Draft Initial Study / Mitigated Negative Declaration

City of Lodi

Surface Water Treatment Facility

May 2010

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Acronyms

ACH	aluminum chlorohydrate
ADA	American Disabilities Act
AF	acre-feet
AFY	acre-feet per year
BMP	best management practice
BPS	best performance standard
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CDFG	California Department of Fish and Game
CIP	clean-in-place
City	City of Lodi
CMU	concrete masonry unit
CNEL	community noise equivalent level
CO_2	carbon dioxide
CO_2E	carbon dioxide equivalents
County	San Joaquin County
CPUC	California Public Utilities Commission
CY	cubic yards
dB	decibel
dBA	A-weighted decibel
DWR	Department of Water Resources
EFM	enhanced flux maintenance
GHG	greenhouse gas
gpm	gallons per minute
HDPE	high-density polyethylene
hp	horsepower
HVAC	heating, ventilation, and air-conditioning

Ldn	day-night average sound level
Leq	equivalent sound level
mgd	million gallons per day
mg/L	milligram per liter
MMT	million metric tons
NAHC	Native American Heritage Commission
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
PAC	powder activated carbon
PG&E	Pacific Gas and Electric
PLC	programmable logic controller
PM	particulate matter
PVC	polyvinyl chloride
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
RWPS	raw water pump station
SCADA	supervisory control and data acquisition system
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWTF	Surface Water Treatment Facility
USEPA	U.S. Environmental Protection Agency
UPRR	Union Pacific Railroad
WID	Woodbridge Irrigation District

Chapter 1 - Introduction

This Initial Study/Mitigated Negative Declaration addresses the potential environmental effects of the construction and operation of the City of Lodi's (City) proposed Surface Water Treatment Facility (SWTF or Proposed Project). The primary purpose of the proposed SWTF is to provide a secure, reliable supplemental supply of water for the City to meet the current and future water needs thereby reducing dependence on groundwater.

This Initial Study has been prepared in accordance with the California Environmental Quality Act (CEQA). The City is the CEQA Lead Agency.

1.1 Project Background

The City currently utilizes groundwater as its sole water supply source. As part of a regional effort to stabilize the groundwater basin, the City plans to reduce its groundwater pumping. To achieve this goal, the City contracted with Woodbridge Irrigation District (WID) in May 2003 to purchase 6,000 acre-feet per year (AFY) of WID's pre-1914 Mokelumne River water entitlement for a period of 40 years (City of Lodi and WID, 2003).

The City has not yet used any of the purchased WID water; however, the water has been "banked." The 2003 Agreement allows the City to carry over and have credit for unused water of up to 18,000 acre-feet (AF) during the initial three years of the agreement. In January 2008, the First Amendment to the 2003 Agreement extended the City's right to carry over and bank 24,000 AF of water for later usage until October 15, 2010, for a combined total of 42,000 AF, and extended the term of the purchase agreement by approximately four years, to October 15, 2047. In March 2008, a Second Amendment to the 2003 Agreement allows the City to sell during 2009 through 2011, up to 6,000 AFY banked by the City, for a total of 18,000 AF to fund the SWTF.

Under the 2003 Agreement, the diversion of WID water from the Mokelumne River is permitted from March 1 through October 15. In April 2009, WID and East Bay Municipal Utilities District (EBMUD) signed a supplementary agreement allowing the City to utilize the water year-round. From March 1 through October 15, the City will receive 5,000 AF; and from October 16 through the end of February, the City will receive 1,000 AF. Banked water can only be used from March 1 through October 15.

WID was able to contract with the City as a result of its conservation efforts to convert to drip irrigation. The WID/City agreement allowed WID to finance the replacement of the aging Woodbridge Dam and incorporate state-of-the-art passage structures and diversion screens for anadromous fish. These improvements would enable WID to keep Lodi Lake full most of the year.

The WID purchase is intended to supplement the City's groundwater supply to meet current water demands and to reduce the City's dependence on the groundwater aquifer, which is in an

overdraft condition (17,140 AFY pumped in 2008 vs. 15,000 AFY safe yield) (City of Lodi, 2009a). Groundwater conditions in the Eastern San Joaquin Groundwater Subbasin are threatened primarily by groundwater withdrawals to the east and south of the City, which has resulted in saline water intrusion from the west (Dyett & Bhatia, 2007). For these reasons, the City proposes to build the SWTF.

The SWTF is proposed as part of a conjunctive use program that would integrate surface water and groundwater management. The surface water component would be the WID water that would be delivered to the SWTF for treatment and distribution to the City. The groundwater component would be well water that is currently pumped for distribution to the City. With the implementation of the SWTF, the City would pump less groundwater and the groundwater levels would be allowed to recover by in-lieu (natural) recharge.

The treated surface water supply would account for about one-third of the total delivery into the water distribution system, on average, but would potentially range under current demand conditions from 18 to nearly 100 percent of the total delivery depending on day-to-day water demands. The remainder of the water supply would be groundwater, supplied by the City's 27 existing wells and one planned well, which would be improved to meet regulatory requirements.

The 2005 Urban Water Management Plan projected that the future water supply would include groundwater, surface water, and recycled wastewater (RMC, 2006). The groundwater supply would be an average minimum of 15,000 AFY from now until year 2030, based on an estimated safe yield of the groundwater basin. The projected surface supply would be 6,000 AFY for 44 years based on the WID contract. However, in some years when the WID water is reduced to 3,000 AFY, the City would pump 18,000 AFY from the groundwater. In addition, as the City grows in area the safe yield would increase.

The City has conducted a conceptual design and feasibility evaluation of alternatives for a SWTF, storage facilities, and distribution system improvements capable of utilizing the full 6,000 AFY of WID water (HDR, 2008). Construction of a SWTF located west of Lodi Lake was identified as the preferred alternative to meet the City's water supply needs and objectives.

The SWTF would include a raw water pump station (RWPS) near the WID canal that would pump water from the WID intake structure, fitted with a 36-inch pipe, to a 30-inch raw water pipeline to the SWTF. From the SWTF, a treated water pipeline would deliver water to the City's existing water distribution system. The design firm capacity of the initial phase SWTF would be 8 million gallons per day (mgd) with the ability to produce 10 mgd with all membrane skids in operation. Sometime in the future, the SWTF would be expanded in stages to provide a treatment capacity to produce 20 mgd. In compliance with Title 22, Section 64650 et seq. of the California Code of Regulations, all utilities using surface water or any groundwater supply under the influence of a surface water supply must provide adequate disinfection. In order to comply with these rules, chlorination facilities would be added to each of the well sites.

1.2 Project Objectives

In 2008, the City conducted a conceptual design and feasibility evaluation of alternatives for a SWTF, storage facilities, and distribution system improvements capable of utilizing the full 6,000 AFY of WID water (HDR, 2008). Development of a SWTF located west of Lodi Lake was identified as the preferred alternative to meet the City's water supply needs and objectives.

These objectives are:

- To protect and restore groundwater resources.
- To provide adequate water supply to accommodate long-term growth.
- These Project objectives are discussed below.

1.2.1 Protect and Restore Groundwater Resources

Currently, all of Lodi's potable water is sourced from groundwater supplies. Twenty-seven existing groundwater wells with a total pumping capacity of 35,200 gallons per minute (gpm) provide Lodi with its current water supply. Therefore, annual groundwater production has equaled the annual water demand. However, the California Department of Water Resources (DWR, 2006) has declared that the groundwater basin underlying Eastern San Joaquin County is overdrafted, and groundwater levels in San Joaquin County (County) and the City are generally decreasing. The groundwater levels fluctuate over time depending on precipitation, aquifer recharge, and pumping demands (City of Lodi, 2009a).

The continuing decline of groundwater levels in the aquifer underlying the City means that the sustainable annual groundwater supply available to the City is less than what is currently extracted. As a member agency of the Northeastern San Joaquin County Groundwater Banking Authority (NSJCGBA), the City is participating in the development of policies and programs, including groundwater recharge and conjunctive use programs, intended to help eliminate the basin overdraft condition. The City plans to reduce its overall groundwater pumping in the future from 17,140 AFY in 2008 to a safe yield of approximately 15,000 AFY (City of Lodi, 2009a). Therefore, upon startup of the SWTF, the City would reduce groundwater pumping by 6,000 AFY to approximately 11,000 AFY, far below the safe yield of 15,000 AFY.

Therefore, the City's long term reliable water supplies include:

- **Groundwater**: The groundwater safe yield for the area currently covered by the City is estimated to be about 15,000 AFY (RMC, 2006).
- **Surface Water**: Under terms of the 2003 Agreement with the WID, 6,000 AFY of surface water is currently available to the City. The 2003 Agreement also provides that, as WID irrigated lands are annexed for development, the City has the option to purchase an additional three AFY for each acre of WID land that is annexed, up to 6,000 AF.

Purchase of the additional water is contingent on the SWTF being constructed and operational (Welch, 2009).

Upon operation of the SWTF, the City would have a long-term, water supply of approximately 21,000 AFY available from its current safe yield of groundwater and the future surface water supplies.

1.2.2 Provide Adequate Water Supply to Accommodate Long-Term Growth

Lodi currently contains approximately 63,400 residents. Accounting for the current population as well as new residents anticipated from recently approved projects (approximately 9,700 residents), the City's population would be 74,100 residents (City of Lodi, 2010). For this population, a water supply demand of 20.4 mgd (or 26,345 AFY) would be required, as shown in Table 1-1.

Table 1-1. Summary of Existing and Projected Average Daily Water Demand (mgd)

Land Use	Water Demand Factor	Existing	Approved Development Projects	Total
Residential	200 gpd/Pop	12.7	2.1	14.8
General Commercial	1,800 gpd/acre	0.7	0.1	0.8
Business Park/Office	1,800 gpd/acre	0.2	0.0	0.2
Industrial	1,000 gpd/acre	0.8	0.0	0.8
Mixed Use	1,800 gpd/acre	0.0	0.0	0.0
Public/Quasi-Public	2,200 gpd/acre	1.1	0.1	1.2
Parks/Open Space	2,000 gpd/acre	0.6	0.2	0.8
Unaccounted for Losses (10% of above)		1.6	0.2	1.8
Total Demand		17.7	2.7	20.4
Total Demand with 15% Residential Conservation from Installation of Water Meters				17.3
Source: City of Lodi, 2010.				

This projection is based on the current water demand factor estimates by land use types, as described in the 2005 Urban Water Management Plan (RMC, 2006). These factors are somewhat conservative for estimating purposes to account for variations in weather, assumed full occupancy, and the uncertainty of the type of user to occupy the non-residential parcels in the future. To illustrate, the resulting calculated annual demand is estimated to be about 15 percent more than estimated water supply of the City in 2008; therefore these factors may be overestimating demand. In the future, the potential 15 percent reduction in residential demand resulting from the installation of water meters would reduce the total city-wide demand at reasonable development to about 17.3 mgd (22,341 AFY) (City of Lodi, 2010).

Based on the assumptions above, the City would have a reliable water supply of 21,000 AFY available from its current and future safe yield of groundwater and surface water supplies, and thus, meeting 100 percent of the estimated demand.

1.3 Document Organization

This Initial Study/Mitigated Negative Declaration is organized into the following chapters:

- **Chapter 1 - Introduction.** Chapter 1 describes the background and goals of the Proposed Project and the contents of the document.
- **Chapter 2 - Project Description.** Chapter 2 describes the proposed improvements for the SWTF, the anticipated construction methods that would be used, and the known regulatory approvals needed.
- **Chapter 3 - Environmental Setting.** Chapter 3 describes the existing environmental setting for each environmental issue area.
- **Chapter 4 - CEQA Initial Study Checklist.** Chapter 4 discusses the potential environmental impacts associated with the construction and operation of the Proposed Project.
- **Chapter 5 - Determination.** Chapter 5 provides the action that is proposed as a result of this Initial Study.
- **Chapter 6 - References.** Chapter 6 provides a list of reference materials consulted during the preparation of the Initial Study.
- **Chapter 7 – List of Preparers.** Chapter 7 contains the list of preparers for this document.

Chapter 2 - Description of Proposed Project

This chapter presents the description of the Proposed Project to meet the goals and objectives as described in Chapter 1 of this document. The purpose of the Proposed Project is to provide a secure, reliable supplemental supply of water for the City to meet their current and future water needs while reducing dependence on groundwater.

2.1 Project Location

The City owns 12.75 acres between the Union Pacific Railroad (UPRR) spur line and Lodi Lake near the intersection of Turner Road and Lower Sacramento Road. The SWTF would be constructed on approximately four acres at the south end of the property adjacent to the UPRR spur line (Figure 2-1). The entrance to the property would be an access road located at the north leg of the intersection of Turner Road and North Mills Avenue (Figure 2-1). The entrance would be shared with future park uses that would be constructed between the SWTF and Lodi Lake.

The City has decided to build the RWPS on the west side of Lower Sacramento Road across from the WID intake and fish screen and south of the WID canal on property currently owned by WID (Figure 2-1). The proposed site layout would provide sufficient setback requirements for safety and aesthetic considerations.

During construction of the WID fish screen structure, a 48-inch pipe was included in the structure to supply surface water to the City. From the 48-inch pipe, a 36-inch raw water pipeline extends to the RWPS site. From the RWPS site, a 30-inch discharge pipeline would discharge to the SWTF (Figure 2-1). A portion of the raw water pipeline was constructed as part of the planned widening and reconstruction of Lower Sacramento Road, and therefore, is not part of the Proposed Project. Only the portion of the raw water pipeline located on the city-owned property is part of the Proposed Project.

The City's water system is currently supplied by groundwater from 27 wells spaced at approximately 0.5 mile intervals throughout the City (Figure 2-2). A 3,200-foot long transmission pipeline from the SWTF would connect to the existing distribution system water mains at four points along Mills Avenue, ending at Elm Street (Figure 2-1).

2.2 Proposed Facilities

Below is a description of the RWPS, SWTF, pipelines, and well modifications. A more detailed description of the SWTF can be found in HDR (2010).

2.2.1 Raw Water Pump Station

The RWPS would deliver 2.0 to 11.5 mgd of untreated water to the SWTF at the initial phase, and would be expandable to 23 mgd at the final phase. The initial phase is expected to be in operation in less than three years and the final phase would be built much later.

Project Location
FIGURE 2-1

HDR
ONE COMPANY | *Many Solutions*

Surface Water Treatment Facility | City of Lodi, CA | HDR Project No. 141.107917.006

Figure 2-1. Project Location

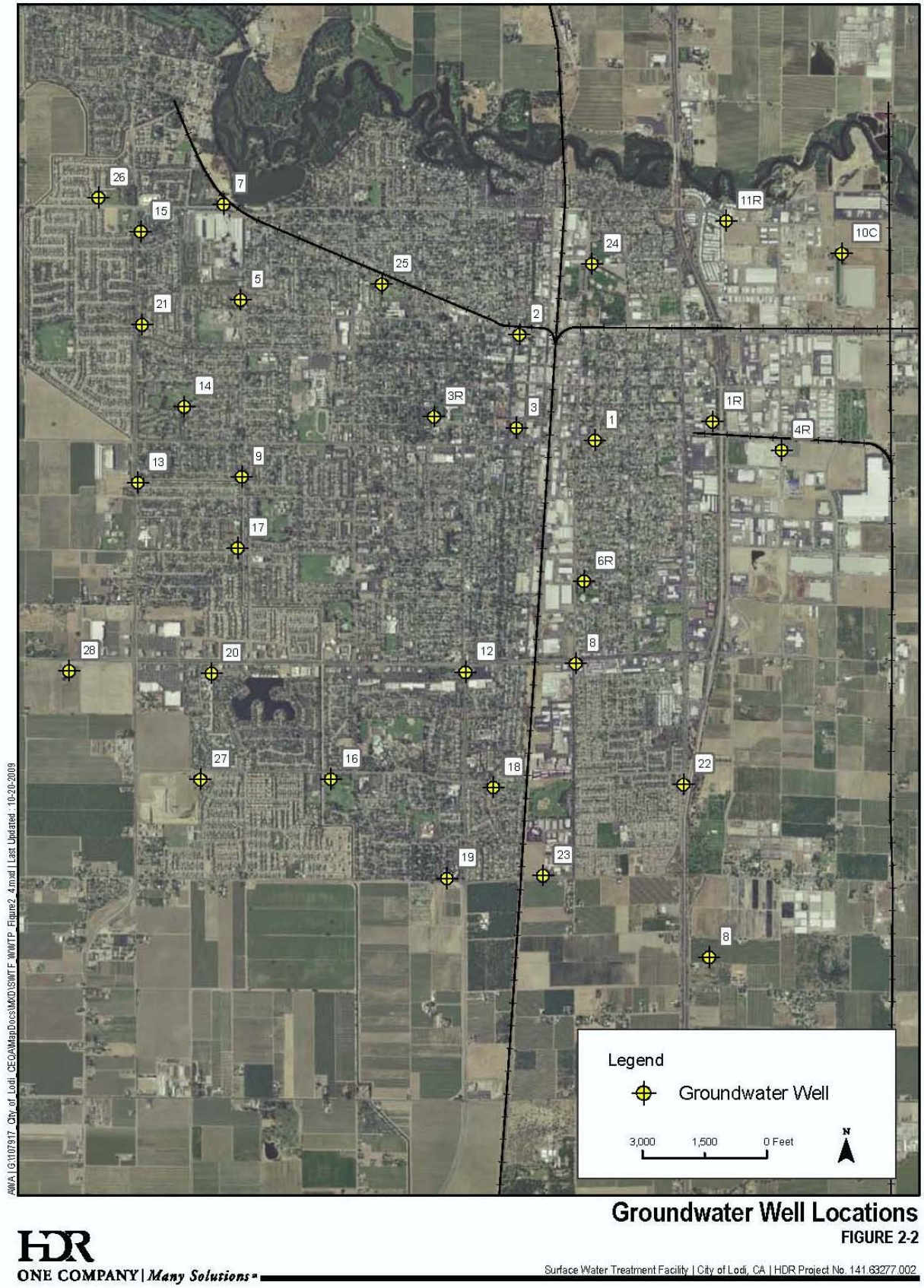


Figure 2-2. Groundwater Well Locations

The RWPS would be constructed with four 30-inch pump cans designed for 75-horsepower (hp) vertical turbine pumps. Initially, three 50-hp pumps would be installed in the oversized cans with a capacity of 5.7 mgd each. Additional capacity would be provided in the future as required by adding a fourth pump and by replacing the 50-hp pumps with 75-hp pumps. The pump station discharge would be measured by a magnetic-type flow meter located outside the pump station (Figure 2-3).

The RWPS building would include a pump room and an electrical room. Concrete masonry construction would be provided for aesthetics, durability, and security reasons. The RWPS building would be designed around vertical turbine pumps, which would be mounted on a concrete pad above the floor. Climate control would be provided for the electrical room to keep the electrical equipment and controls within their operable temperature range. The pump station would be ventilated.

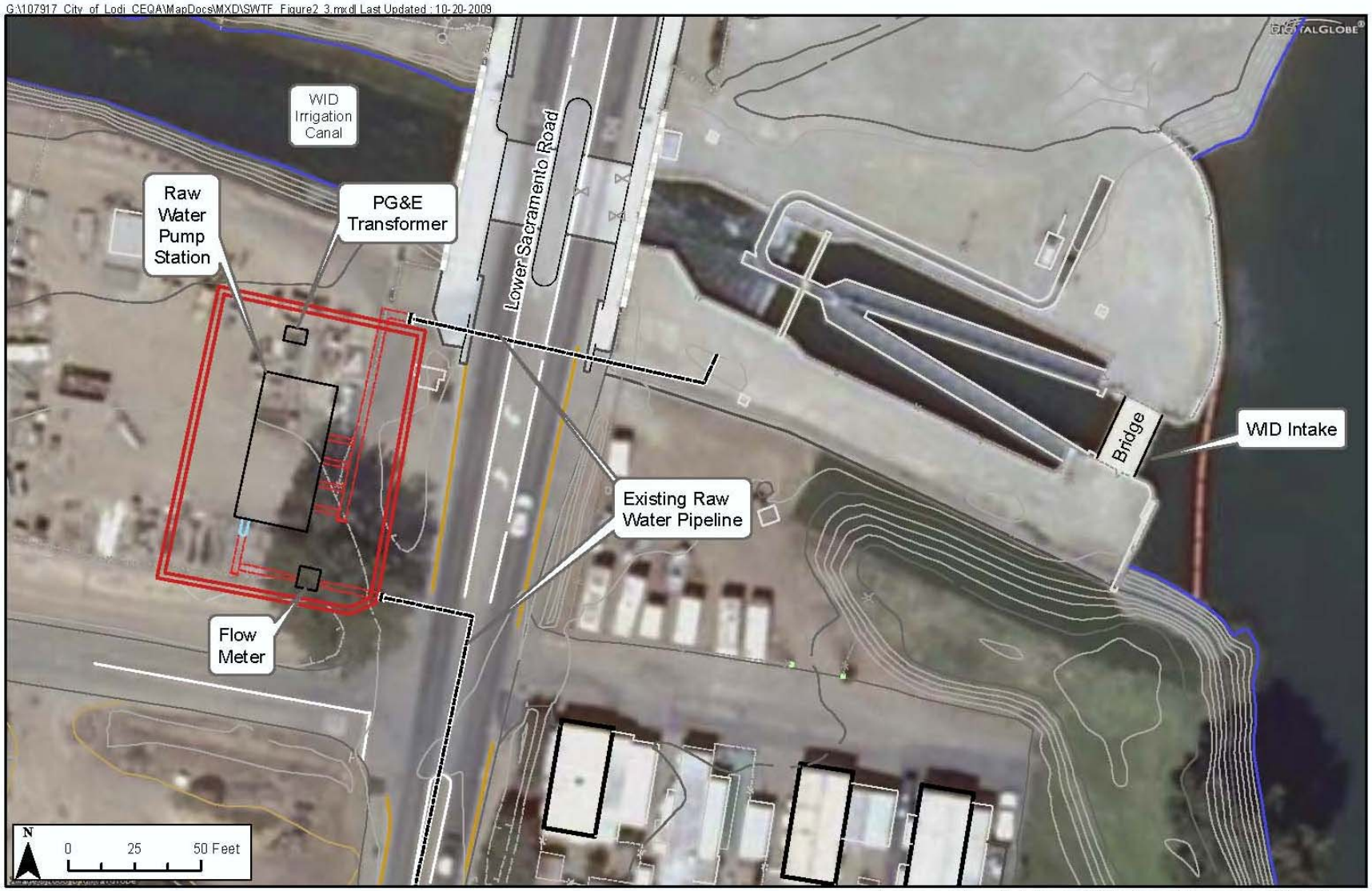
The RWPS would receive electrical service from Pacific Gas and Electric (PG&E) since it is located outside the area served by the City's Electric Utility Department. A new 800-ampere, 480/277 volt, three-phase, four-wire electrical service utility service would serve the RWPS. A PG&E-owned transformer would be located on site and an underground conduit installed to a nearby PG&E overhead power pole (Figure 2-3).

