habitat for the production of mosquitoes. Vector control operations are currently employed at the WWTP to control any outbreak of mosquito-borne disease (e.g., West Nile Virus) or a nuisance infestation of mosquitoes in a community. Although, the addition of new treatment facilities would provide an expanded area for potential habitat, current vector control operations would be expanded to ensure adequate controls. For this reason, this impact is considered less than significant.

Mitigation: None required.

Impact 4.18.7: The use of reclaimed wastewater effluent carries the potential for human contact. (Less than Significant)

Implementation of the Project would be expected to result in the seasonal irrigation of additional lands with disinfected tertiary recycled water. Under Title 22 reuse standards, all surface runoff from irrigation by reclaimed water must be confined to the water use areas, unless the runoff does not pose a public health threat and is authorized by the regulatory agency. By Department of Health Services definitions, disinfected tertiary recycled water is defined as filtered and subsequently disinfected wastewater that exhibits extremely low levels of coliform bacteria and turbidity. In considering the strict regulatory framework developed under Title 22 in conjunction with the treatment processes proposed under the Project, impacts to human health as a result of the use of reclaimed water on nearby agricultural lands is considered less than significant.

Mitigation: None required.

4.19 Population and Housing

4.19.1 Significance Criteria

A population and housing impact of the Project would be considered significant if it met any of the following criteria.

- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

4.19.2 Impacts and Mitigation Measures

Impact 4.19.1: The Project would displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere. (No Impact)

There is no existing housing located within the immediate project area. Therefore, the construction of the project would not result in the displacement of existing residential housing. No impact would occur.

Mitigation: None required.

4.20 Land Use and Zoning

4.20.1 Significance Criteria

The impact analysis presented below evaluates potential Project impacts on current land uses as a result of facility siting, construction, and/or operation. Impact significance criteria are presented for each of these phases of impact. Implementation of the Project would result in a significant land use impact if it would:

- 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
- Result in land uses that are incompatible with current and planned land uses adjacent to Project facilities
- Result in substantial nuisance effects on sensitive land uses that would disrupt use over an extended time period
- Result in the disruption or division of the physical arrangement of an established community

4.20.2 Methodology

Land use impacts associated with the Project would, in most instances, be short term and occur during the construction phase of the Project. Construction activities could result in temporary disruptions to adjacent land uses resulting from nuisance effects such as noise, dust, construction traffic, and possible interference of access to locations along Gove Road during construction activities. Additionally, the Project may require the removal or relocation of improvements (e.g., irrigation laterals). Once operational, the Project would have negligible long-term or permanent land use impacts. Issues relating to nighttime lighting and potential noise are

discussed in Sections 4.9, Noise, and 4.8, Aesthetics. Issues concerning the conversion of important farmlands are covered under Section 4.14, Environmentally Sensitive Areas.

4.20.3 Impacts and Mitigation Measures

Impact 4.20.1: The Project would be consistent with applicable land use goals, policies, and objectives of the City's and County's General Plans. (Less than Significant)

The Project would be consistent with the General Plan goals and objectives adopted by the City to ensure the adequate provision of wastewater treatment service. The Project is responding to current and planned development demands on wastewater treatment capacity rather than installing new capacity that would otherwise exceed the City's needs.

The Project is consistent with policies contained in the Public Facilities Element of the current General Plan, which support the improvement of City's infrastructure and encourage the efficient and cost-effective delivery of public service. More specifically, the Project would be consistent with policies P-1.1, P-1.2, P-1.4, and P-1.5 which support these goals, and direct the Public Works Department to provide adequate public infrastructure to meet the needs of future development, encourage the utilization of existing infrastructure to the maximum extent possible, and accommodate future needs for reclaimed water.

The Project would require the City to acquire 46 acres north and east of the City's WWTP property for public use to enable the expansion of the WWTP. The expansion area is currently designated for Agricultural use under the County's 1990 General Plan. Goals and polices applied to the agricultural use focus on avoiding the placement of urban-type land uses, which may be disruptive to the agricultural economy, near agriculturally zoned lands. As the WWTP is an existing use, its expansion would not be disruptive to adjacent agricultural uses. Further, because the acquisition of 46 acres would reduce the northern property's size from 380 to 338 acres, continued agricultural operations on the adjacent property would remain viable.

Once constructed, maintenance activities would not substantially deviate from baseline conditions. In this context, the Project would not conflict with policies adopted for the purpose of avoiding or mitigating an environmental effect and this impact is considered less than significant.

Mitigation: None required

Impact 4.20.2: Implementation of the Project would create land uses that are incompatible with current and planned land uses adjacent to Project facilities. (Less than Significant)

Expansion of the WWTP would not create a new land use; it would continue existing land uses and allow the capacity of the WWTP to increase for serving future community demands. WWTP expansion requires that 20 acres of agricultural lands be displaced and incorporated into the

WWTP. The effects of this change are addressed in Section 4.14, Environmentally Sensitive Areas, regarding impacts to agricultural resources.

The surrounding agricultural land uses do not conflict with operation of the WWTP. There is no apparent conflict because of traffic, noise, odors, or light and glare emanating from the WWTP. Expanding the WWTP would have a less-than-significant impact on land use and zoning.

Mitigation: None required

Impact 4.20.3: Construction of the Project would create an obstruction that could physically divide an established community. (No Impact)

The WWTP expansion facilities would be constructed on and adjacent to the WWTP site located outside the Merced City limits on property surrounded by lands in agricultural production. As such, the Project would not be constructed within an established residential community. Expansion of the WWTP would have no impact by physically dividing a established community.

Mitigation: None required.

Impact 4.20.4: Implementation of the Project would conflict with a Williamson Act contract or adjacent agricultural zoning. (No Impact)

The WWTP project area is located on agricultural property that is not covered under the provisions of an active Williamson Act contract.

Mitigation: None required.

Impact 4.20.5: Construction of the Project would impact farmland and/or adjacent agricultural operations. Additionally, routine maintenance over the long term could potentially conflict with these operations. (Potentially Significant)

Lands areas north of the WWTP and along Gove Road are currently under agricultural production. Based on review of aerial photographs and field reconnaissance, these agricultural areas include mainly irrigated pasture and row crops. Although the expansion area and access road alignment are minimal in terms of spatial extent, construction activities would require the removal and relocation of existing irrigation structures, drainage facilities, and topsoil. This temporary loss in agricultural productivity within the vicinity of the expansion area could adversely affect ongoing operations and would be considered a potentially significant impact. Implementation of the prescribed mitigation would mitigate impacts to local agricultural operations to a less-than-significant level.

Mitigation Measure

Measure 4.20.5: The City shall consult with all affected landowners where the proposed expansion area would encroach onto productive farmland. As part of the easement acquisition process, the City and affected landowners shall negotiate an agreed-upon compensation for the loss of any existing pasture and/or row crops currently in production. During these consultations the City shall also, in conjunction with landowners' input, identify areas within the expansion area that could be left in agricultural production. Compensation for the loss of crops and associated revenues would be up to the provisions of law.

