January 2012

Draft
Environmental Impact Report
Volume 1 of 2

For the
San Francisco Public Utilities Commission's

SAN ANTONIO BACKUP PIPELINE PROJECT




San Francisco Planning Department Case No. 2007.0039E
State Clearinghouse No. 2007102030

Draft EIR Publication Date: January 25, 2012
Public Hearing Date: February 22, 2012, Sunol
Public Hearing Date: February 23, 2012, San Francisco
Public Comment Period: January 25, 2012 to March 12, 2012

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TO: Distribution List for the San Antonio Backup Pipeline Project Draft EIR

FROM: Bill Wycko, Environmental Review Officer

SUBJECT: Draft Environmental Impact Report for the San Antonio Backup Pipeline Project (Planning Department File No. 2007.0039E)

This is the Draft Environmental Impact Report (EIR) for the San Antonio Backup Pipeline Project. Two public hearings will be held on the adequacy and accuracy of this document. After the public hearings, our office will prepare and publish a document titled "Comments and Responses," which will contain all relevant comments on this Draft EIR and our responses to those comments. It may also specify changes to this Draft EIR. Those who testify at the hearing on the Draft EIR will automatically receive a copy of the Comments and Responses document, along with notice of the date reserved for certification; others may receive a copy of the Comments and Responses and notice by request or by visiting our office. This Draft EIR together with the Comments and Responses document will be considered by the Planning Commission in an advertised public meeting and will be certified as a Final EIR if deemed adequate.

After certification, we will modify the Draft EIR as specified by the Comments and Responses document and print both documents in a single publication called the Final EIR. The Final EIR will add no new information to the combination of the two documents except to reproduce the certification resolution. It will simply provide the information in one document, rather than two. Therefore, if you receive a copy of the Comments and Responses document in addition to this copy of the Draft EIR, you will technically have a copy of the Final EIR.

We are aware that many people who receive the Draft EIR and Comments and Responses have no interest in receiving virtually the same information after the EIR has been certified. To avoid expending money and paper needlessly, we would like to send copies of the Final EIR in Adobe Acrobat format on a compact disk (CD) to individuals only if they request them. Therefore, if you would like a copy of the Final EIR, please fill out and mail the postcard provided inside the back cover to the Major Environmental Analysis division of the Planning Department within two weeks after certification of the EIR. Only those requesting a Final EIR by that time will have a copy mailed to them.

Thank you for your interest in this project.

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GLOSSARY AND ACRONYMS

Glossary

100-year flood – A flood that has a 1-percent chance of being equaled or exceeded in any given year.

A-weighted decibel (dBA) – Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

Alquist-Priolo Earthquake Fault Zone – The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the state geologist established regulatory zones called "earthquake fault zones" around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace.

alluvium – Consists of unconsolidated mixtures of gravel, sand, clay, and silt typically deposited by streams.

aquifer – Permeable subsurface materials (soil, sediments, and rock) that contain groundwater. Aquifers may be large or small, local or regional, shallow or deep, and confined or unconfined, depending on the subsurface geologic conditions. The permeable materials that surround an unconfined aquifer allow the water table to fluctuate in response to recharge (precipitation in the wet season) and discharge (evapotranspiration in the dry season). A confined aquifer is contained within impermeable materials and, as a result, the water table does not fluctuate.

anadromous – Anadromous fish hatch (rear) in freshwater, migrate to the ocean (saltwater) to grow and mature, and migrate back to freshwater to spawn and reproduce.

asbestos – A term used for several types of naturally occurring fibrous materials found in many parts of California, some of which have been found to be cancer-causing agents.

beneficial uses – Those uses of water as defined in the State of California Water Code (Chapter 10 of Part 2 of Division 2), including but not limited to agricultural, domestic, municipal, industrial, power generation, fish and wildlife habitat, recreation, and mining.

biological monitoring – The periodic examination of biological specimens for the purposes of monitoring their exposure to or the effects of potentially toxic chemicals in the environment. Biological monitoring is typically performed by analyzing the amount of a toxic substance or its metabolites in body tissues and fluids. Also refers to assessing the biological status of populations and communities of organisms at risk in order to protect them and to gain an early warning of possible hazards to human health.

Biological Opinion – Document issued under the authority of the Federal Endangered Species Act stating the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service findings as to whether a federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat.

carbon dioxide-equivalent (CO_2e) – Represented as a single number, the total carbon footprint resulting from all different greenhouse gases generated by a project.

channel – A natural or artificial watercourse, with a defined bed and banks to confine and convey continuously or periodically flowing water.

chlorination / dechlorination – A disinfection process that involves the addition of free chlorine, whether as chlorine gas or liquid sodium hypochlorite. Dechlorination is the process of removing chlorine from a substance such as water.

colluvium – A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope.

Community Noise Equivalent Level (CNEL) – Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to "quiet time" noise levels to form a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA "penalty" during the evening hours (7:00 p.m. to 10:00 p.m.) and a 10-dBA penalty during the night hours (10:00 p.m. to 7:00 a.m.).

cultural resource – A fragile and nonrenewable remain of human activity that is valued by or significantly representative of a culture or that contains significant information about a culture. Cultural resources encompass archaeological, traditional, and built environment resources, including landscapes or districts, sites, buildings, structures, objects, or cultural practices that are usually greater than 50 years of age and possess architectural, historic, scientific, or other technical value.

cumulatively considerable – A CEQA term used to indicate whether or not a cumulative impact is significant.

day-night noise level (Ldn) – Another 24-hour noise descriptor, called the day-night noise level (Ldn), is similar to CNEL. While both add a 10-dBA penalty to all nighttime noise events between 10:00 p.m. and 7:00 a.m., Ldn does not add the evening 5-dBA penalty. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources.

deciduous trees – Trees that drop their leaves each year, typically in winter.

discharge – The flow of surface water in a stream or canal or the outflow of groundwater from a flowing artesian well, ditch, or spring. Also refers to the discharge of liquid from a facility, or to chemical emissions into the air through designated venting mechanisms.

disinfection and disinfection byproducts – Disinfection is the treatment process used to inactivate and destroy disease-causing bacteria, viruses, and other waterborne microorganisms. Chlorine, a commonly and historically used disinfectant in drinking water, provides a high degree of public health protection from bacteria and viruses. However, in 1974 it was discovered that chlorine reacts with natural organic and inorganic matter in water to form disinfection byproducts. The major groups of disinfection byproducts produced by chlorination are trihalomethanes and haloacetic acids, and these byproducts have been shown to cause health effects in laboratory animals. Thus, based on numerous toxicological studies, the U.S. EPA adopted the Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules to lower the public health risk associated with potential exposure to disinfection byproducts.

Dissolved Oxygen (DO) – The oxygen freely available in water, which is vital to fish and other aquatic life and for the prevention of odors. DO levels are considered an important indicator of a water body's ability to support desirable aquatic life.

disturbance – Any event or series of events that disrupt ecosystem, community, or population structure and alter the physical environment.

diversion – The use of part of a stream flow as water supply; a channel for diverting water to sites where it can be used and disposed of.

earthquake faults –

> *Reverse faults* involve predominantly vertical movement in which the upper block moves upward in relation to the lower block.
>
> *Thrust faults* are low-angle reverse faults.

ecosystem – A geographically identifiable area that encompasses unique physical and biological characteristics. It is the sum of the plant community, animal community, and environment in a particular region or habitat.

endangered species – Any species or subspecies of bird, mammal, fish, amphibian, reptile, or plant that is in serious danger of becoming extinct throughout all or a significant portion of its range. Federally endangered species are officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service and published in the Federal Register. Species may also be listed under the California Endangered Species Act by the Department of Fish and Game.

endemic species – Endemic species are species that are geographically restricted.

enhancement – Measures that develop or improve the quality or quantity of existing conditions or resources beyond a condition or level that would have occurred without an action (i.e., beyond compensation).

environmental cases (hazardous materials) – Sites suspected of releasing hazardous substances or that have had cause for hazardous materials investigations and are identified on regulatory agency lists. These are sites where soil and/or groundwater contamination is known or suspected to have occurred.

expansive soils – These types of soils are characterized by their ability to undergo significant volume change (shrink and swell) due to variations in soil moisture content.

fault creep – Movement along a fault that does not entail earthquake activity.

floodplain – Land adjacent to a watercourse over which water flows in times of flood. The limits of the flood plain are defined by the peak level of a 1 in 100 year return period flood.

flow – The volume of water passing a given point per unit of time.

fugitive dust – "Fugitive" emissions generally refer to those emissions that are released to the atmosphere by some means other than through a stack or tailpipe.

groundwater recharge – Inflow to aquifers from precipitation, infiltration, through-flow, and/or other means that replaces groundwater lost through pumping or other forms of discharge. The process of water being added to the saturated zone *or* the volume of water added by this process.

hazardous materials – Defined in Section 25501(h) of the California Health and Safety Code, are materials that, because of their quantity, concentration, or physical or chemical characteristics, pose a substantial present or potential hazard to human health and safety or to the environment if released to the workplace or environment. Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications as well as in residential areas to a limited extent.

hazardous waste – Any material that is relinquished, recycled, or inherently waste-like. Title 22 of the California Code of Regulations, Division 4.5, Chapter 11 contains regulations for the classification of hazardous wastes. A waste is considered a hazardous waste if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases) in accordance with the criteria established in Article 3. Article 4 lists specific hazardous wastes, and Article 5 identifies specific waste categories, including Resource Conservation and Recovery Act (RCRA) hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes.

heritage trees – Large, old, or historically important trees that get special protection local municipalities and state law.

hydrology – The science that deals with the waters above and below land surfaces; their occurrence, circulation, and distribution, both in time and space; their biological, chemical, and physical properties; and their reaction with their environment, including their relation to living beings.

juvenile – A young or sexually immature animal.

lateral spreading – A phenomenon where large blocks of intact, nonliquefied soil move downslope on a liquefied substrate of large aerial extent.

Leq – Time variations in noise exposure are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement. Leq (24) is the steady-state energy level measured over a 24-hour period.

Levee – An embankment raised to prevent a river from overflowing.

liquefaction – A phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site.

Level of Service (traffic) – A qualitative description of a transportation facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Levels of service ranges from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

level of service goals and objectives (WSIP) – The SFPUC's Water System Improvement Program (WSIP) includes levels of service for the regional water system that define the system performance objectives through 2030 and assist in the design of the facility improvement projects. The WSIP levels of service address the following categories: water quality, seismic reliability, delivery reliability, and water supply.

mafic rocks – Igneous rocks containing a group of dark-colored minerals, composed chiefly of magnesium and iron.

Maximally Exposed Individual (MEI) – A hypothetical person located at the receptor location where the highest exposure to toxic air contaminants emitted from a given source or project is predicted.

mitigation – One or all of the following: (1) Avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating an impact over time by preservation and maintenance operations during the life of an action; and (5) compensating for an impact by replacing or providing substitute resources or environments.

permitted hazardous materials uses – Facilities that use hazardous materials or handle hazardous wastes but comply with current hazardous materials and hazardous waste regulations.

PPV – To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of peak particle velocity (PPV) in the vertical and horizontal directions (vector sum), typically in units of inches per second (in/sec).

Program Environmental Impact Report – One type of environmental review document identified under the California Environmental Quality Act that may be used to evaluate a plan or program that has multiple components (projects and actions) or to address a series of actions that are related.

rearing – Stage in development when juvenile fish spend feeding in nursery areas of rivers, lakes, streams, and estuaries before migration, or the care and support for young fish.

regional water system – The entire SFPUC water system starting at Hetch Hetchy Reservoir and ending in San Francisco; the regional system includes all facilities serving the SFPUC wholesale and retail customers, except for the retail customers in San Francisco. The SFPUC regional water system consists of a complex network of facilities covering a geographic range of about 160 miles, from the Sierra Nevada on the east to San Francisco on the west. The regional water system crosses seven counties—Tuolumne, Stanislaus, San Joaquin, Alameda, Santa Clara, San Mateo, and San Francisco. The regional water system includes over 280 miles of pipelines, over 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants.

riffles – A stretch of choppy water caused by stones or other objects in a river or stream.

riparian – The land adjacent to a natural watercourse such as a river or stream. Riparian areas support vegetation that provides important wildlife habitat, as well as important fish habitat when sufficient to overhang the bank.

Supervisory Control and Data Acquisition (SCADA) – SCADA systems allow for remote monitoring and operation of facilities.

sedimentation – The deposition of material suspended in a stream system, whether in suspension (suspended load) or on the bottom (bedload).

seiche – Earthquake-induced oscillating waves in an enclosed water body.

sensitive receptors – A land use that is sensitive or more vulnerable to (i.e., "receives") effects of noise, air quality, or a specified resource than the general population.

serpentine – A naturally occurring group of minerals that can be formed when ultramafic rocks are metamorphosed during uplift to the earth's surface. Serpentinite is a rock consisting of one or more serpentine minerals. This rock type is commonly associated with ultramatic rock along earthquake faults. Small amounts of chrysotile asbestos, a fibrous form of serpentine minerals, are common in serpentinite.

siltation – Sediment influx from either erosion or from sediment carried into a water body by inflowing rivers and tributaries.

siphon – In the context of water transmission systems, a siphon is a U-shaped pipeline composed of a drop pipe, a lateral pipe, and a riser pipe. The hydraulic head within the system allows the pipeline to be routed under surface features (such as rivers, creeks, railroad tracks, etc.) while continuing to operate under gravity, despite the drop in elevation.

spawning – Laying (and fertilizing) eggs in the process of reproduction.

special-status species – Several species known to occur within the general region of the project area are accorded "special status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species."

spill sites – Locations where a spill of hazardous materials has been reported to the state or federal regulatory agencies.

subsidence – The lowering of the land surface which can occur in response to groundwater pumping.

substrate – The materials found in streambeds or riverbeds (i.e., large and small boulders, stone, rubble, cobble, pebble, coarse and fine gravel, sand, silt, and clay). The surface upon which an organism grows or is attached.

surface water – All water that is naturally open to the atmosphere (i.e., rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.).

suspended particulates (PM10 and PM2.5) – Particulate matter is a class of air pollutants that consists of solid and liquid airborne particles in an extremely small size range. Particulate matter is measured in two size ranges: PM10 for particles less than 10 microns in diameter, and PM2.5 for particles less than 2.5 microns in diameter.

sustainability – Sustainability or sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs.

swales – Areas where winter rain collects but does not stand as long, as in vernal pools.

terrestrial species – Types of species of animals and plants that live on or grow from the land.

threatened species – Legal status afforded to plant or animal species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range, as determined by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. Species may also be listed under the California Endangered Species Act by the Department of Fish and Game.

ultramafic rocks – These rock units are formed in high-temperature environments well below the surface of the earth.

vernal pools – Seasonal wetlands formed in gently undulating or rolling topography where the soil is underlain by a slowly permeable claypan or hardpan.

water rights – In California, the legal right to the use of a water resource.

waters of the United States – A broad federal definition that describes U.S. Army Corps of Engineers jurisdiction over deep-water habitats and special aquatic sites, including wetlands, as follows:

a. The territorial seas with respect to the discharge of fill material.

b. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.

c. Tributaries to navigable waters of the United States, including wetlands.

d. Interstate waters and their tributaries, including adjacent wetlands.

All other waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.

watershed – A region or area bounded peripherally by waters diverging and draining ultimately to a particular watercourse or body of water.

watershed management – The net result of numerous and varied actions in a watershed that directly affect watershed function and productivity. Actions may include, but are not limited to, land use decision-making, restoration and enhancement projects, monitoring and assessment of watershed condition, natural resource allocation and use, parcel management techniques, and education programs. Watershed management includes protection of existing healthy conditions.

wetland – A zone periodically or continuously submerged or having high soil moisture, which has aquatic and/or riparian vegetation components, and is maintained by water supplies significantly in excess of those otherwise available through local precipitation.

Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACDEH	Alameda County Department of Environmental Health
ACFD	Alameda County Fire Department
ACDD	Alameda Creek Diversion Dam
ACDEH	Alameda County Department of Public Health
ACPWA	Alameda County Public Works Agency
ACTIA	Alameda County Transportation Improvements Authority
AC Transit	Alameda County Transit
ADRR	Archeological Data Recovery Report
APE	Area of Potential Effects
ASCE	American Society of Civil Engineers
ASF	age-sensitivity factor
ATCM	Airborne Toxic Control Measure
ACWD	Alameda County Water District
AASHTO	American Association of State Highway and Transportation Officials
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BAWSCA	Bay Area Water Supply and Conservation Agency
bgs	below ground surface
BMPs	best management practices
BSSC	Building and Seismic Safety Council
C-APE	CEQA Area of Potential Effects
Cal-EPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry
Cal/OSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources, Recycling, and Recovery
Caltrans	California Department of Transportation
Cal Water	California Water Service Company
CAP	Clean Air Plan
CARB	California Air Resources Board
CBC	California Building Code
CCC	Central California Coast
CCR	California Code of Regulations
CCSF	City and County of San Francisco
CDC	California Department of Conservation
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey

CH_4	methane
CIWMB	California Integrated Waste Management Board
CMA	Congestion Management Agency
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide-equivalent
Corps	U.S. Army Corps of Engineers
CPUC	California Public Utilities Commission
CRLF	California red-legged frog
CRSMP	construction risk and soils management plan
CTS	California tiger salamander
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DBH	diameter at breast height
DPM	diesel particulate matter
DPS	Distinct Population Segment
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EBRPD	East Bay Regional Park District
ECAP	East County Area Plan
EIR	Environmental Impact Report
ERO	Environmental Review Officer
ESL	Environmental Screening Levels
ESZ	Ecological Sensitivity Zone
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIRM	Flood Insurance Rate Map
FTA	Federal Transit Administration
g	acceleration due to gravity
GE	General Electric
GHG	greenhouse gas
GIS	geographic information system
gpm	gallons per minute
GWP	global warming potential
H_2O	water vapor (Section 5.9, Greenhouse Gases)
HASP	Health and Safety Plan
HDPE	high-density polyethylene
HHWP	Hetch Hetchy Water & Power

HMBP	Hazardous Materials Business Plan
HOV	High Occupancy Vehicle
I-680	Interstate 680
IBC	International Building Code
kW	kilowatt
kWh	kilowatt-hours
Ldn	day-night noise level
LEED	Leadership in Energy and Environmental Design
Leq	steady-state energy level for noise
Lmax	worst-case noise level
LOS	level of service
LPG	liquid propane gasoline
$\mu g/m^3$	micrograms per cubic meter
M	moment magnitude
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
MEI	maximally exposed individual
MLD	Most Likely Descendant
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mgd	million gallons per day
MMT	million metric tons
mph	miles per hour
MPO	Metropolitan Planning Organization
MRZ	Mineral Resource Zone
msl	mean sea level
MT	metric tons
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NAHC	California Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NIT	New Irvington Tunnel
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOx	nitrogen oxide
NOI	Notice of Intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recovery Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Units
NWP	nationwide permit

O_3	ozone
OAP	Ozone Attainment Plan
OEM	Office of Emergency Management
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEIR	Program Environmental Impact Report
PG&E	Pacific Gas and Electric Company
PM10	particulate matter, 10 microns or less in diameter
PM2.5	particulate matter, 2.5 microns or less in diameter
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code
PTSF	Percent Time-Spent-Following
PVC	polyvinyl chloride
REB	Resource Efficient Building
RMS	root mean square
ROG	reactive organic gases
ROW	right-of-way
RPG	Registered Professional Geologist
RWQCB	Regional Water Quality Control Board
SAAQS	state ambient air quality standards
SABPL	San Antonio Backup Pipeline
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SDC	Seismic Design Category
SFDE	San Francisco Department of the Environment
SFBAAB	San Francisco Bay Area Air Basin
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act of 1975
SMP-24	Surface Mining Permit 24
SMP-30	Surface Mining Permit 30
SO_2	sulfur dioxide
SR 84	State Route 84
SVP	Society of Vertebrate Paleontology
SVRM	Sunol Valley Resource Management Element
SVWTP	Sunol Valley Water Treatment Plant
SWIS	Solid Waste Information System
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
TDS	total dissolved solids
TMDLs	total maximum daily loads

TOCs	total organic compounds
TTLC	Total Threshold Limit Concentration
TTLP	Toxic Characteristic Leaching Procedure
UCMP	University of California Museum of Paleontology
U.S. EPA	U.S. Environmental Protection Agency
USA	Utilities Service Alert
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
v/c	volume-to-capacity ratio
VOC	volatile organic compound
WDR	waste discharge requirements
WEIP	Watershed and Environmental Improvement Program
WET	waste extraction test
WMP	Watershed Management Plan
WQVF	Water Quality Vulnerability Zones
WRCC	Western Region Climate Center
WSIP	Water System Improvement Program
WTP	water treatment plant
Zone 7	Zone 7 Water Agency

CHAPTER 1
Executive Summary

1.1 Introduction and Purpose of the Project

The San Francisco Public Utilities Commission (SFPUC) is proposing the San Antonio Backup Pipeline (SABPL) project (or proposed project). The proposed project would include the construction of several new facilities and improvements to provide reliable conveyance capacity for planned and emergency discharges of Hetch Hetchy water out of the SFPUC regional water system under future flow conditions. Currently, the existing San Antonio Pipeline does not have sufficient conveyance capacity to allow for emergency discharges of the future maximum Hetch Hetchy flow of 315 million gallons per day (mgd). In addition, the proposed project would increase operational flexibility and delivery reliability during emergencies and planned maintenance activities, thereby minimizing the risk of service interruption. All project components are located in the Sunol Valley, an unincorporated area of Alameda County, on Alameda watershed lands owned by the City and County of San Francisco (CCSF) and managed by the SFPUC.

Under the San Francisco Administrative Code, Chapter 31, the San Francisco Planning Department's Environmental Planning Division (formerly the Major Environmental Analysis Division) is responsible for conducting the environmental review of all CCSF projects pursuant to the requirements of the California Environmental Quality Act (CEQA). Thus, Environmental Planning is the lead agency responsible for preparing this Environmental Impact Report (EIR) in compliance with CEQA, and the SFPUC is the project sponsor proposing to implement the SABPL project. This EIR is being prepared for the public and decision-makers to disclose the potential physical impacts of the SABPL project so that an informed judgment can be made about the project's environmental consequences.

1.2 Overview of SFPUC Regional Water System

This overview of the SFPUC regional water system provides background information and context for the proposed SABPL project. The discussion includes a description of the existing water system and the SFPUC's Water System Improvement Program (WSIP).

1.2.1 Existing Regional Water System

The CCSF, through the SFPUC, owns and operates a regional water system that extends from the Sierra Nevada to San Francisco and serves retail and wholesale customers in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. The regional water system consists of water conveyance, treatment, and distribution facilities, and delivers water to retail and wholesale customers. The regional system includes over 280 miles of pipelines, over 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants. The SFPUC currently delivers an annual average of about 265 mgd of water to its customers. The source of the water supply is a combination of local supplies from streamflow and runoff in the Alameda Creek watershed and in the San Mateo Creek and Pilarcitos Creek watersheds (referred to together as the Peninsula watersheds), augmented with imported supplies from the Tuolumne River watershed. Local watersheds provide about 15 percent of total supplies, and the Tuolumne River provides the remaining 85 percent.

The SFPUC serves about one-third of its water supplies directly to retail customers, primarily in San Francisco, and about two-thirds of its water supplies to wholesale customers by contractual agreement. The wholesale customers are largely represented by the Bay Area Water Supply and Conservation Agency (BAWSCA), which consists of 26 member agencies in Alameda, San Mateo, and Santa Clara Counties.[1] Some of these wholesale customers have other sources of water in addition to what they receive from the SFPUC, while others rely completely on the SFPUC for supply.

1.2.2 SFPUC Water System Improvement Program

In October 2008, the SFPUC adopted a systemwide program, the WSIP (also known as the "Phased WSIP Variant") (SFPUC Resolution 08-200). The WSIP is a comprehensive program designed to improve the regional system with respect to water quality, seismic response, and water delivery based on a planning horizon through the year 2030, and to improve the regional system with respect to water supply to meet water delivery needs in the SFPUC service area through the year 2018. The WSIP consists of a water supply strategy and modifications to system operations as well as construction of a series of facility improvement projects in seven counties—Tuolumne, Stanislaus, San Joaquin, Alameda, Santa Clara, San Mateo, and San Francisco. The SABPL project is one of the WSIP facility improvement projects.

1 The Cordilleras Mutual Water Association is an additional wholesale customer that receives water from the SFPUC but is not a BAWSCA member. It is a small water association serving 18 single-family homes in San Mateo County.

The overall goals of the WSIP are to maintain high-quality water; reduce vulnerability to earthquakes; increase delivery reliability and improve the ability to maintain the system; meet customer water supply needs; enhance sustainability in all system activities; and achieve a cost-effective, fully operational system (see Table 2-1 in Chapter 2, Introduction and Background). To further these program goals, the WSIP also includes objectives that address system performance in the areas of water quality, seismic reliability, delivery reliability, and water supply (see SFPUC Resolution 08-0200).

To address the potential environmental impacts of the WSIP in compliance with CEQA, the San Francisco Planning Department prepared a Program EIR (PEIR) on the proposed WSIP, which the San Francisco Planning Commission certified in October 2008 (San Francisco Planning Department, 2008; San Francisco Planning Commission Motion No. 17734). The PEIR evaluated the environmental impacts of the WSIP water supply strategy and system operations at a project level of detail, and evaluated the environmental impacts of the WSIP facility improvement projects at a program level of detail. When the SFPUC approved the WSIP in 2008, it made CEQA Findings on the program, including a statement of overriding considerations and adoption of a mitigation monitoring and reporting program (SFPUC Resolution 08-0200).

This project-level EIR on the SABPL project tiers from the WSIP PEIR and also incorporates by reference the relevant analyses presented in the PEIR with respect to the WSIP's impacts and mitigation measures that apply to the SABPL project. The PEIR (State Clearinghouse No. 2005092026) is available for public review at the San Francisco Planning Department, 1650 Mission Street, San Francisco, CA 94103, and is on the Planning Department's website at http://www.sfplanning.org. CEQA permits tiering from a program-level EIR in order to allow agencies to broadly consider the environmental effects of a series of actions and/or policies, and then to provide a more detailed examination of a project's impacts in a subsequent project-level EIR. The SABPL project was defined as part of the WSIP and was analyzed in the PEIR as a WSIP facility improvement project. This project-level EIR provides more detailed information about the SABPL project, its impacts and project-specific mitigation measures, and alternatives to the project. This EIR summarizes and incorporates by reference the PEIR evaluation of the impacts associated with the WSIP water supply strategy and system operations, including the PEIR analysis and conclusions regarding impacts on the SFPUC's watersheds and the WSIP's growth-inducement impacts. The PEIR analysis of WSIP water supply and growth-inducement impacts accounted for the proposed project in sufficient detail, and no further evaluation of these aspects of the proposed project is required.

1.2.2.1 Description of the WSIP

The WSIP involves improvements to the regional system with respect to water quality, seismic response, water delivery based on a planning horizon through the year 2030. The WSIP also includes phased implementation of a water supply strategy to meet projected water demand through the year 2018. The WSIP also includes full implementation of the proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals are achieved as soon as possible.[2] Under the WSIP, the SFPUC established the year 2018 as an interim mid-term planning horizon for its water supply strategy. Thus, the SFPUC made a decision about a water supply strategy to serve its customers through 2018, and is deferring a decision regarding long-term water supply after 2018 and through 2030 until it undertakes further water supply planning and demand analysis.

The WSIP includes the following key program elements:

- Full implementation of all of the 17 proposed WSIP facility improvement projects described in the PEIR.
- Water supply delivery of 265 mgd (average annual target delivery) to regional water system customers through 2018, with water supplies originating from the Tuolumne, Alameda, and Peninsula watersheds. This includes 184 mgd for the wholesale customers (including 9 mgd for the cities of San Jose and Santa Clara), and 81 mgd for the retail customers.
- Development of 20 mgd of conservation, recycled water and groundwater within the SFPUC service area (10 mgd in the retail service area and 10 mgd in the wholesale service area).
- Dry-year transfer from the Modesto and/or Turlock Irrigation Districts of about 2 mgd coupled with the Westside Groundwater Basin conjunctive-use project to meet the drought year goal of limiting rationing to no more than 20 percent on a systemwide basis.
- Reevaluation of 2030 demand projections, potential regional water system purchase requests, and water supply options by 2018, and a separate SFPUC decision in 2018 regarding regional water system water deliveries after 2018.
- Financial incentives to limit water sales to an annual average of 265 mgd from the watersheds.

Under the WSIP, the SFPUC will deliver to customers up to 265 mgd from the SFPUC watersheds on an average annual basis. While average annual deliveries from the SFPUC watersheds would be limited to 265 mgd, such that there would be no increase in diversions from the Tuolumne River to serve additional demand, there would be a small increase in average annual Tuolumne River diversions of about 2 mgd over existing conditions in order to meet delivery and drought reliability goals through 2018.

The SFPUC must maintain water deliveries to all its customers for the protection of public health and safety. Therefore, under the WSIP, the SFPUC will work with its customers to develop financial incentives to limit water sales to an average annual amount of 265 mgd from the watersheds through 2018. With the projected 20 mgd of conservation, recycled water and groundwater projects, the WSIP water supply strategy would meet average daily demand of 285 mgd in 2018.

[2] The size and design of the WSIP facility improvement projects are driven by the SFPUC's system performance objectives and would not change as a result of the water supply decision included as part of the WSIP (see SFPUC Resolution No. 08-0200).

As part of adoption of the WSIP, the SFPUC has committed to implementing the mitigation measures identified for the WSIP in the PEIR, including measures addressing impacts that may result from increases in deliveries from the SFPUC watersheds over the total average annual of 265 mgd in the event that conservation, recycled water and groundwater projects are not completed prior to the increase in customer demand (SFPUC Resolution No. 08-0200).

1.2.2.2 WSIP Systemwide Operation Strategy

The WSIP also provides a future operating strategy for the regional water system, which addresses the condition of the physical facilities and infrastructure while accounting for factors that affect the system including fluctuating customer demand, meteorological and hydrological conditions, facility and infrastructure capacity and maintenance requirements, and institutional parameters. The operating strategy addresses four components of system operation: water supply and storage, water quality, water delivery, and asset management.

Day-to-day operation of the regional water system under the WSIP would be similar to existing operations, but would provide for additional facility maintenance activities and improved emergency preparedness. This would allow the SFPUC to meet its WSIP objectives and provide for increased system reliability and additional flexibility for scheduling repairs and maintenance. The proposed operations strategy would also include a multistage drought response program. Under the WSIP, regional water system operations would continue to comply with all applicable institutional and planning requirements including complying with all water quality, environmental, and public safety regulations; maximizing the use of water from local watersheds; assigning a higher priority to water delivery over hydropower generation; and meeting all downstream flow requirements.

1.2.2.3 Summary of Impacts and Mitigation Measures Associated with the WSIP Water Supply and System Operations Strategy

The WSIP would result in changes in reservoir levels and associated changes in downstream flows in rivers and creeks in the three affected watersheds, potentially affecting groundwater, water quality, fisheries, and terrestrial biological resources. In the event that deliveries to customers exceed 265 mgd (average annual), streamflow changes in the Tuolumne River watershed could affect fisheries and terrestrial biological resources. In the Alameda Creek and Peninsula watersheds, the WSIP, which includes restoring the historical storage capacities of Calaveras and Lower Crystal Springs Reservoirs, could affect reservoir levels, downstream flows, fisheries, and terrestrial biological resources. In addition, the WSIP proposes to develop groundwater supplies in the North Westside Groundwater Basin as well as a conjunctive-use program in the South Westside Groundwater Basin.

The WSIP impacts identified in the PEIR that are potentially significant but mitigable, potentially significant and unavoidable, and significant and unavoidable are listed below. As set forth in the PEIR, the San Francisco Planning Department determined the environmental impacts on all resources not listed below would be less than significant and no mitigation measures for these impacts would be required. (See WSIP PEIR Chapter 5, Environmental Setting and Impacts, for further discussion of the impact analysis on the WSIP's water supply strategy; see PEIR Chapter 6, Mitigation Measures, for a list of the mitigation measures associated with these impacts.)

Potentially Significant but Mitigable WSIP Water Supply and System Operations Impacts

- *Fisheries Resources*: Tuolumne River (only when average annual deliveries from the watersheds exceed 265 mgd); Alameda Creek.

- *Terrestrial Biological Resources*: Tuolumne River (below La Grange Dam - only when average annual deliveries exceed 265 mgd; and impacts on alluvial features that support meadow and riparian habitat from O'Shaughnessy Dam to Don Pedro Reservoir); Calaveras Reservoir; Alameda Creek; Calaveras Creek; Upper and Lower Crystal Springs Reservoir.

- *Groundwater*: Pumping overdraft; change in water levels in Lake Merced and other surface water features; seawater intrusion due to decreased groundwater levels; contamination of drinking water.

Potentially Significant and Unavoidable WSIP Water Supply and System Operations Impacts

- *Fisheries*: Upper and Lower Crystal Springs Reservoir. Based on the best available information at that time, the PEIR made the conservative determination that the WSIP would result in potentially significant and unavoidable impact on fishery resources in Crystal Springs Reservoir related to inundation of spawning habitat upstream of the reservoir (see PEIR Chapter 5, Section 5.5.5, Impact 5.5.5-1). The project-level fisheries analysis in the EIR on the Lower Crystal Springs Dam Improvements project modified certain PEIR impact determinations based upon more detailed site-specific data and analysis (San Francisco Planning Department, 2010). Project-level conclusions supersede any contrary impact conclusions in the PEIR, and the project-level analysis determined that impacts on fishery resources due to inundation effects would be less than significant.

- *Growth inducement*: SFPUC service area.

Significant and Unavoidable WSIP Water Supply and System Operations Impacts

- *Streamflow*: Alameda Creek below Alameda Creek Diversion Dam. Based on the best available information at that time, the PEIR made the conservative determination that the WSIP would result in a significant and unavoidable impact related to flow along Alameda Creek below the Alameda Creek Diversion Dam ("Alameda Creek Hydrologic Impact") (see PEIR Chapter 5, Section 5.4.1, Impact 5.4.1-2). The project-level analysis in the Calaveras Dam Replacement Project EIR modifies this PEIR impact determination to be less than significant based upon more detailed site-specific data and analysis (San Francisco Planning Department, 2011). Project-level conclusions supersede any contrary impact conclusions in the PEIR.

1.2.2.4 Alternatives to the WSIP

The PEIR evaluated seven alternatives to the WSIP because of their apparent ability to meet most of the WSIP's goals, their ability to reduce one or more of the significant impacts associated with program implementation, their potential feasibility, and their collective ability to provide a reasonable range of alternatives to foster informed decision-making and public participation. Analysis of the No Program Alternative was included as required by CEQA. The seven WSIP alternatives are summarized in Chapter 7, Alternatives, of this EIR; PEIR Chapters 9, CEQA Alternatives, and 14, Master Responses, respectively, present a more detailed summary of these alternatives and are incorporated into this EIR by reference.

1.3 Project Background and Objectives

1.3.1 Project Background

The proposed SABPL project is one of the key regional facility improvement projects under the WSIP. The SABPL project would support the WSIP goals and system performance objectives related to water quality and delivery reliability.

Under existing conditions, planned (nonemergency) operations and emergency operations requiring the diversion of Hetch Hetchy water out of the regional system are performed using the existing San Antonio Pipeline. In general, when Hetch Hetchy flows are within the capacity of the San Antonio Pump Station, flows are pumped to San Antonio Reservoir for storage and subsequent treatment and distribution to customers. When Hetch Hetchy flows exceed the capacity of the San Antonio Pump Station, the water is discharged to San Antonio Creek using the existing discharge facility at the base of James Turner Dam (Turner Dam) at San Antonio Reservoir. The existing chemical facility at the San Antonio Pump Station is used to dechlorinate and pH-adjust Hetch Hetchy water before the water is discharged to San Antonio Creek or pumped to San Antonio Reservoir.