A diesel engine generator is planned for the future to provide standby power to enable the pump station to run to full output during power failures. The generator would be sized for the initial phase and would be replaced with a larger generator for the final phase. Electrical service would be sized to supply electricity at the final phase capacity of 23 mgd.

The RWPS design would incorporate design elements to attenuate the noise generated by the pumps and motors. These building design elements would include acoustical barrier panels on the pump room walls and use of acoustical louvers.

Security measures would be provided to protect the RWPS from vandalism or other threats to the City water supply. Secure locks and intrusion alarms would be provided for the doors and electrical panels. Lighting would be provided on all sides of the building. Video cameras would be provided outside the building and would have the ability to record and store up to 24-hours of data.

The RWPS site, occupying approximately 0.2 acres, would be fenced with access from Carolina Street. Decorative fencing, facing Lower Sacramento Road and Carolina Street, would be provided similar to the existing fish screen fencing. A sidewalk, curb, and gutter would be constructed along the Carolina Street frontage of the RWPS.



Layout of Raw Water Pump Station

FIGURE 2-3

HDR ONE COMPANY | *Many Solutions*

Surface Water Treatment Facility | City of Lodi, CA | HDR Project No. 141.107917.006

Figure 2-3. Layout of Raw Water Pump Station

2.2.2 Raw Water Pipeline

The 36-inch gravity line from the WID fish screen to the RWPS and the 30-inch discharge pressure line from the RWPS to the SWTF, as identified on Figure 2-1, were constructed as part of the planned widening and reconstruction of Lower Sacramento Road by the County. As such, the construction of this portion of the raw water pipeline was covered under previous CEQA documentation (San Joaquin County, 2004).

The 36-inch gravity line connects to the existing 48-inch pipe connection at the fish screen structure. The 36-inch gravity line crosses Lower Sacramento Road about 30 feet south of the WID canal and terminates at the RWPS site. The maximum and minimum operating levels of the WID canal are 41.5 feet and 36.0 feet, respectively. The centerline elevation of the 36-inch gravity line to the RWPS is 29.9 feet to allow gravity flow at the minimum operating level of the WID canal.

2.2.3 Surface Water Treatment Facility

The City owns 12.75 acres land between the railroad tracks and Lodi Lake. The land is flat and grassy with scattered oak trees as shown in Figure 2-4. The SWTF would be constructed on approximately four acres at the south end of the property adjacent to the railroad tracks. The entrance to the property would be located at the southeast corner of the parcel at the intersection of Turner Road and North Mills Avenue. The entrance would be shared with future park uses that would be constructed in the future.

Figure 2-4. Existing SWTF Site

The SWTF would have an Operations Building that would house the membranes, laboratory, and administration and operations offices. A Chemical Building would house a workshop, membrane feed pumps, autostrainers, chemical storage and feed systems, and a future dewatering system. Space would be provided on the site to allow for expanding the Operations and Chemical building s to accommodate plant expansion to 20 mgd. A third building would contain the high service pumps and electrical room. Other components of the SWTF would

include a reverse filtration waste tank, plate settler for reverse filtration water, sedimentation basin, high service pump station, soda ash silo, and a three-million-gallon storage tank.

The SWTF would receive electrical service from the City's Electric Utility Department. The SWTF is located adjacent to the City's MacLane Substation. The SWTF would require a 3,200 ampere, 480/277 volt, three-phase, four-wire electrical service, which would be sufficient to handle the additional loads installed in the future for 20-mgd service.

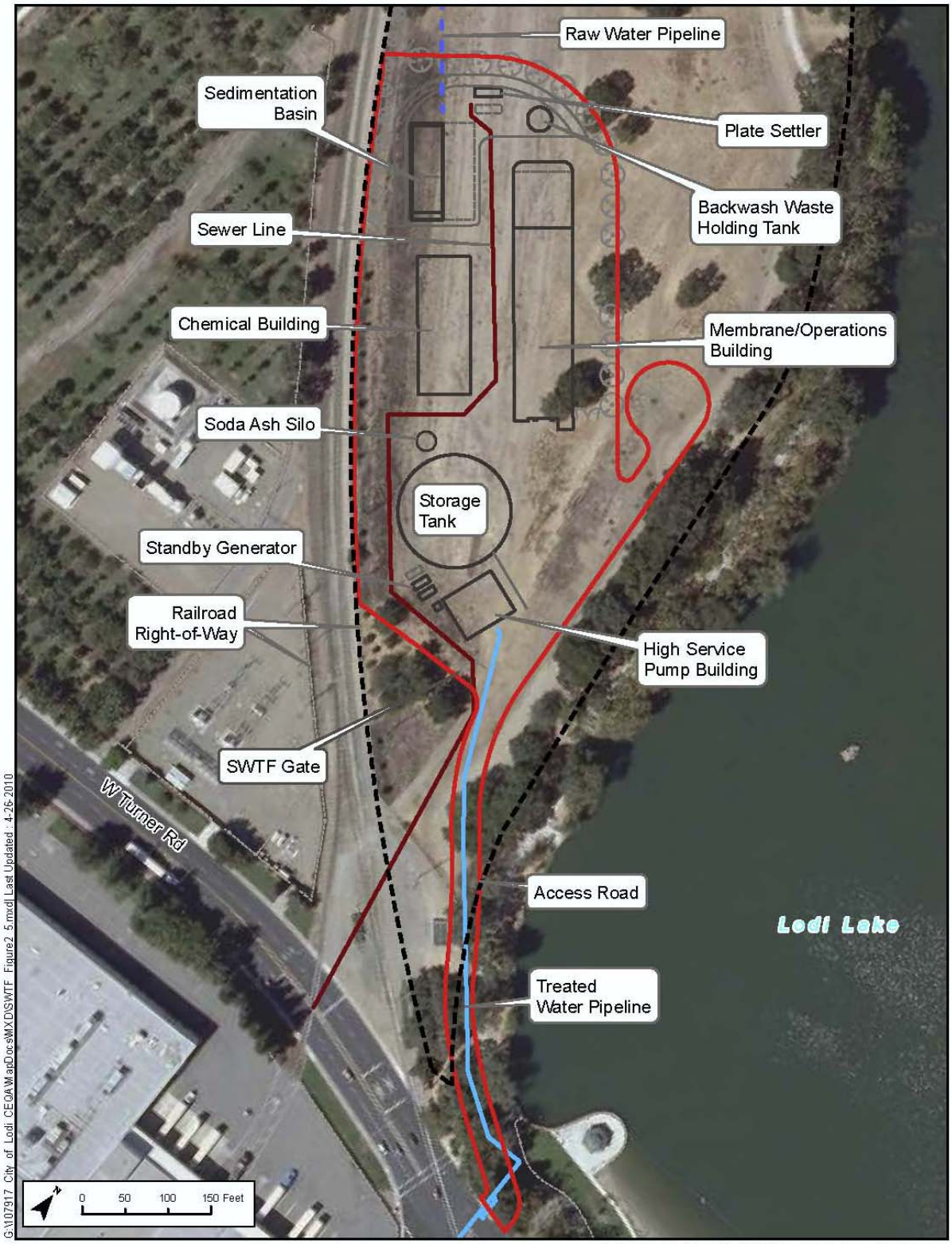
A small standby generator (diesel or natural gas) would be provided to operate critical systems (computers, lights HVAC system, etc.) in the Operations Building. A larger standby diesel engine generator is planned for the future to provide electrical power to the SWTF in case of a power outage. The future backup power system would operate the membrane equipment; chemical feed system; high service pumps; facility lighting; heating, ventilation, and air-conditioning (HVAC) equipment, and supervisory control and data acquisition (SCADA) equipment during power outages. The larger standby generator system could be expanded as the facility grows.

The SWTF would have a SCADA system that would provide control and automatic operation of the water treatment processes as well as storage of plant operating and regulatory compliance data. The SCADA system would include the RWPS, storage facilities, and groundwater wells, and would be set up as a fully functional network node that can be monitored remotely from the City's central SCADA location at the Municipal Service Center.

The following sections discuss the general layout of the SWTF. A layout of the SWTF is presented in Figure 2-5. Refer to Figure 2-10 to view the location of the various components in the treatment process.

Structural Facilities

The Operations Building containing the membranes and operations and administration offices would be located on the west side of the SWTF site and near the SWTF entrance to minimize visitor traffic on the site. The storage tank, soda ash silo, and the high service pump station would be placed on the southeastern portion of the site to minimize their visual impact when viewed from the future park. Views of these structures from Turner Road would be screened by existing trees. The finished floor elevation of both structures would be 48 feet above mean sea level, approximately six inches above finished grade and one foot above the 100-year floodplain. The storage tank would be partially buried to minimize its visual impact. The sedimentation basin would be located along the northwestern property line adjacent to the future park in close proximity to the treatment process. Sanitary service from each building would be routed to the existing sewer main in Turner Road as indicated in Figure 2-5. The sewer line would be bored under the railroad tracks to Turner Road where it would connect to an existing manhole.



Layout of SWTF Facilities
FIGURE 2-5

HDR ONE COMPANY | Many Solutions

Surface Water Treatment Facility | City of Lodi, CA | HDR Project No. 141.107917.006

Figure 2-5. Layout of SWTF Facilities

Operations Building

The Operations Building would house administrative offices, the operations and control room, the process control laboratory, locker rooms, membrane filtration equipment, and associated electrical gear. The large room that would house the filtration equipment would have ample exterior access for the maintenance of this equipment. Roll-up doors would be placed for installing and removing large pieces of equipment, such as the membranes, strainers, chemical storage tanks, and pumps. Overhead doors would be placed in other areas, such as the membrane room, and compressor and electrical rooms to accommodate equipment or truck access.

Chemical Building

The concrete masonry unit (CMU)-block Chemical Building would include the following rooms and equipment: membrane feed pump and autostrainers; electrical room; mechanical room; rooms for polymer, corrosion inhibitor, coagulant, soda ash storage and feed; sodium hypochlorite storage and feed room; aluminum chlorohydrate storage and feed; and a workshop. Space would be provided on the site to expand the building for future facilities that could include rooms for mechanical dewatering, ultraviolet (UV) light disinfection, powdered activated carbon, or fluoride.

High Service Pump Station

The high service pump station would be housed in a CMU-block building that also would have an electrical room, containing the main switch gear for the SWTF. The initial phase of the SWTF high service pump station would have a firm capacity of 10 mgd while the final phase capacity would be 25 mgd. The pump station's capacity would be greater than the SWTF capacity to account for peak periods when demand exceeds treatment capacity. The initial phase would have three 200-hp pumps (two duty; one standby); the final phase would have six 200-hp pumps (five duty; one standby).

Finished Water Storage Tank

The finished water tank would be a partially buried, prestressed concrete tank. The tank would serve as a storage tank for finished water at the SWTF, providing chlorine contact time to inactivate disease-causing organisms and storage of treated water prior to pumping into the City's water distribution system. The 130-foot-diameter tank would store three million gallons of water with three to four feet of free board. The inlet and discharge, and overflow pipes would enter and exit through the floor. The tank would be 35 feet in total height, with 25 to 28 feet above grade and seven to 10 feet below grade.

Soda Ash Silo

The soda ash feed system would consist of an outdoor silo that sits atop the feed equipment. The silo would hold approximately 30 days storage, which would be approximately 35 to 40 tons at build-out. The steel silo would have a standard diameter of 12 feet and a cylinder height of approximately 26 feet. A dust collector would be provided to prevent soda ash dust from leaving the silo. The soda ash silo would be located near the point where the treated water

pipeline enters the concrete storage tank in order to minimize the length of chemical piping. The silo would be painted a neutral (tan or gray) color to match the other structures on the site.

Membrane Treatment

Membrane treatment components would include a sedimentation basin, autostrainers, membrane feed pumps, membrane modules mounted on racks, and ancillary support systems such as CIP, and compressed air systems.

Sedimentation Basin

A sedimentation basin would protect the membranes from fine sand particles that could pass through the autostrainers. The basin would allow sufficient contact time for coagulation and settling of fine sand and could potentially improve water quality enough to permit operation during winter months. The basin would be approximately 113 feet long by 35 feet wide and would handle 12 mgd at a water depth of 16 feet.

The basin would be split into three parts: inlet channel, sedimentation basin, and effluent chamber. After being injected with a pre-oxidant and coagulant, the raw water would enter a two-foot-wide inlet channel that would span the width of the basin. The inlet channel would be used to minimize turbulence and promote even flow distribution across the sedimentation basin. A sludge collector would be installed on the basin floor to collect and discharge settled particles directly to the sewer or to the backwash waste tank, which could reclaim the water by thickening the solids. The final section of the basin would include an eight-foot wide-effluent chamber that would supply the membrane feed pumps. The sedimentation basin could be divided in the future into a flocculation basin followed by inclined settling plates, if more aggressive pretreatment is required. Space would be reserved for a second basin upon future expansion.

Membrane Feed Pumps

Raw water from the sedimentation basin would feed the centrifugal membrane feed pumps housed in the Chemical Building. During the initial phase three 200-hp pumps would be installed (two duty; one standby) each having a capacity of 4,164 gpm (6 mgd) to provide a firm capacity of 12 mgd. Additional capacity would be provided in the future as required by adding a fourth pump (three duty; one standby) and replacing the 150-hp pumps with larger pumps, each having a capacity of 5,552 gpm.

The pumps would be designed to provide sufficient pressure through the autostrainers, membranes, and all piping and valves to the finished water storage tank. The associated suction and discharge isolation and check valves would be sized for the final phase conditions to make future pump installation more cost effective.

Autostrainers

Autostrainers would remove any large particles such as pine needles, leaves, or other items in the raw water influent that pass through the fish screens and sedimentation basin. Any particles of significant size could damage the membranes and decrease their treatment efficiency. Two

strainers would be installed to meet the initial treatment capacity. Each autostrainer would have a screen opening size no greater than 400 microns and be equipped with an automatic cleaning system that would operate without the unit being taken out of service.

Membranes

Membranes would serve as the primary filtration in the production of finished water quality that would meet or exceed state and federal standards for drinking water. The SWTF would utilize a Pall Microza pressure membrane system that would pump water through the membranes under pressure. The membrane system would provide a positive barrier to bacteria and organisms such as *Giardia* and *Cryptosporidium*.

The membrane system would have an initial firm capacity of 8 mgd and a total capacity of 10 mgd net production capacity. The SWTF would be expandable to 20 mgd net production capacity. Four equally sized trains (2 mgd each) would be used to produce 8 mgd. A fifth train would be installed to provide firm capacity when one train would be out-of-service for cleaning and backwashing. All trains could operate to provide additional capacity.

Water and Sewer Pipelines

One 8-inch water service pipeline would connect to the existing 8-inch water line that runs along the east side of the proposed SWTF site. This line would provide potable water for each building, fire sprinklers, and onsite fire hydrants. Backflow prevention devices would be installed on the potable water service, fire service, and irrigation lines. The potable water sent to the group picnic area would also have a backflow prevention device.

Sanitary sewer lines would be separated both vertically and horizontally from all water lines. Sanitary service from each building would be routed to the existing sewer main in Turner Road as indicated in Figure 2-5. The sewer line would be bored under the railroad tracks to Turner Road where it would connect to an existing manhole.

Stormwater System

Stormwater collection at the SWTF would comply with the City's Stormwater Management Program. Bordered areas would be filled with gravel as a structural best management practice (BMP). Culverts would direct runoff from interior borders to perimeter borders where catch basins would be placed. The borders would be excavated approximately six inches and backfilled with gravel material or decorative rock. The gravel would serve to reduce stormwater pollution and ongoing costs otherwise needed for vegetative landscape maintenance. Stormwater would percolate through the gravel into the ground. Periodically, when large volumes of stormwater are collected, the gravel would serve to filter the runoff prior to it entering the catch basins. Borders around the perimeter of the SWTF site would have trees to help screen the SWTF from the park. The storm drain system would connect to the existing stormwater pump station near the SWTF entrance.

2.2.4 Finished Water Main

The City's existing distribution system is typical of a groundwater-based system; incorporating 27 wells distributed across the system and connected by pipelines with diameters in predominantly 6-, 8-, and 10-inches. None of the existing pipelines are greater than 14-inches in diameter. As a result, the City's distribution pipelines do not have significant capacity to transmit large flows to or from any location. Therefore, four connections would be spread out among the existing water mains that are 8-inch diameter and larger. The four connection points for the SWTF would be on North Mills Avenue at Turner Road, Yosemite Drive, Lockeford Street, and Elm Street.

The finished water pipeline would be placed along the south side of the SWTF, parallel to the railroad tracks. The 3,200-foot-long, 36 inch transmission main would exit the SWTF and follow the access road to the intersection of Turner Road and North Mills Avenue, where it would tunnel under the railroad tracks and continue south along North Mills Avenue to Elm Street. In the future, the water transmission main would be extended south another 2,400 feet to West Lodi Avenue and continue west along West Lodi Avenue past Lower Sacramento Road to serve the development west of the Lower Sacramento Road and the City's final phase peak flows.

2.2.5 Access Road

The SWTF would share an access road with future park land. The City plans on designing and constructing the access road to serve both areas. The volume of traffic visiting the SWTF is expected to be minor. Most visitors are expected to arrive by automobile; however, a few large trucks would arrive for deliveries, construction, and maintenance.

The access road to the SWTF would extend northwest from the intersection of Turner Road and North Mills Avenue in the southeast corner of the City's property (Figure 2-6). The road would be 24-feet wide with four-foot wide shoulders. The intersection of Turner Road and North Mills Avenue would require signal modifications to accommodate a four-leg intersection.

For the westbound traffic on Turner Road, an existing raised traffic island in the intersection would be removed to accommodate the northbound through movement from North Mills Avenue. A new traffic signal post would be installed on the existing raised median east of the intersection with new traffic signal heads for both eastbound and westbound left turn movements. In addition, an existing 25-foot signal mast-arm with a street light and signal heads for the northbound, westbound through, and eastbound left turn movement. It would also have a "No Right Turn" sign that would operate with the railroad crossing signal to prevent vehicles from turning right on a red light when a train is approaching. The existing high voltage power pole would remain.

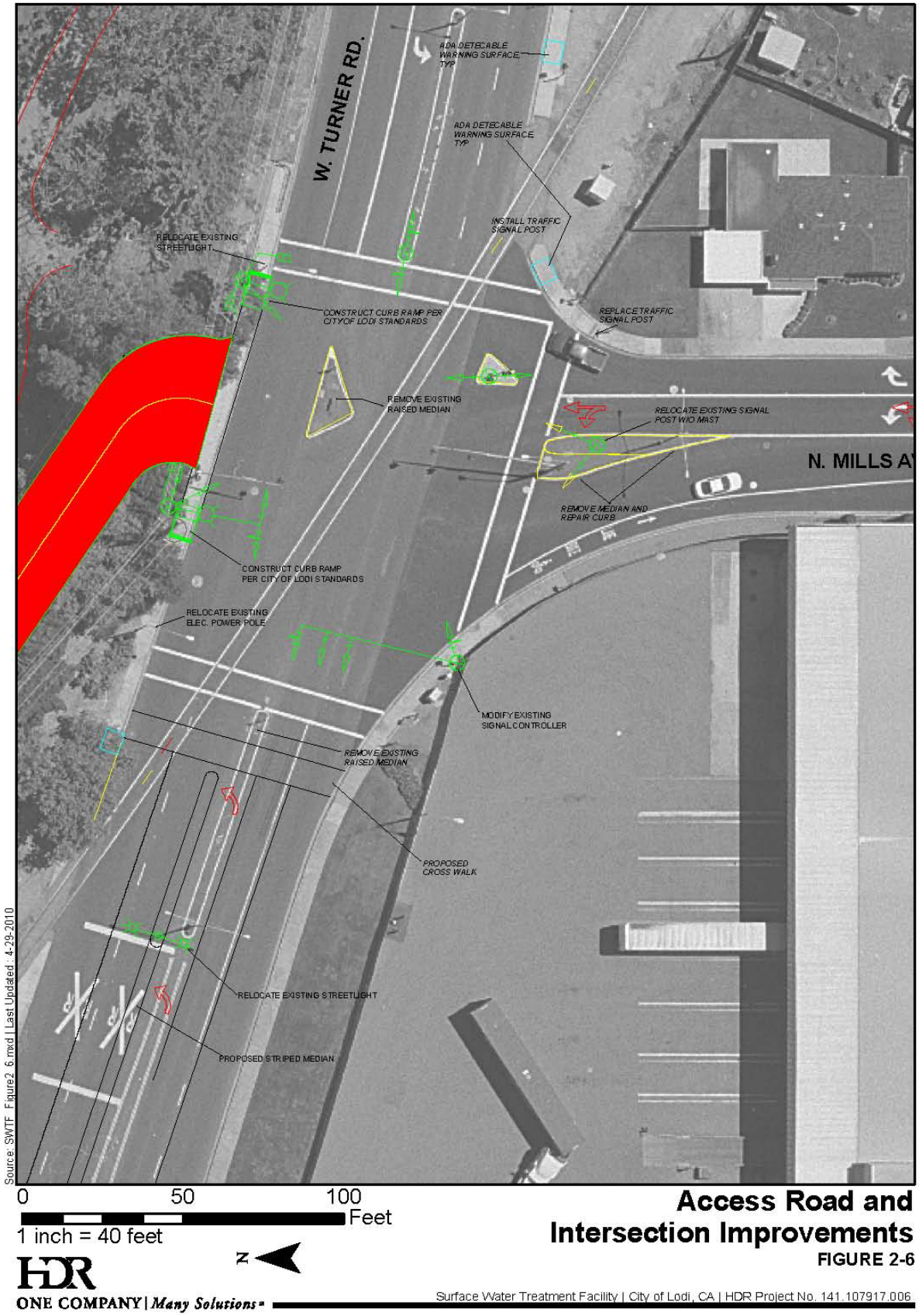


Figure 2-6. Access Road and Intersection Improvements

For the northbound direction on North Mills Avenue, an existing left turn lane would change to a through/left lane. The existing raised traffic island on North Mills Avenue would be reshaped and the existing traffic signal post on the island would be relocated. The 40-foot mast on the traffic signal post would be removed and replaced with a street light. The existing signal post on the right turn median would receive a new southbound signal head for southbound traffic.

For eastbound traffic on Turner Road, a left turn pocket would be added at the intersection to allow movement to the access road. An existing raised median and street light on West Turner Road would be relocated adjacent the new left turn lane. A new 50-foot traffic signal mast would be located on the southwest corner to replace the 40-foot mast arm removed from the island on North Mills Avenue. The crosswalk on the west quadrant would be moved west to maintain 40-foot spacing in front of the new 50-foot mast.

An existing signal controller located at the southwest corner would be modified for the new eastbound left turn and the southbound movements. All new traffic signal heads would be light-emitting diodes (LED) to reduce energy use.