Impact Significance After Mitigation: Less than significant

CHAPTER 5
Project Alternatives

5.1 Introduction

The purpose of the alternatives analysis in an environmental impact report (EIR) is to describe a range of reasonable alternatives to the project that could feasibly attain most of the objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and to evaluate the comparative merits of the alternatives (Section 15126.6(a) of the CEQA Guidelines).

Additionally, Section 15126.6(b) of the CEQA Guidelines requires consideration of alternatives that could substantially lessen or avoid significant adverse environmental effects of the project, including alternatives that may be more costly or would attain most of the project's objectives.

For projects applying for loans through the State Revolving Fund, regulations require that the alternatives analysis discuss the environmental impacts, cost-effectiveness, compatibility with proposed or existing projects, and the reasons for rejection for each alternative and include future options (e.g., recycling regionalization). The fund requirements state that potential alternatives should be feasible and reasonable and should accomplish the basic purposes of the project. Just as importantly, these requirements specify that the analysis carry forward alternatives that avoid or substantially lessen significant effects associated with the proposed project.

5.1.1 Factors in Selection of Alternatives

The alternatives addressed in this EIR were selected in consideration of one or more of the following factors:

- Those alternatives that had been suggested in previously received comment letters;
- The extent to which the alternative would accomplish most of the basic goals and objectives of the Wastewater Treatment Plant Expansion Project (Project) (see Chapter 2, Project Description);
- The extent to which the alternative would avoid or lessen any of the identified significant environmental effects of the Project;
- The feasibility of the alternative, taking into account hydraulic characteristics, site suitability, availability of infrastructure, and consistency with applicable plans and regulatory limitations;

- The appropriateness of the alternative in contributing to a "reasonable range" of alternatives necessary to permit a reasoned choice; and

- The requirement of the California Environmental Quality Act (CEQA) Guidelines to consider a "no project" alternative and to identify an "environmentally superior" alternative in addition to the no project alternative (CEQA Guidelines, Section 15126.6(e)).

The significant environmental impacts that the alternatives will seek to eliminate or reduce include:

- Impacts to biological resources and wetlands
- Conversion of prime agricultural land
- Water quality effects
- Air quality impacts (construction- -related)
- Growth-inducing effects
- Noise and nuisance effects on adjacent residential communities from increased haul trips

5.2 Alternatives Considered, But Eliminated From Further Consideration

A number of alternatives were considered, but eliminated from detailed consideration in this EIR because of their poor cost-effectiveness, limited reliability, and potential to result in significant environmental effects. Alternatives that consisted of a reduced treatment capacity of less than 12 million gallons per day (mgd), were not evaluated in the EIR because they would not meet the basic objectives of the Project, which is to provide sufficient treatment capacity to serve planned growth within the City of Merced's SUDP and the UC-Merced campus.

Therefore, each of the following alternatives is not considered to be feasible, based on criteria in the CEQA Guidelines, Section 15126.6(c):

- Alternative major phases or components
- Alternative siting locations
- Alternative project that could accomplish Project objectives

5.2.1 Alternative Major Phases or Components

Treatment Technologies

Prior to the development of the Project layout shown in Figure 2-3, the City considered alternative treatment technologies and establishing decentralized satellite treatment facilities at various locations in the Merced community. It was concluded that alternative siting options are restrictive from both an engineering and cost standpoint because of the location of the current facilities (e.g., primary clarifiers, headworks). The most cost-effective means to accomplish the proposed wastewater treatment plant (WWTP) upgrades is to place new and/or replacement

facilities near their associated counterparts. This would limit costs for construction materials and maintenance and provide the logical layout of the overall WWTP.

Likewise, the placement of the new outfall pipeline alignment has been identified as the preferred location because of its short distance, avoidance of the woodland areas to the south, and placement within areas currently disturbed by past WWTP operations.

Beyond the WWTP expansion area identified in Figure 2-4, no additional lands are proposed to support physical elements of the Project. Additional lands may be used for biosolids disposal, subject to local review and approval.

Tertiary Treatment Technologies

Tertiary treatment alternatives evaluated as part of Project engineering included sand media, cloth-medium "disk" filters, and membrane filtration technologies. Each of these technologies could produce acceptable quality tertiary effluent consistent with California Department of Health Services "Title 22" pathogen-free reuse criteria. Cloth-medium filters were preferred and selected for the following reasons:

- There are now two Title 22-approved vendors who can provide cloth-medium filters in a competitive environment.
- Cloth-medium filters appear to be the least expensive of the filtration options considered and cost about 15 percent less than conventional sand filtration.
- Cloth-medium filters operate at lower head loss than other filter types and have low backwash rates (ECO:LOGIC, 2006).

Use of Existing Headworks

Continued use of the existing headworks was considered but eliminated because the grit removal channels provide marginal grit removal and generate objectionable odors. Influent Pump Stations Nos. 1 and 2 cannot be expanded cost-effectively to accommodate Project design peak-hour wet weather flows. The required seismic upgrades to the building, electrical modifications, new structures, and condition of the piping and pumps make rehabilitating the facilities more costly than constructing a new pump station. The septage receiving station is in an area that can result in traffic congestion for both the septage haulers and plant operations and conflict with security control of the WWTP facilities (ECO:LOGIC, 2006).

Biosolids Disposal

The proposed biosolids treatment process, as shown in Figure 2-6, includes a combination of facilities that allow the disposal of sludge to multiple locations both before and after drying. Because this combination provides the greatest operational flexibility for disposal options and would result in the lowest risk for future disposal cost increases, the biosolids treatment and handling methods outlined in Chapter 2 were considered the most feasible.

Viable disposal options available in addition to the proposed actions and facilities described in Chapter 2 include offsite hauling to the Forward Landfill in Manteca, California; hauling to the Synagro landfill as both Class A composting and Class B land disposal; or hauling to the Lehigh Cement Plant for disposal (ECO:LOGIC, 2006). These alternatives were generally not preferred due to their higher transportation costs and associated increasing criteria air pollutants emissions (namely, NO_x [nitrogen oxides] and PM_{10} [particulate matter with a diameter of 10 microns or less]). Continued treatment at Class B levels was not considered feasible because of concerns expressed by the Central Valley Regional Water Quality Control Board (RWQCB) and limitations on where Class B may be applied.

5.2.2 Alternative Siting Locations

As part of its North Merced Sewer Master Plan (ECO:LOGIC, 2002), the City evaluated the feasibility of constructing a satellite WWTP in the north Merced area to serve planned development and to minimize the need to expand the current WWTP. The analysis focused on the threshold unit cost (dollars per acre-foot) to be economically feasible to generate a reclaimed water supply. The City concluded that the construction of satellite treatment facilities would not be cost-effective when compared to improving and expanding the current WWTP. This finding is based on the higher price of reclaimed water needed to offset satellite facility construction as compared to other water supplies and the fact that there is demand for reclaimed water only during the dry season (ECO:LOGIC, 2002).