Neither the existing San Antonio Pipeline nor the existing chemical facility have sufficient capacity to accommodate discharges of the future maximum Hetch Hetchy flow of 315 mgd. In addition, the existing facilities do not allow system operators to discharge quality-impaired Hetch Hetchy water while simultaneously conveying water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant (SVWTP) for treatment and distribution to SFPUC customers; this would impair the ability of the SFPUC to meet the WSIP's level of service objective for 2030 of providing 300 mgd when one water source is unavailable. Furthermore, the existing San Antonio Pipeline is susceptible to failure due to corrosion and breakage. Failure of this pipeline would limit water management options during both planned and emergency operations.

1.3.2 Project Objectives

The two main objectives of the SABPL project are:

- Provide reliable conveyance capacity for emergency discharges of Hetch Hetchy water supplies during events that impair water quality or during facility outages
- Increase operational flexibility and delivery reliability during emergencies and planned maintenance

1.4 Project Description

1.4.1 Project Location

The proposed SABPL project is located in an unincorporated area of Alameda County along the west side of Calaveras Road, south of the intersection of Interstate 680 (I-680) and State Route 84 (SR 84). Project construction would occur on CCSF-owned lands that are managed by the SFPUC within the Sunol Valley and the Alameda watershed.[3] The project area extends roughly 2 miles along the west side of Calaveras Road from the San Antonio Pump Station (in the south) to the North Spoils Site just east of the I-680 / SR 84 interchange (in the north). The project area includes quarry Pits F3-East and F3-West and surrounding areas, and is located south of the intersection of I-680 and SR 84 on CCSF-owned land that is currently leased to Hanson Aggregates and operated under Surface Mining Permit 24 (SMP-24). Quarry Pit F2, also operated by Hanson Aggregates under SMP-24, is just north of the project area. Quarry Pits F4, F5, and F6 are adjacent to the project area on CCSF-owned land that is currently leased to Oliver De Silva, Inc. and operated under Surface Mining Permit 30 (SMP-30).

1.4.2 Project Components

The SABPL project would include the following components:

- 7,000-foot-long San Antonio Backup Pipeline (backup pipeline)
- Discharge facility at Pit F3-East, including a discharge valve vault, an electrical control building, a baffled outfall, and a reinforced-concrete splash pad
- Chemical facility for dechlorination and pH adjustment
- Cutoff wall around quarry Pits F3-East and F3-West
- Dewatering facilities and related equipment
- Alameda Creek Pump Station, including a wet well (water holding tank), an electrical control building, a transfer pipeline, and a retaining wall
- Other improvements, including power supply facilities and Supervisory Control and Data Acquisition (SCADA)[4] transmitters
- Replacement of a 5,700-foot-long section of water pipeline to the town of Sunol

[3] The Alameda watershed refers to CCSF-owned lands managed by the SFPUC as part of the SFPUC regional water system; the Alameda watershed lands are located within the much larger hydrologic boundary of the southern Alameda Creek watershed.

[4] SCADA systems allow for remote monitoring and operation of facilities.

The proposed project would construct an approximately 7,000-foot-long, 66-inch-diameter backup pipeline (e.g., the San Antonio Backup Pipeline) extending from Alameda Siphon No. 3 (located near the San Antonio Pump Station), along the west side of Calaveras Road and beneath the San Antonio Creek channel, to a new discharge facility on the southern slope of quarry Pit F3-East. A cutoff wall would be constructed around Pits F3-East and F3-West to minimize the seepage of groundwater into the quarry pits and help maintain sufficient capacity in the pits to accommodate project discharges. Two quarry buildings located east of Pit F3-East would be demolished to facilitate cutoff wall construction. Dewatering facilities and equipment (e.g., submersible pumps, portable pumps mounted on floating platforms, flexible hoses, and a dewatering pipeline) would be installed at Pits F3-East and F3-West to pump the discharged water from the quarry pits to the wet well beneath the proposed Alameda Creek Pump Station. A transfer pipeline would be constructed along the southern perimeter of Pits F3-East and F3-West to convey the water from the Alameda Creek Pump Station to existing pipelines. Implementation of the SABPL project would enable the SFPUC to conserve discharged water and convey it to San Antonio Reservoir or to the SVWTP for subsequent treatment and delivery to customers. The new chemical facility would replace the existing chemical facility near the San Antonio Pump Station. The proposed facilities and improvements described above would have sufficient capacity to handle the future maximum Hetch Hetchy flow of 315 mgd under the WSIP. Also, an auxiliary feature of the proposed project—a 5,700-foot-long, 12-inch-diameter segment of water pipeline to serve the town of Sunol—would be installed in a trench parallel to the proposed backup pipeline.

1.4.3 Project Construction

Construction of the SABPL project is expected to occur from October 2012 through June 2014, resulting in an overall construction period of approximately 21 months. Project construction would generally take place on weekdays and Saturdays during the daytime hours, 7 a.m. to 7 p.m.; however, approximately six weeks of extended construction hours and Sunday work would be necessary during certain phases of construction, including air gap construction and connection with the proposed backup pipeline, and connection of the backup pipeline to Alameda Siphon No. 3. Haul trips to transport construction materials to the project area and excavated spoils to landfill facilities would be limited to weekdays between 7 a.m. and 7 p.m. Calaveras Road would be the primary construction access route to the project area.

Approximately 25.6 acres would be disturbed to install staging areas and a work platform for construction of the cutoff wall. Project activities would include vegetation removal, grading and excavation, demolition and construction of structures and buildings, pipeline installation, and backfilling. An estimated 68,000 cubic yards of excess spoils would be generated during project construction. These spoils could be temporarily placed in the SMP-30 area for subsequent processing, resale, and reuse; permanently placed in an earthen berm at the North Spoils Site which is located parallel to and west of Calaveras Road, or in an earthen berm at the former nursery site located east of Pit F3-East; or hauled offsite to an appropriate landfill facility.

1.4.4 Project Operations

Once construction of the SABPL project is complete, the SFPUC would continue to use the San Antonio Pipeline to transfer water to and from San Antonio Reservoir; discharges from the reservoir to San Antonio Creek would occur solely through the existing outlet structure and discharge facility at the base of Turner Dam. With the proposed project, planned and emergency discharges from the Hetch Hetchy system that are currently conveyed to San Antonio Creek via the existing San Antonio Pipeline would be routed to Pit F3-East via the proposed backup pipeline.

Hanson Aggregates, the quarry operator of the SMP-24 area, has indicated its intention to extend the lease for the CCSF-owned portions of the SMP-24 area (the current lease expires in 2012) and retain access to Pits F3-East and F3-West to support active mining in the SMP-32 area. The SFPUC would work cooperatively with Hanson Aggregates to maintain water levels in Pits F3-East and F3-West at or below 195 feet mean sea level (msl) to ensure sufficient capacity for subsequent discharges from the backup pipeline. Hanson Aggregates would, similar to the manner in which it currently manages water in the SMP-24 quarry pits, continue to use the existing network of portable pumps and hoses to move water between the pits and maintain water levels in Pits F3-East and F3-West at or below 195 feet msl. Similar to existing operations, during wet periods and when there is excess water in the SMP-24 quarry pits, Hanson Aggregates would continue to use the existing outfall in Alameda Creek to discharge the excess water in accordance with the company's current discharge permit.

If a discharge from the backup pipeline were to cause water elevations in Pit F3-East to rise above 195 feet msl, in 30 days or less the SFPUC would recover some or all of the discharged water using the proposed dewatering facilities and equipment, the Alameda Creek Pump Station, and the transfer pipeline. The volume of water recovered would not exceed the volume of water that was discharged into the quarry pit. The recovered water would be pumped to San Antonio Reservoir for storage or to the SVWTP for treatment. The Hetch Hetchy water would be dechlorinated and pH-adjusted at the new chemical facility before being discharged to the quarry pit. The proposed project would provide the SFPUC with the operational flexibility to simultaneously discharge Hetch Hetchy flows to Pit F3-East via the backup pipeline while meeting water demand by using the existing San Antonio Pipeline to access water stored in San Antonio Reservoir and convey the stored water to the SVWTP for treatment and subsequent delivery to customers.

In the event that Hanson Aggregates' lease is not extended, the SFPUC would solely manage the water levels in Pits F3-East and F3-West to maintain sufficient capacity for discharges from the proposed project. Under these circumstances, the SFPUC might need to obtain a new discharge permit to discharge water from the quarry pits to Alameda Creek. It is expected that the SFPUC would use a pump system similar to the system currently used by Hanson Aggregates, as well as Hanson Aggregates' existing outfall at Alameda Creek, to conduct these discharges.

1.5 Summary of Project Impacts and Mitigation Measures

Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, of this EIR presents the environmental impact analyses for all CEQA topic areas and provides mitigation measures that would reduce significant impacts to a less-than-significant level, where feasible. A summary of all impacts and mitigation measures is provided below in **Table 1-1**. The categories used to designate impact significance in Table 1-1 are:

- **No Impact (NI).** An impact is considered not applicable (no impact) if there is no potential for impacts or if the environmental resource does not occur within the project area or the area of potential effect. For example, there would be no impact related to tree removal if no trees would be removed at a project site.

- **Less than Significant impact, no mitigation required (LS).** This determination applies if the potential exists for some limited impact, but not for a substantial adverse effect that qualifies under the significance criteria as a significant impact.

- **Less than Significant impact with Mitigation (LSM).** This determination applies if the project would result in an adverse effect that meets the significance criteria, but feasible mitigation is available that would reduce the impact to a less-than-significant level.

- **Significant Impact (S).** A "significant effect" is defined by Section 15382 of the CEQA Guidelines as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the project area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment … [but] may be considered in determining whether the physical change is significant."

- **Significant and Unavoidable impact for which feasible mitigation is not available (SU).** This determination applies if the project would result in an adverse effect that meets the significance criteria, but for which there appears to be no feasible mitigation available to reduce the impact to a less-than-significant level. The impact would therefore be significant and unavoidable.

- **Significant and Unavoidable impact with implementation of feasible Mitigation (SUM).** This determination applies if the project would result in an adverse effect that meets the significance criteria and mitigation is available to lessen the impact, but the residual effect after implementation of the measure would remain significant. The impact would therefore be significant and unavoidable with mitigation.

As discussed in Chapter 6, Section 6.1, Growth Inducement, the proposed project is one of several capital improvement projects that make up the SFPUC's WSIP. Implementation of the WSIP would support growth in the SFPUC service area, thereby contributing indirectly to environmental impacts caused by that growth. Because the proposed project is part of the WSIP and would contribute to the WSIP's growth-inducement impact, the SABPL project would therefore contribute to the significant and unavoidable program-level impacts associated with growth inducement.

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.2: Land Use			
Impact LU-1: Project construction would not have a substantial impact on the existing character of the vicinity.	LS	None required.	LS
Impact LU-2: Project construction could substantially disrupt or displace existing land uses or land use activities.	S	**M-TR-3 (Traffic Control Plan); M-NO-1 (Administrative and Source Controls); M-AQ-1a (BAAQMD Basic Construction Measures); and M-AQ-1b (BAAQMD Additional Construction Measures for NO_x Reduction)** would apply to this impact.	LS
Impact LU-3: Project operations would not result in substantial long-term or permanent impacts on the existing character of the vicinity.	LS	None required.	LS
Impact C-LU: Project construction would result in a cumulatively considerable contribution to cumulative impacts on existing land uses.	S	**M-TR-3 (Traffic Control Plan); M-NO-1 (Administrative and Source Controls); M-AQ-1a (BAAQMD Basic Construction Measures); M-AQ-1b (BAAQMD Additional Construction for NO_x Reduction); and C-M-TR (Combined Sunol Valley Traffic Control Plan)** would apply to this impact.	LS
Section 5.3: Aesthetics			
Impact AE-1: Project construction could result in substantial adverse effects on scenic vistas and temporarily degrade the visual character of the site and its surroundings.	S	**M-AE-1: Site Maintenance.** The SFPUC shall require the contractor to ensure that construction-related activity is as clean and inconspicuous as practical by storing construction materials and equipment at the proposed construction staging areas or in areas that are generally away from public view, and by removing construction debris promptly at regular intervals. This measure does not apply to temporary spoils placement in quarry Pit F6, at the SMP-30 aggregate processing facility, or alongside pipeline trenches.	LS
Impact AE-2: Project construction would not result in significant impacts related to a new source of substantial light or glare.	LS	None required.	LS
Impact AE-3: Implementation of the proposed project could result in long-term adverse effects on scenic vistas and scenic resources, and degradation of the visual character of the site and its surroundings.	S	**M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)** would apply to this impact.	LS
Impact AE-4: The proposed project would not create a new permanent source of substantial light or glare.	LS	None required.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.3: Aesthetics (cont.)			
Impact C-AE: Implementation of the proposed project could result in a cumulatively considerable contribution related to cumulative impacts on scenic vistas, scenic resources, and visual character.	S	**M-AE-1 (Site Maintenance) and M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)** would apply to this impact.	LS
Section 5.4: Population and Housing			
No impacts related to population and housing.	NI	None required.	NI
Section 5.5: Cultural and Paleontological Resources			
Impact CP-1: Project construction could cause a substantial adverse change in the significance of a historical resource.	S	**M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3)** would apply to this impact.	LS
Impact CP-2: Project construction could cause a substantial adverse change in the significance of a historical or unique archaeological resource.	S	**M-CP-2a: Site Protection Measures for Prehistoric Archaeological Site SA-1.** All archaeological work performed under this mitigation measure shall be subject to review by the Environmental Review Officer (ERO) or designee. To protect prehistoric archaeological site SA-1, the SFPUC shall place exclusionary signage on the existing locked gate(s) and install orange-barrier construction fencing between archaeological site SA-1 and the construction work areas. Construction personnel shall be informed that, due to the sensitive nature of the area, it is off-limits to all equipment, staging, and other activities. The exclusionary signage and fencing required by this measure shall be maintained throughout project-related construction activities. **M-CP-2b**: **Accidental Discovery of Archaeological Resources.** To avoid any potential adverse effects on accidentally discovered buried cultural resources, as defined in CEQA Guidelines Section 15064.5(a)(c), the SFPUC shall distribute the San Francisco Planning Department's archaeological resource "ALERT" sheet to the project prime contractor; to any subcontractors (including firms subcontracted to perform demolition, excavation, grading, foundation, pile driving, etc.); and/or to any utilities firm involved in soil-disturbing activities within the project area. Prior to any soil-disturbing activities, each contractor shall be responsible for ensuring that the ALERT sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The SFPUC shall provide the ERO with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) confirming that all field personnel have received copies of the ALERT sheet.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.5: Cultural and Paleontological Resources (cont.)			
Impact CP-2 (cont.)		If the ERO determines that an archaeological resource may be present within the project area, the SFPUC shall retain the services of a qualified archaeological consultant. The archaeological consultant shall advise the ERO as to whether the discovery is an archaeological resource that retains sufficient integrity and is of potential scientific/historical/cultural significance. If an archaeological resource is present, the consultant shall identify and evaluate the archaeological resource. The archaeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the SFPUC. Measures might include: preservation in situ of the archaeological resource; an archaeological monitoring program; or an archaeological evaluation program. If an archaeological monitoring program or archaeological testing program is required, it shall be subject to review by the ERO. The ERO may also require that the SFPUC immediately implement a site security program if the archaeological resource is at risk from vandalism, looting, or other damaging actions. For any accidental discovery, the archaeological consultant shall submit an archaeological data recovery report (ADRR) to the ERO which, in addition to the usual contents of the ADRR, shall include an evaluation of the historical significance of any discovered archaeological resource; describe the archaeological and historical research methods employed in the archaeological monitoring/data recovery program(s) undertaken; and present, analyze, and interpret the recovered data. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the final report. Once approved by the ERO, copies of the ADRR shall be distributed as follows: the relevant California Historical Resources Information System Information Center shall receive one copy, and the ERO shall receive one copy of the transmittal letter of the ADRR to the Information Center. The San Francisco Planning Department, Environmental Planning Division shall receive three copies of the ADRR along with copies of any formal site recordation forms (California Department of Parks and Recreation Form 523 series) and/or documentation for nomination to the National Register/California Register. The SFPUC shall receive copies of the ADRR in the number requested. In instances of high public interest in or high interpretive value of a resource, the ERO may require a different final report content, format, and distribution than that presented above. All archaeological work performed under this mitigation measure shall be subject to review by the ERO or designee.	
Impact CP-3: Project construction could result in a substantial adverse effect by directly or indirectly destroying a unique paleontological resource or site.	S	**M-CP-3: Paleontological Resources Mitigation Program.** Prior to the initiation of any site preparation or start of construction, the SFPUC shall retain a qualified professional paleontologist or a California Registered Professional Geologist (California RPG) with appropriate paleontological expertise, as defined by the Society of Vertebrate Paleontology's Conformable Impact Mitigation Guidelines Committee (SVP 1995 Guidelines), to carry out a paleontological resources training program for construction workers and to develop a paleontological mitigation program. The SFPUC shall require the paleontologist to be "on-call" throughout the duration of ground-disturbing activities. At a minimum, the mitigation program shall include:	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.5: Cultural and Paleontological Resources (cont.)			
Impact CP-3 (cont.)		• *Preparation of a Preconstruction Paleontological Assessment Based on Final Project Design*. The professional paleontologist shall prepare a preconstruction assessment, including a review of the information presented in this EIR, existing fossil localities in the region, and project geological/geotechnical reports, to determine with greater precision the depth and extent of geologic units of high paleontological potential (Pleistocene alluvium and Briones Formation) within the areas to be excavated. The results shall be documented in a report along with recommendations for appropriate and feasible procedures to avoid or minimize damage to any paleontological resources present. Based on the volume and depth of soil excavations and the professional judgment of the paleontologist, he or she shall make recommendations regarding the need, if any, for paleontological monitoring of ground-disturbing activities in geologic units of high paleontological potential. The SFPUC shall review and approve the report in consultation with the ERO. • *Paleontological Resources Training.* All construction forepersons and field supervisors shall be trained in the recognition of potential fossil materials prior to the initiation of any site preparation or start of construction. Training on paleontological resources shall also be provided to all other construction workers, but may include videotape of the initial training and/or the use of written materials rather than in-person training by the qualified paleontologist. In addition to fossil recognition, the training shall convey procedures to follow if construction crews encounter potential fossil materials in the course of earthwork, excavation, or grading, as described below. • *Assessment and Salvage of Potential Fossil Finds*. If construction crews discover potential fossils, all earthwork or other types of ground disturbance within 50 feet of the find shall stop immediately until the qualified professional paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the monitor may record the find and allow work to continue, or recommend salvage and recovery of the fossil. The monitor may also propose modifications to the stop-work radius based on the nature of the find, site geology, and the activities occurring on the site. Recommendations for any necessary treatment shall be consistent with the SVP 1995 Guidelines (SVP Conformable Impact Mitigation Guidelines Committee, 1995) and currently accepted scientific practices. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation and publication of a report describing the finds. The monitor's recommendations shall be subject to review and approval by the ERO or designee. The SFPUC shall be responsible for ensuring that treatment is implemented and reported to the San Francisco Planning Department. If no report is required, the SFPUC shall nonetheless ensure that information on the nature, location, and depth of all finds is readily available to the scientific community through university curation or other appropriate means. • *Active Monitoring of Construction Sites for Paleontological Resources, if Recommended in the Preconstruction Paleontological Assessment.* Paleontological monitoring shall consist of periodically inspecting disturbed, graded, and excavated surfaces, as well as soil stockpiles and disposal sites. The monitor (i.e., the professional paleontologist or a designee of the paleontologist) shall have authority to divert grading or excavation away from exposed surfaces temporarily in order to examine disturbed areas more closely and/or recover fossils. The monitor shall coordinate with the construction manager to ensure that monitoring is thorough but does not result in unnecessary delays. If the monitor encounters a paleontological resource, he or she shall assess the fossil, and record or salvage it, as described above.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.5: Cultural and Paleontological Resources (cont.)			
Impact CP-4: Project construction could result in a substantial adverse effect related to the disturbance of human remains.	S	**M-CP-4: Accidental Discovery of Human Remains.** The treatment of any human remains and associated or unassociated funerary objects discovered during soil-disturbing activities shall comply with applicable state laws. Such treatment would include immediate notification of the Alameda County coroner and, in the event of the coroner's determination that the human remains are Native American, notification of the NAHC, which would appoint a Most Likely Descendant (MLD) (PRC Section 5097.98). The archaeological consultant, SFPUC, and MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of any human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5[d]). The agreement would take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. The PRC allows 48 hours to reach agreement on these matters. If the MLD and the other parties could not agree on the reburial method, the SFPUC shall follow Section 5097.98(b) of the PRC, which states that "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance." All archaeological work performed under this mitigation measure shall be subject to review by the ERO or designee.	LS
Impact C-CP: Construction of the proposed project could result in a cumulatively considerable contribution related to cumulative impacts on historical, archaeological, or paleontological resources, or human remains.	S	**M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3); M-CP-2a (Site Protection Measures for Prehistoric Archaeological Site SA-1); M-CP-2b (Accidental Discovery of Archaeological Resources); M-CP-3 (Paleontological Resources Mitigation Program); and M-CP-4 (Accidental Discovery of Human Remains)** would apply to this impact.	LS
Section 5.6: Transportation and Circulation			
Impact TR-1: Construction of the proposed project would not substantially 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 travel.	LS	None required.	LS
Impact TR-2: Project construction activities would not result in inadequate emergency access.	LS	None required.	LS
Impact TR-3: Project construction activities would decrease the safety of public roadways for vehicles, bicyclists, and pedestrians.	S	**M-TR-3: Traffic Control Plan.** The SFPUC or its contractor(s) shall prepare and implement a traffic control plan. The plan shall conform to the state's *Manual of Traffic Controls for Construction and Maintenance Work Areas* (Caltrans, 2006), where applicable. Elements of the traffic control plan shall include, but not be limited to, the following:	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.6: Transportation and Circulation (cont.)			
Impact TR-3 (cont.)		• Advance warning signs shall be installed on Calaveras Road (to the south and north of the access points) advising motorists, bicyclists, and pedestrians of the construction zone ahead in order to minimize hazards associated with construction activities immediately adjacent to Calaveras Road, including the entry and egress of project-related construction vehicles. • Pedestrian and bicycle access and circulation shall be maintained during project construction where it is safe to do so. • A public information program shall be developed and implemented to advise motorists, bicyclists, and nearby properties of the impending construction activities (e.g., media coverage, direct distribution of flyers to affected properties, email notices, portable message signs, and informational signs). • All equipment and materials shall be stored within the designated work areas as to avoid obstructing traffic. • Hauling of excavated materials shall be limited to weekdays to reduce potential conflicts with recreational bicycling on Calaveras Road on weekends. • Adequate driving and bicycling conditions on Calaveras Road shall be maintained throughout the construction period. • The SFPUC and its contractors shall coordinate individual traffic control plans for SFPUC projects in the Sunol Valley.	
Impact TR-4: Vehicle trips generated during project operations and maintenance activities would not substantially conflict with an applicable congestion management program.	LS	None required.	LS
Impact C-TR: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative traffic increases and safety hazards on local and regional roads.	S	**C-M-TR: Combined Sunol Valley Traffic Control Plan.** The SFPUC or its construction contractor(s) shall coordinate and comply with the ongoing Regional Traffic Coordination Plan for the Sunol Valley region; this plan coordinates the project-specific traffic control plans for SFPUC projects developed as part of Mitigation Measure M-TR-3 (Traffic Control Plan) and identifies additional measures to minimize the impacts of construction traffic on Calaveras Road and I-680. **M-TR-3 (Traffic Control Plan)** would also apply to this impact.	LS
Section 5.7: Noise and Vibration			
Impact NO-1: Construction activities would result in substantial temporary increases in ambient noise levels that could interfere with nearby land uses.	S	**M-NO-1: Administrative and Source Controls.** The SFPUC shall include in construction contract specifications the requirement that the construction contractor conform to the sleep interference threshold of 50 dBA (Leq) between 10 p.m. and 7 a.m. when operating equipment within 1,000 feet of the SFPUC watershed keeper's residence east of Calaveras Road (if it is occupied at the time of construction). Measures to maintain noise levels at or below this performance standard shall include implementation of best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, acoustically attenuating shields or shrouds, and enclosures around stationary equipment such compressors or generators) for all equipment used at night.	LS