Currently, the traffic signals also function as the railroad crossing control signals. The City met with the California Public Utilities Commission (CPUC) and UPRR to determine if any changes to the crossing controls would be needed with the intersection improvements. Due to the low number of incidents at the intersection, the CPUC decided to allow the existing crossing controls to remain. American Disabilities Act (ADA), signage, and striping improvements would be included in the proposed improvements. A preliminary design will be submitted to UPRR for review during the 60 percent design review. This will then be followed by submitting a General Order 88B (application for railroad crossing) to the CPUC.

New crosswalk, curb ramps, and traffic signal poles with traffic and pedestrian signal heads would be added for the north leg of the intersection. The access road would be constructed along the lake, which would necessitate the removal of mature trees and an earthen embankment. The access road would be routed from Turner Road, between the existing concrete pedestrian/bicycle path that runs along the lake and the stormwater pump station to the SWTF's entrance gate. A second wooden power pole located in the berm would have to be reinstalled when the berm is removed. A few street lights and park benches along the path would be moved away from the access road to the lake side of the path. The lights at the park and the SWTF would be integrated along with the road and the pathway.

Figure 2-7 shows the existing view from Turner Road looking towards the lake. Figure 2-8 shows a conceptual image of the same view after the SWTF is built after the removal of 12 oak trees (three valley oaks and nine interior live oaks) along the proposed access road. Figure 2-9 shows a conceptual image of the SWTF as viewed from Turner Road after the removal of four oak trees (one valley oak and three interior live oaks) and one black locust tree from the SWTF site during construction.

Figure 2-7. Existing Location of Entrance

Figure 2-8. SWTF Entrance

Figure 2-9. SWTF as Viewed from Turner Road

Signage and Striping

Directional signs on Turner Road would guide vehicles to the SWTF entrance. Parking signs would be placed on the site to delineate ADA, visitor, and staff parking areas. The intersection would be striped to delineate the new lanes, crosswalks, etc. Only a center line stripe and crosswalk at the intersection are planned for the access road at this time. Additional striping and additional width of pavement for bike lanes, etc. could be added in the future when the access road becomes a public road shared by the park. Directional arrow pavement markings could also be placed at that time. No lane striping would be placed on the SWTF site other than for delineation of the fire lanes and parking stalls.

Parking

Eight standard mixed use parking spaces and two disabled parking spaces would be located at the SWTF entrance for City employees and visitors. The SWTF would have two entrances: one for staff and visitors, and one for deliveries. After passing through the parking area, staff and visitor vehicles would be directed to proceed in a counter-clockwise direction around the SWTF. This route, which would also serve as fire access, would loop past all of the building access points and back to either the main entrance or the delivery entrance. Large vehicles and delivery trucks would enter and exit through the delivery gate. The main buildings would have several large access doors that would be accessed by different types of vehicles. The area around the buildings would be paved, providing access to these points. Concrete sidewalks would extend four to six feet from the buildings. The finished grade for the pavement would be four to six inches below the sidewalks, creating a curb intended to deter large vehicles with tall trailers from damaging the roof eaves. Ramps would be constructed at roll-up doors to permit unobstructed access when loading and unloading equipment and supplies.

2.2.6 Well Modifications

The City's water system is currently supplied by groundwater from 27 well pump stations and a grid water main system (Figure 2-2). Well 27 will be constructed by 2011. Portable chlorination equipment consisting of a tank of 12.5 percent sodium hypochlorite solution and a small feed pump are used to chlorinate the well water on an as needed basis. Well 4R includes permanent chlorination facilities and would not require any modifications. All wells except for wells 2, 8, and 12 would be active and maintained for the lifetime of the SWTF. The City plans to decommission wells 2, 8, and 12 in the near future. The City's wells are listed in Table 2-11.

The need for existing groundwater well modifications arises from operational and regulatory requirements to accommodate the combined use of surface and groundwater supplies, water quality monitoring, and disinfection guidelines. In compliance with Title 22, Section 64650 et seq. of the California Code of Regulations, all utilities using surface water or any groundwater supply under the influence of a surface water supply must provide adequate disinfection. In order to comply with these rules, chlorination facilities would be added to each of the well sites.

Two federal regulations also affect the operation and structure of the City's water system. First, the introduction of the new surface water supply will require continuous chlorination of the

groundwater supplies due to California regulations stemming from the U.S. Environmental Protection Agency's (USEPA's) Total Coliform Rule. This rule requires the maintenance of a detectable level of chlorine throughout a distribution system that contains surface water. Second, USEPA's Ground Water Rule requires sanitary surveys of groundwater supplies every 3 to 5 years and source water monitoring for coliform bacteria.

Table 2-1. Existing Groundwater Wells

Well No.	Assumed Capacity, gpm	Add Chlorine Facilities	Comment
1R	1,130	Yes	
2	820	No	Decommissioning planned
3R	820	Yes	
4R[a]	1,960	No	Pumps directly to elevated storage tank. Station includes existing chlorination facilities.
5	1,180	Yes	
6R	1,580	Yes	
7	1,160	Yes	
8	800	No	Decommissioning planned
9	900	Yes	
10C	1,300	Yes	
11R	1,320	Yes	
12	800	No	Decommissioning planned
13	1,150	Yes	
14	1,670	Yes	
15	1,500	Yes	
16[a]	1,110	Yes	
17	1,800	Yes	
18[a]	1,800	Yes	
19	1,110	Yes	
20[a]	2,070	Yes	
21	2,050	Yes	
22[a]	1,400	Yes	
23[a]	1,410	Yes	
24	1,420	Yes	
25	1,580	Yes	
26	1,370	Yes	
27		Yes	
28		Yes	
[a] equipped with granular activated carbon			

To ensure compliance with state and federal regulations, modifications to the existing groundwater distribution system would include the following:

- Chlorination of each groundwater supply to provide a minimum of 0.5 milligram per liter (mg/L) of residual chlorine at the entry point into the distribution system.
- Continuous monitoring of the chlorine residual at each distribution system entry point.

All groundwater supply facilities would be updated with permanent chlorination facilities. Continuous chlorination would require sodium hypochlorite tanks and an electronically controlled chemical feed pump monitored by an online chlorine residual analyzer and controlled by the well pump programmable logic controller (PLC). Because none of the well pumps in the City's system have variable-frequency drives, simple on/off control of the chemical feed pump would be sufficient.

The proposed control scheme would be to continuously feed sodium hypochlorite when a well pump is operating. During well pump startup, the station PLC would activate the chemical feed pump to provide 12.5 percent sodium hypochlorite solution into the well pump discharge piping. If the analyzer detects an inadequate chlorine residual, the PLC would shut down the well pump. The SCADA system would monitor the chlorine residual measurements, well pump on/off status, chemical feed pump on/off status, and the chemical storage level. The control system would alert the on-call operator of any anomalies or failures of the chlorination system operation. Ten spare metering pumps would be kept at the City's maintenance shop.

A fiber-reinforced plastic (FRP) or high density polyethylene (HDPE) sodium hypochlorite storage tank, local SCADA system equipment, chemical feed pumps and PLCs, and chlorine residual analyzer would be housed in a FRP shed mounted on a concrete slab at each well site.

Taste and odor issues associated with chlorinating the groundwater supplies would be minimized by the use of high-quality sodium hypochlorite and maintaining the chlorine residuals in the well water at about 0.5 mg/L and in no case greater than 1.0 mg/L.

2.3 Construction

Construction is expected to take approximately 18 months. The finished water storage tank and the soda ash silo would be the tallest structures, approximately 25 to 28 feet and 26 feet above ground, respectively.

Concrete and CMU block would be the primary construction material for structures. Major process piping would be made of steel and ductile iron. The chemical storage tanks would be HDPE. The major construction phases for the SWTF and RWPS would be:

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

The primary construction equipment would be:

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

2.3.1 Clearing and Grubbing

Survey staking would be used to define the limits of the RWPS and SWTF sites. Vegetation and trees that would interfere with construction and operation would be removed from the sites.

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

2.3.2 Excavation and Sitework

Excavation

Youngdahl Consulting Group, Inc. completed a geotechnical report for the treated water pipeline, and SWTF and RWPS sites (HDR, 2010). Two to three feet of organic laden fill was encountered at the SWTF and RWPS sites that would need to be removed and replaced.

Therefore, a geotechnical engineer would be on-site during all grading operations in case soft or undesirable soils would be encountered during excavation.

Approximately 5,000 cubic yards (CY) of soil would be excavated for construction of the storage tank and the soda ash silo. An additional 2,600 CY of soil would be excavated for the construction of the high service pump station, pipelines, and lakeside embankment. It is anticipated that some of the excavated soil would be suitable for use as fill elsewhere on the SWTF site. However, based on geotechnical data and the possibility of organics in the soil, the soil would require testing to meet specifications prior to use. Any excavated soil that would be unsuitable for fill would be placed around the remainder of the park site.

Fill

The Flood Insurance Rate Map (FIRM) for the Project area places the RWPS, SWTF, and pipelines outside of the 100-year floodplain. The Proposed Project is located in Zone X (unshaded), which is defined as an area of minimal flood hazard and above the 500-year flood level and protected by a levee from the 100-year flood. However, in order to provide proper onsite drainage for the SWTF, the entire site would be elevated to six inches, which would require approximately 21,000 CY of fill. The 21,000 CY includes fill for the amount of top soil that the geotechnical reports (HDR, 2010) recommend for removal since it is unsuitable plus the extra fill needed to raise the site. Likewise, the RWPS site would need approximately 300 CY of fill to elevate it six inches for proper drainage.

All fill would be compacted to 90 percent relative density during rough grading. Foundations would subsequently be prepared and compacted according to recommendations in Appendix A in HDR (2010).

Dewatering

During construction dewatering may be required for deep excavations due to the close proximity of the Proposed Project site to the Mokelumne River, WID canal, and Lodi Lake. California Department of Water Resources (DWR) well data indicate that seasonal groundwater levels in the Project area fluctuate between 24 and 30 feet below grade. Geotechnical investigations of the SWTF site measured groundwater at 34 feet below grade (HDR, 2008, 2010). A boring at the RWPS found groundwater at 19 feet below grade.

The higher level encountered at the RWPS site is influenced by the WID canal, which was full when the geotechnical investigation was conducted. The pump cans would be placed approximately 18 feet below grade. Even with WID restricting construction to the winter months when the canal is empty, the groundwater level could still be high enough to require dewatering at the RWPS site.

The groundwater fluctuates with seasonal variations, rainfall, and lake level. Depending on the construction schedule, dewatering may also be necessary during construction of the tank and high service pump station at the SWTF site.

Grade

The entire SWTF site would be graded with slopes towards the graveled borders, which would capture runoff from the site. Borders around the perimeter would also provide areas for vegetative landscaping. Standard erosion control and stormwater pollution prevention BMPs would be required during construction. Construction BMPs would conform to the City's Stormwater Management Program and may include fiber rolls, slope tracking, and proper equipment staging areas.

Sitework would involve installing large underground pipes (6-inch diameter or larger), manholes, structural foundation, curbs, gutters, and sidewalks.

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

2.3.3 Structural Facilities

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

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

2.3.4 Paving and Striping

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

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

2.3.5 Electrical, Process Mechanical, and Instrumentation

After the structures have been erected and roofed, electrical equipment (e.g., machinery control consoles, switchboards, lighting, etc.) would be installed. Site work such as installing pull boxes, conduits, and cables would continue.

Process mechanical equipment (e.g., pumps, mixers, and chemical injection systems) would be installed and piped through the process facilities. Site work would continue as small diameter chemical piping would be routed throughout the site.

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

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

2.3.6 Architectural, Landscaping, and Security

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

Decorative fencing or a wrought iron style fence would be constructed where the SWTF is exposed to the park or otherwise visible from the street. On the side facing the railroad track, one-inch chain-link fencing, eight feet in height topped with three strands of barbed wire would be placed.

The SWTF would have three vehicular gates: the main entrance, delivery entrance, and a utility entrance. Motorized gates would be provided at both the main and delivery entrances. The main entrance would be located in the parking lot adjacent to the Operations Building. The delivery entrance would be located on the other side of the storage tank from the Operations Building and out of view. The utility gate would provide access for service or maintenance on the north side of the Operations Building. It would be a manual gate since its use would be infrequent and it would be normally locked. Manual gates would be provided at the parking lot in front of the administration offices to prevent park guests from using the SWTF's parking during weekends or after hours.

Landscaping within the facility would be kept to the perimeter to screen the SWTF and to minimize maintenance. Evergreen trees would be placed along the fence line facing the future park. Sixteen oak trees and one black locust trees would be removed in the construction of the SWTF and the access road. The trees removed would be mitigated with oak trees planted in the future park and at other city parks.

Approximately five crew members would plant trees, hydroseed, and install irrigation lines.

2.3.7 Startup and Testing

This final phase of construction would involve city personnel (i.e., operators, maintenance crews, and instrumentation specialists) working with the equipment vendors to understand how each piece of equipment would operate and function at the RWPS and the SWTF. Under city supervision, the equipment vendors would startup and test the equipment on-site to guarantee that pumps, mixers, gauges, SCADA system, and other operating equipment are functional and able to meet design standards. A 30-day performance test would be conducted to verify that the membranes would meet specified performance standards.

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

2.3.8 Staging Areas

Staging areas would be located on both the RWPS and SWTF sites and on future park land. The staging areas would store pipe, construction equipment, and other construction related items. The staging areas will be delineated on the project civil drawings. Staging areas would be used for the duration of construction.

2.3.9 Environmental Commitments

Below are proposed construction methods and BMPs that will be incorporated into the Proposed Project and the mitigation monitoring and reporting program in order to minimize potential adverse impacts.

- All drainage patterns and grades will be returned to preconstruction conditions.
- Comprehensive subsurface geotechnical investigations will be prepared by a licensed geotechnical engineer prior to final design and construction of all Project facilities. These investigations will evaluate unstable and corrosive soil conditions, shrink/swell potential, and earthquake fault and related geologic hazards. All Project facilities will be constructed in accordance with 2001 CBC requirements.
- All proposed facilities that include the addition of external lighting will direct all lighting features downward to prevent light trespass onto adjacent properties and public roadways.
- During construction, standard dust abatement and other applicable control measures will be implemented to reduce air quality impacts from construction activities. Construction practices will incorporate BMPs and best available control technology as identified by the San Joaquin Valley Air Pollution Control District (SJVAPCD).
- Standard erosion control measures and BMPs will be identified in a Stormwater Pollution Prevention Plan (SWPPP) and will be implemented during construction to reduce sedimentation of waterways and loss of topsoil.
- During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment will be cleared of dried vegetation or other materials that could serve as fire fuel. Any construction equipment that normally includes a spark arrester will be equipped with an arrester in good working order.
- In the event that any prehistoric or historic subsurface cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the resource(s) will be halted and the City will consult with a qualified archaeologist or paleontologist to assess the significance of the find.

2.4 Operations and Maintenance

The SWTF would operate continuously, 24 hours per day, every day of the year at various flow rates during the year with ongoing operations and maintenance. The process schematic for the SWTF is illustrated in Figure 2-10. Because the SWTF would be automated, it is anticipated that the City would retain a relatively small task force for day-to-day operations. Projected personnel would include a plant manager, two operators/general maintenance technicians, one specialty maintenance technician, one instrument technician, one half-time laboratory analyst, and one half-time administrative assistant.

It is anticipated that the staff would accept full operations and maintenance responsibility for both the existing groundwater facilities and the new surface water supply facility. Staff hours would be 6:00 am to 4:00 pm, Monday through Friday. Because the SWTF would not be continuously staffed, the staff would also be responsible for responding to emergency calls during unattended hours of operation. Staff hours and shifts may change as more experience is gained with plant operation.

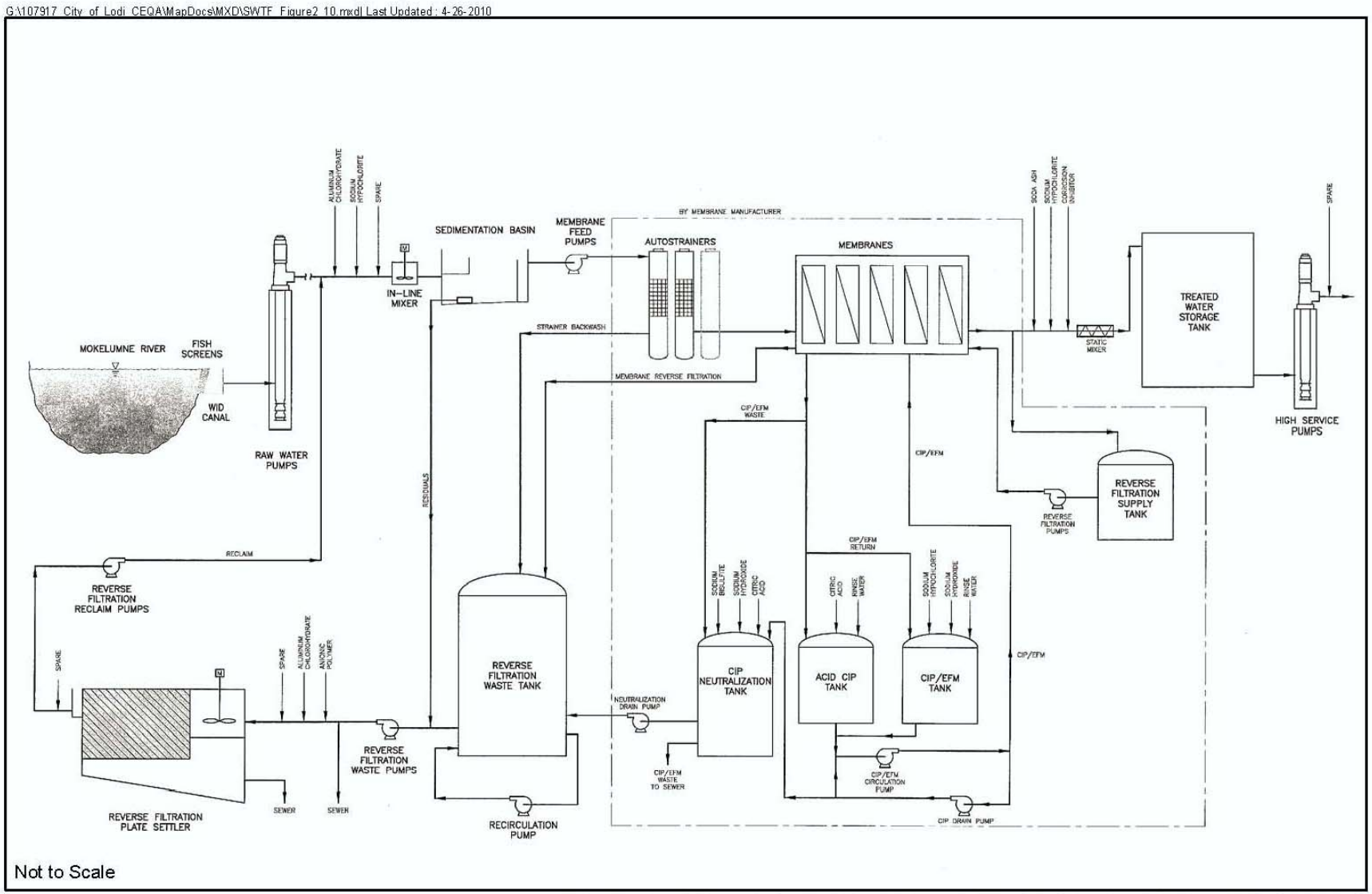
Raw water from the Mokelumne River would be drawn through the fish screens into a 36-inch-diameter pipeline connecting to the RWPS. The raw water pumps would be sized to lift water from the intake to the sedimentation basin at the SWTF. Membrane feed pumps would then lift the water from the sedimentation basin, through the autostrainers and through membranes, and into the storage tank. The pumps would be sized to accomplish this under the worst case conditions, which are dirty membranes and strainers, and a high storage tank water level. The high service pump station would be sized for a discharge pressure of approximately 65 pounds per square inch to match the existing distribution system pressure.

2.4.1 Autostrainers

Raw water from the sedimentation basin would feed the membrane feed pumps housed in the Chemical Building. Autostrainers would remove any large particles such as leaves or other items in the raw water influent. Each autostrainer would be equipped with an automatic backwash system that would use city water to reverse flow through one portion of the strainer at a time to clean it. The backwash waste stream from the strainers would be sent to the backwash waste tank for treatment with the membrane backwash water prior to recycle. The backwash frequency would depend on solids build-up and would be triggered by a differential pressure set point.

2.4.2 Membrane System

Water from the autostrainers would be pumped through the Pall membranes under variable feed pressure. As the water flows through the membranes, the membranes would eventually foul or clog. Two processes would be utilized to clean the membranes: (1) an air scrub in which compressed air would be injected through the membranes; and (2) a combination backwash, or reverse filtration, which would immediately follow the air scrub.



Surface Water Treatment Facility Process Flow Schematic

FIGURE 2-10

ONE COMPANY | *Many Solutions*

Surface Water Treatment Facility | City of Lodi, CA | HDR Project No. 141.107917.006

Figure 2-10. Surface Water Treatment Facility Process Flow Schematic

Two other processes would also be used to clean the membranes: (1) enhanced flux maintenance (EFM), and (2) clean-in-place (CIP). The EFM process would extend the time between CIPs. Depending on water quality and solids loading, the EFM would automatically occur either daily or weekly. During the process the membrane system would be drained and warm sodium hypochlorite solution would be introduced into the system. The solution would then circulate through the membrane feed to remove accumulated debris. After the process is complete, the solution would be drained and the membranes would be rinsed before normal operation resumes.

Eventually the membranes may be unable to be cleaned via the reverse filtration or EFM processes. Therefore, to fully clean the membrane system, a CIP would be performed. The CIP process would occur every 30 to 90 days, and similar to the EFM wash, the frequency would be dependent on the raw water quality and membrane run time. The CIP process would be completed in two steps: (1) first, a wash in a solution of one percent sodium hydroxide and 1,000 mg/L sodium hypochlorite; and (2) followed by an acidic wash in a solution of two percent citric acid. After the CIP process, the membranes would go through a reverse filtration process.

Chemicals for Membrane Operation

Sodium hypochlorite, sodium hydroxide, citric acid, and sodium bisulfite would be used in membrane operations.

Sodium hypochlorite would be used to prepare batch make-up solution for the EFM and CIP cleaning processes. Due to the volume of sodium hypochlorite needed for EFM/CIP, it would be stored centrally in the Chemical Building with the sodium hypochlorite needed for pre-oxidation and disinfection. The Chemical Building would be kept cool during the summer by the HVAC system, which would help protect the sodium hypochlorite from deteriorating. The sodium hypochlorite would be stored in a HDPE tank; the piping material would be polyvinyl chloride (PVC). Sodium hypochlorite would be supplied as a 12.5 percent solution.

Applications of sodium hydroxide in the membrane cleaning process would include the pH adjustment of batch make up of the CIP/EFM system, which needs make-up water high in pH; and neutralization of the spent citric acid used for CIP of the membrane. Sodium hydroxide would be supplied in solution form up to a 50 percent concentration.