5.2.3 Alternative Projects That Could Accomplish the Project Objectives

Project Objectives

The objectives of the Project consist of:

- Installing sufficient WWTP capacity to meet wastewater loads generated by planned population growth and development within the City's service area
- Installing additional levels of wastewater treatment sufficient to meet current and future effluent quality regulatory limits by replacing aged facilities with improved wastewater treatment technologies and processes

The physical capacity and authorized discharge of the current WWTP is 10.0 mgd. With the installation of previously planned improvements, issuance of a new NPDES permit and certification of this EIR, the WWTP could be operated at an average daily wastewater flow of 11.5 to 12 mgd. The physical facilities at the WWTP are not capable of a higher capacity without sacrificing effluent quality and possibly exceeding effluent quality limits established in Waste Discharge Requirements. Therefore, there are no viable alternatives to installing equipment and treatment facilities capable of increasing the WWTP capacity.

As noted in Chapter 1, the approved City of Merced SUDP and UC-Merced campus LRDP call for future population growth and development that will ultimately create wastewater loads of 20 mgd. Alternatives that would enhance existing treatment technologies (e.g. tertiary-treatment) without establishing additional WWTP capacity capable of serving this volume would conflict with these plans and previous land use decisions. For this reason, other projects that would only provide enhanced treatment technologies were eliminated from further consideration in this document. For various engineering, cost, or other reasons, other treatment technologies, alternative sites, and alternative facilities were considered, but eliminated from detailed consideration in this analysis. Based on these circumstances, the alternatives considered in this EIR are limited to the CEQA-mandated No Project Alternative.

5.3 Alternatives Evaluated in This EIR

As previously discussed, several alternative projects, technologies, and locations were considered during the Project's engineering and planning stages. Only the No Project Alternative is being carried forward for detailed consideration in this document.

5.3.1 No Project Alternative

With selection of the No Project Alternative, the Project would not be constructed. The No Project Alternative would avoid construction-related impacts to wetlands and adverse air quality effects that are associated with the Project's construction. Other impacts that would initially be avoided include land use conflicts, construction- and operation-related noise, potential erosion, conversion of prime agricultural land, and potential disruptions to traffic and emergency service. Wastewater flows would continue to be discharged into Hartley Slough at the existing rate of about 8.5 mgd and could increase up to the 10 mgd as currently authorized by the CVRWQCB. However, the City would be unable to satisfy its objective of providing sufficient wastewater treatment capacity and, therefore, be unable to serve planned populations and development anticipated in the City's General Plan and the UC-Merced LRDP. If the No Project Alternative is selected, community growth and development would be limited by available WWTP capacity.

Water quality benefits associated with the Project would not be realized, including upgrades to achieve disinfected, tertiary-treated effluent that could be used as recycled water. It may be technically feasible for another entity to propose and operate a wastewater treatment facility to serve the Merced SUDP, UC-Merced campus, and surrounding unincorporated lands; however, multiple constraints would likely limit such a facility's location, operation, and ability to comply with regulatory requirements. For instance, a suitable receiving waterway would need to be identified for discharge of treated effluent. If not identified, the land-application of treated effluent with sufficient storage to retain flow during wet winter months would likely be needed. Such a facility would likely discharge treated effluent overlying existing groundwater supplies used by the City. Additional study would be needed to determine if such an operation would contaminate existing City drinking water supplies.

Establishment of a separate wastewater treatment facility to serve lands within the SUDP would require modify existing sewers and wastewater conveyance systems. Substantial reconstruction and installation of additional pumping and conveyance facilities may be needed to serve portion of the SUDP, separate from the existing WWTP.

Because of the complexities and potential for significant environmental effects, the establishment of other wastewater facilities is considered to be a separate project and would be subject to another CEQA environmental impact review process.

5.4 Environmentally Superior Alternative

The No Project Alternative would avoid many of the potential environmental effects associated with construction of the Project. However, it would not achieve the long-term water quality improvements that would occur with implementation of the Project. Because the Project would improve the long-term water quality of Hartley Slough, the Project is considered to be environmentally superior to the No Project Alternative.

With selection of the No Project Alternative, the City would be unable to meet planned wastewater demands and unable to achieve improved effluent quality. The No Project Alternative would conflict with the City's General Plan objective of updating sanitary sewer infrastructure and facilitating continued implementation and build-out of the Specific Urban Development Plan and the UC-Merced LRDP. Under the No Project Alternative, the City would not be able to fulfill the objectives of the Central Valley RWQCB to improve the water quality within Hartley Slough, which is classified as an effluent-dominated water body that ultimately drains toward the San Joaquin River. As a result, the Project considered Environmentally Superior Alternative when compared to the No Project Alternative.

CHAPTER 6
Growth-Inducing Impacts

6.1 Introduction

6.1.1 CEQA Definition of Growth-Inducement

The CEQA Guidelines require that an environmental impact report (EIR) evaluate the growth-inducing impacts of a proposed action (Section 15126.2(d)). A growth-inducing impact is defined by the CEQA Guidelines as:

> *[T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth .... It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project can have direct and/or indirect growth-inducement potential. Direct growth-inducement would result if a project actually induced or required that additional actions or projects be implemented. For instance, a new housing project could require construction of new electric transmission lines to serve the new population. A project can also have indirect growth-inducement potential if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises) or if it would involve a substantial construction effort that would indirectly stimulate the need for additional housing and services to support the new employment demand.

Similarly, under CEQA, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as increasing the capacity of an essential public service. An example of this indirect effect, as cited in the CEQA Guidelines (Section 15126.2(d)), would be the expansion of a wastewater treatment plant, which would enable more construction in its service area.

Finally, projects that may encourage or facilitate other activities that have the potential to affect the environment, either individually or cumulatively, need to be identified and addressed in this discussion.

6.1.2 Approach to Growth-Inducement Analysis

The environmental impacts associated with a growth-inducing action are secondary, or indirect, physical effects of growth. Secondary effects of growth-inducing action typically include, but are not limited to, increased traffic, degradation of air quality, loss of biological resources and habitats, increased demand on public services, and changes in land use.

Local land use plans (e.g., General Plans) provide land use development patterns and growth policies that allow the planned and orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service, and solid waste service. A project that would induce unplanned growth (i.e., conflict with the local land use plans) could indirectly cause additional adverse environmental impacts and other public services impacts not previously envisioned. Thus, to assess whether a project with the potential to induce growth will result in adverse secondary effects beyond what is anticipated by local jurisdictions, it is important to assess the degree to which the growth associated with a project would or would not be consistent with applicable land use plans.

6.1.3 Overview of Growth-Inducement Potential

Sanitary sewer service is an essential public service needed to support urban development. The Wastewater Treatment Plant (WWTP) Expansion Project (Project) would provide sufficient wastewater capacity to serve populations and activities planned to occur within the City of Merced's (City) Specific Urban Development Plan (SUDP) and the Long-Range Development Plan (LRDP) for the University of California-Merced (UC-Merced). Additional treatment technologies provided by the Project would improve effluent quality to satisfy more stringent Waste Discharge Requirements that the Central Valley Regional Water Quality Control Board may impose. Therefore, proposed WWTP facility upgrades are necessary to maintain future wastewater service to City residents and businesses within the SUDP.