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

<table>
<tr><th>IMPACT</th><th>Level of Significance Prior to Mitigation</th><th>Mitigation Measure(s)</th><th>Level of Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 5.7: Noise and Vibration (cont.)</td></tr>
<tr><td>Impact NO-1 (cont.)</td><td></td><td>The name and phone number of a designated project liaison shall be provided to the inhabitant(s) of the SFPUC watershed keeper’s residence in the event that noise disturbance occurs. This liaison shall take steps to resolve any complaints received, including modifying construction practices as necessary to address the noise complaint.</td><td></td></tr>
<tr><td>Impact NO-2: Construction activities would expose people to noise levels in excess of standards established by the Alameda County Noise Ordinance.</td><td>S</td><td>M-NO-2: Noise Control Plan. The SFPUC shall include in construction contract specifications the requirement that the construction contractor prepare a Noise Control Plan. The contract specifications shall stipulate that before the start of mobilization or construction, the contractor must submit to the SFPUC for review and approval a noise control plan prepared by a qualified noise consultant. For work performed beyond local ordinance time limits (e.g., construction of air gaps and connection to Alameda Siphon No. 3), the noise control plan shall also ensure that noise levels do not exceed the following noise performance standards:
<table>
<tr><th><u>Time Period</u></th><th><u>Maximum Noise Level</u></th></tr>
<tr><td>Weekdays
7 p.m. to 10 p.m.</td><td>One-hour Leq of 58 dBA at nearest residence
Lmax of 65 dBA at project boundary</td></tr>
<tr><td>Saturdays
7 a.m. to 8 a.m. and
5 p.m. to 7 p.m.</td><td>One-hour Leq of 58 dBA at nearest residence
Lmax of 65 dBA at project boundary</td></tr>
<tr><td>All days
10 p.m. to 7 a.m.</td><td>One-hour Leq of 50 dBA [a] at nearest residence
Lmax of 65 dBA at project boundary</td></tr>
<tr><td colspan="2">[a] Rather than the one-hour Leq of 53 dBA from the Alameda County Construction Ordinance, the more restrictive sleep criterion limit of 50 dBA is applicable during these hours.</td></tr>
</table>
To achieve the above Leq performance standards, the contractor shall incorporate noise and source controls listed under Mitigation Measure M-NO-1 (Administrative and Source Controls), as necessary.

To achieve the above Lmax standards, the contractor may use administrative controls instead of audible backup alarms, subject to safety priorities and consistent with state and federal worker safety laws. Such administrative controls shall provide backup warning on all vehicles that operate in areas where backward movement would constitute a hazard to employees working in the area on foot, and where the operator’s vision is obstructed to the rear of the vehicle (earthmoving</td><td>LS</td></tr>
</table>

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.7: Noise and Vibration (cont.)			
Impact NO-2 (cont.)		equipment) (California Code of Regulations, Title 8, Section 1592). Administrative controls may include designing traffic patterns in the project area to minimize the need for backward movement, or requiring a spotter or flagger in clear view of the operator to direct the backing operation or requiring the operator to dismount and circle the vehicle immediately prior to starting a backup operation. Alternatively, the SFPUC shall consult with Cal/OSHA to determine whether additional noise reductions may be achieved through Cal/OSHA-approved alternatives to backup alarms without compromising site safety. If Cal/OSHA indicates that such alternatives are a viable option and the SFPUC, in consultation with the contractor, determines that site safety would not be compromised, then the contractor shall apply for a variance from Cal/OSHA and use such alternatives consistent with Cal/OSHA requirements. Such alternatives could include, but are limited to: • "Smart" alarms that have an audible range of 77 to 97 (dBA but limit the warning signal to 5 dBA over ambient noise levels) • Radar presence-sensing alarms, which identify objects in the reversing path of a truck • Use of "bbs-tek" broadband backup alarm systems, which use a broadband sound instead of a more noticeable single-frequency sound • Use of strobe lights instead of audible alarms (which are particularly effective at night) The administrative source controls and alternatives identified above that are approved by Cal/OSHA instead of backup alarms shall be included in the noise control plan. If none of these alternatives to backup alarms can be implemented, the use of backup alarms shall be avoided during the evening and nighttime hours to achieve the Lmax performance standard (e.g., by routing trucks and equipment to eliminate the need to back up, or by eliminating truck and heavy equipment use at night).	
Impact NO-3: Construction activities would not result in excessive groundborne vibration.	LS	None required.	LS
Impact NO-4: Project operations would not result in a substantial permanent increase in ambient noise levels in the project vicinity or significant impacts related to the exposure of people to noise levels in excess of standards established by the Alameda County Noise Ordinance.	LS	None required.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.7: Noise and Vibration (cont.)			
Impact C-NO: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative noise impacts.	S	**M-C-NO: Coordination of Nighttime Construction and Truck Traffic.** The SFPUC shall coordinate the nighttime construction activities of the SABPL project with the nighttime construction activities and haul traffic of other SFPUC projects in the Sunol Valley, including the NIT project, Filter Gallery project, and Calaveras Dam Replacement project, to ensure that maximum nighttime noise levels do not cumulatively exceed the 50-dBA sleep interference criterion or the noise performance standards of the Alameda County Noise Ordinance at the Garcia residence or SFPUC watershed keeper's residence (when occupied). Alternatively, to mitigate impacts on the watershed keeper's residence, the SFPUC can elect to temporarily relocate its inhabitants (restrictions on maximum nighttime noise levels above would still apply at the Garcia residence). **M-NO-1 (Administrative and Source Controls) and M-NO-2 (Noise Control Plan)** would also apply to this impact.	LS
Section 5.8: Air Quality			
Impact AQ-1: Emissions generated during project construction activities would violate air quality standards and would contribute substantially to an existing air quality violation.	S	**M-AQ-1a: BAAQMD Basic Construction Measures.** The SFPUC shall post one or more publicly visible signs with the telephone number and person to contact at the SFPUC with complaints related to excessive dust or vehicle idling. This person shall respond to complaints and, if necessary, take corrective action within 48 hours. The telephone number and person to contact at the BAAQMD's Compliance and Enforcement Division shall also be provided on the sign(s) in the event that the complainant also wishes to contact the applicable air district. In addition, to limit dust, criteria pollutants, and precursor emissions associated with project construction, the following BAAQMD-recommended Basic Construction Measures shall be included in all construction contract specifications for the proposed project: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material offsite shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • Vehicle speeds on unpaved areas shall be limited to 15 miles per hour. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times for construction equipment (including vehicles) shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to two minutes. Clear signage of this requirement shall be provided for construction workers at all access points to construction areas.	SU

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.8: Air Quality (cont.)			
Impact AQ-1 (cont.)		• All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. **M-AQ-1b: BAAQMD Additional Construction Measures for NOx Reduction.** To reduce NO_X emissions during construction, the following provisions shall be included in all construction contractor specifications for the proposed project: • To reduce NOX during construction, 40 percent of the total horsepower-hours from diesel-powered off-road equipment with engines greater than 50 horsepower shall be from equipment that satisfies United States Environmental Protection Agency (USEPA) Tier 3 NOX emission standards. The SFPUC shall demonstrate this to the San Francisco Planning Department by presenting an inventory of all equipment with engines over 50 horsepower that will be used and an estimate of the number of hours each piece of equipment will operate to calculate the total number of horsepower-hours for project construction (equipment horsepower multiplied by the hours of operation). The inventory shall also identify which equipment meets Tier 3 NOX emissions and demonstrate that they constitute 40 percent of the total horsepower-hours. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-market products, and/or other options as they become available. • All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NO_X and DPM, including all generators meeting Tier 4 standards. • All contractors shall use equipment that meets the CARB's most recent certification standard for off-road heavy-duty diesel engines for a given model year engine.	
Impact AQ-2: Project construction would not expose sensitive receptors to substantial pollutant concentrations.	LS	None required.	LS
Impact AQ-3: Project construction activities would not create objectionable odors affecting a substantial number of people.	LS	None required.	LS
Impact AQ-4: Project operations would not violate air quality standards or contribute substantially to an existing air quality violation.	LS	None required.	LS
Impact AQ-5: Project operations would not expose sensitive receptors to substantial pollutant concentrations.	LS	None required.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.8: Air Quality (cont.)			
Impact AQ-6: Project operations would not create objectionable odors affecting a substantial number of people.	NI	None required.	NI
Impact AQ-7: Implementation of the proposed project would not conflict with or obstruct implementation of the 2010 Clean Air Plan.	LS	None required.	LS
Impact C-AQ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative air quality impacts associated with criteria pollutant emissions and health risks.	S	**M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NOx Reduction)** would apply to this impact.	SU
Section 5.9: Greenhouse Gas Emissions			
Impact GG-1: Project construction would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	LS	None required.	LS
Impact GG-2: Project operations would generate GHG emissions, but not at levels that would have a significant impact on the environment.	LS	None required.	LS
Impact GG-3: Project operations would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	LS	None required.	LS
Impact C-GG: The proposed project would not result in a cumulatively considerable contribution to cumulative GHG emissions.	LS	None required.	LS
Section 5.10: Wind and Shadow			
No impacts related to wind and shadow.	NI	None required.	NI