Citric acid would be primarily used in the CIP system. Citric acid solution would be circulated through the membranes to clean the membranes of any biological and colloidal fouling approximately once every three months. Citric acid would also be used for neutralization of spent sodium hydroxide solution used for removing fouling from the membranes. Citric acid would be supplied in liquid form as a 30 percent solution.

Sodium bisulfite would be used to neutralize any residual chlorine in the membrane unit after EFM. A 38 percent sodium bisulfite solution would be used.

Table 2-2 summarizes the chemicals to be used in the membrane system. Details of chemical storage, containment, etc. can be found in Section 2.4.4.

Table 2-2. Chemicals for Membrane System

Chemical	Parameter	Initial (8 mgd)	Final (20 mgd)
Sodium Hypochlorite	Number of Storage Tanks	1	2
	Storage Volume, each (includes EFM and CIP)	400 gallons	400 gallons
	Storage Tank Capacity (day tanks)	2 to 3 days	2 to 3 days
Sodium Hydroxide	Number of Storage Totes	1	2
	Storage Tank Volume, each	350 gallons	350 gallons
	Storage Tank Capacity	3 months	3 months
Citric Acid	Number of Storage Totes	1	2
	Storage Tank Volume, each	350 gallons	350 gallons
	Storage Tank Capacity	4 months	4 months
Sodium Bisulfite	Number of Storage Totes	1	2
	Storage Tank Volume, each	350 gallons	350 gallons
	Storage Tank Capacity	37 days	74 days

2.4.3 Chemical Systems

Sodium Hypochlorite

Sodium hypochlorite would be used at the SWTF for: (1) pre-oxidation of raw water; (2) disinfectant in the treated water storage tank and a chlorine residual in the distribution system; (3) to prepare batch make-up solution for EFM of the membranes; and (4) to prepare batch make-up CIP solution for the membranes. The latter two uses are discussed above in Section 2.4.2.

The sodium hypochlorite storage tank would be located inside the Chemical Building, which would be kept cool during the summer by the HVAC system. Sodium hypochlorite would be delivered in a 12.5 percent solution for use as the primary disinfectant of raw water and in the filtrate to achieve 0.5-log *Giardia* disinfection in the treated water storage tank. Sodium hypochlorite would also be used to prepare batch make-up solution for EFM and CIP solutions for the membranes.

Aluminum Chlorohydrate

Aluminum chlorohydrate (ACH) would be used, if needed, as a coagulant in both the sedimentation basin for the removal of turbidity, suspended solids, total organic carbon, and color; and at the plate settler to assist in the solids removal.

Coagulant Polymer

An anionic polymer would be used in the reverse filtration recovery system to assist the ACH and enhance performance. Using polymer would lower the ACH dosage and provide more operational flexibility of the backwash recovery system.

Corrosion Inhibitor (Zinc Orthophosphate)

Zinc orthophosphate would be used for corrosion control when blending with groundwater. The storage tank would be located in the chemical storage area. The zinc orthophosphate would be injected upstream of the finished water storage tank before the high service pump station.

Sodium Carbonate (Soda Ash)

Soda ash would be required to adjust the alkalinity of the membrane effluent prior to entering the storage tank. The soda ash feed system would be skid mounted and installed inside the Chemical Building. It would include a bin feeder and overhead hoist that would be used to lift bags of soda ash into a five-ton bin. The soda ash system would be placed in its own room.

Powder Activated Carbon

Powdered activated carbon (PAC) was not included in the initial design; however, space has been reserved in the Chemical Building. In the future, PAC may be added to provide taste and odor control. PAC can be purchased and stored in bags, and fed as a powder using dry feed machines or using bulk liquid delivery and wet feed.

Table 2-3 summarizes the process chemicals to be used by the SWTF.

Table 2-3. Process Chemicals

Chemical	Parameter	Current (8 mgd)	Final (20 mgd)
Aluminum Chlorohydrate	Number of Storage Tanks	1	2
	Storage Tank Volume, each	4,000 gallons	4,000 gallons
	Storage Tank Capacity	45 days	45 days
Coagulant Polymer	Number of Storage Drums	1	1
	Storage Tank Volume, each	55 gallons	55 gallons
	Storage Tank Capacity	165 days	88 days
	Diluted Polymer Batch Tank Capacity	30 gallons	30 gallons
Sodium Hypochlorite	Number of Storage Tanks	1	2
	Storage Tank Volume, each[1]	6,000 gallons	6,000 gallons
	Storage Tank Capacity	30 days	30 days
Corrosion Inhibitor (Zinc Orthophosphate)	Number of Storage Totes	1	1
	Storage Tank Volume, each	1,000 gallons	1,000 gallons
	Storage Tank Capacity	80 days	32 days
Sodium Carbonate (Soda Ash)	Maximum Feed Rate	42 lb/hr	105 lb/hr
	Dry Chemical Usage	1,000 lb/day	2,500 lb/day

[1] Sodium hypochlorite storage includes volume for membrane CIP/EFM processes

2.4.4 Chemical Storage, Pipelines, and Containment

Sodium hypochlorite, ACH, corrosion inhibitor, and polymer would be stored in the Chemical Building. Sodium hypochlorite, ACH, and corrosion inhibitor would each have their own containment area below the building floor. Both the polymer and corrosion inhibitor storage and feed systems would be contained behind a curb. Sodium hydroxide, sodium bisulfite, citric acid, and a small volume of sodium hypochlorite would be stored in the CIP chemical room in the Operations Building. Each of the CIP chemical storage and feed systems would be contained behind a curb. Dry chemicals would be stored in bags on a platform one foot above grade level. HDPE tanks would be used for liquid chemical storage. For sodium hypochlorite, which is subject to degradation with storage, a maximum of 28 days storage would be used.

Double-wall piping would be used for chemical lines outside of containment areas. PVC and chlorinated polyvinyl chloride (CPVC) pipe would be used for containment pipe; tubing would be used to carry the product. Leak detectors would be provided at the low point on each chemical line. The leak detection panel would feed an alarm to the main plant computer. Flushing taps would be provided on all chemical pipes to allow for draining or flushing of chemicals.

All chemicals stored in tanks would have a fill station to receive bulk delivery. A sump would be provided in the sodium hypochlorite and ACH containment areas. In case of a large leak from these chemicals, a vacuum truck would pump out the containment area and the chemicals would be legally disposed. Alternatively, a sump pump would be provided in each containment area to recover leakage.

The floor in front of the ACH and sodium hypochlorite tanks would be depressed approximately 4.5 feet for spill containment. A grated floor would span the containment area. The metering pumps would be placed atop pedestals that rise above the grating in the containment area. Permanent tanks would sit atop concrete pedestals to ensure that the pumps maintain a flooded suction. The containment area for each chemical would be separated to avoid cross contamination. All containment areas would be lined with a coating system that is compatible with the stored chemicals to protect the concrete. Chemicals spilled into the containment areas would be pumped out.

The containment areas for the polymer, corrosion inhibitor, and CIP chemicals would be pumped out to a truck and hauled away for proper disposal. If there is a large spill (e.g., tank failure), a contractor would remove the spilled material.

2.4.5 Residuals Handing

Periodically (every 20 to 40 minutes), the membranes would go through a reverse filtration process to remove the accumulated solids and return the membranes back to their original operating pressure. In addition to the reverse filtration process, the membranes periodically would need a chemical cleaning to remove any scale or particulate matter that is not removed through reverse filtration. A CIP would also be used once every 1 to 2 months to remove the

accumulated organic and inorganic scales. On a more frequent basis (once per day), the membranes would receive an EFM chemical cleaning to help extend membrane life.

After a reverse filtration sequence, the residual stream from the reverse filtration would flow to a waste tank, which would equalize the flow fed to the thickening system. Coagulant and small dose of polymer would be used as the thickener to efficiently separate the solids from the liquid stream. Thickened solids would be sent to the sewer for disposal. The water would then be recycled to the head of the plant. The treatment process would produce residual flows from membrane reverse filtration process and the CIP neutralization tank. The CIP and EFM spent chemical streams would be neutralized and sent directly to the sewer.

2.5 Responsible Agencies and Permits

Table 2-4 summarizes the potential permits and/or approvals that may be required prior to construction and operation of the SWTF. Additional local approvals and permits may also be required.

Table 2-4. Regulatory Requirements and Permits for SWTF Facilities

Agency	Type of Approval	Project Component
State Agencies		
Central Valley Regional Water Quality Control Board	National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit	SWTF, RWPS, and raw and treated water pipelines
	General Order for Dewatering and Other Low Threat Discharge to Surface Waters Permit	SWTF, RWPS, and raw and treated water pipelines
	NPDES Industrial Storm Water Permit	SWTF
State Historic Preservation Office	Compliance with Sections 5024 and 5024.5 of the California Public Resources Code.	SWTF, RWPS, and raw and treated water pipelines
California Public Utilities Commission	Authorization to Alter Highway-Rail Crossing Pursuant to General Order 88-B	Treated water pipelines
California Department of Public Health	Domestic Water Supply Permit Amendment	SWTF
Local/Other Agencies		
San Joaquin Valley Air Pollution Control District	Authority to Construct	SWTF, RWPS, and raw and treated water pipelines
	Permit to Operate	RWPS and SWTF
San Joaquin County	Site Approval Permit	RWPS, SWTF, and raw and treated water pipelines
Union Pacific Railroad	Crossing and/or Encroachment Permit	Raw and treated water pipelines
San Joaquin Council of Governments	San Joaquin County Multi-Species Conservation & Open Space Plan Incidental Take Measures	SWTF, RWPS, and raw and treated water pipelines
City of Lodi	Storm Water Management Plan	SWTF, RWPS, and raw and treated water pipelines
	Building Permit	SWTF, RWPS, and raw and treated water pipelines
	Site Plan and Architectural Review	SWTF, RWPS, and raw and treated water pipelines

Chapter 3 - Environmental Setting

This chapter describes the environmental setting for the Proposed Project. This environmental setting constitutes the baseline physical conditions by which the City will determine whether a potential environmental impact is significant in Chapter 4, CEQA Initial Study Checklist.

3.1 General Setting

3.1.1 Land Use

The City is located along the Mokelumne River, adjacent to the Sacramento River Delta, in the San Joaquin Valley between the City of Stockton, six miles to the south; the City of Sacramento, 35 miles to the north; and along State Route (SR) 99. The City is located on the main line of the UPRR and is within five miles of Interstate 5 via SR 12.

Major land uses currently developed in the city limits are residential (50 percent); public and quasi-public including schools (13 percent); industrial (12 percent); commercial, including retail and office (9 percent); vacant land (7 percent); miscellaneous land, including county, state, and parking areas (6 percent); agriculture and wineries (1 percent), utilities (less than 1 percent), and mixed-uses (less than 1 percent) (City of Lodi, 2009a).

The 43-acre Lodi Lake Park is the only regional park within city limits. The park is characterized by the Mokelumne River, swimming, beaches, and large picnic areas. It is also attached to the Lodi Lake Wilderness Area. A proposed expansion of the park, planned on the lake's west bank area, will add approximately eight acres to the regional park (four additional acres have been designated for the SWTF). In the Lodi General Plan, land use for the SWTF site was designated open space (City of Lodi, 2010).

The SWTF site is situated in Section 34, Township 4 North, Range 6 East of the Mount Diablo Base and Meridian. The site is undeveloped property east of the northeast corner of West Turner Road and North Lower Sacramento Road and north of Mills Avenue. Adjacent property includes the railroad tracks to the west, Lodi Lake and the Mokelumne River to the east, West Turner Road to the south, and the Masonic (Woodbridge) Cemetery to the north. Industrial development, including a substation and power plant, is located to the west and south of the site. The General Mills facility is located across West Turner Road to the south. Three residences are located west of the railroad tracks along the northwest side of the site.

The SWTF site is presently a vacant field covered in non-native grass, occasional weedy patches, and several oak trees. The site area was planted in vineyards from a point of time between 1939 to 1941 and 1967 to 1977, possibly later (USACE, 1941; USGS, 1939, 1976; Napton and Greathouse, 1977).

3.1.2 Topography and Geology

The SWTF site is located in the lower San Joaquin Valley. The site lies at an elevation of approximately 42 feet above mean sea level. The overall topography of the site is flat. Groundwater in the Project area exists at a depth of approximately 35 feet below ground surface and flows in a southwesterly direction.

The SWTF site is located within the Great Valley Geomorphic province. The site is located in a large, northwest-trending asymmetric structural trough, filled with marine and continental sediments up to six miles thick. Stream-channel deposits of coarse sand occur along the San Joaquin River and its major eastside tributaries. The basin deposits are interbedded lacustrine, marsh, overbank, and stream-channel sediments deposited by numerous sloughs and meanders of the major rivers, including the Mokelumne River bordering the site (HDR, 2008).

According to the "Fault Activity Map of California and Adjacent Areas (Jennings, 1994), no active faults or Earthquake Fault Zones (Special Studies Zones) are located on or near the SWTF site. No evidence of recent or active faulting has been observed at the SWTF site (Youngdahl, 2010). The nearest mapped faults to the SWTF site are related to the potentially active Vernalis and Stockton Fault zones located approximately 19 and 14 miles southwest of the site, respectively. The nearest mapped active fault to the site is Marshall Creek-Greenville fault zone, located approximately 30 miles to the west-southwest (HDR, 2008).

The Soil Survey of San Joaquin County describes the Project area as consisting of Tokay-Urban land complex, 1 to 2 percent slopes (SCS, 1992). This nearly level map unit is on low fan terraces. This unit is 50 percent Tokay fine sandy loam and 35 percent urban land. Tokay soil is very deep and well drained; permeability is moderately rapid; and available water capacity is high. The Urban land consists of areas covered by impervious surfaces or structures, such as roads, driveways, sidewalks, buildings and parking lots. The soil underneath is similar to nearby soils (HDR, 2008).

3.1.3 Climate and Air Quality

The San Joaquin Valley Air Basin (SJVAB) includes the counties of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern County. Comprising nearly 25,000 square miles, it represents approximately 16 percent of the geographic area of California. The SJVAB has a population of over 3.3 million people, with major urban centers in Bakersfield, Fresno, Modesto, and Stockton.

The SJVAB consists of a continuous inter-mountain valley approximately 250 miles long and averaging 80 miles wide. On the western edge is the Coast Mountain range, with peaks reaching 5,020 feet, and to the east of the valley is the Sierra Nevada Range with some peaks exceeding 14,000 feet. The Tehachapi Mountains form the southern boundary of the valley. The region's topographic features act to restrict air movement through and out of the air basin. Airflow in the SJVAB is primarily influenced by marine air that enters through the Carquinez

Strait, where the San Joaquin-Sacramento Delta empties into the San Francisco Bay. The SJVAB is highly susceptible to pollutant accumulation over time. Frequent transport of pollutants into the SJVAB from upwind sources contributes to poor air quality.

The SJVAB has an inland Mediterranean climate that is typified by warm, dry summers and cooler winters. Summer high temperatures often exceed 100ºF, averaging from the low 90s in the northern part of the valley to the high 90s in the south. The daily summer temperature variation can be as great as 30ºF. Generally, winters are mild. Average high temperatures during the winter are in the 50s, while the average daily low temperature is about 45ºF. The SJVAB averages over 260 sunny days per year. Annual rainfall varies from north to south, with the northern counties receiving as much as 11 inches of rainfall and the southern counties as little as four inches per year. Nearly 90 percent of the annual precipitation in the SJVAB falls November through April.

Wind speed and direction play an important role in dispersion and transport of air pollutants. During summer periods airflow in the region is primarily influenced by marine air that enters through the Carquinez Strait. Winds usually originate out of the north end of the San Joaquin Valley and flow in a south-southeasterly direction through the Valley, through the Tehachapi Pass and into the neighboring Southeast Desert Air Basin. Summer transport of pollutants into the region from upwind sources sometimes contributes to ozone formation. Additionally, local emissions may impact downwind communities. Winter air quality is influenced by regional storms carrying moisture from the Pacific Ocean, with periods of calm winds between storms. During winter months, winds occasionally originate from the south end of the Valley and flow in a north-northwesterly direction. Also, during winter months, the Valley experiences light, variable winds, less than 10 miles per hour. Low wind speeds, combined with low inversion heights, create a winter climate conducive to high concentrations of certain air pollutants (e.g., particulate matter and carbon monoxide).

3.1.4 Biological Resources

The SWTF site is bordered by the Masonic (Woodbridge) Cemetery to the north, Lodi Lake and the Mokelumne River to the east, and residential and industrial development to the south and west. On August 2, 2007, a reconnaissance survey of the SWTF site was conducted as part of the conceptual design study (HDR, 2008). A follow-up survey was conducted on February 12, 2010, which also included the RWPS site and the pipeline alignments.

Vegetation

The RWPS site is completely disturbed. The site is a dirt pad with a few weeds, and is currently being used as a WID storage yard.

The 12.75 acres on which the raw water pipeline, SWTF site, and SWTF access road would be located are an open field with widely scattered clumps of native valley oak and live oak (*Quercus lobata* and *Q. wislizenii*), respectively. The habitat type is non-native annual grassland, which is composed primarily of ruderal grasses and forbs that typically grow in

disturbed areas. Dominant plant species include barley (*Hordeum murinum*), annual bluegrass (*Poa annua*), common chickweed (*Stellaria media*), filaree (*Erodium moschatum*), shepherd's purse (*Capsella bursa-pastoris*), yellow star-thistle (*Centaurea solstitialis*), bur clover (*Medicago polymorpha*), cheeseweed (*Malva* sp.), and miner's lettuce (*Claytonia perfoliata*).

An access road to the SWTF site is located on a berm that is dominated by ruderal areas and native oak trees and sycamore trees (*Platanus racemosa*). Dominant plant species include stinging nettle (*Urtica urens*), common chickweed, miner's lettuce, wild oats (*Avena sp.*), Bermuda buttercup (*Oxalis pes-caprae*), periwinkle (*Vinca major*), privet (*Ligustrum* sp.), and Himalaya blackberry (*Rubus aermeniacus*).

The treated water pipeline would be constructed in Mills Avenue. Therefore, no plant or animal habitat would be disturbed.

No wetlands or others waters of the U.S. were observed at the RWPS and SWTF sites or along the pipeline alignments.

Wildlife

During the reconnaissance and follow-up surveys, several ground squirrel burrows were observed in the field. A fox squirrel (*Sciurus niger*) and several birds were also observed. No special-status wildlife species were observed. Bird observations included: American goldfinch (*Spinus tristis*), American pipit (*Anthus rubescens*), Anna's hummingbird (*Calypte anna*), belted kingfisher (*Megaceryle alcyon*), black phoebe (*Sayornis nigricans*),bushtit (*Psaltriparus minimus*), common raven (*Corvus corax*), Cooper's hawk (*Accipiter cooperi*), northern flicker (*Colaptes auratus*), Nuttall's woodpecker (*Picoides nuttallii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), ruby-crowned kinglet (*Regulus calendula*), western scrub-jay (*Aphelocoma californica*), and yellow-rumped warbler (*Dendroica coronata*).

Special-Status Species

The SWTF and RWPS sites and pipeline alignments are not expected to provide habitat for any special-status plant or animal species. However, the SWTF site does provide suitable foraging habitat for Swainson's hawk (*Buteo swainsoni*; state threatened) and other raptors and migratory birds as well as marginal nesting habitat for these species; although no bird nests were observed in the site during the surveys. Special-status plant and animal species (with the exception of birds) that are known to occur in the region are primarily associated with aquatic habitats such as rivers and streams and other wet places including marshes and swamps, vernal pools, and other seasonal wetlands. No such aquatic habitats occur on either the RWPS or the SWTF site. Therefore, the RWPS and SWTF sites and pipeline alignments do not provide suitable habitat for any non-bird special-status plant or animal species known to occur in the region.

3.1.5 Cultural Resources

Prehistoric setting

Though there is little archaeological evidence of human use of the Project area during the late Pleistocene and early Holocene (14,000 to 8,000 before present [BP]), this is likely a product of the archaeological record itself, rather than the lack of use of this area. Most Pleistocene and Holocene era sites are deeply buried in accumulated gravels and silts, or have eroded away (Moratto, 2004).

The earliest archaeological evidence of human use of the Central Valley region dates from approximately 5,000 BP. The period from 8,000 to 4,000 BP is referred to as the Early Horizon. During this time period, a generalized subsistence strategy is thought to have been replaced by a more specialized strategy. This intensification can be seen in what Fredrickson (1973) has identified as the Windmiller Pattern. Artifact assemblages and faunal remains at Windmiller sites indicate that a diverse range of resources was exploited, including seeds, a variety of small game, and fish (Moratto, 2004).

The Middle Horizon dates from approximately 4,000 B.C. to 1,500 BP. Sites from this period have also been found in the Central Valley. The adaptive pattern that is found most frequently during this period is called the Berkeley Pattern (Fredrickson, 1973), though sites displaying the Windmiller Pattern assemblages have also been dated to the Middle Horizon. The Berkeley Pattern differs from the Windmiller Pattern primarily in the increased emphasis on the exploitation of the acorn as a staple. This is reflected in the more numerous and varied mortars and pestles. This complex is also noted for its especially well-developed bone industry and such technological innovations as ribbon flaking of chipped stone artifacts. During this period, flexed burials replaced extended burials and the use of grave goods generally declined (Moratto, 2004).

The period between 1,500 BP and the arrival of the Spanish in central California has been named the Late Horizon. The predominant pattern during this period is called the Augustine Pattern (Fredrickson, 1973). This period is characterized by large village sites, increasing evidence of acorn and nut processing, the introduction and use of the bow and arrow, and use of clam shell disc beads as the primary medium of exchange. During the last part of the period, cremation became a common mortuary practice (Moratto, 2004).

Ethnographic Setting

The Project area was aboriginally inhabited by the Northern Valley Yokuts. Ethnographic work with this group is lacking. Because of the early decimation of the aboriginal populations in the lower San Joaquin Valley, most information regarding this group is gleaned from accounts of Spanish military men and missionaries that have been translated. A summary of these sources was compiled by Wallace (1978), and it is upon this work that the following ethnographic setting is based.

The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, perhaps being pushed out of the foothills about 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. Principal settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Settlements were composed of single-family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small and lightly constructed, semi-subterranean and oval. The public structures were large and earth covered.

Subsistence among the Northern Valley Yokuts revolved around the waterways and marshes of the lower San Joaquin Valley. Fishing with dragnets, harpoons, and hook and line yielded salmon, white sturgeon, river perch, and other species of edible fish. Waterfowl and small game attracted to the water also provided a source of protein. The contribution of big game to the diet was probably minimal. Vegetal staples included acorns, tule roots, and seeds.