6.2 Growth Trends in the City of Merced Area

Historically, the economy within Merced County has been tied to agriculture. While agriculture is still a major industry within Merced County, it is no longer the sole driving force of economic growth. Merced County, like other counties in the San Joaquin Valley, is experiencing major structural shifts in the distribution of new job growth. This job growth also requires more financial, insurance, real estate, and local government services for an increased number of people. The following section provides detailed information for current population, housing, and employment projections, based on data from the U.S. Census, the California Department of Finance, the Merced County Association of Governments, and Merced County.

6.2.1 Planned Population Growth

Merced's population in December 2005 was 76,225, an increase of 2.9 percent from December 2004 (DOF, 2006). The City is the primary urban center of Merced County, comprising roughly 30.6 percent of the county's total population. The 1997 City of Merced General Plan projects that the population of the SUDP will increase to 133,250 by 2015. The SUDP population is anticipated to increase to 202,070 by 2035 (City of Merced, 1997).

When the 1997 City of Merced General Plan was prepared, it envisioned that the UC-Merced campus would be constructed and add 8,200 residents by 2015 and reach 37,140 residents by 2035. Therefore, the General Plan foresaw a population in 2015 of about 157,450 residents and a population in 2035 of 230,070 people residing in the SUDP and immediate area. The 2002 UC-Merced Long-Range Development Plan estimated that a full-development population of about 31,248 students, faculty, and staff would be associated with the campus.

More recent population data developed by the Merced County Association of Governments (MCAG) Regional Transportation Plan (RTP) projects a slightly slower growth rate when compared to projections presented in the City's 1997 SUDP. Nonetheless, project-related engineering studies have estimated the volume of wastewater to be generated according to population projections contained in the 1997 City of Merced General Plan and the 2002 UC-Merced Campus LRDP to provide a reasonably conservative estimate of future wastewater flows (ECO:LOGIC, 2002). Table 6-1 presents the population projections presented in the SUDP (1997) and MCAG RTP (2004) and the associated wastewater flow volumes. Based on the more recent RTP projections, the City has identified a 12 mgd development phase that would be implemented if the SUDP population and development estimates prove to be high.

TABLE 6-1
RELATION OF WASTEWATER FLOW
TO PLANNED POPULATION AND DEVELOPMENT

City SUDP Projections		MCAG RTP (2004) Projections		Year
Population	MGD [1]	Population	MGD [1]	
100,880	11.6	72,600	8.35	2005
116,800	13.43	81,900	9.42	2010
133,250	15.32	89,400	10.28	2015
149,700	17.22 [2]	97,700	11.2 [2]	2020
--	--	106,800	12.28	2025
--	--	116,000	13.34	2030
202,070	23.24 [3]	--	--	2035

(1) Per capita wastewater demand = 115 gallons per day
(2) An additional 2.25 mgd of wastewater capacity would be required to accommodate UC Merced Campus at 2015.
(3) An additional 3.6 mgd of wastewater capacity would be required to accommodate UC Merced Campus at 2035.
SOURCE: City of Merced, 1997; ECO:LOGIC, 2002; UC-Merced, 2002

6.2.2 Economy

According to California Department of Finance statistics, there were about 52,000 nonagricultural jobs and 11,700 agricultural jobs in Merced County in 2000 (DOF, 2005). As of 2004, Merced County was ranked fifth statewide for agricultural production with a gross value of $2.365 billion (Agricultural Commissioners Report, 2004). Of the 52,000 nonagricultural jobs, 12,300 were in the trades. Other large employment sectors in the county were state and local government, with 11,700 jobs, and manufacturing, with 10,800 jobs.

Merced accounts for approximately 43 percent of the total jobs in Merced County. Retail, services, and local government sectors account for 68 percent of those jobs. Agriculture-related employment is relatively less significant for Merced than for the county as a whole. Projections through 2020 indicate that employment in Merced County will increase to 98,200 without UC-Merced, assuming a growth rate of around 1.0 percent (UC-Merced, 2001). Most of this employment growth would occur in the services and retail sector, which will provide 27 percent and 26 percent of all new jobs, respectively.

6.2.3 Housing

Merced currently provides roughly one-third of the county's housing stock. According to the California Department of Finance, there were 24,757 housing units in Merced as of January 2005 (DOF, 2005). Approximately 5.1 percent of the total housing units in Merced were vacant as of January 1, 2005. The DOF considers a 5 percent vacancy rate "normal" to allow for turnover of units.

Based on the expected population growth within the city and assuming an average household size of 3.074 (DOF, 2004), it is expected that an additional 22,500 new units (a 90 percent increase) will be added to Merced's housing stock by 2015.

6.2.4 General Plan Growth Policies

The City's SUDP contains several goals and supporting policies that specifically direct the way in which the City is to manage planned growth. Along with these goals and policies, the City has adopted corresponding policies that identify the circumstances in which the City would consider extending sanitary sewer infrastructure to serve planned growth. These goals and policies are outlined in the following discussion.

Goal Area UE-1 – Urban Expansion

Goals

- A compact urban form
- Preservation of agriculturally significant areas
- Efficient urban expansion

Policies and Implementing Actions

UE-1.3: Control the timing, density, and location of new land uses within the City's urban expansion boundaries.

1.3.a: The City should require that all new urban development be contiguous to existing urban areas and have reasonable access to public services and facilities.

1.3.b: The City should develop systems to evaluate the cost of providing various services to new development and establish clear policy for meeting those costs.

1.3.f: Evaluate future annexation requests against the following conditions:

c) Can the proposed development be served by the City water, sewer, storm drainage, fire and police protection, parks, and street systems to meet acceptable standards and service levels without requiring improvements beyond which the developer will consent to provide?

UE-1.7: Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP) during the planning period.

1.7.a: The City should promote the annexation of unincorporated urban areas within the urban expansion boundaries which cause a duplication of public services and hinder extension of City services to new development.

1.7.c: Provide assistance to residents of unincorporated areas to address public health and safety concerns of on-site water and sewer systems.

Goal Area P-1: Public Facilities and Services

Goals

- Maintenance and improvement of Merced's existing infrastructure
- New development which includes a full complement of infrastructure and public facilities
- Efficient and cost-effective public service delivery

Policies and Implementing Actions

P-1.1: Provide adequate public infrastructure and services to meet the needs of future development.

1.1.a: Through development review, ensure that utilities are adequately sized to accommodate the proposed development and, if applicable, allow for extensions for future developments, consistent with master plans.

1.1.b: Master infrastructure plans for newly developing areas may be prepared and adopted as necessary.

1.1c: Include Specific Plans and master plans, a phasing plan for providing access, sewer, water, drainage, flood control, schools, parks and other appropriate governmental facilities and services.

1.1d: Construct a stormwater drainage system, water system and sewer system in accordance with master plans.

1.1e: Apply for Federal, State, and regional funding sources set aside to finance infrastructure costs to the maximum extent feasible.

P-1.2: Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of infrastructure and services where necessary.

1.2.a: Develop plans which establish priorities to address existing inadequacies in the City's infrastructure system.

1.2b: Expand existing facilities to the extent possible at present locations.

1.2c: Periodically evaluate the City's service delivery system and identify policies and programs which may improve operating efficiency and/or reduce service delivery costs.

P-1.3: Require new development to provide or pay for its fair share of public facility and infrastructure improvements.