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.11: Recreation			
Impact RE -1: The proposed project could temporarily degrade existing recreational uses during construction.	S	**M-AQ-1a (BAAQMD Basic Construction Measures)**; **M-AQ-1b (BAAQMD Additional Construction Mitigation Measures for NOx Reduction); and M-TR-3 (Traffic Control Plan)** would apply to this impact.	LS
Impact RE -2: The proposed project would not degrade existing recreational uses during project operations.	NI	None required.	NI
Impact C-RE: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on recreational resources and uses.	S	**M-AQ-1a (BAAQMD Basic Construction Measures)**; **M-AQ-1b (BAAQMD Additional Construction Measures for NOx Reduction); M-TR-3 (Traffic Control Plan); and M-C-TR (Combined Sunol Valley Traffic Control Plan)** would apply to this impact.	LS
Section 5.12: Utilities and Service Systems			
Impact UT-1: Project construction could result in a substantial adverse effect related to disruption of utility operations or accidental damage to existing utilities.	S	**M-UT-1a: Confirm Utility Line Information.** The SFPUC or its contractors shall locate overhead and underground utility lines that may be encountered during excavation work prior to opening an excavation. Information regarding the size, color, and location of existing utilities shall be confirmed before excavation activities commence. These utilities shall be highlighted on all construction drawings. **M-UT-1b: Safeguard Employees from Potential Accidents Related to Underground Utilities.** While any excavation is open, the SFPUC or its contractors shall protect, support, or remove underground utilities as necessary to safeguard employees. As part of contractor specifications, the contractor(s) shall be required to provide updates on planned excavations for the upcoming week and to specify when construction will occur near a high-priority utility—specifically the 36-inch diameter and 22-inch-diameter PG&E high-pressure gas pipelines, as well as any other high-priority utility lines that are identified. At the beginning of each week when this work will take place, SFPUC construction managers shall attend tailgate meetings with contractor staff, as required by the California Occupational Safety and Health Administration, to record all protective and avoidance measures regarding such excavations. **M-UT-1c**: **Notify Local Fire Departments.** In the event that construction activities result in damage to high-priority utility lines, including leaks or suspected leaks, the SFPUC or its contractors shall immediately notify local fire departments to protect worker and public safety. **M-UT-1d: Emergency Response Plan.** Prior to commencing construction activities, the SFPUC shall develop an emergency response plan that outlines procedures to follow in the event of a leak or explosion. The emergency response plan shall identify the names and phone numbers of PG&E staff who would be available 24 hours per day in the event of damage or rupture of the high-pressure PG&E natural gas pipelines. The plan shall also detail emergency response protocols including notification, inspection and evacuation procedures; any equipment and vendors necessary to respond to an emergency such as an alarm system; and routine inspection guidelines.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.12: Utilities and Service Systems (cont.)			
Impact UT-1 (cont.)		**M-UT-1e**: **Ensure Prompt Reconnection of Utilities.** The SFPUC or its contractors shall promptly notify utility providers to reconnect any disconnected utility lines as soon as it is safe to do so. **M-UT-1f: Coordinate Final Construction Plans with Affected Utilities.** The SFPUC or its contractors shall coordinate final construction plans and specifications with affected utilities. **M-UT-1g**: **Avoidance of Utilities Constructed or Modified by Other SFPUC Projects.** The final construction drawings for the SABPL project shall reflect any changes in utility locations as well as the locations of any new utilities installed during construction of other SFPUC projects in the Sunol Valley whose disturbance areas overlap with the SABPL project area. These overlapping projects include the Alameda Siphons Seismic Reliability Upgrade, Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir, San Antonio Pump Station Upgrade, and New Irvington Tunnel projects. **M-UT-1h: Measures to Protect Alameda Siphons Nos. 1, 2, and 3.** SFPUC engineers and the construction contractor's engineers shall evaluate the structural integrity of Alameda Siphons Nos. 1, 2, and 3 in the vicinity of the proposed connection with the backup pipeline and identify the specific design and construction techniques to be implemented during connection of the backup pipeline to Alameda Siphon No. 3 to prevent damage to Alameda Siphons Nos. 1, 2, and 3. Particular attention shall be paid to Alameda Siphons Nos. 1 and 2, which are historical resources. The SFPUC shall incorporate protective measures into the construction contract specifications if applicable to prevent damage to Alameda Siphons Nos. 1, 2, and 3. Potential measures include shoring excavated areas around the siphons, using low-impact tunneling equipment, prohibiting unnecessary equipment movement over or near the siphons, and/or securing or enclosing the siphons to prevent movement or damage during connection with the proposed backup pipeline.	
Impact UT-2: Project construction could result in a substantial adverse effect related to the relocation of regional or local utilities.	S	**M-UT-1a (Confirm Utility Line Information)**; **M-UT-1f (Coordinate Final Construction Plans with Affected Utilities); and M-UT-1g (Avoidance of Utilities Constructed or Modified by Other SFPUC Projects)** would apply to this impact.	LS
Impact UT-3: Project construction would not result in a substantial adverse effect related to landfill capacity.	LS	None required.	LS
Impact UT-4: Project construction would not result in a substantial adverse effect related to compliance with federal, state, and local statutes and regulations pertaining to solid waste.	LS	None required.	LS
Impact UT-5: Project operations would not have a substantial adverse effect related to the disruption or relocation of existing utilities or utility services.	LS	None required.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.12: Utilities and Service Systems (cont.)			
Impact C-UT: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts related to disruption or relocation of utilities.	S	**M-UT-1a (Confirm Utility Line Information); M-UT-1b (Safeguard Employees from Potential Accidents Related to Underground Utilities); M-UT-1c (Notify Local Fire Departments); M-UT-1d (Emergency Response Plan); M-UT-1e (Ensure Prompt Reconnection of Utilities); M-UT-1f (Coordinate Final Construction Plans with Affected Utilities); M-UT-1g (Avoidance of Utilities Constructed or Modified by Other SFPUC Projects); and M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3)** would apply to this impact.	LS
Section 5.13: Public Services			
No impacts related to public services.	NI	None required.	NI
Section 5.14: Biological Resources			
Impact BI-1: The proposed project could have a substantial adverse effect on special-status animal species during construction.	S	**Mitigation Measure M-BI-1a: General Protection Measures.** The SFPUC shall ensure that the following general measures are implemented by the contractor(s) during construction to minimize or avoid impacts on biological resources: • Construction contractor(s) shall minimize the extent of the construction disturbance as much as feasible. • Prior to the start of construction, the construction contractor, in coordination with a qualified biologist, shall install 4-foot-tall fencing at the limits of construction. In addition, fencing shall be installed outside the driplines of all trees to be retained that are located within 50 feet of any grading, road improvements, underground utilities, or other construction activity. A qualified biologist and the SFPUC must first approve any encroachment beyond these fenced areas. The contractor shall maintain the temporary fencing until all construction activities are completed. No construction activities, parking, or staging shall occur beyond the fenced areas. • Project-related vehicles shall observe a 15-mile-per-hour speed limit on unpaved roads in the work area, or as otherwise determined by the applicable regulatory agencies. • The contractor shall provide closed garbage containers for the disposal of all food-related trash items (e.g., wrappers, cans, bottles, food scraps). All garbage shall be collected daily from the project site and placed in a closed container, from which garbage shall be removed weekly. • Construction personnel shall not feed or otherwise attract fish or wildlife in the project area. • No pets shall be allowed in the project area. • No firearms shall be allowed in the project area. • Staging areas shall be located at least 50 feet from riparian habitat, creeks, and wetlands, where feasible. • If vehicle or equipment fueling or maintenance is necessary, it shall be performed in the designated staging areas.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		• In cases where excavations require dewatering, the intakes shall be screened with a maximum mesh size of 5 millimeters. **Mitigation Measure M-BI-1b: Worker Training and Awareness Program.** The SFPUC shall ensure that mandatory biological-resources awareness training is provided to all construction personnel as follows: • The training shall be developed and provided by a qualified biologist or construction compliance manager familiar with the sensitive species that may occur in the project area. If a consulting biologist prepares the training program, SFPUC staff shall approve the program prior to implementation. • The training shall be provided before any work, including vegetation clearing and grading, occurs within the work area boundaries. • The training shall provide education on the natural history of the special-status species potentially occurring in the project area, and discuss the required mitigation measures to avoid impacts on the special-status species and the penalties for failing to comply with biological mitigation requirements. • If new construction personnel are added to the project, the contractor shall ensure that they receive training prior to starting work. The subsequent training of personnel can include a videotape of the initial training and/or the use of written materials rather than in-person training by a biologist. **Mitigation Measure M-BI-1c: Minimize Disturbance to Riparian Habitat.** To minimize disturbance to creeks and riparian habitat, the SFPUC and its contractors shall conduct in-channel work in San Antonio Creek during the dry season. **Mitigation Measure M-BI-1d: Prevent Movement of Specific Species through the Work Areas.** To prevent CTS, CRLF, Alameda whipsnake, and other special-status species from moving through the project area, the SFPUC or its contractors shall install temporary exclusion fencing at selected locations along the work area boundaries (including access roads, staging areas, etc.) prior to the start of project construction activities. Fencing locations will be based on observations of these specific species or the presence of habitats that are likely to support higher densities of these species. Other portions of the work area boundaries would not be fenced, based on coordination with the CDFG and USFWS. The SFPUC shall monitor disturbance areas to determine whether additional fencing is necessary to minimize potential impacts. The SFPUC shall ensure that the temporary fencing is continuously maintained until all construction activities are completed and that construction equipment is confined to the designated work areas. The fencing shall be made of suitable material that does not allow any of the animals listed above to pass through, and the bottom shall be buried to a depth of 6 inches (or to a sufficient depth as specified by the applicable resource agencies) so that these species cannot crawl under the fence. During fence installation, a qualified biological monitor shall be present onsite to relocate any animals to outside the work area boundaries. The biologist must be authorized by the federal (USFWS) and/or state (CDFG) regulatory agencies to relocate animals. After construction is completed, the exclusion fencing shall be removed.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		**Mitigation Measure M-BI-1e: Preconstruction Surveys and Construction Monitoring and Protocols for California Tiger Salamander, California Red-Legged Frog, and Alameda Whipsnake.** ***Preconstruction Surveys*** Prior to initial ground-disturbing activities in the project area, a qualified biologist shall survey the construction areas as well as undeveloped areas in the immediate vicinity for the presence of CTS, CRLF, and Alameda whipsnake, as follows: <u>California tiger salamander and California red-legged frog</u>. Not more than two weeks prior to the onset of work activities (including equipment mobilization) and immediately prior to commencing work, the qualified biologist shall survey upland habitat in the project area for CTS and CRLF, and potential refuge or burrow/estivation sites. As feasible, burrow/estivation areas identified within the project boundaries shall be temporarily fenced (per Mitigation Measure M-BI-1d) and avoided. At locations where potential refuge/estivation burrows are identified and cannot be avoided, the burrows shall be excavated by hand or by other means approved by the CDFG and USFWS prior to construction. If a burrow is occupied, the individual animal shall be moved to a natural burrow or artificial burrow constructed of PVC pipe within 0.25 mile of the project area or other location as agreed to by the appropriate agencies. <u>Alameda whipsnake</u>. Not more than two weeks prior to the onset of work activities (including equipment mobilization) and immediately prior to commencing work, a qualified biologist shall conduct a reconnaissance survey of suitable upland habitat for Alameda whipsnake in the project area. If an Alameda whipsnake is found, the qualified biologist shall relocate the animal outside of the construction area. Excavation, relocation, or collapse of burrows shall only be conducted as authorized by the USFWS (for federally listed species), by the CDFG (for state-listed species), or by both agencies (for species protected at both the federal and state levels). ***Construction Monitoring and Protocols*** At the beginning of each workday that includes initial ground disturbance, including grading, excavation, and vegetation-removal activities, a qualified biologist shall conduct onsite monitoring for the presence of CTS, CRLF, and Alameda whipsnake in the area where ground disturbance shall occur, as follows: • San Antonio Creek shall be surveyed prior to any ground-disturbing or vegetation removal activities at or near this creek. • Perimeter fences shall be inspected to ensure they do not have any tears or holes, that the bottoms of the fences are still buried, and that no individuals have been trapped in the fences. • Any CTS, CRLF, or Alameda whipsnakes found along and inside the fence shall be closely monitored until they move away from the construction area.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		• All open trenches or holes and areas under parked vehicles shall be checked for the presence of CTS, CRLF, and whipsnakes. • All excavated or deep-walled holes or trenches greater than 2 feet shall be covered at the end of each workday using plywood or similar materials, or escape ramps shall be constructed of earth fill or wooden planks. Before such holes are filled, they shall be thoroughly inspected for trapped animals. • Project personnel shall be required to immediately report any harm, injury, or mortality of a special-status species during construction (including entrapment) to the construction foreman or biological monitor, and the construction foreman or biological monitor shall immediately notify the SFPUC. The SFPUC shall provide verbal notification to the USFWS Endangered Species Office in Sacramento, California and/or to the local CDFG warden or biologist (as applicable) within one working day of the incident. The SFPUC shall follow up with written notification to the USFWS and/or CDFG (as applicable) within five working days of the incident. All observations of federally and state-listed species shall be recorded on CNDDB field sheets and sent to the CDFG by the SFPUC or representative biological monitor. While it is not necessary that the biological monitor stay onsite for the entire day, the monitor shall remain on-call in case any of these animals are discovered and it is necessary to move them. The SFPUC shall designate an SFPUC representative as the point of contact in the event that a CTS, CRLF, or Alameda whipsnake is discovered onsite when the biological monitor is not present. If the biological monitor or construction personnel find any of these species within the work area, construction activities shall cease in the immediate vicinity of the individual until: (1) the USFWS and/or CDFG are contacted and/or the animal has been removed from the construction area, in accordance with permits, by an approved biologist and released near a suitable burrow or other suitable habitat within 0.25 mile of the construction area, or (2) the animal moves away from the construction area on its own. Once all initial ground-disturbing activities are completed, the biological monitor shall perform spot checks of the project area at least once a week for the duration of construction to ensure that the perimeter fence is in good order, trenches are being covered if left open overnight (or escape ramps provided), project personnel are conducting checks beneath parked vehicles prior to their movement, and all other required biological protection measures are being followed. **Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation.** The SFPUC shall prepare and implement a vegetation restoration plan with detailed specifications for minimizing the introduction of invasive weeds and restoring all temporarily disturbed areas, and shall ensure that the contractor successfully implements the plan. The plan shall indicate the best time of year for seeding to occur. To facilitate preparation of the plan, the SFPUC shall ensure that, prior to construction, a qualified botanist (i.e., one experienced in identifying sensitive plant species in the project area) performs additional preconstruction surveys of the areas to collect more detailed vegetation composition data, including species occurrence, vegetation characterization (tree diameter size, etc.), and percent cover of plant species. Photo documentation shall be used to show pre-project conditions.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		If required, the SFPUC shall provide the vegetation restoration plan to the Corps, the CDFG, the RWQCB, and the USFWS during the permitting process, as any vegetation to be removed may provide habitat for special-status species and may also be within areas under the jurisdiction of the Corps and the RWQCB. The minimum avoidance, minimization, and restoration measures as well as success criteria to be included in the vegetation restoration plan are described below. Invasive Weed Control Measures Invasive weeds such as yellow star-thistle, purple star-thistle, Italian thistle, bull thistle, and stinkwort readily colonize soils that have been disturbed by grading or other mechanical disturbance. Although the project area has an extensive weed infestation and relatively few native species, the SFPUC shall incorporate the following measures into the construction plans and specifications to prevent the further spread of invasive weeds into nearby areas: • Construction equipment shall arrive at the project area free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species. • Any imported fill material, soil amendments, gravel etc., required for construction and/or restoration activities that would be placed within the upper 12 inches of the ground surface shall be free of vegetation and plant material. • Certified, weed-free, imported erosion-control materials (or rice straw in upland areas) shall be used exclusively, as applicable (this measure concerns biological material and does not preclude the use of silt fences, etc.). • The environmental awareness training program for construction personnel shall include an orientation regarding the importance of preventing the spread of invasive weeds. • To reduce the seed bank in weed-dominated ruderal areas, the contractor shall mow, disk, apply spot-applications of herbicide to weeds, and/or remove weeds, as appropriate and as early as feasible prior to surface clearing and site preparation. • Before construction equipment leaves the project area, any accumulation of plant debris, soil, and mud shall be washed off the equipment or otherwise removed onsite, and air filters shall be blown out. • The restoration plan shall specify measures to remove and/or control weeds in the project area. • No invasive species shall be used in any restoration plantings. • Implementation of these measures during construction and site restoration activities shall be verified and documented by a biological or environmental monitor. ***Minimum Restoration Measures*** Restoration areas are areas within the project area that would be disturbed during project-related construction activities but would subsequently be restored to their preconstruction conditions as defined by the success criteria described below. In order to restore these areas, the SFPUC shall ensure the following:	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		• The SFPUC shall ensure that topsoil is salvaged during grading and earthmoving activities (including during the preparation of spoils sites), stockpiled separately from subsoils, and protected from erosion (e.g., covered or watered); that composting amendments are added, if needed; and that potentially compacted construction work areas are properly prepared prior to reuse of the soil in the post-construction restoration of temporarily disturbed areas. The SFPUC shall ensure that a minimum of 12 inches of topsoil is salvaged, or if there is less than 12 inches of topsoil, as much as practicable. • For grassland and ruderal areas, the affected areas shall be reseeded with a native or non-invasive grass and forb seed mix. High seed application rates shall be used to help compete with the weedy seed bank. • For riparian and wetland habitats, the affected areas shall be replanted with similar plants of appropriate species and density as those removed. If possible, locally native stock shall be used. • For any isolated mature native tree (i.e., one that is not part of a woodland or riparian cover) or any tree to be removed from the Alameda County Calaveras Road right-of-way that meets the criteria described below, the SFPUC shall ensure that replacement trees are planted within or in the vicinity of the project area as follows: - At a minimum, for each removed mature native tree (i.e., trees that are 6 inches in diameter at breast height [dbh] or ten inches aggregate dbh for multi-trunk trees), affected areas shall be replanted with the same species on an inch-by-inch basis for any native mature tree outside the county right-of-way or as otherwise agreed to in consultation with the USFWS and CDFG. For example, eight tube trees (each 1-inch in diameter) could be planted to replace one 8-inch native tree. Other tree sizes could also be used as long as the total dbh replaces the dbh of the removed tree or trees. - Trees shall be replaced within the first year after the completion of construction or as soon as possible in an area where construction is completed during a favorable time period as determined by a qualified arborist or biologist. - Replacement trees shall be planted in or near the area experiencing surface disturbance from project construction and in locations suitable for the replacement species. - Selection of replacement sites and installation of replacement plantings shall be supervised by a qualified arborist or biologist. Irrigation of trees during the initial establishment period shall be provided as deemed necessary by a qualified arborist or biologist. - A qualified arborist or biologist shall monitor newly planted trees at least twice a year for 5 years (7 years for oaks). - Any trees planted as remediation for failed plantings shall be planted as stipulated here for original plantings, and shall be monitored for a period of 5 years (7 years for oaks) following installation, or as otherwise determined by the applicable resource agencies. - To replace trees removed from the Calaveras Road right-of-way, the SFPUC shall plant replacement trees along Calaveras Road, where feasible. If additional mitigation trees are required but their spacing cannot be accommodated along Calaveras Road, the trees shall be planted in the vicinity of the project area.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		- For non-native trees that are between 2 and 6 inches dbh within the Calaveras Road right-of-way, replacement trees shall be planted on a one-to-one basis for any trees removed. ***Minimum Success Criteria*** Unless otherwise determined by the applicable resource agencies, the success criteria for restoring temporarily disturbed areas shall be as follows: • All temporarily disturbed areas shall be restored to approximate their baseline condition. • Vegetation within restoration areas shall be functional, fully established, and self-sustaining as evidenced by successive years of healthy vegetative growth; observed increase in vegetative cover, canopy cover, and/or plant height; successful flowering, seed set, and/or or vegetative reproduction over the 5-year monitoring period. • Revegetation work shall start within one year of construction completion. • Revegetation of grassland areas shall be monitored at least once a year for 5 years. With the exception of Oak trees, which shall be monitored for 7 years, all other replacement trees shall be monitored for 5 years. • Restoration areas shall be monitored for target invasive plants quarterly in the first 5 years following replanting. If invasive plants are found during the 5-year monitoring period, they shall be removed as necessary to support meeting the cover and vegetation composition success criteria. Monitoring and maintenance shall continue until the minimum success criteria specified in the table below are met, or as otherwise determined by the applicable resource agencies.	