Most Northern Valley Yokuts groups had their first contact with Europeans in the early 1800s, when the Spanish began exploring the Sacramento-San Joaquin Delta. The gradual erosion of the Yokuts culture began during the mission period. Escapees brought foreign (European and Native American) habits and tastes, as well as the Spanish expeditions to recover the escapees. Epidemics of European diseases played a large role in the decimation of the native population. With the secularization of the mission and the release of neophytes, tribal and territorial adjustments were set in motion. People returned to other groups, and a number of polyglot “tribes” were formed. The final blow to the aboriginal population came with the Gold Rush and its aftermath. In the rush to the southern mines, native populations were pushed out of their territories. Ex-miners settling in the fertile valley applied further pressure to the native groups, and altered the landforms and waterways of the valley. Many Yokuts resorted to wage labor on farms and ranches. Others were settled on land set aside for them on the Fresno and Tule River Reserves.

Historic Setting

San Joaquin County

Early explorers visited the region relatively frequently. Eighteenth-century explorers included Pedro Fages, Juan Bautista de Anza , and Francisco Eliza. Between 1806 and 1817, mission site reconnaissance expeditions were led by Gabriel Moraga , Father Ramon Abella, Jose Antonio Sanchez , and Father Narciso Duran (Hoover et al., 1990).

The first Euro-American to traverse the area was probably Jedediah Strong Smith, who opened the Sacramento Trail in the late 1820s. Smith reported to the Hudson’s Bay Company about the quantity and quality of furs available in California, and in 1828, the company sent its first trapping expedition. Trappers working for Hudson’s Bay Company established the settlement of French Camp south of the modern location of the City of Stockton (Hoover et al., 1990).

San Joaquin County remained largely unsettled during the Spanish and Mexican Periods. Following California's Gold Rush in 1849, settlement of the region gradually increased as former gold seekers realized the potential for crop production and cattle raising. Small towns such as Woodbridge, Stockton, and Mokelumne (present day Lodi) were founded in the County because railroad development throughout the area provided access, goods, and employment. In turn, these small towns further influenced settlement patterns in the San Joaquin Valley. Agriculture has remained a steady industry within the County during the 20th century (Tinkham, 1923; Hillman and Covello, 1985).

City of Lodi

The City was originally founded as Mokelumne in 1869, when early settlers Charles O. Ivory and John M. Burt established the Ivory Store, just south of the Project area. During the early 1870s, former gold miners began settling the town where they developed agricultural properties, many of which specialized in vineyards and other orchards. In 1874, the town was renamed Lodi. The region's close proximity to the Mokelumne River and railroad development brought an influx of residents to the region and within four years the area's population grew to 450 residents, many of whom were German immigrants from Russia who entered the region via the Midwest. In 1906 the City was incorporated, with a population of 1,946 (Hillman and Covello, 1985; City of Lodi, 2006; Clark, 2009).

During the early to mid 20th century, the City continued to grow with residential and infrastructural expansion. The region's primary industry continued to be agricultural, and the grape and wine industry continued to be the area's predominant agricultural product. By 1940, the City reached a population of 11,000; following World War II, the population surpassed 20,000 residents. During the late 20th century, the City continued to grow with residential development. By the 1990s, the population exceeded 50,000 residents. The City continues to have a significant agricultural and manufacturing industry to the present day (City of Lodi, 2006).

Railroad development in the San Joaquin County originally began in 1869 when the Central Pacific Railroad laid tracks through the county, connecting Sacramento with San Jose through the town of Mokelumne (later named Lodi). In 1870, the line was extended northward to Oakland and southward to southern California. This railroad provided greater access for goods transport and allowed for residential growth in the Lodi region. In 1907, the Central California Traction Company extended the railroad, thereby linking Lodi to southern cities Stockton and Sacramento. This railroad line was consolidated with the Southern Pacific Railroad in 1959 and during the late 20th century, UPRR acquired the line and continues to operate it into the present (Robertson, 1998).

3.1.6 Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, similar to a greenhouse. The accumulation of GHGs has been implicated as a driving force for global

climate change, which can be described as the changes in the earth's climate caused by natural fluctuations and the impact of human activities. Both natural processes and human activities emit GHGs.

Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation and temperature. Although there is disagreement as to the speed of global warming and the extent of the impacts attributable to human activities, the vast majority of the scientific community agrees that there is a direct link between increased emission of GHGs and long-term global temperature. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to the marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other health-related problems (CARB, 2008).

The accumulation of GHGs in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of GHGs. GHGs include, but are not limited to, carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride (California Health and Safety Code section 38505(g)). Carbon dioxide is the reference gas for climate change because it is considered the most important GHGs. To account for the warming potential of different GHGs, GHG emissions are quantified and reported as CO_2 equivalents (CO_2E).

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), which requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions will be reduced to 1990 levels by 2020.

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons (MMT) of CO_2 equivalents of GHGs. The 2020 target requires the reduction of 174 MMT of CO_2E, or approximately 30 percent, from the State's projected 2020 emissions of 596 MMT of CO_2E (under condition considered to be business-as-usual). Also in December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32, which became effective January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for facilities that make up the bulk of the stationary source emissions in California. Major facilities are those that generate more than 25,000 MMT per year of CO_2E. Cement plants, oil refineries, electric-generating facilities/ providers, cogeneration facilities, hydrogen plants, and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2E, make up 94 percent of the point source CO_2E emissions in California (CARB, 2007).

In December, 2008, CARB adopted its *Climate Change Scoping Plan* (CARB, 2008). The Plan states that local governments are "essential partners" in the effort to reduce GHG emissions, and that they have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to GHG emissions. The Plan acknowledges that local governments have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The Plan encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020 (CARB, 2008). The Plan also includes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities.

SB 97 "2007 Statutes, Ch. 185" acknowledges that local agencies must analyze the environmental impact of GHGs under CEQA. As required by the bill, the State Office of Planning and Research submitted to the Natural Resources Agency its proposed amendments to the State CEQA guidelines for the effects and mitigation of GHG emissions. The amendments added a new set of environmental checklist questions (VII. Greenhouse Gas Emissions) to the CEQA Guidelines Appendix G and are presented in Chapter 5. The amendments became effective on March 18, 2010.

To assist Lead Agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific GHG on global climate change, the SJVAPCD has adopted the *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* and the policy: *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPSs) to assess significance of project specific GHG emissions on global climate change during the environmental review process, as required by CEQA. Use of BPSs is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPSs would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact. The guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project related impacts on global climate change. The SJVAPCD has developed BPSs for the following stationary sources: boilers; steam generators; gasoline dispensing facilities; dry cleaners; oil and gas extraction, storage, transportation, and refining operations; and co-generation (SJVAPCD, 2009).

To date, the City has not yet adopted any plan, policy, or regulation for reducing the emissions of GHGs guiding and implementing policies intended to conserve energy and reduce climate

change in the City. The following policies contained in the recently adopted General Plan that are applicable to the SWTF include:

- **Guiding Policy C-G10.** Reduce greenhouse gas emissions by 15% over 2008 levels by 2020, to slow the negative impacts of global climate change.
- **Implementing Policy C-P35.** Reduce energy consumption within city government facilities and motor fleets.
- **Implementing Policy C-P36.** Adopt a comprehensive Climate Action Plan.

3.1.7 Noise

Noise levels that are considered acceptable or unacceptable can characterize various environments. Lower noise levels are expected in rural or suburban areas than what would be expected in commercial or industrial zones. Table 3-1 identifies decibel levels for common sounds heard in the environment.

Table 3-1. Typical noise levels

Noise Level decibels (dBA)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at 3 feet, jet flyover at 1,000 feet	Rock band
80–90	Diesel truck at 50 feet	Loud television at 3 feet
70–80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at 3 feet, vacuum cleaner at 10 feet
60–70	Commercial area	Normal speech at 3 feet
40–60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20–40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10–20		Broadcast / recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

The A-weighted decibel scale (dBA) is cited in most noise criteria. The most commonly used noise descriptors are the equivalent sound level over a given time period (Leq); average day-night 24-hour average sound level (Ldn); and community noise equivalent level (CNEL).

A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level") measured in dB. A dBA is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels.

[2] The Leq is a single value of a constant sound level for the same measurement period duration, which has sound energy equal to the time–varying sound energy in the measurement period.

[3] Ldn is the day–night average sound level that is equal to the 24–hour A–weighted equivalent sound level with a ten–decibel penalty applied to night between 10:00 p.m. and 7:00 a.m.

[4] CNEL is the average A–weighted noise level during a 24–hour day, obtained by addition of five decibels in the evening from 7:00 to 10:00 p.m., and an addition of a ten–decibel penalty in the night between 10:00 p.m. and 7:00 a.m.

Source: modified from Caltrans, 1998

The A-weighted decibel (dBA) scale is cited in most noise criteria. The most commonly used noise descriptors are the equivalent sound level over a given time period (Leq); average day-night 24-hour average sound level (Ldn); and community noise equivalent level (CNEL). Noise levels that are generally considered acceptable or unacceptable can characterize various environments. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones.

City of Lodi Standards

The applicable noise standards governing the SWTF are set forth in the Noise Element of the Lodi General Plan and Noise Ordinance.

The City's General Plan Noise Element does not identify any compatibility standards specifically for water treatment plants. However, the most appropriate land use category would be Industrial, Manufacturing Utilities, and Agriculture. The Noise Element identifies compatibility standards for industrial facilities as shown in Table 3-2 (City of Lodi, 2010).

Table 3-2. Standards for Industrial, Manufacturing Utilities, and Agriculture

Land Use Category	Outdoor Ldn or CNEL Value		
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable
Manufacturing and Other Industrial Facilities	Below 70	70-80	Above 80
Notes: CNEL criteria apply to outdoor noise from sources that operate continuously or that operate frequently throughout most of a 24-hour period. CNEL criteria should be applied to noise conditions that are typical for the noise source, not to conditions reflecting temporary peak activities.			

The City's Noise Ordinance (Municipal Code Chapter 9.24 contains general standards for evaluating noise violations (City of Lodi, 2009b).

9.24.020 Public Nuisance Noise

A. General Noise Regulations. Notwithstanding any other provision of this chapter, and in addition thereto, it is unlawful for any persons to willfully make or continue or permit or cause to be made or continued, any loud, unnecessary or unusual noise which unreasonably disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal noise sensitivity.

9.24.030 Excessive, Offensive or Disturbing Noise

C. It is unlawful for any person, firm or corporation to cause, permit, or generate any noise or sound as described herein between the hours of ten p.m. and seven a.m. which exceeds the ambient noise level at the property line of any residential property (or, if a condominium or apartment house within any adjoining apartment) as determined at the time of such reading by

more than five decibels. This section shall be applicable whether such noise or sound is of a commercial or noncommercial nature (Ord. 1449 § 1 (part), 1989).

3.2 Regulatory Setting

This section summarizes the regulations that apply to construction and operation of the SWTF.

3.2.1 State Agencies

California Clean Air Act

Under the California Clean Air Act, patterned after the federal Clean Air Act, areas have been designated as attainment or nonattainment with respect to the state standards. The Project area is nonattainment for particulate matter (PM_{10} and $PM_{2.5}$[1]) and 8-hour ozone. Responsibility for meeting California's standards lays with CARB and local air pollution control districts such as the SJVAPCD, which covers the Project area.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act (Porter-Cologne Act) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout California, while the Central Valley Regional Water Quality Control Board (RWQCB) conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are only allowed if the change is consistent with the maximum beneficial use of the state, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans.

NPDES Stormwater Construction Permit

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

[1] PM_{10} is used to describe particles of 10 micrometers or less; $PM_{2.5}$ is used to describe particles of 2.5 micrometers or less.

NPDES Industrial Activities Stormwater Permit

The Central Valley RWQCB administers the NPDES stormwater permitting program in the Central Valley region. The regulations require that stormwater associated with industrial activity (stormwater) that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. The City must submit a Notice of Intent to the RWQCB to be covered by the General Industrial Activities Permit prior to the beginning of operation. The General Industrial Activities Permit requires the preparation and implementation of a SWPPP.

NPDES Dewatering Permit

The Central Valley RWQCB also administers the NPDES General Dewatering and Low Threat Discharges to Land Permit. Small/temporary dewatering projects such as excavations during construction is regulated under the General waste discharge requirements (WDRs). The City must submit a Notice of Intent to the RWQCB to be covered by the General Permit prior to the beginning of construction.

California Department of Health Services

The California Department of Public Health amends existing water supply permits, pursuant to the requirements of the California Health and Safety Code, Division 104, Part 12, Chapter 4 (California Safe Drinking Water Act), Article 7, Section 116550.

California Public Resources Code Sections 5024 and 5024.5 (Cultural Resources)

The California Environmental Quality Act (CEQA) requires that public projects or private projects financed or approved by public agencies must assess the effects of the project on historical resources. CEQA also applies to effects on archaeological sites, which may be included among “historical resources” as defined by Guidelines Section 15064.5, subdivision (a), or, in the alternative, may be subject to the provisions of Public Resources Code, Section 21083.2, which governs review of “unique archaeological resources.”

Historical resources may generally include buildings, sites, structures, objects or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance. Archaeological resources that are not “historical resources” according to the above definitions may be “unique archaeological resources” as defined in Public Resources Code, Section 21083.2, which also generally provides that “non-unique archaeological resources” do not receive any protection under CEQA.

3.2.2 Local Agencies

San Joaquin Valley Air Pollution Control District

The SJVAPCD is the primary local agency responsible for protecting human health and property from the harmful effects of air pollution in the SJVAB, and has jurisdiction over most stationary source air quality matters in the SJVAB.

The SJVAPCD is responsible for developing attainment plans for the SJVAB, for inclusion in California's State Implementation Plan (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. The SJVAPCD is required to regulate emissions associated with stationary sources such as agricultural burning and industrial operations.

While all criteria pollutants are a concern of the SJVAPCD, and a project's air quality impacts are considered significant if they would violate any of the state air quality standards. Ozone precursors, PM emissions, and toxic air contaminants are emphasized in the review of applications for an Authority to Construct/Permit to Operate.

San Joaquin Council of Governments

The San Joaquin County Multi-Species Conservation & Open Space Plan (SJMSCP), administered by the San Joaquin Council of Governments (SJCOG) was implemented in San Joaquin County in order to streamline the development process for developers. Under the federal and state Endangered Species Acts, developers are responsible to ensure there is no "take" of endangered or threatened species by cause of their development. The SJMSCP is permitted to operate through U.S Fish and Wildlife Service Section 10 and California Department of Fish and Game (CDFG) Section 2081 permits. Therefore, developers can now choose to use the SJMSCP and take care of their state and federal Endangered Species Act requirements more easily.

The SJMSCP allows SJMSCP permittees (SJCOG, Inc., San Joaquin County and the cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton and Tracy) to issue Incidental Take Permits or allows project applicants to mitigate for impacts to SJMSCP Covered Species resulting from Open Space land conversion resulting from covered projects. Once an Incidental Take Permit is issued it allows the project applicant to unintentionally "Take" a threatened or endangered species listed under the federal and/or state Endangered Species Acts.

Union Pacific Railroad

UPRR requires permits for encroachments, crossings, or both. An "encroachment" is a pipeline that enters the railroad company's right-of-way and either does not leave the right of way or follows along the right of way for some distance. A "crossing" is a pipeline that enters the railroad company's trackage from one side of the right-of-way to the other side of the right of way in as near a straight line as possible. If an installation entails both an encroachment and a crossing, procedures for both must be followed. If the installation method for this utility is to involve the use of a directional drilling method, specific guidelines established by UPRR must be met.

City of Lodi

As part of the City's Phase II NPDES stormwater permit, the City developed a Stormwater Management Program (SMP). The SMP has three objectives: to minimize the impact of stormwater drainage on the residents of Lodi, to minimize the negative impacts of receiving water quality of the Mokelumne River, and to minimize the negative impacts on the fish and wildlife habitat. In order to accomplish these objectives, the SMP is designed to reduce the discharge of stormwater pollutants to the Maximum Extent Practicable (MEP), protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act.

Chapter 4 - CEQA Initial Study Checklist

This section evaluates the potential for the SWTF to have a significant effect on the environment.

4.1 Approach to Analysis

This chapter evaluates the potential for the SWTF to have a significant effect on the environment through the use of a modified CEQA Environmental Checklist as presented in Appendix G of the CEQA Guidelines (effective March 18, 2010). According to Section 15382 of the CEQA Guidelines, 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 Checklist, impact significance thresholds are defined for each environmental topic. Where appropriate, mitigation measures are identified to reduce the identified impact below a level of significance. For this checklist, the following designations are used to distinguish between levels of significance of potential impacts to each resource area:

- **Potentially Significant Impact.** Adverse environmental consequences that have the potential to be significant according to the threshold criteria identified for the resource, even after mitigation strategies are applied and/or an adverse effect that could be significant and for which no mitigation has been identified. If any potentially significant impacts are identified, an environmental impact report must be prepared to meet CEQA requirements.

- **Less Than Significant Impact with Mitigation Incorporated.** Adverse environmental consequences that have the potential to be significant, but can be reduced to less-than-significant levels through the application of identified mitigation strategies that have not already been incorporated into the Proposed Project description.

- **Less Than Significant Impact.** Potential adverse environmental consequences have been identified. However, they are not so adverse as to meet the significance threshold criteria for that resource. Therefore, no mitigation measures are required.

- **No Impact.** No adverse environmental consequences have been identified for the resource or the consequences are negligible or undetectable. Therefore, no mitigation measures are required.

4.2 Environmental Resources to Be Evaluated

The following discussion evaluates the potential for the SWTF to have a significant effect on the environment. This discussion is organized by the following resource areas:

- ☒ Aesthetics
- ☒ Agriculture and Forest Resources
- ☒ Air Quality
- ☒ Biological Resources
- ☒ Cultural Resources
- ☒ Geology/Soils
- ☒ Greenhouse Gas Emissions
- ☒ Hazards & Hazardous Materials
- ☒ Hydrology/Water Quality
- ☒ Land Use/Planning
- ☒ Mineral Resources
- ☒ Noise
- ☒ Population/Housing
- ☒ Public Services
- ☒ Recreation
- ☒ Transportation/Traffic
- ☒ Utilities/Service Systems
- ☒ Mandatory Findings of Significance

Aesthetics

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐

Discussion

a) **No Impact**. The SWTF site is not located in or near any designated scenic vistas, and therefore, would not have a substantial impact on any scenic vista. As a result, no impact would occur and no mitigation is required.

b) **No Impact**. The SWTF site is not located near or within a state scenic highway, and therefore would not damage scenic resources, including but not limited to trees, outcroppings, and historic buildings within a state scenic highway. As a result, no impact would occur and no mitigation is required.

c) **Less Than Significant with Mitigation Incorporated**. Features associated with the RWPS and the SWTF would result in permanent changes to the visual and aesthetic character of the Project sites. During construction of the RWPS, construction equipment, materials, and activities would be visible from Lower Sacramento Road and would produce temporary adverse aesthetic effects. Construction of the SWTF would be visible to pedestrians walking on the berm adjacent to Lodi Lake. However, construction impacts would be temporary and are considered less than significant. Installation of the pipelines would result in short-term changes during construction, but would not cause permanent visual alteration since they would be buried.

The RWPS facility would be visible from Lower Sacramento Road and Carolina Street. The RWPS layout would provide sufficient setback requirements from the streets for safety and aesthetic considerations. Decorative fencing, facing Lower Sacramento Road and Carolina Street, would be provided similar to the existing fish screen fencing that would be across Lower Sacramento Road from the RWPS.

The storage tank, soda ash silo, and the high service pump station would be placed on the southeastern portion of the site to minimize their visual impact when viewed from

the future park. Views of these structures from Turner Road would be screened by existing trees. The 35-feet-tall finished water storage tank would be partially buried (25 to 28 feet above grade and seven to 10 feet below grade) to minimize its visual impact. The nearby soda ash silo would be approximately 26 feet tall. Trees will be planted along the perimeter of the SWTF site to screen to screen the SWTF facilities from public view. Decorative fencing or a wrought iron style fence will be constructed where the SWTF is exposed to the future park or otherwise visible from the street.

- **Mitigation Measure AE-1: Reduce Visual Impacts**. The design of the Proposed Project, including the choice of color and materials, shall reduce the visual impacts of the RWPS and the SWTF. Bright and reflective materials shall be avoided.

d) **Less Than Significant with Mitigation Incorporated.** The RWPS and SWTF would be new sources of light in the Project area. Both facilities would have nighttime lighting for security. Compliance with the following mitigation measure will reduce the potential impacts to aesthetics to less than significant.

- **Mitigation Measure AE-2: Minimize Substantial Light or Glare**. Outdoor light sources shall be properly shielded and installed to prevent light trespass on adjacent properties. Any flood or spot lamps installed will be aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side) when the source is visible from any off-site residential property, public roadway, or Lodi Lake Park.

Agricultural and Forest Resources

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE and FOREST RESOURCES -- In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to farm resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique 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, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

a) **No Impact.** The Proposed Project would not convert to non-agricultural use any Prime Farmland, Unique 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 SWTF would be constructed on non-agricultural property that is owned by the City, and the RWPS would be constructed on non-agricultural property that is owned by WID. Land uses surrounding the Proposed Project include low density residential, general commercial, and park lands. No farming or agriculture takes place within the Project area. As a result, the Proposed

Project would not affect agricultural practices or convert any farmland to non-agricultural usage. Therefore, no impact would occur and no mitigation is required.

b) **No Impact.** The Proposed Project would not conflict with zoning for agricultural use or a Williamson Act contract. As stated above, the Proposed Project would be constructed on property that is owned by the City and WID. No farming or agriculture takes place on the Project sites. The land is not zoned for agricultural use nor is it under a Williamson Act contract. As a result, the Proposed Project would not conflict with agricultural practices or a Williamson Act Contract. Therefore, no impact would occur and no mitigation is required.

c) **No Impact.** The Proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)). As stated above, the Proposed Project would be constructed on property that is owned by the City and WID. No forest lands occur on the Project sites. Therefore, no impact would occur and no mitigation is required.

d) **No Impact.** The Proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. As stated above, the Proposed Project would be constructed on property that is owned by the City and WID. No forest lands occur on the Project sites. Therefore, no impact would occur and no mitigation is required.

e) **No Impact.** The Proposed Project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use. As stated above, the Proposed Project would be constructed on property that is owned by the City and WID. No farmland or forest lands occur on the Project sites. Therefore, no impact would occur and no mitigation is required.

Air Quality

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion

a) **Less Than Significant Impact**. The Proposed Project would not conflict with or obstruct implementation of the applicable air quality plan. The Proposed Project site is within the jurisdiction of the SJVAPCD that is charged with improving the health and quality of life for all Central Valley residents through efficient, effective, and entrepreneurial air quality-management strategies. If a project is proposed in a city or county with a general plan that is consistent with the most recently adopted air quality plan, and if the project is consistent with that general plan, then the project is considered to be consistent with applicable air quality plans and policies.