1.3.a: Prepare and adopt adequate fee schedules commensurate with the cost of planned improvements and services, with annual review and update.

1.3.b: Periodically evaluate the City's service delivery system and identify policies and programs which may be applied to new development to improve operating efficiency and/or reduce service delivery costs.

1.3.c: All new development shall contribute its fair share of the cost of on-site and off-site public infrastructure and services as appropriate.

1.3.d: The City may require developments to install off-site facilities which also benefit other properties.

Goal Area P-4: Wastewater

Goals

- An adequate wastewater collection, treatment and disposal system in Merced

Policies and Implementing Actions

P-4.1: Provide adequate wastewater collection, treatment and disposal capacity for projected future needs.

4.1.a: Maintain the existing wastewater system to increase the lifetime of the system.

4.1.b: Develop wastewater master plans to serve future Merced urban expansion

4.1.c: Design wastewater collection systems that discourage development of prime agricultural soils.

4.1.d: Coordinate wastewater planning activities with the County.

P-4.2: Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

4.2.a: Consider designs for reclaimed water systems, including pipelines, pump stations and storage ponds, to primarily serve as irrigation for feed and fodder crops.

4.2.b: Consider conducting a reclaimed water market study to identify potential users.

4.2.c: Consider preparing a plan for the use of reclaimed water which evaluates the facilities and costs required to serve potential users, determines required capacities of facilities, and presents and implementation plan.

6.3 Growth-Inducement Potential of the Project

Significance Criteria

The Project would result in a growth-inducing effect if it would induce substantial population growth in an area, either directly or indirectly; including situation where the Project would remove an obstacle to, encourage, or otherwise facilitate future population growth or development.

Impact Analysis

Impact 6.1: The Project would indirectly induce substantial population growth by eliminating an obstacle for growth by increasing wastewater treatment capacity, an essential service for urban development. (Significant)

The Project would incrementally increase the WWTP's operating capacity up to 20 mgd. Incremental capacity increases of 12, 16, and ultimately 20 mgd would be driven by increasing wastewater inflows and the rate of near-term development in new growth areas. Because wastewater infrastructure is recognized as a constraint to continued population growth in the Merced SUDP and the UC-Merced campus, the additional capacity provided by the Project would be considered as removing an existing obstacle to growth. Growth-inducement within the SUDP and the UC-Merced campus is addressed in environmental documents previously prepared for the 1997 SUDP Update (City of Merced, 1997a) and the 2001 UC-Merced LRDP (University of California, 2001). Both EIRs were certified and included the adoption of a Statement of Overriding Considerations for the unavoidable significant impacts associated with the implementation of both plans. The unavoidable impacts identified in these documents are disclosed in the following discussion and would be accommodated as a consequence of implementing the Project.

While some of the effects of implementing the 1997 SUDP and 2001 UC-Merced LRDP are significant and unavoidable, others can be mitigated to a less-than-significant level. Potentially significant impacts associated with implementation of the 1997 SUDP include:

- Loss of agricultural land,
- Loss of habitat,

- Increased traffic and traffic congestion,
- Air quality impacts,
- Increased traffic noise,
- Increased energy demand,
- Alteration of the region's visual character, and
- Increased use of non-renewable fossil fuels.

The General Plan's policy framework is its main tool for mitigating these effects, except those identified as significant and unavoidable in the 1997 SUDP EIR. These impacts include:

- Effects to Air Quality – Implementation of the General Plan would contribute to the cumulative regional impact on PM_{10} and ozone concentrations that exceed the Attainment status of the San Joaquin Valley Air Basin.

- Loss of Agricultural Soils – Implementation of the General Plan would result in the loss of Prime Farmland as a consequence of conversion to urban land uses.

The EIR prepared for the UC-Merced LRDP identified significant impacts that could not be eliminated or reduced to a less-than significant level by mitigation measures imposed by the university. These significant and unavoidable impacts would result from the development proposed under build-out of the Phase 1 portion of the campus and include:

- Aesthetic Resources – Implementation of the Phase 1 Campus would create new sources of light or glare. Campus development, in combination with other community development, would change the visual character of the area and affect scenic vistas and other scenic resources.

- Aesthetic Resources – Lighting for Phase 1 Campus buildings and other facilities would create a new source of light or glare that could spill onto Lake Yosemite Regional Park and other sensitive areas.

- Agriculture – Implementation of the LRDP will result in the conversion of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland to nonagricultural use.

- Air Quality – Development of the Phase 1 Campus would generate increased emissions levels of carbon monoxide and ozone precursors (reactive organic gases and nitrogen oxides).

- Biological Resources – Development under the LRDP, in conjunction with other development, would result in the loss or adverse modification of important native plant and wildlife habitat, including wetlands, vernal pool habitat, clay playa habitat, and annual grassland habitat, and adverse effects to special-status species associated with these habitats.

- Noise – Implementation of the Phase 1 Campus development would result in significant and unavoidable increased ambient noise levels because of increased traffic on the local roadways. Construction of the campus facilities could expose nearby receptors, especially users of the county park, to elevated noise levels (UC-Merced, 2001).

- Public Services – The development of the campus would generate demand for elementary and secondary educational services, which could result in physical effects on the environment.

- Recreation – Cumulative growth in area population will result in an increased demand for recreational facilities, which could cause a deterioration of the current facilities.

- Traffic and Circulation – Implementation of the LRDP, in combination with the proposed University Community and regional growth in Merced County, would result in increased traffic levels in the vicinity of the campus and exceedance of the roadway level of service thresholds.

- Utilities – Implementation of the LRDP would induce substantial economic and population growth in the region and would result in the construction of additional housing.

In addition to these significant unavoidable effects, the university identified significant irreversible changes to the environment resulting from build-out of the Phase 1 Campus. These significant irreversible changes generally fall into three categories: (1) irretrievable commitment of materials and energy during construction and maintenance of the project; (2) loss of agricultural, biological, and cultural resources when undeveloped lands are converted to urban uses; and (3) increased use of natural resources due to increased population at and surrounding the campus site. In the context that the Project would accommodate a critical infrastructure component of both plans, this impact is identified as a significant and unavoidable effect of the Project for which no mitigation is available.

CHAPTER 7
Other Statutory Considerations

7.1 Cumulative Impacts

A cumulative impact is created when two or more projects act in combination to cause related impacts that are greater than the subject project alone. California Environmental Quality Act (CEQA) Guidelines (Section 15130(a)) require an environmental impact report (EIR) to identify and 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 combination with the effects of past, current, and probable future projects. If the lead agency determines that the incremental effect of the project is not cumulatively considerable, then it may conclude the effect is less than significant.

The CEQA Guidelines also state 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 one of the following two may be used to complete an adequate cumulative analysis:

- 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

- A summary of projections contained in an adopted General Plan or related planning document designed to evaluate regional or area-wide conditions. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency (i.e., the plan approach).

As discussed in Chapter 4, Environmental Analysis, a majority of the environmental effects associated with the Merced Wastewater Treatment Plant (WWTP) Expansion Project (Project) would occur during facility construction. Therefore, this analysis focuses on other concurrent construction projects that may act in combination with construction of the Project.