MINIMUM SUCCESS CRITERIA FOR VEGETATION RESTORATION

Parameter	Field Indicator/Measurement
Vegetative Cover	**Grassland:** 70 percent absolute cover of typical native and naturalized grassland species known from the Sunol Region by the end of the fifth monitoring year. **Individual Native Mature Trees:** 65 percent plant survivorship by the fifth monitoring year. **Alameda Creek Channel and Willow Riparian Forest/Scrub:** Greater than or equal to 45 percent canopy cover of target willow and/or mulefat species by the end of the fifth monitoring year.
Target Invasive Species	No more than 5 percent or 10 percent absolute cover of target invasive species shall remain in the in any given restoration area by the end of the fifth monitoring year.

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		***Compensatory Mitigation*** The SFPUC shall fully compensate for permanent losses of non-native grassland and ruderal habitat that provide potential low-quality upland refugial and dispersal habitat for CTS and CRLF, as well as potential low quality foraging and dispersal habitat for Alameda whipsnake (approximately 0.5 acre). Compensatory mitigation may occur through habitat enhancements at two of the SFPUC's Bioregional Habitat Restoration sites: the Goat Rock compensation site and the San Antonio Creek compensation site. Habitat enhancement shall occur at a location and at compensation ratios to be determined in consultation with USFWS and CDFG. Enhancements to grassland habitat may occur at the Goat Rock compensation site and enhancements to riparian habitat at the San Antonio Creek compensation site shall be conducted in accordance with the SFPUC's Sunol Region Mitigation and Monitoring Plan, which specifies the success criteria and mechanisms for monitoring to ensure compensation. **Mitigation Measure M-BI-1g: Measures to Minimize Disturbance to Special-Status Bird Species.** As feasible, the SFPUC shall conduct tree and shrub removal in the project area and the habitat compensation areas during the nonbreeding season (generally August 16 through February 14) for migratory birds, raptors, and special-status bat species. If construction activities must occur during the breeding season for special-status birds (February 15 to August 15), the SFPUC shall retain a qualified wildlife biologist who is experienced in identifying birds and their habitat to conduct nesting-raptor surveys in and within 500 feet of the project area. Migratory bird surveys shall be conducted within 100 feet of all work areas (as feasible) unless otherwise directed by CDFG. All migratory bird and active raptor nests within these areas shall be mapped. These surveys must be conducted within two weeks prior to initiation of construction activities at any time between February 15 and August 15. If no active nests are detected during surveys, no additional mitigation is required. If migratory bird and/or active raptor nests are found in the project area or in the adjacent surveyed area, the SFPUC shall establish a no-disturbance buffer around the nesting location to avoid disturbance or destruction of the nest site until after the breeding season or after a wildlife biologist determines that the young have fledged (usually late June through mid-July). The extent of these buffers would be determined by a wildlife biologist in consultation with CDFG and would depend on the species' sensitivity to disturbance (which can vary among species); the level of noise or construction disturbance; line of sight between the nest and the disturbance; ambient levels of noise and other disturbances; and consideration of other topographical or artificial barriers. The wildlife biologist shall analyze and use these factors to assist the CDFG in making an appropriate decision on buffer distances. **Mitigation Measure M-BI-1h: Conduct Preconstruction Surveys for Any Special-Status Bats Found and Implement Avoidance and Minimization Measures.** Not more than one week prior to tree removal and demolition of the two quarry buildings located to the east of Pit F3-East, a qualified biologist (i.e., one familiar with the identification of bats and signs of bats) shall survey the trees to be removed and the buildings to be demolished for the presence of roosting bats. Bats may be present any time of the year. The biologist shall thoroughly search the two buildings and any trees that provide appropriate habitat (trees with foliage or cavities or that are hollow) for the presence of roosting bats or evidence of bats. If no roosting bats or evidence of bats are found in the trees, tree removal may proceed. Similarly, if no roosting bats or evidence of bats are found in the quarry buildings, demolition may proceed. If bats are found or evidence of use	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-1 (cont.)		by bats is present, the biologist shall map and mark the trees and/or locations within the buildings with flagging. As appropriate, the SFPUC shall ensure that the trees are not removed and/or the buildings are not demolished until the CDFG has been consulted for guidance on measures to avoid and minimize disturbance of the special-status bats. Measures may include: monitoring trees or structures and excluding bats from the tree(s) or structures to be removed/demolished; timing tree removal and building demolition to minimize disturbance to bats; and/or use of a construction buffer to avoid disturbance of young before they are able to fly (for pallid bats, this period is between April and August). **M-HY-1a (Prepare and Implement a SWPPP) and M-HY-1b (Creek Restoration and Revegetation)** would also apply to this impact.	
Impact BI-2: The proposed project could have a substantial adverse effect on riparian habitat and other sensitive habitats during construction.	S	**M-BI-1a** (**General Protection Measures**); **M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)**; **M-BI-1b (Worker Training and Awareness Program)**; **and M-BI-1c (Minimize Disturbance of Riparian Habitat)** would apply to this impact.	LS
Impact BI-3: The proposed project could have a substantial adverse effect on jurisdictional waters during construction.	S	**M-BI-3: Avoidance and Protection Measures for Jurisdictional Water Bodies.** The SFPUC and its contractors shall minimize impacts on waters of the United States and waters of the state, including wetlands, by implementing the following measures: • Construction activities in saturated or ponded wetlands and streams (typically during the spring and winter) shall be avoided to the maximum extent feasible. Where wetlands or other water features must be disturbed, the minimum area of disturbance necessary for construction shall be identified and the area outside avoided. • A silt fence shall be installed adjacent to all wetlands and drainages to be avoided within 50 feet of any proposed construction activity, and signs installed indicating the required avoidance. No equipment mobilization, grading, clearing, or storage of equipment or machinery, or similar activity, shall occur until a representative of the SFPUC has inspected and approved the fencing installed around these features. This restriction applies to both onsite construction and any offsite mitigation area. The SFPUC shall ensure that the temporary fencing is continuously maintained until all construction activities are completed. No construction activities, including equipment movement, material storage, or temporary spoil stockpiling, shall be allowed within the fenced areas protecting wetlands. • To minimize the degradation of wetland soils and vegetation where avoidance is infeasible, protective practices such as geotextile cushions and other materials (e.g., timber pads, prefabricated equipment pads, geotextile fabric) or vehicles with balloon tires shall be employed in saturated conditions (e.g., when there is noticeable rutting due to saturated conditions and mixing of topsoil and subsoil). • Exposed slopes and streambanks shall be stabilized immediately upon the completion of construction activities. • The banks of San Antonio Creek shall be stabilized (if disturbed during construction) using a non-vegetative material that will bind the soil initially and break down within a few years (e.g., jute mat). More aggressive erosion control treatments shall be implemented as needed for stabilization, such as geotextile mats, excelsior blankets, or other soil stabilization products.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact BI-3 (cont.)		**M-BI-1a (General Protection Measures); M-BI-1b (Worker Training and Awareness Program); M-BI-1c (Minimize Disturbance of Riparian Habitat); M-BI-1d (Prevent Movement of Specific Species through the Work Areas); M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation); M-HY-1a (Preparation and Implementation of a SWPPP); and M-HY-1b (Creek Restoration and Revegetation)** would also apply to this impact.	
Impact BI-4: The proposed project could have a substantial adverse effect on resident trout and other native fishes during construction, either by impeding movement or adversely affecting aquatic habitat.	S	**M-HY-1a (Preparation and Implementation of a SWPPP); M-HY-1b (Creek Restoration and Revegetation); M-BI-1b (Worker Training and Awareness Program); M-BI-1c (Minimize Disturbance of Riparian Habitat); and M-BI-3 (Avoidance and Protection Measures for Jurisdictional Water Bodies)** would apply to this impact.	LS
Impact BI-5: The proposed project would not have a substantial adverse effect on wildlife corridors or wildlife nursery sites during construction.	LS	None required.	LS
Impact BI-6: Construction activities associated with the proposed project could conflict with local policies or ordinances protecting biological resources.	S	**M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)** would apply to this impact.	LS
Impact BI-7: Project operations could have a substantial adverse effect on special-status animal species during project operations.	S	**M-BI-7: Screen Dewatering Pump Intakes.** The SFPUC shall screen the intake pipes for the submersible pumps at Pit F3-East, and the intakes for the pumps on floating platforms in Pit F3-West to prevent the entrainment of CRLF into these pipes. The screens shall be made of wire mesh with openings not larger than 5 millimeters.	LS
Impact BI-8: Project operations would not have a substantial adverse effect on jurisdictional waters, riparian habitat, or aquatic resources during project operations.	LS	None required.	LS
Impact BI-9: The proposed project would not have a substantial adverse effect on sensitive habitats during project operations.	LS	None required.	LS
Impact BI-10: The proposed project would not interfere with the movement of native resident trout and other native migratory fishes during project operations.	LS	None required.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.14: Biological Resources (cont.)			
Impact C-BI: Project implementation could result in a cumulatively considerable contribution to cumulative impacts on biological resources during project construction and operation.	S	**M-BI-1a (General Protection Measures); M-BI-1b (Worker Training and Awareness Program); M-BI-1c (Minimize Disturbance to Riparian Habitat); M-BI-1d (Prevent Movement of Specific Species through the Work Areas); M-BI-1e (Preconstruction Surveys and Construction Monitoring and Protocols for California Tiger Salamander, Red-Legged Frog, and Alameda Whipsnake); M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation); M-BI-1g (Measures to Minimize Disturbance to Special-Status Bird Species); M-BI-1h (Conduct Preconstruction Surveys for Any Special-Status Bats Found and Implement Avoidance and Minimization Measures); M-BI-7 (Screen Dewatering Pump Intakes); M-HY-1a (Preparation and Implementation of a SWPPP); M-HY-1b (Creek Restoration and Revegetation); and M-BI-3 (Avoidance and Protection Measures for Jurisdictional Water Bodies)** would apply to this impact.	LS
Section 5.15: Geology and Soils			
Impact GE-1: The project is located on a geologic unit that could become unstable as a result of project construction.	S	**M-GE-1: Shoring Plan for Pit F3-East.** The SFPUC shall contract with a licensed geotechnical engineer to implement a shoring plan assessing potential slope instability risks associated with the final design for construction of the outfall and splash pad at quarry Pit F3-East. The shoring plan shall specify measures to minimize the potential for slope failure during construction and shall include: a dimensioned site plan showing the location of the shoring; data regarding the expected loads on the shoring (surcharge), details of the shoring system; a soils report; and structural calculations for the shoring system. A qualified geotechnical or civil engineer shall prepare the soils report, and a civil and/or structural engineer shall prepare structural plans and calculations for the shoring. The SFPUC shall ensure that the construction contractor implements the plan; that the shoring is inspected by a qualified civil or structural engineer for compliance with the provisions of the shoring plan prior to beginning construction; and that construction activities are periodically observed to verify that all work conforms to the approved shoring plan.	LS
Impact GE-2: The project could result in substantial soil erosion or loss of topsoil during construction.	S	**M-HY-1a (Preparation and Implementation of a SWPPP) and M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)** would apply to this impact.	LS
Impact GE-3: The project would not expose people or structures to substantial adverse effects related to the risk of loss, injury, or death due to rupture of a known earthquake fault.	LS	None required.	LS
Impact GE-4: The project would not expose people or structures to substantial adverse effects related to the risk of loss, injury, or death due to seismically induced groundshaking.	LS	None required.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.15: Geology and Soils (cont.)			
Impact GE-5: The project would not expose people or structures to substantial adverse effects related to the risk of loss, injury, or death due to seismically induced ground failure, including liquefaction, lateral spreading, or settlement.	LS	None required.	LS
Impact GE-6: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced landslides or other slope failures.	LS	None required.	LS
Impact GE-7: The project would not create substantial risks to life or property due to expansive or corrosive soil.	LS	None required.	LS
Impact GE-8: Project operations would not result in substantial soil erosion during project operations.	LS	None required.	LS
Impact GE-9: The proposed project would not substantially change the topography or any unique geologic or physical features of the project area.	LS	None required.	LS
Impact C-GE: Project construction could result in a cumulatively considerable contribution to cumulative impacts related to the loss of topsoil.	S	**M-HY-1a (Preparation and Implementation of a SWPPP) and M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)** would apply to this impact.	LS
Section 5.16: Hydrology and Water Quality			
Impact HY-1: Project construction could substantially degrade water quality as a result of erosion and sedimentation or an accidental release of hazardous chemicals.	S	**M-HY-1a: Preparation and Implementation of a SWPPP.** Consistent with the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction Activity, the SFPUC or its contractor(s) shall submit a notice of intent to the SWRCB's Division of Water Quality, develop a SWPPP, and implement site-specific BMPs to prevent discharges of nonpoint-source pollutants in construction-related stormwater runoff into downstream water bodies, including Alameda and San Antonio Creeks. The San Francisco Bay RWQCB, the primary agency responsible for protecting water quality in the project area, would review the SWPPP to ensure compliance with the general permit.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.16: Hydrology and Water Quality (cont.)			
Impact HY-1 (cont.)		The BMPs contained in the SWPPP are also subject to review and approval by the RWQCB. The recommended BMPs are listed below. However, the measures themselves may be altered, supplemented, or deleted during the review process, since the RWQCB has final authority over the terms of the SWPPP. <u>Scheduling</u> • Schedule construction to minimize ground disturbance during the rainy season. • Stabilize all disturbed soils as soon as possible following the completion of soil-disturbing work in the project area. • Provide plans to stabilize soil with vegetation or physical means in the event rainfall is expected. • Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities. <u>Erosion and Sedimentation</u> • Preserve existing vegetation in areas where no construction activity is planned or where construction activity will occur at a later date. • Stabilize and revegetate disturbed areas as soon as possible after construction by planting or seeding and/or using mulch (e.g., straw or hay, erosion control blankets, hydromulch, or other similar material) except in actively cultivated areas. • Install silt fences or fiber rolls or implement other suitable measures around the perimeter of the construction zone, staging areas, temporary stockpiles, spoil areas, stream channels, and swales, as well as down-slope of all exposed soil areas, and in other locations determined necessary to prevent offsite sedimentation. • Install temporary slope breakers during the rainy season on slopes greater than 5 percent where the base of the slope is less than 50 feet from a water body, wetland, or road crossing at spacing intervals required by the RWQCB. • Use filter fabric or other appropriate measures to prevent sediment from entering storm drain inlets. • Detain and treat water produced by construction site dewatering using sedimentation basins, sediment traps (when water is flowing and there is sediment), or other measures to ensure that discharges to receiving waters meet applicable water quality objectives. <u>Tracking Controls</u> • Grade and stabilize construction site entrances and exits to prevent runoff from the site and to prevent erosion. • Install a trackout control device (e.g., gravel pad, grizzlie, wash facility, etc.) at site access points to allow for carryout and trackout prevention when vehicles exit the site. This provision may be omitted if the RWQCB determines that vacuum sweepers, as required by Mitigation Measure M-AQ-1a (BAAQMD Basic Construction Measures), are sufficient to prevent trucks from tracking dirt.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.16: Hydrology and Water Quality (cont.)			
Impact HY-1 (cont.)		• Remove any soil or sediment tracked off paved roads during construction by employing street sweeping. Instream Construction BMPs • Minimize disturbance of the ground surface and substrate within San Antonio Creek during installation of the backup pipeline. • Limit the use of construction vehicles in the San Antonio Creek channel not actively involved in construction across the creek. • Monitor instream construction activity and coordinate with the contractor to identify periods when localized increases in turbidity may occur. • Prevent raw cement, concrete or concrete washings, asphalt, paint or other coatings, oil or other petroleum products, or any other substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses. • Any physical barriers within San Antonio Creek that are needed to isolate the construction area for dewatering purposes or for erosion and sediment control shall be installed under the direction of a qualified biologist to minimize stress, injury, and mortality to wildlife. • Keep visible oil, grease, or foam from forming on soil or water surfaces. • In the event that construction activities create a visible plume in surface waters, initiate monitoring of turbidity concentrations at the discharge site and 50 feet downstream while the visible plume persists, and initiate corrective action to reduce construction-related turbidity so that it complies with turbidity criteria specified in the Basin Plan for the coldwater fish habitat beneficial use, as measured in surface waters 50 feet downstream of the working area. Implement corrective actions as needed to ensure construction activities are within the Basin Plan's surface water quality objective for turbidity, which states that turbidity increases shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU. Corrective actions would depend on the cause of the sediment discharge and could include installing additional silt fences and other erosion control devices, covering stockpiled material, and improving the system for treating water from the dewatering operation. • Avoid operation of construction vehicles and equipment in flowing water. Non-stormwater Control • Keep construction vehicles and equipment clean; do not allow excessive build-up of oil and grease. • Check construction vehicles and equipment daily at startup for leaks, and repair any leaks immediately. • Do not refuel vehicles and equipment within 100 feet of surface waters to prevent run-on and runoff and to contain spills.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.16: Hydrology and Water Quality (cont.)			
Impact HY-1 (cont.)		• Conduct all refueling and servicing of equipment with absorbent material or drip pans underneath to contain spilled fuel. Collect any fluid drained from machinery during servicing in leak-proof containers and deliver to an appropriate disposal or recycling facility. • Cover all storm drain inlets when paving or applying seals or similar materials to prevent the offsite discharge of these materials. Waste Management and Hazardous Materials Pollution Control • Remove trash and construction debris from the project area regularly. Provide an adequate number of waste containers with lids or covers to keep rain from out of the containers and to prevent trash and debris from being blown away during high winds. • Locate sanitary facilities a minimum of 200 feet from Alameda and San Antonio Creeks. • Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water. • Maintain sanitary facilities regularly. • Store all hazardous materials in an area protected from rainfall and stormwater run-on and prevent the offsite discharge of leaks or spills. • Minimize the potential for contamination of surface water bodies, including Pits F3-East and F3-West, and Alameda and San Antonio Creeks, by maintaining spill containment and cleanup equipment onsite, and by properly labeling and disposing of hazardous wastes. • Locate waste collection areas close to construction entrances and away from roadways, Alameda and San Antonio Creeks, and Pits F3-East and F3-West. • Inspect dumpsters and other waste and debris containers regularly for leaks, and remove and properly dispose of any hazardous materials and liquid wastes placed in these containers. • Train construction personnel in proper material delivery, handling, storage, cleanup, and disposal procedures. BMP Inspection, Maintenance, and Repair • Inspect all BMPs on a regular basis to confirm proper installation and function. • Inspect all stormwater BMPs daily during storms. • Inspect sediment basins, sediment traps, and other detention and treatment facilities regularly throughout the construction period.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.16: Hydrology and Water Quality (cont.)			
Impact HY-1 (cont.)		• Provide sufficient devices and materials (e.g., silt fence, fiber rolls, erosion blankets, etc.) throughout project construction to enable immediate repair or replacement of failed BMPs. • Inspect all seeded areas regularly for failures, and remediate or repair as soon as feasible. <u>Permitting, Monitoring, and Reporting</u> • Obtain and comply with the RWQCB Section 401 Water Quality Certification and California Department of Fish and Game Streambed Alteration Agreement. • Provide the required documentation for SWPPP inspections, maintenance, and repair requirements. • Maintain written records of inspections, spills, BMP-related maintenance activities, corrective actions, and visual observations of any offsite discharge of sediment or other pollutants, as required by the RWQCB. • Monitor water quality to assess the effectiveness of control measures. • Notify the RWQCB and other agencies as required (e.g., California Department of Fish and Game) if the criteria for turbidity, oil/grease, or foam are exceeded, and undertake corrective actions. • Immediately notify the RWQCB and other agencies as required (e.g., California Department of Fish and Game) of any spill of petroleum products or other organic or earthen materials, and undertake corrective action. <u>Post-construction BMPs</u> • Revegetate all temporarily disturbed areas as required after construction activities are completed. • Remove any remaining construction debris and trash from the project area and staging areas upon project completion. • Phase the removal of temporary BMPs as necessary to ensure stabilization of the site. • Maintain post-construction site conditions to avoid any unintended drainage channels, erosion, or areas of sedimentation. • Correct post-construction site conditions as necessary to comply with the SWPPP and any other pertinent RWQCB requirements. **M-HY-1b: Creek Restoration and Revegetation.** Following installation of the backup pipeline at the San Antonio Creek crossing, the SFPUC shall revegetate the disturbed creek banks with native vegetation and restore the geometry of the disturbed creek channel to pre-existing conditions. Plantings shall be monitored and maintained for up to two years to ensure stabilization of the creek channel. This mitigation measure shall be implemented in conjunction with Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation).	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.16: Hydrology and Water Quality (cont.)			
Impact HY-2: Dewatering of excavated areas during project construction would not substantially deplete groundwater supplies.	LS	None required.	LS
Impact HY-3: Discharges of dewatering effluent from excavated areas during project construction could substantially degrade water quality.	S	**M-HY-3: Management of Dewatering Effluent Discharges.** To address potential impacts on receiving water quality during the construction period related to dewatering effluent discharges and to comply with NPDES requirements, the construction contractor(s) shall prepare and implement a project-specific dewatering plan. Discharges of dewatering effluent during project construction shall be conducted in accordance with NPDES general construction permit requirements. ***Construction Dewatering Plan*** The dewatering plan shall specify how the water will be collected, contained, treated, monitored, and discharged to vegetated areas, Alameda Creek, and San Antonio Creek. Subject to review and approval by the RWQCB, the plan shall at a minimum: • Identify methods and locations for collecting and handling water onsite prior to discharge, determine treatment requirements, and determine the capacity of settling basins, treatment ponds, and/or holding tanks. • Identify methods for treating water onsite prior to discharge, such as filtration, coagulation, sedimentation settlement areas, oil skimmers, pH adjustment, and other BMPs. • Establish procedures and methods for maintaining and monitoring dewatering operations to ensure that no breach in the process occurs that could result in an exceedance of applicable water quality objectives. • Identify discharge locations and include details regarding how the discharge will be conducted to minimize erosion and scour. ***Relevant Water Quality Objectives*** At a minimum, the project discharges to surface waters shall not exceed the water quality objectives for receiving waters included in the current San Francisco Bay Basin Plan, including (but not limited to): • pH shall not be depressed below 6.5 nor raised above 8.5. • Turbidity shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU. • Temperature shall not be increased by more than 5 °F (2.8 °C) above natural receiving water temperature. • Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses. • Waters shall not contain floating material, including solids, liquids, foams, or scum, in concentrations that cause nuisance or adversely affect beneficial uses.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.16: Hydrology and Water Quality (cont.)			
Impact HY-3 (cont.)		• Waters shall not contain oils, greases, waxes, or other materials in concentrations that: result in a visible film or coating on the surface of the water or on objects in the water, cause nuisance, or otherwise adversely affect beneficial uses. • All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Construction contractor(s) shall comply with all monitoring and reporting requirements established by the RWQCB. Any exceedences of established narrative or numeric water quality objectives shall be reported to the RWQCB and corrective action taken. Corrective action may include an increase in residence time in treatment features (e.g., longer holding time in settling basins) and/or incorporation of additional treatment measures (e.g., addition of sand filtration prior to discharge).	
Impact HY-4: Discharges of treated water from existing and newly installed pipelines during project construction would not substantially degrade water quality.	LS	None required.	LS
Impact HY-5: The placement of project facilities within a 100-year flood hazard zone would not substantially impede or redirect flood flows, or result in damage to SFPUC facilities or private property.	LS	None required.	LS
Impact HY-6: Project implementation would not expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of dam failure.	LS	None required.	LS
Impact HY-7: Project implementation would not alter drainage patterns such that there would be a substantial increase in erosion, siltation, or the rate or amount of surface runoff.	LS	None required.	LS
Impact HY-8: Future discharges from the backup pipeline would not substantially degrade water quality or exceed the capacity of Pit F3-East.	LS	None required.	LS
Impact C-HY: Project construction could result in a cumulatively considerable contribution to cumulative impacts on hydrology and water quality.	S	**M-HY-1a (Preparation and Implementation of a SWPPP); M-HY-1b (Creek Restoration and Revegetation); and M-HY-3 (Management of Dewatering Effluent Discharges)** would apply to this impact.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.17: Hazards and Hazardous Materials			
Impact HZ-1: Project construction could result in a substantial adverse effect related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	S	**M-HZ-1a: Evaluate Soil Quality.** Prior to project construction, the SFPUC shall perform a soil investigation to determine the presence of chemical residues within shallow soils in proposed construction work areas where sampling has not been previously conducted, and in the area south of the Alameda Siphons (in the vicinity of the San Antonio Pump Station, where a release of diesel and waste oil was previously remediated and concentrations of total oil and grease are reported to be ubiquitous). Samples shall be collected from surface soils (from the ground surface to 1.5 feet below the surface) in each of the proposed work areas and spoils sites that will be disturbed during project construction, and to the depth of the planned excavation in the vicinity of the San Antonio Pump Station. At a minimum, surface soil samples shall be analyzed for total copper, arsenic, lead, mercury, and organochlorine pesticides. To evaluate the potential for petroleum products and semivolatile organic compounds to be present, subsurface soil samples from the vicinity of the San Antonio Pump Station shall be analyzed for total petroleum hydrocarbons (as gasoline, diesel, and waste oil) and for semivolatile organic compounds. The results of the soil investigation shall be incorporated into the construction risk and spoils management plan prepared in accordance with Mitigation Measure M-HZ-1b (Implement a Construction Risk and Spoils Management Plan) to determine whether: specific soils management and disposal procedures for contaminated materials are required; excavated soils are suitable for reuse; and appropriate construction worker health and safety procedures for working with contaminated materials are required. **M-HZ-1b: Implement a Construction Risk and Spoils Management Plan.** The SFPUC shall require the construction contractor to prepare and implement a construction risk and spoils management plan (CRSMP), subject to review by the SFPUC, to address hazardous materials and other worker health and safety issues during construction of the proposed project. The CRSMP shall include all necessary procedures to ensure that excavated materials are stored, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The SFPUC shall ensure that the CRSMP includes the following information: • Results of previous soil sampling within the construction work areas as well as sampling conducted in accordance with Mitigation Measure M-HZ-1a (Evaluate Soil Quality). • A site-specific health and safety plan (HASP) prepared by a qualified environmental professional in accordance with federal OSHA regulations (29 CFR 1910.120) and Cal/OSHA regulations (8 CCR 5192). The HASP shall include all required measures to protect construction workers and the general public by including engineering controls, monitoring, and security measures to prevent unauthorized entry to the construction area and to reduce hazards outside of the construction area. If prescribed contaminant exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. Submission of the CRSMP to the SFPUC, or any review of the contractor's CRSMP or HASP by the SFPUC, shall not be construed as approval of the adequacy of the contractor's health and safety professional, the contractor's HASP, or any safety measure taken in or near the construction site. The contractor shall be solely and fully responsible for compliance with all laws, rules, and regulations applicable to health and safety during the performance of the construction work.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.17: Hazards and Hazardous Materials (cont.)			
Impact HZ-1 (cont.)		• Step-by-step procedures for evaluation, handling, stockpiling, storage, testing, and disposal of excavated material, including criteria for: reuse within the pipeline trenches; placement at the North Spoils Site; temporary storage in SMP-30 Pit F6 or aggregate processing facility prior to processing for resale and reuse; and offsite disposal. All excavated materials shall be inspected prior to initial stockpiling, and spoils that are visibly stained and/or have a noticeable odor shall be stockpiled separately to minimize the amount of material that may require special handling. In addition, excavated materials shall be stored away from Alameda and San Antonio Creeks and other water features in accordance with the storm water pollution prevention plan (SWPPP) prepared in accordance with Mitigation Measure M-HY-1a (Preparation and Implementation of a SWPPP) and inspected for buried building materials, debris, and evidence of underground storage tanks; if identified, these materials shall be stockpiled separately and characterized in accordance with landfill disposal requirements. The chemical quality of the spoils intended for reuse shall be characterized, and spoils may be permanently placed at the North Spoils Site, or temporarily placed in Pit F6 or at the SMP-30 aggregate processing facility if they are found to meet the reuse criteria established in the CRSMP. Any spoils that do not meet the reuse criteria shall be segregated and disposed of at a permitted landfill facility. • Procedures to be implemented if unknown subsurface conditions or contamination are encountered, such as previously unreported tanks, wells, or contaminated soils. • Detailed control measures for use and storage of hazardous materials to prevent the release of pollutants to the environment, and emergency procedures for the containment and cleanup of accidental releases of hazardous materials to minimize the impacts of any such release. These procedures shall also include reporting requirements in the event of a reportable spill or other emergency incident. At a minimum, the SFPUC or its contractor shall notify applicable agencies in accordance with guidance from the California Office of Emergency Services as well as the Alameda County Water District. • Fire-prevention measures, including cigarette smoking in disturbed areas only and disposing of cigarette butts in waste bins, parking in non-vegetated areas, and complying with the requirements of the California PRC, beginning with Section 4427. • Required worker health and safety provisions for all workers potentially exposed to contaminated materials, in accordance with state and federal worker safety regulations, and designated personnel responsible for implementation of the CRSMP. **Mitigation Measure M-HZ-1c: Hazardous Building Materials.** Prior to demolishing the residential-style building and associated shed, the SFPUC shall ensure that a qualified environmental professional survey the buildings for electrical equipment containing polychlorinated biphenyls (PCBs), fluorescent lights containing mercury vapors or fluorescent light ballasts containing PCBs or Di (2-ethylhexyl) phthalate (DEHP). Any of these materials shall be removed and disposed of properly prior to demolition of the buildings. **M-HY-1a (Preparation and Implementation of a SWPPP)** would also apply to this impact.	