The most recently adopted air quality plans are the 2007 Ozone Plan, the 2007 PM_{10} Plan, and the 2008 $PM_{2.5}$ Plan. The 2007 Ozone Plan identifies strategies for SJVAPCD to reach attainment for state and federal ozone standards (SJVAPCD, 2007). The Lodi General Plan addresses air quality problems in the area and describes climate change, its potential impacts on the City and region, the City's contributions to global climate change, and its energy conservation efforts to try to reduce GHG emissions and the rate of global climate change. The Lodi General Plan also includes a review of existing air quality sources and a comprehensive set of guiding and implementing policies. These policies are designed to reduce air quality impacts, in order to improve public health, reduce GHG emissions, and enhance overall quality of life (City of Lodi, 2010).

The purpose of the Project is to increase the City's water treatment capabilities and improve its distribution system to meet current and planned demand. The Project would be consistent with the current land use designation, and therefore, the Project would not require a General Plan Amendment.

In summary, the Project is consistent with the Lodi General Plan that is consistent with the strategies identified in the 2007 Ozone Plan (SJVAPCD, 2007). Therefore, the Proposed Project would not conflict with the region's air quality management plans and would be considered a less than significant impact and no mitigation is required.

b) **Less Than Significant with Mitigation Incorporated**. The Proposed Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. The Project would affect local pollutant concentrations in two ways. First, during construction, the Project would affect local particulate concentrations by generating dust. Over the long-term, any onsite stationary air pollutant sources associated with the Project could also affect local pollutant concentrations. However, since all stationary air pollutant sources would be subject to SJVAPCD permit requirements, they can be presumed to have a less-than-significant impact on local pollutant concentrations.

Construction

The primary concern to the SJVAPCD during construction would be the particulate matter (PM), specifically PM_{10}, emissions from dust-generating activities. The entire SJVAB is a serious nonattainment area for PM_{10} and a substantial increase in PM_{10} emissions would be considered significant.

Per the SJVAPCD's *Guide for Assessing and Mitigation Air Quality Impacts (GAMAQI)*, the SJVAPCD's approach to CEQA analyses of construction impacts is to require implementation of effective and comprehensive control measures rather than to require detailed quantification of emissions (SJVAPCD, 2002). From the perspective of the SJVAPCD, compliance with Regulation VIII and implementation of other control measures, depending on the size and location of the project site, would constitute sufficient mitigation to reduce PM_{10} impacts to less than significant.

The following controls are required by Regulation VIII to be implemented at all construction sites (SJVAPCD, 2002):

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day shall prevent carryout and trackout. Construction equipment, on-road heavy-duty trucks, and construction-worker vehicles would also generate criteria air pollutant emissions. Emissions from construction-worker commute trips would be minor compared to emissions from heavy-duty trucks. Criteria pollutant concentrations of reactive organic gases (ROG) and nitrogen oxides (NO_x) from these emissions sources would incrementally add to regional atmospheric loading of ozone precursors during the construction period. The *GAMAQI* recognizes that construction equipment emits ozone precursors and indicates that very large construction projects may exceed the annual thresholds for ROG and NOx emissions. In which case, SJVAPCD will recommend quantification methods for these projects on a case-by-case basis (SJVAPCD, 2002).

Because construction of the RWPS and SWTF would be considered a small construction project, it can be assumed that the level of ROG and NOx would not exceed the significance criteria of 10 tons per year. However, since modeling was required to calculate GHG emissions (discussed below in section VII. Greenhouse Gas Emissions) and the results include criteria pollutants, estimated construction-related emissions are provided. As shown in Table 4-1, criteria pollutants from construction of the Project would be less than significant. Appendix A provides additional information regarding the air emission calculations, assumptions, and methodologies.

Table 4-1. Estimated Construction and Operation-related Criteria Air Pollutants

	Criteria Air Pollutants (tons per year)	
	ROG	**NO_x**
Project Construction	0.4	2.6
Project Operations	0.7	1.3
SJVAPCD Threshold of Significance	**10**	**10**
Exceed Threshold of Significance? (Yes or No)	No	No

Another issue of concern by the SJVAPCD during construction is asbestos. However, since the Project does not include any demolition, renovation, or removal of asbestos-containing materials and because the Project area is not identified as an area likely to contain naturally-occurring asbestos, this issue is not discussed further (DOC, 2000).

- **Mitigation Measure AIR-1. Minimize PM_{10} Impacts**. With implementation of Regulation VIII control measures for PM_{10} (SJVAPCD, 2002), PM_{10} impacts from construction would be less than significant.

Operation

As shown in Table 4-1, impacts from mobile emissions would be less than significant because the site would generate only a few employee and vendor trips per day.

A diesel generator is planned for the RWPS in the future to provide standby power to enable the pump station The RWPS would require a standby diesel generator to run during power failures. The generator would be sized for the initial phase and would be replaced with a larger generator for the final phase.

At the SWTF, a small standby generator (diesel or natural gas) would be provided to operate critical systems (computers, lights HVAC system, etc.) in the Operations Building. A larger standby diesel engine generator is planned for the future to provide electrical power to the SWTF in case of a power outage.

Operational emissions of criteria pollutants would include only the minimal mobile emissions and the occasional use of the standby generators and would be well below the thresholds of 10 tons per year for both ROG and NO_x. These sources would not lead to further violations of the ambient air quality standards in the area. Therefore, this would be a less than significant impact.

Permitting of standby diesel generators larger than 50 hp is required per SJVAPCD Rule 2201 – New and Modified Stationary Source Review. The units would be required to meet all applicable emissions requirements, including those for particulate emissions.

c) **Less Than Significant Impact**. As discussed above, the Project would result in air pollutant emissions well below the SJVAPC thresholds of 10 tons per year for ROG and NO_x. Therefore the Project's individual impact on regional air quality would be less than

significant. For projects with less than significant individual impacts, the *GAMAQI* states that the cumulative impact would also be less than significant (SJVAPCD, 2002).

d) **Less Than Significant Impact**. As noted in b) above, the Project would not generate substantial pollutant concentrations, and thus would not expose sensitive receptors to substantial pollutant concentrations. Odors are addressed below in e).

e) **No Impact**. The SJVAPCD defines significant odor problems as:

- 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.

In addition, Rule 4102 – Nuisance requires the following: A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.

The types of land use development that pose potential odor problems include refineries, chemical plants, wastewater treatment plants, landfills, composting facilities, and transfer stations. As a general rule, raw water pumping stations and water treatment plants do not generate odors. In addition, the Project's pumping and treatment operations would occur in enclosed structures and distribution pipelines would be underground. The Project would not generate objectionable odors. Therefore, no impact would occur and no mitigation is required.

Biological Resources

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) 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?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion

A reconnaissance survey of the SWTF site was conducted on August 2, 2007 for biological resources and wetlands or other waters of the U.S. An additional survey of the RWPS site, SWTF site, and pipeline alignments were conducted on February 12, 2010. Both surveys consisted of walking through the RWPS and SWTF sites and driving along proposed pipeline alignments that were accessible by road.

Prior to conducting the reconnaissance survey, a list of special-status species known to occur and/or having the potential to occur in the project areas was obtained from U.S. Fish and

Wildlife Service, CDFG's California Natural Diversity Database, and the California Native Plant Society database. The potential for each regionally occurring special-status species to be impacted by the Project was then evaluated based on the results of the reconnaissance survey.

a) **Less Than Significant with Mitigation Incorporated.** Special-status plant and animal species (with the exception of birds) that are known to occur in the region are primarily associated with aquatic habitats such as rivers and streams and other wet places including marshes and swamps, vernal pools, and other seasonal wetlands. No aquatic habitats occur on the RWPS site, SWTF site, or along pipeline alignments. Therefore, the sites do not provide suitable habitat for any non-bird special-status plant or animal species known to occur in the region.

The SWTF site provides suitable foraging habitat for Swainson's hawk (*Buteo swainsoni*; state listed threatened) and other raptors and migratory birds. Trees in and surrounding the SWTF site provide marginal nesting habitat for these species. Although no bird nests were observed on the site during the reconnaissance or follow-up surveys. Implementation of the following mitigation measure would reduce potential impacts to Swainson's hawk foraging habitat to less than significant.

During construction several trees on the SWTF site and along the future access road will be removed (Figure 4-1). These trees provide potential nesting habitat for various common resident and migratory bird species. Nesting birds are protected under California Fish and Game Code Section 3503 and the federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989). Removal of trees that provide nesting habitat for birds could have an adverse effect. Construction noise and human disturbance could cause nest abandonment, death of the young, or loss of reproductive potential at active nests located near construction activities. Implementation of the following mitigation measure would reduce potential impacts to nesting raptors and other special-status nesting birds during the breeding season to less than significant.

- **Mitigation Measure BIO-1a: Replace Swainson's Hawk Foraging Habitat.** The City anticipates that the project would be approved for participation in the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) for all facilities (RWPS site, SWTF site and pipelines). Compliance with the SJMSCP would provide for impact avoidance measures (e.g., pre-construction surveys during appropriate seasons for identification, construction set-backs, restriction on construction timing) and mitigation for loss of foraging habitat for Swainson's hawk. Avoidance measures would include, but are not limited to, the species-specific measures presented below, which are summarized from the SJMSCP. Incidental take minimization measures for the hawk can be found in Section 5.2.4 of the SJMSCP.

- **Mitigation Measure BIO-1b: Avoid Disturbance of Nesting Swainson's Hawks.** In order to encourage the retention of known or potential Swainson's hawk nest trees (i.e., trees that hawks are known to have nested in within the past three years or trees, such as large oaks, which the hawks prefer for nesting), for any nest tree that becomes occupied during construction activities, all construction activities shall remain a distance of two times the dripline of the tree, measured from the nest. Alternatively, nest trees may be removed between September 1 and February 15, when the nests are unoccupied.

- **Mitigation Measure BIO-1c: Avoid Disturbance of Nesting Birds (except Swainson's Hawk).** If construction activities (i.e., ground clearing and grading, including tree removal of trees or shrubs) are scheduled to occur during the non-breeding season (September 1 through January 31), no mitigation is required. If construction activities are scheduled to occur during the breeding season (February 1 through August 31), the following measures are required to avoid potential adverse effects to nesting resident and migratory birds:

  - A qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitats within 500 feet of Project activities where access is available.

  - If active nests are found during preconstruction surveys, a no-disturbance buffer acceptable in size to the CDFG will be created around active nests during the breeding season or until it is determined that all young have fledged. Bird nests initiated during construction are presumed to be unaffected and no buffer is necessary. However, the "take" of any individuals will be prohibited.

  - If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by nesting birds or that are located outside the no-disturbance buffer for active nests may be removed.

b) **No Impact.** No riparian habitats or sensitive natural communities are located on the Proposed Project site. Therefore, no impacts would occur and no mitigation is required.

c) **No Impact.** No wetlands or other waters of the U.S. occur on the SWTF site, access road, or associated facilities. Therefore, no impacts would occur and no mitigation is required.

d) **No Impact.** Wildlife movement corridors link areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or areas of human disturbance or urban development. Topography and other natural factors, in combination with urbanization, can fragment or separate large open-space areas. The fragmentation of natural habitat creates isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species

diversity. Movement corridors mitigate the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange with separate populations.

The Proposed Project site is located west of Mokelumne River and Lodi Lake. The Mokelumne River provides a migratory corridor for wildlife that allows east-west movement. The Proposed Project would not remove, degrade or otherwise interfere substantially with the structure or function of this migratory wildlife corridor. Therefore, no impact would occur and no mitigation is required.

e) **Less Than Significant with Mitigation Incorporated.** The future SWTF site and access road contain several trees, which would be removed during construction. The City's policy contained in the recently adopted General Plan (Implementing Policy P-P13) requires a two-for-one replacement or transplantation for trees removed. In addition, the City regulates the removal of trees that are defined as "heritage trees." There are no trees at the RWPS site.

The number and species of trees that could potentially be removed during construction is shown in Table 4-2 and Figure 4-1. Compliance with the following mitigation measure will reduce the potential impacts to trees to less than significant.

Table 4-2. Trees Within the SWTF Site and Access Road

Tag #	Tree Type	DBH (in.)	Height (ft.)	Dripline (ft.)	Vigor	Remove	Comments
101	Valley oak	30	40	30	F	Remove	Pruned heavily for power lines
102	Interior live oak	30	40	30	F-G	Remove	
103	Interior live oak	15	30	15	G	Remove	
104	Interior live oak	16,8,4	35	20	F-G	Remove	Some dieback
105	Interior live oak	18,9	30	20	F-P	Remove	Shaded, dieback
106	Interior live oak	13,14	20	20	F-P	Remove	Shaded, leans, dieback
107	Valley oak	33	60	25	F-G	Remove	Weak crotch 25 feet up from trunk
108	Interior live oak	7	15	7	G		
109	Interior live oak	32	45	25	G	Remove	
110	Valley oak	32	40	20	F	Remove	Pruned heavily for power lines
111	Valley oak	18	35	20	G		
112	Interior live oak	21,19	40	20	F-P		One trunk decayed
113	Interior live oak	32	45	25	F		Weak crotch at co-dominant stems
114*	Valley oak	32	50	25	G		
115*	Valley oak	17	20	20	F-P		Shaded, leans
116*	Interior live oak	32,19	50	25	F-G		Decay at site of past stem removal

Tag #	Tree Type	DBH (in.)	Height (ft.)	Dripline (ft.)	Vigor	Remove	Comments
117	Interior live oak	17,15	40	20	F	Remove	Leans, dieback
118	Interior live oak	14,12	20	20	F	Remove	Leans, dieback
119	Interior live oak	29	45	25	P	Remove	Decay at base, nearly dead
120	Interior live oak	7,6	20	10	G	Remove	
121	Black locust	12,7,6,7,5	25	10	G	Remove	
122	Valley oak	19	60	20	G	Remove	
123	Interior live oak	16	35	15	G	Remove	
124	Interior live oak	11,11,10,7, 20,13,11	35	20	G	Remove	
125*	Valley oak	29	40	20	F		Weak crotch at co-dominant stems
126*	Interior live oak	7	15	10	G		
127*	Valley oak	18	35	15	G		
128*	Valley oak	16	30	10	G		
129*	Valley oak	11,17	30	15	G		

Key:
DBH – diameter breast height (multiple trunks)
F = fair
P = poor
G - good

- **Mitigation Measure BIO-2:** Pursuant to the City of Lodi General Plan, where tree removal is required, the City shall replace or transplant the removed tree. If replacement occurs, a two-for-one ratio and a minimum size of 15-gallon container trees will be used.

f) **No Impact.** The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) is approved as a state and federal Endangered Species Act permitting mechanism for covered projects within San Joaquin County. In 2001, The City adopted the SJMSCP, thereby allowing the City to use this plan to mitigate open space conversions while satisfying CEQA requirements. The City shall follow recommendations from the San Joaquin Council of Governments on implementation of SJMSCP requirements.

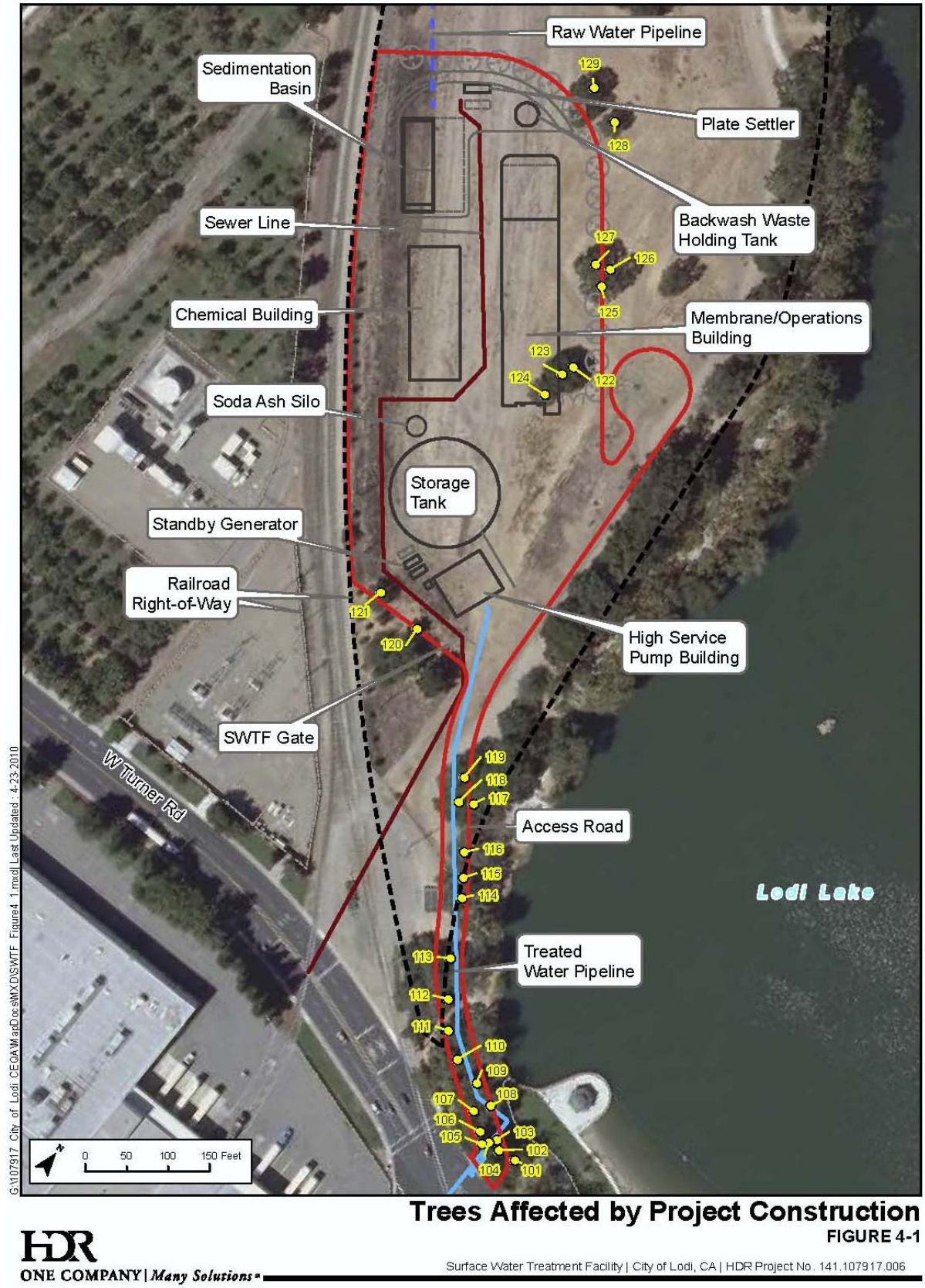


Figure 4-1. Trees Affected by Project Construction

Cultural Resources

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Discussion

Research Methods

Efforts to locate cultural resources within the Project area consisted of conducting a records search, review of previous investigations within and near the Proposed Project area, contacting the Native American Heritage Commission (NAHC) and Native American representatives, and a pedestrian field survey.

A records search was conducted on January 19, 2010, by staff at the Central California Information Center of the California Historical Resources Information System. During the records search, the State's database of cultural resources studies and recorded cultural resources sites was examined for the Project site and a 0.5-mile radius around the project area. Other sources consulted included national and state inventories and registers of cultural resources and pertinent historic maps.

The records search indicated that there were no prehistoric cultural resources identified in the immediate Project area. There are four historic resources located within the Project vicinity, but are not situated directly in the Project footprint. In addition, there are seven historic resources recorded within a 0.5-mile radius of the Project area. There is one prehistoric resource located within a half-mile radius of the Project area. This is CA-SJO-36 (P-39-172), which is an occupation and burial site.

The records search indicated that the SWTF site was formerly inspected for the presence of cultural resources (Clark, 1975; Napton and Greathouse, 1977), and that several other cultural resources surveys have been completed within 0.5 miles of the Project site.

Consultation

Native American consultation began on January 4, 2010, with a request to the NAHC to search its Sacred Lands file for the presence of Native American cultural resources in the Project vicinity. A list of Native American contacts was also requested. On January 28, 2010, letters were mailed to nine individuals, tribes, and tribal organizations, whose contact information was provided by the NAHC. The letters requested information regarding the existence of sites that may be affected by the proposed project. No responses have been received to date.

Surveys

A pedestrian and windshield survey was conducted of the Proposed Project area on January 6, 2010. The area was examined by driving along roads and road shoulders where visibility, access, and terrain allowed, and by walking the areas of the proposed pipelines, storage tank, silo, and water treatment facilities using intensive pedestrian survey techniques. No archaeological resources were located as a result of this survey.

A survey was conducted of built-environment resources (buildings, structures, and/or linear features) in the Proposed Project area on January 6, 2010. The survey consisted of driving and walking the area, and noting and photographing any built-environment resources that visually appeared to be at least 45 years old. One resource (UPRR) was noted to be within the Project area.

a) **No Impact**. One architectural resource was identified in the Project area (UPRR). The UPRR segment within the Project area was constructed in 1869 and has lost integrity due to alterations including modern ties, paving and signage. Because of a lack of integrity, the segment does not qualify as a significant resource for the purposes of CEQA. Accordingly there are no historical resources in the Project area for the purposes of CEQA. Therefore, no impact would occur and no mitigation is required.

b) **Less Than Significant with Mitigation Incorporated.** No archaeological resources were identified or are previously recorded in the Project area. However, the potential exists for buried archaeological resources to be inadvertently unearthed during construction, which would be a significant impact. Therefore, implementation of Mitigation Measure CR-1 would reduce this impact to less than significant.

- **Mitigation Measure CUL-1: Stop work if Archaeological Materials are discovered during construction.** If archaeological materials (such as chipped or ground stone, historic debris, building foundations, or non-human bone) are inadvertently discovered during ground-disturbing activities, the construction contractor will stop work in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and develop appropriate treatment measures. Treatment measures will be made in consultation with the City and other parties as appropriate. Treatment measures typically include development of avoidance strategies or mitigation of impacts through data recovery programs such as excavation or detailed documentation.

If cultural resources are discovered during construction activities, the construction contractor and lead contractor compliance inspector will verify that work is halted until appropriate treatment measures are implemented. Implementation of this mitigation measure may be sufficient to reduce impacts on archaeological sites to less than significant.

c) **Less Than Significant with Mitigation Incorporated.** No paleontological resources were observed or appear likely to be present in the Project area. However, it is possible, although unlikely, that human remains are buried and would be unearthed during construction activities. Implementation of Mitigation Measure CUL-1 would reduce this impact to less than significant.

d) **Less Than Significant with Mitigation Incorporated.** No known human remains are located within the Project area. However, it is possible that construction activities would result in the discovery of human remains. This potential impact is considered significant. Therefore, implementation of Mitigation Measure CR-2 would reduce this impact to less than significant.

- **Mitigation Measure CUL-2: Stop Work if Human Remains are Discovered.** If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary for the City to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the NAHC (Public Resources Code [PRC] 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, the City will not allow further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

  1. The San Joaquin County coroner has been informed and has determined that no investigation of the cause of death is required; and

  2. If the remains are of Native American origin:

     - The descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98, or

     - The NAHC was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the NAHC.