In addition, this analysis addresses the identified significant and unavoidable effects of implementing the City of Merced's (City) General Plan and the Long-Range Development Plan (LRDP) for the University of California-Merced (UC-Merced). If the Project further impacted the effects identified as significant and unavoidable in these two EIRs as a result of serving the

Specific Urban Development Plan (SUDP) and UC-Merced campus, then these effects would be considered cumulatively significant.

7.1.1 Past, Present and Reasonably Foreseeable Future Projects

This analysis is based on a summary of existing and anticipated projects within the immediate vicinity of the Project and includes future population growth and development that could occur within the SUDP and Phase 1 of the UC-Merced Campus as a result of expanding the WWTP capacity and facilitating future development in the community. A detailed discussion of growth-inducing impacts associated with this Project is presented in Chapter 6, Growth-Inducing Impacts.

A general summary of projects in the vicinity of the WWTP that are either under construction, have been recently approved, or are pending approval is presented in Table 7-1. A majority of the listed projects are related to development projects that are focused around the Merced Municipal Airport.

Much of the land area in the southern portion of Merced is already urbanized and built to allowable densities. The listed projects, therefore, consist mainly of infill developments and are generally limited in size, whereas most lands located immediately south of the city limits and under Merced County jurisdiction are in an agricultural land use.

The documents referenced in Table 7-1, along with a summary of their associated impacts, are available to the public for review at the City of Merced Development Services and Public Works Departments and the Merced County Association of Governments.

The projects listed in Table 7-1 are anticipated to result in construction-related effects that may not be individually significant; however, if they are constructed simultaneously with the Project, they could contribute to cumulative effects on air quality including emissions of nitrogen oxides (NO_x), reactive organic gases (ROG), and particulates; traffic congestion; and temporary increases in noise, light and glare. Over the long-term future, the residential and commercial projects are expected to also increase local traffic, whereas the public works project will likely improve traffic movement and reduce traffic congestion. The schedule for developing these projects is not known.

7.1.2 Summary of Projections Contained in an Adopted General Plan or Related Planning Document

The 1997 Merced General Plan EIR identified a series of environmental impacts that would occur with implementation of the SUDP. Several of these impacts were considered to be significant and unavoidable, while other impacts could be reduced to a less-than-significant level with the implementation of appropriate mitigation. Table 7-2 identifies these impacts and which are considered to be significant and unavoidable:

TABLE 7-1
LIST OF PROJECTS IN THE VICINITY OF THE PROJECT

Project Name	Size	Project Description	Status
Development Projects			
Pad at Home Depot	5,400 square feet	Retail; located at the northwest corner of 18th and R Streets	Application was approved December 2001; Conditional Use Permit (CUP) #998
Skyview Industrial Park	22.7 acres	Industrial subdivision; located near the Merced Municipal Airport on the north side of Wardrobe Avenue, west of Massasso	Application was approved Jan. 2002; Vesting Parcel Map #01-10
Warehouses	Six 10,000-square-foot warehouses	Warehouses; located near the Merced Municipal Airport on the north side of Wardrobe Ave.	Application was approved July 2003; CUP #1029
Merced Apartments	28 units	Apartments; located near the SW corner of R and W. 2nd Streets	Application was approved Dec. 2003; CUP #1037
Cypress Terrace	47 acres	Tentative Subdivision Map #1219; 255 units	Expiration Date 5-20-04
Moss Landing #6	7.7 acres	Tentative Subdivision Map #1240; 37 units	Expiration Date 8-07-04
Cypress Terrace #2	10.2 acres	Tentative Subdivision Map #1242; 49 units	Expiration Date 2-05-05
Vista Del Sol	29.8 acres	Tentative Subdivision Map #1243	Expiration Date 2-19-05
Indoor Soccer	16,000 square feet	Indoor soccer facility; located near the west side of Heron Way at 115 Heron Way	Application was approved Oct. 2004; CUP #1052
Planning Project			
City of Merced General Plan Update	40,000 acres	The City of Merced is in the process of updating its General Plan to define future objectives and policies to guide population growth, development, and land uses within the urban development area for the foreseeable planning horizon.	In September 2005, the City Council adopted a General Plan Update Study Area Boundary. The General Plan Update is expected to be completed by mid- to late 2007.
South Merced Specific Plan	N/A	The City is proceeding to develop a Specific Area Plan for the south Merced area. This area currently supports commercial and industrial land uses. Future plans envision establishing a tourist corridor, recreational facilities, and other improvements to promote public use.	Planning is within preliminary stages, focusing on soliciting public comment and guidance. In 2004, a Strategic Plan was prepared to outline the opportunities, vision, and next steps in Plan development.
Ranchwood Mission Lake Project	N/A	Residential and commercial development located outside the SUDP.	No application submitted to date.
Public Works Projects			
Highway 59 realignment (Castle Hwy.)		Tier 1[1] infrastructure improvement to provide access to N. Merced and reduce travel on Highway 99 in Merced; Location: Highway 99 to Bellevue Rd. to Highway 59.	
Highway 59 realignment south		Tier 2[2] infrastructure improvement to reduce travel through downtown Merced; Location Highway 140 south to Dickenson Ferry Road to Highway 59.	
Highway 99 Merced/Atwater Freeway expansion to 6 lanes		Tier 2 infrastructure improvement for safety and to increase capacity from 4 to 6 lanes; Location from the Merced city limits to the Atwater city limits.	

[1] Tier 1 refers to primary improvement projects that do not require additional funding to be implemented.
[2] Tier 2 refers to secondary improvement projects that require additional funding to be implemented.

SOURCE: Merced County Association of Governments. 2004.

TABLE 7-2
ENVIRONMENTAL EFFECTS OF IMPLEMENTING
CITY OF MERCED SPECIFIC URBAN DEVELOPMENT PLAN

Issue	Impact Significance with Mitigation	Effect
Air Quality	Significant – Mitigation not available	Effects of regional growth on air quality are considered to be significantly adverse and unmitigable. Other measures, combined with General Plan policies expected to reduce growth within Specific Urban Development Plan (SUDP) to less than significant
Water Resources and Water Quality	Less Than Significant	Mitigation measures are available to reduce or eliminate potential adverse effects resulting from growth and development.
Plant and Animal Species	Less Than Significant	Mitigation measures are available to reduce or eliminate potential adverse effects resulting from growth and development.
Land Use Impacts	No Impact	No potential significant adverse impact was found to exist as a result of plan implementation.
Natural Resources and Agricultural Land	Significant – Mitigation not available	Expansion of the urban land uses will result in the loss of crop land. The loss cannot be mitigated. Potential loss of agricultural lands is deemed to be minimized to the degree possible as a result of SUDP policies.
Population and Housing	No Impact	No potential significant adverse impact was found to exist as a result of plan implementation.
Transportation and Circulation	Less Than Significant	Mitigation measures are available to reduce or eliminate potential adverse effects resulting from growth and development.
Public Services	Less Than Significant	Mitigation measures are available to reduce or eliminate potential adverse effects resulting from growth and development.
Parks and Recreation	No Impact	No potential significant adverse impact was found to exist as a result of plan implementation.