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.17: Hazards and Hazardous Materials (cont.)			
Impact HZ-2: Project construction could result in a substantial adverse effect related to accident conditions involving the release of hazardous construction chemicals into the environment.	S	**M-HY-1a (Preparation and Implementation of a SWPPP)** would apply to this impact.	LS
Impact HZ-3: Project construction would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.	LS	None required.	LS
Impact HZ-4: Project construction would not expose people or structures to a significant risk of loss, injury, or death involving fires.	LS	None required.	LS
Impact HZ-5: Project operations would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LS	None required.	LS
Impact HZ-6: Project operations would not expose people or structures to a significant risk of loss, injury, or death involving fires.	LS	None required.	LS
Impact C-HZ: Construction of the proposed project would result in a cumulatively considerable contribution related to cumulative impacts related to hazards and hazardous materials.	S	**M-HZ-1a (Evaluate Soil Quality); M-HZ-1b (Implement a Construction Risk and Spoils Management Plan); M-HZ-1c (Hazardous Building Materials); and M-HY-1a (Preparation and Implementation of a SWPPP)** would also apply to this impact.	LS
Section 5.18: Minerals and Energy Resources			
Impact ME-1: Project construction would not result in the temporary loss of availability of known mineral resources that would be of value to the region or residents of the state, or the temporary loss of availability of a locally important mineral resource recovery site.	LS	None required.	LS
Impact ME-2: Project construction could result in substantial adverse effects related to the use of large amounts of fuel or energy, or the use of these resources in a wasteful manner.	S	**M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NOx Reduction)** would apply to this impact.	LS

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

IMPACT	Level of Significance Prior to Mitigation	Mitigation Measure(s)	Level of Significance After Mitigation
Section 5.18: Minerals and Energy Resources (cont.)			
Impact ME-3: Project implementation would not result in the permanent loss of availability of known mineral resources that would be of value to the region or residents of the state, or the permanent loss of availability of a locally important mineral resource recovery site.	LS	None required.	LS
Impact ME-4: Project operations would not result in substantial adverse effects related to the long-term use of large amounts of fuel or energy, or the use of these resources in a wasteful manner.	LS	None required.	LS
Impact C-ME: Project construction would result in a cumulatively considerable contribution to cumulative impacts related to mineral and energy resources.	S	**M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NOx Reduction)** would apply to this impact.	LS
Section 5.19: Agriculture and Forest Resources			
Impact AG-1: Implementation of the proposed project would result in the conversion of Unique Farmland, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.	S	**M-AG-1: Compensation for Loss of Unique Farmland.** The SFPUC shall compensate for the conversion of Unique Farmland to non-agricultural use as follows: • As compensation for the permanent loss of Unique Farmland at the former nursery site, the SFPUC shall dedicate a permanent agricultural conservation easement equal in area to the Unique Farmland converted to non-agricultural use. • As an alternative to the permanent agricultural easement described above, the SFPUC shall contribute funds to a local agricultural land conservancy to establish a conservation easement to protect an equivalent acreage of similarly valued land in the area. Should the Farmland Mapping and Monitoring Program remove the Unique Farmland designation from the former nursery site before the earthen berm is constructed, this mitigation measure would no longer be warranted and would not be required.	LS
Impact C-AG: Implementation of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to the conversion of Unique Farmland to non-agricultural uses.	S	**M-AG-1 (Compensation for Loss of Unique Farmland)** would apply to this impact.	LS

1.6 SABPL Pumping Variants

This EIR evaluates two variations of the proposed project that are under consideration by the SFPUC. The variants address two different pumping scenarios (one-step vs. two-step pumping) for dewatering Pit F3-East after a discharge of quality-impaired Hetch Hetchy water. While the proposed project proposes construction of the Alameda Creek Pump Station, the variants provide the SFPUC with flexibility as it continues to evaluate pumping options. During the project approval process, the SFPUC could select the proposed project or one of the pumping variants for implementation. The construction schedules for the pumping variants are assumed to be the same as, or very similar to, the construction schedule for the proposed project.

1.6.1 Pumping Variant 1

1.6.1.1 Description

Under Pumping Variant 1, facility operators would use two high-pressure submersible pumps adjacent to the new discharge facility at Pit F3-East to pump water directly (one-step pumping scenario) from Pit F3-East through the dewatering pipeline and other existing pipelines to San Antonio Reservoir or to the SVWTP. Pumping Variant 1 would not include construction of the Alameda Creek Pump Station and associated facilities (wet well, electrical control building, overhead powerline between the Hetch Hetchy Water & Power (HHWP) Calaveras Substation to the pump station, electrical transformer, and retaining wall) or the transfer pipeline.

1.6.1.2 Impacts of Pumping Variant 1

Since Pumping Variant 1 does not include construction of the Alameda Creek Pump Station and associated facilities (wet well, electrical control building, overhead powerline between the HHWP Calaveras Substation to the pump station, electrical transformer, and retaining wall) or the transfer pipeline, implementation of this variant would reduce the magnitude of some construction impacts that were identified for the proposed project, including impacts related to soil erosion, slope instability, landfill capacity, haul truck traffic, and air quality. However, the impact conclusions, significance determinations, and mitigation measures for all construction impacts would be the same as those for the proposed project. The operational impacts of Pumping Variant 1 would be the same as proposed project's, except for the impact related one topic area: energy use. Pumping Variant 1 would result in a reduction in operational energy use when compared to the proposed project. However, the overall significance determination for this impact would be the same that of as the proposed project. All impact conclusions, significance determinations, and mitigation measures for operational impacts would also be the same as those identified for the proposed project.

1.6.2 Pumping Variant 2

1.6.2.1 Description

Pumping Variant 2 would provide the SFPUC with the option of either: (1) pumping the water discharged from the backup pipeline into Pit F3-East directly to San Antonio Reservoir or to the SVWTP (one-step pumping scenario), or (2) first pumping water from Pits F3-East and F3-West to the Alameda Creek Pump Station, and subsequently pumping the water to San Antonio Reservoir or to the SVWTP (two-step pumping scenario). Pumping Variant 2 includes all of the same facilities as the proposed project, except that one of the low-pressure submersible pumps adjacent to the new discharge facility at Pit F3-East would be replaced with a high-pressure submersible pump.

1.6.2.2 Impacts of Pumping Variant 2

Since Pumping Variant 2 includes all of the same facilities and improvements as the proposed project, this variant would result in the same construction impacts. With the exception of energy use during project operations, which would be less than energy use under the proposed project when one-step pumping is used, all operational impacts would be exactly the same as those of the proposed project. Thus, the impact conclusions, significance determinations, and mitigation measures for construction and operational impacts would also be the same as those identified for the proposed project.

1.7 Alternatives to the Proposed Project

Chapter 7, Alternatives, of this EIR evaluates three alternatives to the proposed project:

- **Alternative 1: No Project Alternative.** The SFPUC would not make improvements, and the San Antonio Pipeline would continue to operate as it does under existing conditions.