Geology, Soils, and Seismicity

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY, SOILS, AND SEISMICITY -- Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on 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 fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion

a) **Less Than Significant Impact.** The Project site is located in a large, northwestern-trending, asymmetric structural trough, filled with marine and continental sediments up to six miles thick. Stream-channel deposits of coarse sand occur along the Mokelumne River. The basin deposits are interbedded lacustrine, marsh, overbank, and stream-channel sediments deposited by the river.

The Project site is located 65 miles east of San Francisco Bay Area (Bay Area) and lies within Seismic Risk Zone 3. Earthquakes in Seismic Risk Zone 3 pose a lesser risk

than those experienced in Zone 4 (such as the Bay area). According to Jennings (1994), no active faults or Earthquake Fault Zones (Special Studies Zones) are located near the Project site. The nearest mapped fault to the Project site is related to the Stockton Fault Zone, which is located 13 miles to the south-southeast of the site, and the potentially-active Bear Mountains Fault Zone (Youngs Creek Fault) located 27 miles east of the site, the Rio Vista Fault 23 miles to the west, and the Vernalis Fault 25 miles to the south-southwest (Youngdahl, 2010). The nearest mapped active faults to the Project site are the Clayton and Marsh Creek faults located about 35 miles to the southwest and the historic Greenville Fault. According to Petersen et al. (1996), the Project site can probabilistically be expected to experience 0.2g (percent of gravity) from a seismic event during its design life, with a 10 percent chance of exceedance in 50 years). Because the site is not on an active or potentially active fault, the potential for surface fault rupture is low and the Proposed Project's impact would be less than significant.

Due to the absence of a permanent elevated groundwater table, the relatively low seismicity of the Project area, and the medium dense to dense nature of site materials (below the loose surface soils, the potential for damage due to site liquefaction, slope instability, and surface rupture are considered negligible (Youngdahl, 2010).

The Proposed Project will be designed in accordance with the 2007 California Building Code, Chapter 16 and constructed to meet the most current seismic and geotechnical standards As a result, any potential impact would be less than significant and no mitigation is required.

b) **Less Than Significant with Mitigation Incorporated.** The Proposed Project would include grading, cut-and-fill, and soil stockpiling, resulting in potential erosion impacts. The potential for erosion would be increased if these activities coincide with heavy winds or rain.

The Soil Survey of San Joaquin County (SCS, 1992) notes that soils at the Project site consist of the Tokay-Urban land complex, 0 to 2 percent slopes. The nearly level map unit is on low fan terraces. The unit is 50 percent Tokay fine sandy loam and 35 percent Urban land. Tokay soil is very deep and well drained, permeability is moderately rapid and available water capacity is high. The urban land consists of areas covered by impervious surfaces or structures, such as roads, driveways, sidewalks, buildings, and parking lots. The soil underneath is similar to nearby soils. Therefore, the Proposed Project could potentially result in the loss of topsoil associated with construction activities. This impact would be reduced to less than significant with the implementation of **Mitigation Measure HYDRO-1: Prepare and Implement SWPPP and Construction BMPs,** as discussed on pages 4-29 through 4-32.

c) **Less Than Significant Impact.** See discussion under a) above. Any potential impact would be less than significant and no mitigation is required.

d) **Less Than Significant Impact.** See discussion under a) above. Potential impacts are highly unlikely and are considered to be less than significant and no mitigation is required.

e) **No Impact.** No septic tanks or alternative wastewater disposal systems are necessary to support the Proposed Project. Therefore, no impact would occur and no mitigation is required.

Greenhouse Gas Emissions

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS -- Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion

a) **Less Than Significant Impact**. The Proposed Project would be considered to have a less than significant impact, if BPSs are implemented. The Proposed Project would implement BMPs to minimize operational costs. However, since the SJVAPCD has not yet developed BPSs for turbine pumps, raw water pumping stations, and/or water treatment plants, this impact analysis will consider the following:

1) Identification of any potential conflicts with the recommended actions identified in the AB 32 *Scoping Plan*.

2) Evaluation of the relative size of the Project. The Proposed Project's GHG emissions will be compared to the size of major facilities that are required to report GHG emissions (25,000 metric tons/year of CO_2E)[2] to the state; and the project size will be compared to the estimated state GHG reduction goal of 174 MMT of CO_2E per year by 2020. As noted above, the 25,000 metric ton annual limit identifies the large stationary point sources in California that make up 94 percent of the stationary emissions. If the Project's total emissions are below this limit, its total emissions are equivalent in size to the smaller projects in California that as a group only make up six percent of all stationary emissions. It is assumed that the activities of these smaller projects will not conflict with the State's ability to reach AB 32 overall goals. In reaching its goals, the CARB will focus upon the largest emitters of GHG emissions.

3) Evaluation of the basic energy efficiency parameters of the Project to determine whether its design is inherently energy efficient.

2 The State of California has not provided guidance as to quantitative significance thresholds for assessing the impact of greenhouse gas emissions on climate change and global warming concerns. Nothing in the *CEQA Guidelines* directly addresses this issue.

4) Evaluation of any potential conflicts with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

With regard to Item 1, the Proposed Project does not pose any apparent conflict with the most recent list of the CARB early action strategies. As a matter of fact, the Project would be creating an energy efficient water system, consistent with AB 32 Recommended Actions Measure No. W-3.

With regard to Item 2, the maximum GHG emissions that Project construction would generate would be approximately 241 metric tons per year of CO_2E. Project operations would generate approximately 3,382 metric tons per year of CO_2E (including emissions from vehicle trips, space heating, and indirect emissions from the use of electricity). Based on the Proposed Project's size, the Project would not be classified as a major source of GHG emissions; operational emissions would be about 14 percent of the lower reporting limit of 25,000 metric tons/year of CO_2E.

When compared to the overall state reduction goal of approximately 174 MMT per year of CO_2E, the maximum GHG emissions for the project (3,382 metric tons per year of CO_2E, or 0.002 percent of the state goal) are quite small and would not conflict with the state's ability to meet the AB 32 goals. Appendix A provides additional information regarding the GHG calculations, assumptions, and methodologies for the Proposed Project.

With regard to Item 3, there are, at a minimum, three elements of the Project's design that are inherently energy efficient and keep the generation of GHG emissions to a minimum. First, as noted above, the Project would implement BPSs that would help minimize electricity consumption, and thus minimize operational costs and GHG emissions. Second, the Project is relatively small in size and would not be considered a major source of GHG emissions. Third, the Project is efficiently located between the water source and existing water mains.

With regard to Item 4, the Project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. While the SJVAPCD has not yet established BPS for water treatment facilities and associated equipment, the Project would incorporate BMPs for water treatment facilities. The project would be consistent with the SJVAPCD's approach of implementing BPSs.

The Proposed Project would not conflict with the State's goals in AB 32 nor the SJVAPCD's guidance and policy for addressing GHG emissions, and therefore, this impact would be less than significant.

b) **Less Than Significant Impact**. As stated in a) above, the Proposed Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the GHG emissions. Therefore, this would be a less than significant impact.

Hazards and Hazardous Materials

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) 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?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion

a) **Less Than Significant with Mitigation Incorporated.** Project construction would involve the use of fuels, oils, and solvents, which could potentially lead to the accidental exposure of individuals and the environment to hazardous materials. During construction 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 aboveground 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 is considered a potentially significant impact. With the implementation of the proposed mitigation measures, this impact would be reduced to less than significant.

Project operation may involve the routine transport, use, storage, and/or disposal of hazardous materials. The proposed SWTF would use potentially hazardous materials in the treatment of surface water. Chemicals to be used for the membrane system and other treatment processes can be found in Tables 2-2 and 2-3 of this document. Sodium hypochlorite, sodium hydroxide, citric acid, sodium bisulfite, aluminum chlorohydrate, and zinc orthophosphate are considered potentially hazardous materials. In addition to these chemicals, paint thinners, paints, waste oils miscellaneous lubricating oils, laboratory solvents, compressed acetylene and oxygen gas, and diesel fuel may be stored in various small quantities throughout the Project site. Sodium hypochlorite would be used at the groundwater well sites.

Section 2.2.4, Chemical Storage, Pipelines, and Containment, discusses various mitigations for the SWTF. With these measures and implementation of the proposed mitigation measures below, this impact would be reduced to less than significant.

- **Mitigation Measure HAZ-1: Handling and Storage of Hazardous Materials**. The storage, handling, and use of construction-related hazardous shall be in accordance with applicable, federal, state, and local laws. Construction-related hazardous materials and hazardous wastes (e.g., fuels and waste oils) shall be staged and stored away from stream channels and steep banks to prevent these materials from entering surface waters in the event of an accidental release. Consideration shall also be given to keeping these materials at sufficient distance from nearby residences or other land uses. This includes materials stages for expected use, materials in equipment and vehicles, and waste materials.

- **Mitigation Measure HAZ-2: Compliance with Design Codes and Regulations**. The SWTF shall be designed to comply with all pertinent sections of the Uniform Building Code, Uniform Fire Code, and Hazardous Materials Management Plan. Final project design shall include, but not be limited to, the following design features and measures:

- Incompatible chemicals will be physically separated;
- Fire suppression and control systems in chemical storage areas will utilize the appropriate fire retardant;
- All spill collection systems, containment, and aprons will be contained on site for truck pick up and not routed to any storm drain system;
- Outdoor storage vessels will be protected from accidental vehicle contact; and
- Bulk liquid hazardous materials delivery areas will include a delivery vehicle spill containment with collection sump.

◈ **Mitigation Measure HAZ-3: Enforce Contractual Obligations**. The City shall ensure, through the enforcement of contractual obligations that all contractors transport, store, handle, and dispose of construction-related hazardous materials in a manner consistent with the relevant regulations and guidelines. At minimum, these regulations and guidelines include those recommended and enforced by the Caltrans, the RWQCB, the City's Fire Department, and San Joaquin County.

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 conditions required by the RWQCB-issued NPDES stormwater permit for construction activities would be followed 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 utilizing appropriate spill containment and countermeasures. If required by the City's Fire Department, the San Joaquin County Office of Emergency Services, or any other regulatory agency, contaminated media shall be collected and disposed of at offsite facility approved to accept such media.

b) **Less Than Significant with Mitigation Incorporated.** The operation of the Proposed Project could create an additional significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. As with all construction activities, accidents could occur and release hazardous materials into the environment. If the SWTF has hazardous materials above threshold limits, then with the incorporation of **Mitigation Measures HAZ -2** and **HAZ-3**, identified above, this impact would be reduced to less than significant.

c) **No Impact.** The Proposed Project would not be constructed within one-quarter mile of an existing or proposed school. Therefore, construction of the Proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. As a result, no impact would occur and no mitigation is required.

d) **No Impact.** The Proposed Project is not located on sites known to be included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, therefore, would not create a significant hazard to the public or the environment. As a result, no impact would occur and no mitigation is required.

e) **No Impact.** The Proposed Project is not located within an airport land plan or within two miles of an airport. The Lodi Airport is more than four miles northeast of the Project site.

f) **No Impact.** The Proposed Project is not located within the vicinity of a private air strip. As a result, no impact would occur and no mitigation is required.

g) **No Impact.** The Proposed Project would not impair the implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan. As a result, no impact would occur and no mitigation is required.

h) **No Impact.** The Proposed Project would be constructed in an urbanized area and would not be constructed in an area where the risk of a wildland fire could occur. Therefore, no impact would occur and no mitigation is required.

Hydrology and Water Quality

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) 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 which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing 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 off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☒	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion

a) **Less Than Significant with Mitigation Incorporated.** Construction and operation of the Proposed Project have the potential to adversely affect water quality through the exceedance of applicable water quality standards or waste discharge requirements (WDRs).

Construction

During site grading, trenching, and construction activities, areas of bare soil would be exposed to erosive forces. Bare soils are much more likely to erode than vegetated areas due to the lack of dispersion, infiltration, and retention created by covering vegetation. Construction activities involving soil disturbance, excavation, cutting and filling, stockpiling, and grading activities could result in increased erosion and sedimentation to surface waters. In addition, hazardous materials associated with construction equipment could adversely affect surface and groundwater quality if spilled or stored improperly. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff, a major contributor to the degradation of water quality.

The federal Clean Water Act requires that construction sites greater than one acre be covered under the General Permit for Discharges of Storm Water Associated with Construction Activity. Construction activities, including the staging area and drainage connections, would exceed one acre, and therefore, would be required to obtain coverage under this permit. The permit would require that the City (or its designated contractor) submit a Notice of Intent to the SWRCB in order to be covered by the General Permit prior to the commencement of construction. The General Permit requires the preparation and implementation of a SWPPP, which must be prepared before construction begins. Components of a SWPPP typically include specifications for BMPs that must be implemented during project construction in order to minimize the discharge of pollutants in stormwater from the construction area, and identification of a plan to inspect and maintain project BMPs and facilities. The SWPPP would instruct and inform construction workers of appropriate practices to reduce stormwater runoff, erosion of loose sediments, and handling of potentially hazardous materials as well as measures to minimize the amount of pollutants in runoff after construction is completed. Implementing the following mitigation measure would minimize or eliminate potential water quality impacts associated with construction surface water runoff, resulting in a less-than-significant impact.

- **Mitigation Measure HYDRO-1: Prepare and Implement a SWPPP and Construction BMPs.** The SWPPP will include a grading and erosion control plan required for all construction plans to address potential erosion during construction. This requirement will be integrated with the Project SWPPP, provided that it meets the requirements of both the City and the RWQCB.

All construction plans and activities shall implement BMPs to provide effective erosion, runoff, and sediment control. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Performance and effectiveness of these BMPs shall be determined either by visual means where applicable (i.e., observation of above-normal sediment release) or by actual water sampling in cases where verification of contaminant reduction or elimination (inadvertent petroleum release) is required by the RWQCB to determine adequacy of the measure.

The grading and erosion control plan shall include specific measures to accomplish erosion and sediment control and to minimize the removal of natural vegetation. The plan shall include, but is not limited to, the following measures.

- Grading activities will be scheduled for the dry season only (April 15 to October 15), to the extent possible. This will reduce the chance of severe erosion from intense rainfall and surface runoff, as well as the potential for soil saturation in swale areas.

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

- Temporary erosion control measures will be provided until perennial revegetation or landscaping is established and can minimize discharge of sediment into nearby waterways.

- After pipelines and other underground facilities are installed, compacted backfill shall be placed and the ground surface shall be restored to its original condition and topography.

- Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas. Temporary or permanent soil disposal stockpile areas must be outside jurisdictional wetlands, riparian areas, and oak woodlands. Stockpiles remaining onsite through the wet season shall be protected (e.g., with straw bales) to prevent erosion.

- After completion of grading, erosion protection will be provided on all cut-and-fill slopes. Revegetation will be facilitated by mulching, hydroseeding, or other methods and shall be initiated as soon as possible after the completion of grading and prior to the onset of the rainy season (by November 1).

- Permanent revegetation and landscaping will emphasize drought-tolerant perennial ground coverings, shrubs, and trees to improve the probability of slope and soil stabilization without adverse impacts to slope stability from irrigation infiltration and long-term root development.

- BMPs selected and implemented for the Project will be in place and operational prior to the onset of major earthwork on the site. The construction phase facilities will be maintained regularly and cleared of accumulated sediment as necessary.

- Hazardous materials such as fuels and solvents used on the construction sites will be stored in covered containers and protected from rainfall, runoff, and vandalism. A stockpile of spill cleanup materials will be readily available at all construction sites. Employees will be trained in spill prevention and cleanup, and individuals will be designated as responsible for prevention and cleanup activities.

Operation

The Proposed Project would comply with applicable water quality standards and WDRs. Therefore, potential impacts associated with operations would be considered less than significant and no mitigation is required.

b) **No Impact.** The Proposed Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Currently the water supply for the City is provided by groundwater wells. The primary purpose of the proposed SWTF is to provide a secure, reliable supplemental supply of water for the City to meet the current and future water needs while reducing dependence on groundwater. Therefore, no impact would occur and no mitigation is required.

c) **Less Than Significant with Mitigation Incorporated.** During construction, the site drainage pattern would be temporarily altered. Surface water runoff volumes and rates generated from undeveloped, unpaved areas could increase significantly when the site is paved and the capability of surface water infiltration is reduced or eliminated. The Proposed Project facilities and access road would substantially increase impervious surface area. Therefore, with the incorporation of Mitigation Measure HYDRO-1, identified above, construction and operation impacts would be reduced to less than significant.

d) **Less Than Significant with Mitigation Incorporated.** The Proposed Project could alter the drainage pattern of the site or area in a manner that could result in flooding either onsite or offsite. However, with the incorporation of Mitigation Measure HYDRO-1, identified above, this impact would be considered less than significant.

e) **No Impact.** The Proposed Project would not create or contribute runoff water that would exceed the capacity of the City's stormwater drainage systems or provide substantial additional sources of polluted runoff. Stormwater collection at the SWTF would comply with the City's Stormwater Management Program. The storm drain system would connect to the existing stormwater pump station near the SWTF entrance. Therefore, no impact would occur and no mitigation is required.

f) **Less Than Significant With Mitigation Incorporated.** The Proposed Project would not substantially affect water quality. As discussed earlier, construction could result in minor, temporary, and highly localized soil erosion and siltation issues. It is expected that groundwater would be encountered in excavations. Temporary groundwater control would be required to lower the groundwater level below the bottom of excavation and to provide a relatively dry and stable subgrade. Operation would increase the amount of impervious surfaces. With the incorporation of Mitigation Measure HYDRO-1, identified above, potential impacts to water quality would be reduced to less than significant.

g) **No Impact.** The Proposed Project would not redirect flood flows or otherwise place housing within a 100-year flood hazard area. No impact would occur and no mitigation is required.

h) **No Impact.** The Federal Emergency Management Agency (FEMA) is responsible for predicting hazards related to floods. It forecasts the levels of inundation under various conditions and relates the information on Flood Insurance Rate Maps (FIRMs). The FIRM for the Project area places the RWPS, SWTF, and pipelines outside of the 100-year floodplain. The Proposed Project is located in Zone X (unshaded), which is defined as an area of minimal flood hazard and above the 500-year flood level and protected by a levee from the 100-year flood. Therefore, no impact would occur and no mitigation is required.

i) **No Impact.** The Proposed Project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding resulting from a levee or dam failure. No impact would occur and no mitigation is required.

j) **No Impact.** The Proposed Project is separated by a berm from the Mokelumne River; however, risks associated with a seiche or tsunami are not anticipated. In addition, the Project site is essentially level, with minimal hazards from mudflows. Therefore, no impact would occur and no mitigation is required.

Land Use and Planning

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING --Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion

a) **No Impact.** The Proposed Project would not physically divide an established community. The Proposed Project would be located within the city limits and constructed on city-owned property. Land uses surrounding the Project site include industrial and low density residential. Therefore, the Proposed Project would not result in a disruption, physical division, or isolation of residential or open space areas. As a result, no impact would occur and no mitigation is required.

b) **No Impact.** The Proposed Project would be constructed on land currently owned by the City. The Project site is zoned as Open Space. Areas surrounding the Project site are zoned for industrial and low density residential. The Proposed Project is in compliance with the City's General Plan and would not conflict with any applicable land use plan, policy, or regulation. Therefore, no impact would occur and no mitigation is required.

c) **No Impact.** The Proposed Project would not conflict with the provisions of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP)**.** In 2001, The City adopted the SJMSCP, thereby allowing the City to use this plan to mitigate open space conversions while satisfying CEQA requirements. Therefore, no impact would occur and no mitigation is required.

Mineral Resources

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion

a) **No Impact.** The Proposed Project site has not been identified as a significant source of mineral resources. Specifically, the Proposed Project is in an area classified by the State Geologist as MRZ-1, meaning it is highly unlikely to contain significant mineral resources. As a result, the Proposed Project would not result in the loss of availability of known mineral resources. Therefore, no impact would occur and no mitigation is required.

b) **No Impact.** The City's General Plan does not identify any locally important mineral resources or recovery sites in the Proposed Project's area. Further, as discussed in a), the Proposed Project would be unlikely to result in the loss of availability of a mineral resource deposit that has been identified as a mineral resource of value. Therefore, no impact would occur and no mitigation is required.

Noise

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☒
f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion

Noise sensitive receptors (land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise) typically include residential dwellings, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. Noise measurements and observations were taken near the Project site on January 26 through 28, 2010. The nearest sensitive receptors to the Project site include the mobile home park approximately 90 feet southeast of the proposed RWPS site, the residences approximately 280 feet northwest and Lodi Lake Park approximately 500 feet southeast of the proposed SWTF, and residences approximately 25 feet east of the proposed distribution pipeline alignment along North Mills Avenue.

Noise measurements and observations were taken near the Project site on January 26 through 28, 2010. To quantify existing ambient noise levels in the immediate project vicinity, short-term and long-term continuous noise levels were measured. Noise measurements were made

using Metrosonics db308 Sound Level Meters. Figure 4-2 shows the location of each of the noise measurements. The continuous (48-hour) noise level measurement locations were selected to measure existing noise sources and to measure locations that could be affected by the project. The noise measurements are summarized in Table 4-3.

Noise Measurement Locations
FIGURE 4-2
Surface Water Treatment Facility | City of Lodi, CA | HDR Project No. 141.107917.006

HDR ONE COMPANY | *Many Solutions*

Figure 4-2. Noise Measurement Locations

Table 4-3. Existing Noise Environment at Project Site

Location	Time Period	Leq (decibels)	Noise Sources
Site 1: 50 feet from center of Lower Sacramento Road and Carolina Street	24-hour CNEL measurements: 1/27/10: 66 1/28/10: 66	Hourly Averages ranged from 52 - 66	Unattended noise measurements do not specifically identify noise sources.
Site 1: 50 feet from center of Lower Sacramento Road and Carolina Street	1/26/10 from 11:57 am – 12:07 pm	5-minute Average Noise Levels: 64, 66	Noise from traffic. 3 axle truck, 73 dBA
Site 2: 50 feet from center of Lower Sacramento Road at railroad crossing	1/26/10 from 12:22 – 12:32 pm	5-minute Average Noise Levels, Leq 62, 63	Noise from traffic. Speeding vehicle, 75 dBA
Site 3: 25 feet from center of North Mills Avenue and Holly Drive	24 hour CNEL measurements were: 1/27/10: 70 1/28/10: 68	Hourly Averages ranged from 53 - 73	Unattended noise measurements do not specifically identify noise sources.
Site 3: 50 feet from center of North Mills Avenue and Holly Drive	1/26/10 12:59 – 1:09 pm	5-minute Average Noise Levels, Leq 63, 59	Noise from traffic. Diesel truck approximately 10 feet away, 75 dBA
Site 4: 25 feet from center of North Mills Avenue and Lockeford Street	24 hour CNEL measurements were: 1/27/10: 68 1/28/10: 69	Hourly Averages ranged from 50 - 69	Unattended noise measurements do not specifically identify noise sources.
Site 4: 50 feet from center of North Mills Avenue and Lockeford Street	1/26/10 1:26 – 1:36 pm	5-minute Average Noise Levels, Leq 61, 68	Noise from traffic. Trash truck, 83 dBA Old truck, 72 dBA

Figures Noise-2 through 7 in Appendix B how the hourly values for L_{eq}, L_{max},[3] L_2,[4] and L_{90}[5] in each hour of the long-term measurements for January 27 and 28, 2010.