Source: City of Merced, 1997

As noted in Table 7-2, two impacts were identified as potentially significant and unavoidable. These impacts are highlighted in the following text.

- Air Quality – Implementation of the General Plan would contribute to the cumulative regional impact of PM_{10} and ozone concentrations, which currently exceed the attainment status of the San Joaquin Valley Air Basin.

- Agricultural Soils – Implementation of the General Plan would result in the loss of Prime Farmland as a result of conversion to urban land uses.

The UC-Merced LRDP EIR (UC-Merced, 2002) identified significant impacts that could not be eliminated or reduced to a less-than significant level by mitigation measures. These significant and unavoidable impacts are:

- Aesthetic Resources – Implementation of the Phase 1 Campus would create new sources of light or glare. Campus development, in combination with other community development, would change the visual character of the area and affect scenic vistas and other scenic resources.

- Aesthetic Resources – Lighting for Phase 1 Campus buildings and other facilities would create a new source of light or glare that could spill onto Lake Yosemite Regional Park and other sensitive areas.

- Agriculture – Implementation of the LRDP will result in the conversion of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland to nonagricultural use.

- Air Quality – Development of the Phase 1 Campus would generate increased emissions levels of carbon monoxide and ozone precursors (ROG and NO_x).

- Biological Resources – Development under the LRDP, in conjunction with other development, would result in the loss or adverse modification of important native plant and wildlife habitat, including wetlands, vernal pool habitat, clay playa habitat, and annual grassland habitat, which could lead to adverse effects to special-status species associated with these habitats.

- Noise – Implementation of the Phase 1 Campus development would increase ambient noise levels due to increased traffic on local roadways. Construction of the campus facilities could expose nearby receptors, especially users of the county park, to elevated noise levels

- Public Services – The development of the campus would generate demand for elementary and secondary educational services, which could result in physical effects on the environment.

- Recreation – Cumulative growth in area population will result in an increased demand for recreational facilities, which could cause a deterioration of the current facilities.

- Traffic and Circulation – Implementation of the LRDP, in combination with the proposed University Community and regional growth in Merced County, would result in increased traffic levels in the vicinity of the campus and exceedance of the roadway level of service thresholds.

- Utilities – Implementation of the LRDP would induce substantial economic and population growth in the region and would result in the construction of additional housing.

7.1.3 Project Impacts That May Contribute to Cumulative Effects

Of the identified impacts that would result with the implementation of the Project, the loss of Prime Farmland and the impacts of construction activities on air quality are the only effects found to be significant and unavoidable. The City proposes to acquire 42 acres of agricultural land for the Project. The Project would convert approximately 20 acres of prime agricultural land to WWTP facilities. This 20 acres is considered relatively minor when compared to the overall county agricultural land base (1,165,872 acres in 2002), but is still considered a significant project-level impact. The remaining 22 acres of agricultural land would remain in agricultural

production. An additional four acres of land, not used for agricultural purposes would also be acquired for the WWTP expansion.

The loss of 20 acres of farmland, when considered in combination with other farmland losses occurring in Merced County and elsewhere in California, is considered a significant cumulative impact.

The Project's air quality emissions were evaluated using the San Joaquin Valley Air Pollution Control District's (SJVAPCD) 2002 Guide for Assessing and Mitigating Air Quality Impacts (SJVAPCD, 2002a; 2002b). This analysis considers the possibility that construction of the Project, although temporary, could have a significant impact on ozone precursors (NO_x). However, emissions of NO_x from construction equipment and construction-related truck and worker trips would be mitigated to a less than significant level through the implementation of prescribed mitigation. These emissions would not be cumulatively considerable..

Construction-related emissions of particulates less than 10 microns in diameter (PM_{10}) would be reduced to a less-than-significant level with the implementation of best management practices and other measures defined in this document. Although temporary, these emissions would produce a significant cumulative impact, if construction of the Project occurred simultaneously with construction of other projects in the vicinity (Table 7-1).

Impacts to biological resources, as discussed in Section 4.6, may result in the loss of less than 0.5 acre of wetlands, impacts to special-status species, and impacts to riparian habitats. However, these impacts would be reduced to less-than-significant levels through the implementation of mitigation measures. With these measures, these effects will not contribute to cumulative loss of habitat or direct impacts on special-status species. Planned roadway improvements to State Route 59 identified in Table 7-1 could lead to potential cumulative impacts if improvements coincide with the construction of the Project and require the Project's construction equipment access routes to be directed to different roadways that may not be operating at acceptable levels of service. If this were to occur, construction equipment traffic would contribute to localized traffic congestion until more direct access along State Route 59 becomes available. This scenario is considered a cumulative impact.

Specific Project effects that would result from the temporary generation of construction noise, dust, energy consumption, additional lighting, and potential erosion and sedimentation of local waterways would also be mitigated to less-than-significant levels and would not result in cumulative impacts when considered in combination with other projects. Furthermore, because it was determined that Project impacts to visual resources, recreational resources, groundwater supplies, drainage, seismicity, solid waste, public transit, and emergency access would be less than significant, these impacts would not be cumulatively considerable.

7.2 Unavoidable Significant Impacts

CEQA Section 21100(b)(2) requires that any significant effect on the environment that cannot be avoided must be identified. In addition, Section 15093(a) of the CEQA Guidelines allows the decision-making body of the lead agency to determine if the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. The City can approve a project with unavoidable adverse impacts if it prepares a "Statement of Overriding Considerations" that sets forth the specific reasons for making such a judgment.

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

- The permanent conversion of 20 acres of Farmland, Unique Farmland or Farmland of Statewide Importance to non-agricultural use that would occur with the Project implementation.

- The significant unavoidable secondary effects associated with removing an obstacle to planned urban growth, as described in the SUDP and associated EIR, and the UC-Merced Campus LRDP and associated EIR, that the implementation of the 20 mgd WWTP would accommodate.

The significant and unavoidable environmental impacts associated with implementing the City's SUDP and the UC-Merced Campus LRDP include:

- Loss of agricultural land
- Loss of habitat
- Increased traffic and traffic congestion
- Air quality impacts
- Increased traffic noise
- Increased energy demand
- Alteration of the region's visual character
- Increased use of non-renewable fossil fuels

The City's General Plan is its main tool for mitigating these effects, except those identified as significant and unavoidable in the 1997 Merced Vision 2015 General Plan:

- Effects to Air Quality. Implementation of the General Plan would contribute to the cumulative regional impact on PM_{10} and ozone concentrations that exceed the Attainment status of the San Joaquin Valley Air Basin.

- Loss of Agricultural Soils. Implementation of the General Plan would result in the loss of prime farmland as a consequence of conversion to urban land uses.

The EIR prepared for the UC-Merced LRDP identified significant impacts that could not be eliminated or reduced to a less-than-significant level by mitigation measures imposed by the university (UC-Merced, 2001). These significant and unavoidable impacts would result from development proposed under the build-out of the Phase 1 portion of the LRDP and include:

- Aesthetic Resources. Implementation of the Phase 1 Campus would create new sources of light or glare. Campus development, in combination with other community development, would change the visual character of the area and affect scenic vistas and other scenic resources.
- Aesthetic Resources. Lighting for Phase 1 Campus buildings and other facilities would create a new source of light or glare that could spill onto Lake Yosemite Regional Park and other sensitive areas.
- Agriculture. Implementation of the LRDP will result in the conversion of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland to nonagricultural use.
- Air Quality. Development of the Phase 1 Campus would generate increased emissions levels of carbon monoxide and ozone precursors (reactive organic gases and nitrogen oxides).
- Biological Resources. Development under the LRDP, in conjunction with other development would result in the loss or adverse modification of important native plant and wildlife habitat, including wetlands, vernal pool habitat, clay playa habitat, and annual grassland habitat, and adverse effects to special-status species associated with these habitats.
- Noise. Implementation of the Phase 1 Campus development would result in significant and unavoidable increased ambient noise levels because of increased traffic on the local roadways. Construction of the campus facilities could expose nearby receptors, especially users of the county park, to elevated noise levels.
- Public Services. The development of the Phase 1 Campus would generate demand for elementary and secondary educational services, which could result in physical effects on the environment.
- Recreation. Cumulative growth in area population will result in an increased demand for recreational facilities, which could cause a deterioration of the facilities.
- Traffic and Circulation. Implementation of the LRDP, in combination with the proposed University Community and regional growth in Merced County, would result in increased traffic levels in the vicinity of the campus and exceed the roadway level-of-service thresholds.
- Utilities. Implementation of the LRDP would induce substantial economic and population growth in the region and would result in the construction of additional housing.

In addition to these significant unavoidable effects, the university identified significant irreversible changes to the environment resulting from build-out of the Phase 1 Campus. These significant irreversible changes generally fall into three categories: (1) irretrievable commitment of materials and energy during construction and maintenance of the project; (2) loss of agricultural, biological, and cultural resources as undeveloped lands are converted to urban uses; and (3) increased use of natural resources due to increased population at and surrounding the campus site. In the context that the Project would accommodate a critical infrastructure component of both plans, this impact is identified as a significant and unavoidable effect of the Project for which no mitigation is available.

7.3 Significant Irreversible Environmental Changes Which Would Result from the Proposed Project Should It Be Implemented

Section 15126(c) of the CEQA Guidelines requires an EIR to include a discussion of significant irreversible environmental changes that would result from implementation of a project. Implementation of the Project would indirectly result in the commitment of nonrenewable natural resources used in construction (such as gravel, petroleum products, steel, and others) and slowly renewable resources, such as wood products for the construction of the Project; however, this would not be considered a significant impact.

Operation of the Project would also result in a commitment of energy resources in the form of fossil fuels, including fuel oil, natural gas, and gasoline, for wastewater treatment and distribution facility services. However, operational characteristics associated with the Project would not substantially deviate from current operations, and therefore, no significant increase in the use of these resources is expected beyond current baseline conditions.

CHAPTER 8
Report Preparers and Organizations and Persons Consulted

8.1 Report Authors

8.1.1 Lead Agency

John Raggio, Director of Public Works - Operations
David Tucker, City Engineer
Humberto Molina, Wastewater Treatment Supervisor
Michael Wegley, Principal Engineer
Bill King, Principal Planner
Jeanne Schechter, Chief Deputy City Attorney

8.1.2 Consultants

Environmental Science Associates

Steve Brown, Project Director
Richard Hunn, Project Manager
Clint Meyer, Deputy Project Manager

Technical Specialists

Clint Meyer, Land Use and Planning
Linda Huff, Aesthetic Resources
Clint Meyer, Agriculture
Linda Huff, Transportation, Traffic and Circulation, Public Services and Utilities, Population and Housing
Thomas Leeman, Biological Resources
Mary Pakenham-Walsh, Biological Resources
Sara Lee, Biological Resources
Leah Aragon, Biological Resources
Mahala Young, Biological Resources
Clint Meyer, Noise
Matt Morales, Air Quality
Paul Miller. Air Quality
Clint Meyer, Hydrology and Water Quality
Michele Stern, Hydrology and Water Quality
Clint Meyer, Geology and Soils

Dean Matorana, Cultural Resources
Mike Ratte, Hazards and Hazardous Materials
Susan Lamb and Phil Wade, Word Processing and Report Production
Thomas Wyatt, Graphics
Solomon McCrea, GIS

Erler & Kalinowski

Stephen Tarnantino, Project Manager

Eco:Logic Engineers

Steve Beck, Engineering Manager
Dan Rich, Engineering Project Manager
Doug Brewer, Document Review
Tiffany Knapp, Engineer
Greg Harris, Engineer

CHAPTER 9
Acronyms

°F	Degrees Fahrenheit
µmg/m^3	micrograms per cubic meter
µmhos/cm	micromhos per centimeter
AB	Assembly Bill
ADT	Average daily trips
BARCT	Best Available Retrofit Control Technology
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
City	City of Merced
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
County	Merced County
CVRWQCB	Central Valley Regional Water Quality Control Board
dB	decibel
dBA	A-weighted decibels)
DEIR	draft environmental impact report
Delta	Sacramento-San Joaquin Delta
DNL	24-hour day and night A-weighed noise exposure level

DPM	Diesel particulate matter
EIR	environmental impact report
FIP	Federal Implementation Plan
HAPs	Hazardous Air Pollutants
HCP	Habitat Conservation Plan
IS	Initial Study
L_{10}	noise level that is equaled or exceeded 10 percent of the specified time period
L_{90}	noise level that is equaled or exceeded 90 percent of the specified time period
LAFCO	Local Agency Formation Commission
Lb	Pound
lb/day	pounds per day
Leq	equivalent sound level
Lmax	instantaneous maximum noise level for a specified period of time
LOS	Level of service
LRDP	University of California Merced Campus Long-Range Development Plan
M	Richter magnitude
MCAG	Merced County Association of Governments
mg/L	milligrams per liter
mgd	million gallons per day
MID	Merced Irrigation District
MPN	Most Probable Number
msl	mean sea level
MWMA	Merced Wildlife Management Area
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
National standards	National Ambient Air Quality Standards
NCCP	Natural Communities Conservation Plan
NEPA	National Environmental Policy Act
NO_2	Nitrogen dioxide
NOP	Notice of Preparation

NO_X	nitrogen oxides
NPDES	National Pollution Discharge Elimination System
pd/h	Passenger cars per hour
PM_{10}	particulates less than 10 microns in diameter
PM_{10}	particulate matter ten microns or greater
$PM_{2.5}$	particulates less than 2.5 microns in diameter
ppm	Parts per million
Project	WWTP Expansion Project
RAS	return activated biosolids
ROG	Reactive organic gases
RTP	Regional Transportation Plan
SCBA	Self-contained breathing apparatus
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur dioxide
SR	State Route
SUDP	Specific Urban Development Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
Task Force	San Joaquin Valley Wastewater Task Force
TMDL	total maximum daily load
TUc	Chronic Toxicity Units
UC-Merced	University of California-Merced
USEPA	U.S. Environmental Protection Agency
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	Ultra-violet
WDRs	Waste Discharge Requirements
WWTP	Merced Wastewater Treatment Plant

CHAPTER 10
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