The existing ambient noise levels along the Project site and in the immediate Project vicinity are defined primarily by trucks and cars on Lower Sacramento Road and North Mills Avenue. Additional noise sources observed in the area include miscellaneous sources such as music, birds, church bells, airplanes flying overhead, and traffic on other nearby roadways. Operable railroad tracks cross through the Project area, although no trains were observed. Short-term measurements near the Project site indicate that average noise levels range from 41 to 68 L_{eq} dBA and are primarily dependent upon the type and speed of, and distance from the vehicle.

3 L_{max} is the highest instantaneous noise measurement during any measurement period.

4 L_2 is the noise level equaled or exceeded for 2 percent (approximately one minute for hourly measurements) of the specified measurement period.

5 L_{90} is the noise level equaled or exceeded for 90 percent of the specified measurement period. It is often referred to as the background noise level.

Site 1 (Table 4-3) recorded noise levels near the proposed RWPS site at Lower Sacramento Road and Carolina Street. Two days of continuous sound level measurements along Lower Sacramento Road indicate that the average noise level at 50 feet west of the centerline of Lower Sacramento Road (at the current fenceline of the proposed RWPS) was 66 dBA CNEL and the hourly L_{eq} range is approximately 52 to 66 dBA. Short-term daytime measurements at the same location ranged from 64 to 66 dBA. These existing noise levels are presumed to be acceptable for manufacturing and other industrial facilities, but are considered normally unacceptable for mobile homes.

Existing roadway noise levels along North Mills Avenue were also measured at Holly Drive (Site 3) and Lockeford Street (Site 4), both near the proposed distribution pipeline alignment. Two days of continuous measurements at Site 3 indicate that the existing noise level range is approximately 68 to 70 dBA CNEL and the hourly L_{eq} range is approximately 53 to 73 dBA. Short-term daytime measurements at the same location ranged from 59 to 63 dBA. Two days of continuous measurements at Site 4 indicate that the existing noise level range is approximately 68 to 69 dBA CNEL and the hourly L_{eq} range is approximately 50 to 69 dBA. Short-term daytime measurements at the same location ranged from 61 to 68 dBA. These existing noise levels are considered normally unacceptable for residential land uses.

a) **Less Than Significant with Mitigation Incorporated.** Construction is expected to last for approximately 18 months. Construction activities would require the use of numerous pieces of noise-generating equipment, such as jackhammers, pneumatic impact equipment, saws, and tractors. Pile driving is not anticipated as part of the Project. 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. Construction activities associated with development of the Project would result in a temporary increase in ambient noise levels in the vicinity of construction. The increase in noise could result in temporary annoyance to residents and park users immediately adjacent to the construction site. However, proposed construction activities would occur only during the hours permitted in accordance with the City's Noise Regulations.

Noise levels typically associated with outdoor construction noise levels are listed in Tables 4-4 and 4-5.

Table 4-4. Typical Construction Noise Levels

Construction Phase	Noise Level (dBA Leq)
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

Notes: 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.
dBA = A-weighted decibel; Leq = equivalent sound level
Source: USEPA, 1971

Table 4-5. Typical Noise Levels from Construction Equipment

Construction Equipment	Noise Level (dBA Leq at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Scraper	88
Jackhammer	88
Dozer	87
Paver	89
Generator	76
Piledriver	101
Backhoe	85
Notes: dBA = A-weighted decibel; Leq = equivalent sound level *Source: Cunniff, 1977*	

Noise from construction activities generally attenuates at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Where topography or physical structures obstruct a line of sight from the noise-producing equipment to the receptor location, noise levels would be reduced (generally by at least 5 dBA).

As shown in Tables 4-4 and 4-5, the estimated construction noise levels at a distance of 50 feet could reach almost 90 dBA Leq, if there are no intervening barriers (excluding pile driving). Pile driving would be higher; however, it is not anticipated for the project. The proposed construction activities could be within 25 feet of the nearest home east of the proposed distribution pipeline alignment. Noise levels could reach almost 98 dBA and would likely violate the City's General Noise Regulations. Therefore, cconstruction noise would be considered a potentially significant impact. In order to reduce or mitigate short-term noise impacts to nearby noise sensitive receptors, the City would be required to restrict construction between the hours of 7:00 a.m. and 10:00 p.m., per Noise Regulation 9.24.030 and should incorporate the additional mitigation measures identified below. Implementation of Mitigation Measure Noise-1 would reduce the potential construction noise impacts to less than significant.

Operation of the Project could increase noise levels at the Project boundaries depending upon the actual equipment installed and the level of insulation that is provided. The noise levels of the new equipment would be reduced to acceptable project boundary limits. The design of the RWPS and SWTF would incorporate elements to attenuate the noise generated by the pumps and motors. These design elements would include acoustical barrier panels on the pump room walls and use of acoustical louvers. However, without

proper insulation of the pump stations, noise levels could be more than five dBA over the ambient noise level at the property line of any residential property between the hours of 10:00 p.m. and 7:00 a.m. and have a significant adverse impact on nearby residences. As shown in Appendix B, the lowest ambient noise level (L_{90}) between 10:00 p.m. and 7:00 a.m. is 42 dBA. Implementation of Mitigation Measure Noise-2 would reduce this potential impact to less than significant.

The volume of traffic visiting the SWTF would be minor. The approximately six employees and any visitors would arrive by automobile; however, a few large trucks would arrive for deliveries and maintenance. The Project would have a less-than-significant impact on traffic-related noise.

- **Mitigation Measure Noise-1: Minimize Noise during Construction.** The following measures shall be implemented during construction:

  - Construction activities shall be limited from 7:00 a.m. to 10:00 p.m.
  - Generators, if utilized, shall be located as far as practical from sensitive noise receptors.
  - Depending on the type of equipment used and the location and duration of the activity, physical reduction measures such as temporary noise barriers that provide separation between the source and the receptor (e.g., temporary soundproof structures to house portable generators) shall be provided.
  - Construction equipment that is equipped, operated, and maintained with manufacturer recommended mufflers or the equivalent shall be utilized.
  - The City shall post signs at the construction site that shall include permitted construction days and hours, expected timeframe for construction, and a day and evening contact number for complaints about construction noise and vibration.

- **Mitigation Measure Noise-2: Minimize Noise during Operation.** The RWPS and SWTF shall be designed to be consistent with the City's Noise Regulation 9.24.030. Based on the noise measurements, existing ambient noise levels between the hours of 10:00 p.m. and 7:00 a.m. currently range between 42 and 53 dBA at nearby residences. So as not to exceed the lowest ambient noise level by more than five decibels, noise levels from pumps and motors shall be reduced to 45 dBA or below at the property line of the nearest residential property, including the mobile home park approximately 90 feet southeast of the proposed RWPS and the residences approximately 280 feet northwest of the proposed SWTF.

b) **Less Than Significant Impact**. Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically cause a nuisance only to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically an annoyance only indoors, where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves.

Peak particle velocity (PPV) relates to the maximum instantaneous peak of the vibration signal and is often used in measuring the magnitude of vibration. Construction vibration is analyzed in accordance with standards established by the Transportation and Construction-Induced Vibration Guidance Manual issued by the California Department of Transportation (Caltrans), as shown in Table 4-6. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. Transient sources create a single isolated vibration event, such as tractor-trailer movements. Thresholds are provided for both structural damage and annoyance. Structural damage thresholds are considered the CEQA significance thresholds; however, annoyance thresholds are also provided for the purposes of context.

Table 4-6. Vibration Exposure Thresholds

Type of Structure	Threshold	Maximum Peak Particle Velocity (inches/second)	
		Continuous Sources	Transient Sources
Older residential structures	Structural damage	0.3	0.5
	Annoyance	0.1	0.9
Newer residential structures	Structural damage	0.5	1.0
	Annoyance	0.1	0.9
Source: Caltrans, 2004			

Construction activities can produce vibration that may be felt by adjacent uses. The Project construction is not expected to require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary sources of vibration during construction would be from bulldozers, backhoes, crawler tractors, and scrapers. If required, a vibratory roller would produce the greatest amount of vibration on the Project site during typical construction activities, with a 0.210 PPV at 25 feet. If pile driving were required for building footings, these activities could produce a maximum 1.518 PPV at 25 feet.

As noted earlier, the nearest sensitive receptor to the proposed RWPS site is the mobile home park approximately 90 feet to the southeast. The nearest residence to the proposed

SWTF site is approximately 280 feet to the northwest. The nearest residences along North Mills Avenue could be as close as 25 feet east of the pipeline. According to Caltrans, vibration impacts are only a potential impact (even considering the vibration from an impact pile driver) within 100 feet of structures (Caltrans, 2002). To be conservative, these residences are classified as "older" residential structures, and therefore, have a continuous vibration exposure structural damage threshold of 0.3 PPV and an annoyance threshold of 0.1 PPV. Depending on the actual location of the transmission pipeline, the nearest construction activities could be approximately 25 feet from residences and would include the use of typical small size construction equipment such as backhoes, graders, jackhammers and dump trucks. Table 4-7 provides the estimated construction vibration levels at the residences.

Table 4-7. Estimated Maximum Construction Vibration Levels

Receptor	Distance From Nearest Construction Activity (feet)	Predicted Maximum Peak Particle Velocity (inches/second)	Significance Thresholds (inches/second)	
			Structural Damage	Annoyance
Residences east of North Mills Avenue	25	0.21[1,2]	0.3	0.1
Mobile Home Park east of Lower Sacramento Road	90 (90 if pile driving were required)	0.03[1,2] (0.22 if pile driving were required)	0.3	0.1

Notes:

[1] Predicted Maximum Peak Particle Velocity (PPV) assumed a worst-case scenario of a vibratory roller operating at the given distance from the nearest residence.

[2] Federal Transit Administration, 2006.

As shown in Table 4-7, 0.21 PPV is the maximum vibration the residences would be expected to experience. These vibration levels are below the 0.3 PPV structural damage significance threshold. However, the 0.21 PPV exceeds the 0.1 PPV annoyance threshold. As noted earlier, structural damage thresholds are considered the CEQA significance thresholds and the annoyance thresholds are provided for the purposes of context. Therefore, vibrations from vibratory rollers would be considered less than significant. PPV from backhoes, graders, jackhammers and dump trucks at 25 feet would be well below the significance threshold. By providing a contact for reporting and potentially addressing complaints about construction noise and vibration, implementation of **Mitigation Measure Noise-1** would mitigate the vibration levels that could be considered annoying.

c) **Less Than Significant with Mitigation Incorporated**. See discussion under Noise item a) above. Implementation of **Mitigation Measure Noise-**2 would reduce the impact to less than significant.

d) **Less Than Significant with Mitigation Incorporated**. As discussed above in a), the project would result in an incremental increase in temporary or periodic noise levels in the area due to the short-term construction activities for the project. Implementation of **Mitigation Measure Noise-1** would reduce the impact to less than significant.

e) **No Impact**. The Proposed Project is not located within an airport land plan or within two miles of an airport. Therefore, no impact would occur and no mitigation is required.

f) **No Impact**. The Proposed Project is not within the vicinity of a private airstrip. The Project would not increase onsite exposure to aircraft noise. Therefore, no impact would occur and no mitigation is required.

Population and Housing

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

a) **Less Than Significant Impact.** The SWTF would not induce substantial population growth in an area, either directly or indirectly. The purpose of the Proposed Project is to protect and restore groundwater resources and to provide adequate water supply to accommodate short-term and long-term growth. The SWTF is being designed to fully utilize 6,000 AFY of WID water. Currently the water supply for the City is provided by groundwater wells. The Proposed Project would not induce substantial population growth, and therefore, would be considered a less than significant impact and no mitigation is required.

b) **No Impact.** The Proposed Project would not result in displacing any numbers of housing units or necessitating the construction of replacement housing elsewhere. The Proposed Project site is located on vacant city-owned property. Construction of the Proposed Project would not demolish any houses and would not affect any other housing structures. As a result, the Proposed Project would not displace existing housing, and therefore, no impact would occur and no mitigation is required.

c) **No Impact.** The Proposed Project would not displace any numbers of people, necessitating the construction of replacement housing elsewhere. The Proposed Project site is located on city-owned property. Construction of the Proposed Project would not demolish any housing and other housing structures. As a result, the Proposed Project would not displace people from their homes. Therefore, no impact would occur and no mitigation is required.

Public Services

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
i) Fire protection?	☐	☐	☐	☒
ii) Police protection?	☐	☐	☐	☒
iii) Schools?	☐	☐	☐	☒
iv) Parks?	☐	☐	☐	☒
v) Other public facilities?	☐	☐	☐	☒

Discussion

a) **No Impact.** The Proposed Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, or the need for new or physically altered governmental facilities. The operation and maintenance of the Proposed Project would not be labor-intensive, and therefore, would not substantially increase the need for city staff. The Proposed Project would not increase the demand for the kinds of public services (e.g., schools, parks, fire, police, or other public facilities) that would support new residents. The Proposed Project would not substantially increase the demand for police and fire protection. As a result, no impact would occur and no mitigation is required.

Recreation

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

a) **No Impact.** The Proposed Project would not contribute to population growth. The Proposed Project would only meet the current needs of the City. Therefore, the Proposed Project would not 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. In addition, the Proposed Project would not impact the Lodi Lake Park located east of the SWTF site. As a result, no impact would occur and no mitigation is required.

b) **No Impact.** The Proposed Project does not include or require construction or expansion of recreational facilities. Furthermore, as discussed in a) above, the Proposed Project would not increase the demand for recreational facilities nor would it impact Lodi Lake Park. As a result, no impact would occur and no mitigation is required.

Transportation/Traffic

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC -- Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☒	☐	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

Discussion

a) **Less Than Significant With Mitigation Incorporated**. The Proposed Project site is located within city limits near the section of Turner Road and Lower Sacramento Road (Figure 2-1 in Chapter 2, Project Description). As discussed in Section 2.2.5, an access road from the SWTF would be constructed to the intersection of Turner Road and North Mills Avenue. As part of the Proposed Project, signal modifications would occur to accommodate a four-leg intersection (Figure 2-6). This would allow traffic to move smoothly through the intersection.

Construction

Construction activities would occur over approximately 18 months and would be limited to weekdays from 7:00 a.m. to 7:00 p.m. Potential traffic-generating construction activities would consist of truck and equipment deliveries and the daily arrival and departure of construction workers. The proposed truck routes would include State Route 99, Turner Road, Stockton Street, and Lower Sacramento Road.

During construction, an average of five to 10 construction workers are expected to work at the Project site and a maximum of 12 construction workers would be onsite during the most intense construction activities. It is expected that each construction worker would drive alone to the Project site, generating up to 12 round-trips (24 one-way trips) each day during the most intense construction activities.

Construction would not disrupt transportation and circulation patterns in the vicinity of the Proposed Project site. Construction-generated traffic would be temporary and would be limited to bringing empty trucks and equipment to the SWTF during earthwork activities. Construction equipment and trucks would remain onsite until completion of construction activities. As a result, potential traffic-related impacts are highly unlikely and are considered to be less than significant and no mitigation is required.

The treated water pipeline would exit the SWTF site at the intersection of Turner Road and North Mills Avenue, where it would run south down North Mills Avenue. Construction would involve trenches construction at the intersection and open-cut trenching along North Mills Avenue.

Construction would temporarily disrupt transportation and circulation patterns in the vicinity of the Proposed Project, thus disrupting local vehicular, bicycle, and pedestrian traffic along haul routs. Although construction-generated traffic would be temporary, during peak excavation and earthwork activities, the Proposed Project could generate up to 30 round-trip truck trips per day. However, average daily truck trips would be less and would range from about 5 to 10 round-trips per day during construction. The primary impacts from the movement of trucks would include short-term and intermittent lessening of roadway capacities due to the trucks' slower movements and larger turning radii compared to passenger vehicles. Implementation of the following mitigation measures would reduce potential impacts to less than significant.

Operation

Operation of the Proposed Project would require six employees at the SWTF; therefore, there would be minimal increase in traffic along city streets. In addition, there would be periodic deliveries. As a result, no impact would occur and no mitigation is required.

- **Mitigation Measure TR-1: Prepare Traffic Control Plan.** The City shall require the contractor to prepare a traffic control plan to show specific methods for maintaining traffic flows. Examples of traffic control measures to be considered include (1) use of flaggers to maintain alternating one-way traffic while working on one-half of the street;

(2) use of advance construction signs and other public notices to alert drivers of activity in the area; and (3) use of "positive guidance" detour signing on alternate access streets to minimize inconvenience to the driving public.

- **Mitigation Measure TR-**2: **Haul Route Maintenance**. Following construction, the City shall ensure that road surfaces damaged during construction are returned to their pre-construction condition.

b) **No Impact.** The Proposed Project would not temporarily exceed, either individually or cumulatively, current LOS standards. Traffic generally moves smoothly, without much congestion, in Lodi. Most streets in Lodi operate at a LOS C or better, which is the threshold for acceptable operations consistent with the Lodi General Plan (City of Lodi, 2009a). Lower Sacramento Road, Mills Road, and Turner all have a LOS A (indicating free-flow traffic conditions with little or no delay) in the Project area (City of Lodi, 2009a). Therefore, no impact would occur and no mitigation is required.

c) **No Impact.** The Proposed Project would not involve use of air transit, nor is it expected to cause any change in air traffic patterns. Therefore, no impact would occur and no mitigation is required.

d) **No Impact.** The Proposed Project does not propose to make changes to roadways that would create road hazards or alter design features developed to mitigate such hazards. As discussed in Section 2.2.5, an access road from the SWTF would be constructed to the intersection of Turner Road and North Mills Avenue. As part of the Proposed Project, signal modifications would occur to accommodate a four-leg intersection (Figure 2-6). This would allow traffic to move smoothly through the intersection. Therefore, no impact would occur and no mitigation is required.

e) **No Impact.** The Proposed Project would not affect traffic flow, resulting in delays for emergency vehicle access in the vicinity of the Project. Most streets in Lodi operate at a LOS C or better, which is the threshold for acceptable operations consistent with the Lodi General Plan (City of Lodi, 2009a). Lower Sacramento Road, Mills Road, and Turner all have a LOS A (indicating free-flow traffic conditions with little or no delay) in the Project area (City of Lodi, 2009a). Therefore, no impact would occur and no mitigation is required.

f) **No Impact.** Project-related construction activities would temporarily require additional parking for workers and equipment. However, the Proposed Project contains sufficient space to accommodate the parking needs for construction workers and equipment. As a result, no impact would occur and no mitigation is required.

g) **No Impact.** The Proposed Project would not cause a demand for alternative transportation. In addition, the Proposed Project would have no impact on alternative transportation facilities. Therefore, no impact would occur and no mitigation is required.

Utilities and Service Systems

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

a) **No Impact.** The Proposed Project would not exceed wastewater treatment requirements of the Central Valley Regional Water Quality Control Board. The Proposed Project would not discharge wastewater to either surface water or groundwater. Any wastewaters from the SWTF would be sent directly to the sewer. Therefore, no impact would occur and no mitigation is required.

b) **No Impact.** The purpose of the Proposed Project is to protect and restore groundwater resources by constructing the Proposed Project. Environmental effects that may result from implementation of the Proposed Project are analyzed in this document and specific

mitigation measures are proposed to reduce potential impacts, where identified within this document, to less than significant.

c) **No Impact.** The Proposed Project would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities. The storm drain system would connect to the existing stormwater pump station near the SWTF entrance. Therefore, no impact would occur and no mitigation is required.

d) **No Impact.** No new or expanded water supplies or entitlements would be required under or as a result of the Proposed Project beyond those already obtained. The Proposed Project would have sufficient water supplies available to serve the project from its existing WID contract of 6,000 AFY. Therefore, no impact would occur and no mitigation is required.

e) **Less Than Significant Impact.** Wastewater from the SWTF would be sent directly to existing wastewater facilities. The wastewater treatment provider has adequate capacity to serve the Proposed Project's projected demand. Therefore, the impact is considered to be less than significant and no mitigation is required.

f) **No Impact.** Construction and operation of the Proposed Project would not generate a significant amount of solid wastes. Therefore, no impact would occur and no mitigation is required.

g) **No Impact.** The Proposed Project would comply with all relevant federal, state, and local statutes and regulations related to solid waste. Therefore, no impact would occur and no mitigation is required.

Mandatory Findings of Significance

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion

a) **Less Than Significant with Mitigation Incorporated.** The Proposed Project could have potential effects on aesthetics, air quality, biological resources, cultural resources, water quality, and noise. However, these effects would be mitigated by the design of the Proposed Project and the implementation of **Mitigation Measures AE-1, AE-2, AIR-1, BIO-1, BIO-2, CUL-1, CUL-2, HYDRO-1, NOISE-1, and NOISE-2**. The City has adopted these measures as part of the construction mitigation strategy for the Proposed Project. The particular impacts, as well as the Proposed Project design elements and mitigation measures that would reduce them below a level of significance, are described in the respective sections of this Initial Study checklist. All impacts have been either avoided or reduced to less than significant.

b) **Less Than Significant with Mitigation Incorporated**. As discussed in the previous sections of this checklist, all potentially significant impacts that could be caused by the Proposed Project would be reduced to less than significant by approaches included in the Project design or by mitigation that would be included as part of the Project. The resources most likely to be cumulatively affected by the Proposed Project would be air quality,

biological resources, and water quality. These resources are discussed below; however, it is expected that the implementation of **Mitigation Measures AIR-1, BIO-1, BIO-2,** and **HYDRO-1** would reduce potential individually limited yet cumulatively considerable impacts to less than significant.

c) **Less Than Significant with Mitigation Incorporated.** The Proposed Project would not directly or indirectly cause substantial adverse effects on human beings. Air quality, hazardous materials, and noise would provide the only impacts through which the Proposed Project could have an effect on human beings. However, all potential effects of the Proposed Project on air quality, hazardous materials, and noise generated by general construction activities and operation would be mitigated to less than significant through implementation of **Mitigation Measures AIR-1, HAZ-1 through HAZ-3, NOISE-1,** and **NOISE-2,** and therefore, would avoid causing substantial adverse effects on human beings. The impact analysis included in this chapter indicates that for all other resource areas, the Proposed Project would either have no significant impacts or, for impacts that would not affect human beings, would have less-than-significant impacts with mitigation incorporated.

Chapter 5 - Determination

On the basis of the Initial Study:

☐ I find that the Proposed Project WOULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT will be prepared.

☐ I find that the Proposed Project may have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the Proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the Proposed Project/Action, nothing further is required.

Signature	5-4-2010 Date
Konradt Bartlam Printed Name and Title	Community Development Director City of Lodi
Printed Name and Title	Affiliation

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