- **Alternative 2: SABPL Discharges to Base of Turner Dam.** The SFPUC would install a new 2-mile-long backup pipeline between the San Antonio Pump Station and San Antonio Creek at the base of Turner Dam. Improvements would be made to the existing discharge facility at the base of Turner Dam. As with the proposed project, a new chemical facility would be constructed near the San Antonio Pump Station. This alternative would not construct the new discharge facility at Pit F3-East, the cutoff wall around Pits F3-East and F3-West, the Alameda Creek Pump Station, wet well, transfer pipeline, or dewatering pipeline.

- **Alternative 3: Aboveground SABPL.** This alternative would construct all of the same facilities and improvements as the proposed project; however, the backup pipeline would be constructed aboveground.

Although the No Project Alternative would avoid the construction-related impacts of the proposed project, it would not meet any of the project objectives. The alternatives analysis determined that Alternative 2, SABPL Discharges to Base of Turner Dam, would result in greater overall construction and operational impacts in some areas relative to the proposed project but would fully meet both project objectives. Although Alternative 3, Aboveground SABPL, would reduce construction-related impacts in some areas relative to the proposed project, it would result in significant and unavoidable impacts on scenic resources because the aboveground pipeline would be visible from Calaveras Road, a designated scenic roadway. Due to the identification of a significant and unavoidable impact for Alternative 3, this alternative would result in greater overall impacts when compared to the proposed project. Therefore, among the alternatives to the proposed project, Alternative 2 is considered environmentally superior.

1.8 Areas of Controversy

No areas of scientific or technical controversy have been identified for this project. During the scoping meeting, held on October 25, 2007, attendees commented on the scope of the Draft EIR. Written comments were also received during the scoping period (between October 5 and November 5, 2007). A scoping report was prepared that summarizes the comments received on the project, including a transcript of oral testimony at the October 2007 scoping session (see **Appendix B**). Refer to Table 2-2 in Chapter 2, Introduction and Background, for an overview of environmental concerns raised during the scoping period.

1.9 References

San Francisco Planning Department, *San Antonio Backup Pipeline Project, Environmental Impact Report, Summary of Public Scoping Comments*. December 2007.

San Francisco Planning Department, *Final Program Environmental Impact Report for the San Francisco Public Utility Commission's Water System Improvement Program*, File No. 2005.0159E, State Clearinghouse No. 2005092026. Certified October 30, 2008.

San Francisco Planning Department, *Final Environmental Impact Report for the San Francisco Public Utility Commission's Lower Crystal Springs Dam Improvements Project*, File No. 2006.0536E, State Clearinghouse No. 2007012002. Certified October 7, 2010.

San Francisco Planning Department, *Final Environmental Impact Report for the San Francisco Public Utilities Commission Calaveras Dam Replacement Project*, File No. 2005.0161E, State Clearinghouse No. 2005102102. Certified January 27, 2011.

San Francisco Public Utilities Commission (SFPUC), SFPUC Resolution 08-200, *Water System Improvement Program California Environmental Quality Act Findings: Findings of Fact, Evaluation of Mitigation Measures and Alternatives, and Statement of Overriding Considerations*. October 2008.

CHAPTER 2
Introduction and Background

Sections	Figures	Tables
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2.1 Introduction

The proposed San Antonio Backup Pipeline (SABPL) project involves upgrades to San Francisco Public Utilities Commission (SFPUC) regional water facilities in the Sunol Valley of unincorporated Alameda County. The SFPUC is proposing the SABPL project to improve facility operators' ability to respond to emergencies, perform routine maintenance of regional facilities, minimize the risk of service interruptions to customers during planned maintenance events and emergency conditions, and assist the SFPUC in meeting all current and foreseeable future federal and state water quality requirements. Proposed project improvements include the construction of an approximately 7,000-foot-long, 66-inch-diameter backup pipeline, a new discharge facility, a new chemical facility, a new pump station and wet well, and several auxiliary improvements, all of which would be designed with sufficient capacity to handle the future maximum flows from the system.

2.2 Background – Regional Water System and the WSIP

2.2.1 SFPUC Regional Water System Overview

The City and County of San Francisco (CCSF), through the SFPUC, owns and operates a regional water system that extends from the Sierra Nevada to San Francisco and serves drinking water to 2.4 million people in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties.

The regional water system consists of water conveyance, storage, treatment, and distribution facilities, and delivers water to retail and wholesale customers. The existing system includes over 280 miles of pipeline, over 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants. The SFPUC currently delivers an annual average of about 265 million gallons per day (mgd) of water to its customers. The source of the water supply is a combination of local supplies from streamflow and runoff in the Alameda Creek watershed and in the San Mateo Creek and Pilarcitos Creek watersheds (referred to together as the Peninsula watershed), which is augmented with imported supplies from the Tuolumne River watershed. Local watersheds provide about 15 percent of total supplies, and the Tuolumne River provides the remaining 85 percent. **Figure 2-1** illustrates the general location of the SFPUC regional system, and **Figure 2-2** shows the location of the water supply watersheds.

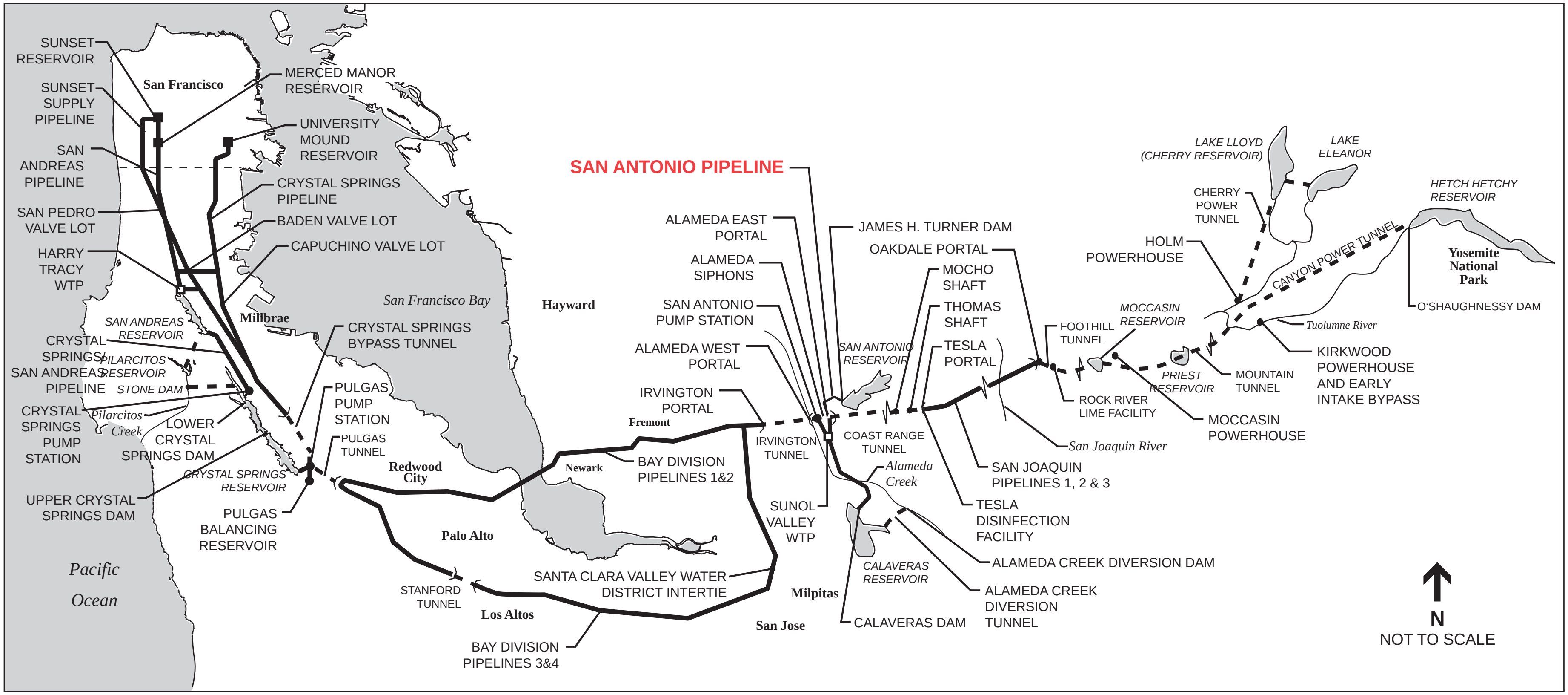
Water from the upper Tuolumne River watershed that is captured in Hetch Hetchy Reservoir can be delivered to SFPUC customers without filtration, provided it meets all federal[1] and state[2] "filtration avoidance" requirements. These requirements specify that the water provider must meet source water quality standards and disinfection criteria, and conduct extensive routine water quality monitoring and watershed protection activities. The SFPUC maintains the filtration avoidance status for Hetch Hetchy water by proactively operating and maintaining facilities to prevent contamination of water supplies, and, when unfavorable changes in water quality do occur, by diverting the quality-impaired Hetch Hetchy water out of the regional system to prevent the water from being delivered to customers (SFPUC, 2000). SFPUC water supplies from the Alameda and Peninsula watersheds do not meet the filtration avoidance criteria and require filtration before delivery to customers.

The SFPUC serves about one-third of its water supplies directly to retail customers, primarily in San Francisco, and about two-thirds of its water supplies to wholesale customers by contractual agreement. The wholesale customers are represented by the Bay Area Water Supply and Conservation Agency (BAWSCA), which consists of 26 member agencies, as shown on **Figure 2-3**.[3] Some of these wholesale customers have access to other sources of water in addition to the supplies they receive from the SFPUC regional water system, while others rely completely on the SFPUC for water supply.

1 In 1991, the U.S. Environmental Protection Agency (U.S. EPA) adopted the Surface Water Treatment Rule, which includes water quality provisions for unfiltered water systems. In 1993, the U.S. EPA approved Hetch Hetchy water supplies as an unfiltered source that meets all filtration avoidance criteria contained in the federal statute.

2 In 1998, the state added filtration avoidance provisions to Title 22 of the California Code of Regulations, under which the California Department of Public Health currently regulates the Hetch Hetchy water system.

3 The Cordilleras Mutual Water Association is an additional wholesale customer receiving water from the SFPUC, but it is not a BAWSCA member and is not shown in Figure 2-3. It is a small water association serving 18 single-family homes in San Mateo County.

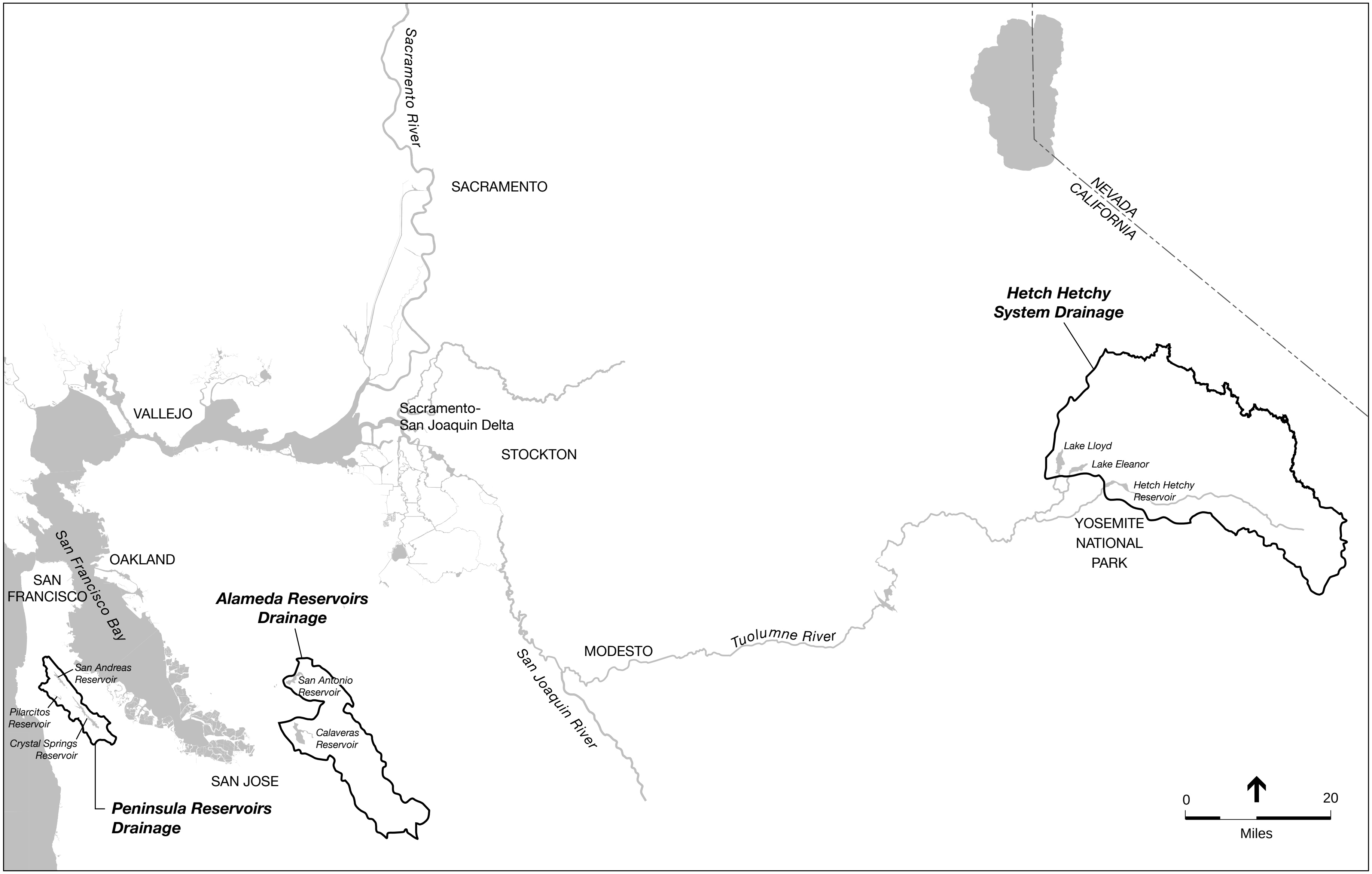


Pipeline
Tunnel
Water Treatment Plant (WTP)
Other Facilities
Segments of the system not shown

SOURCE: ESA+Orion, 2009

SFPUC San Antonio Backup Pipeline Project

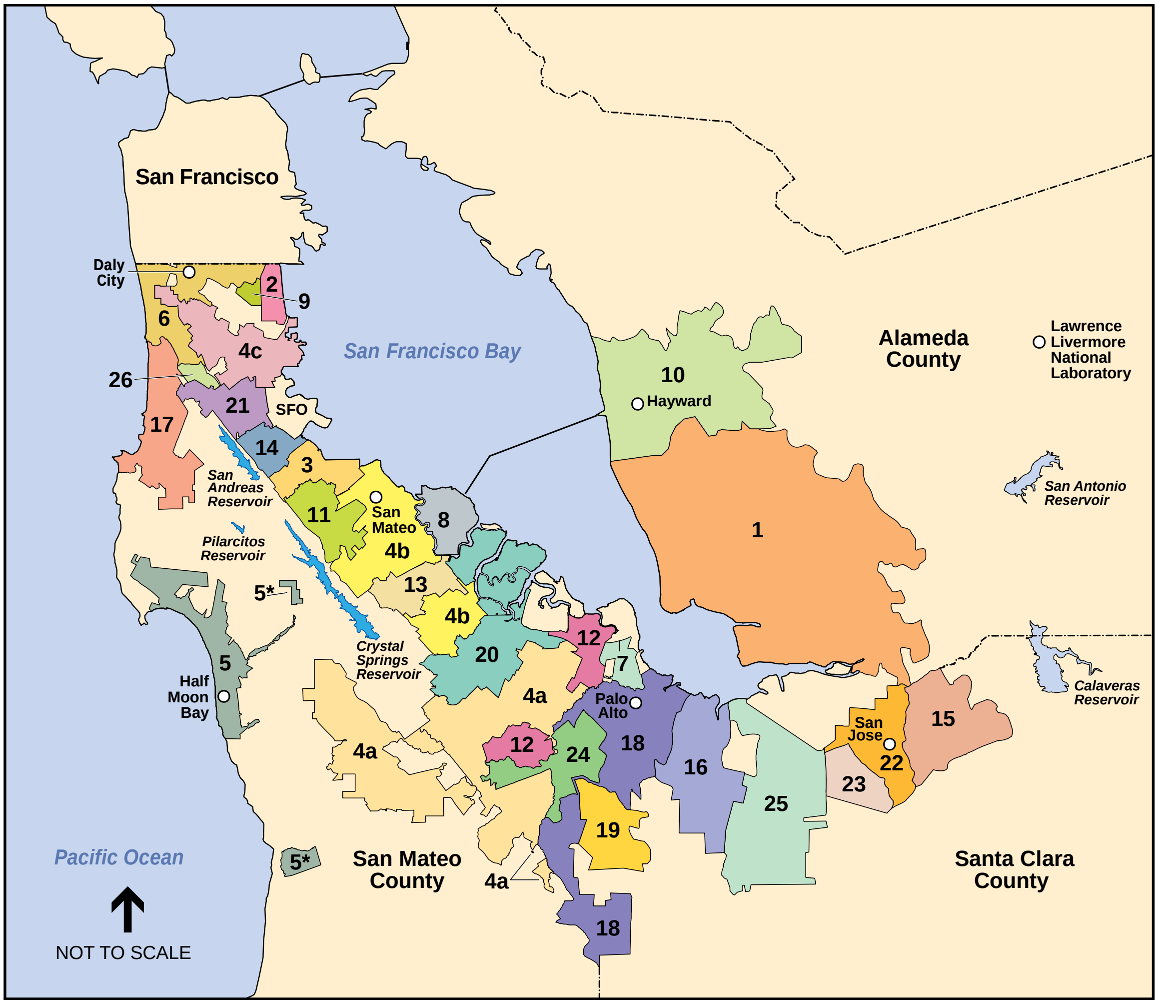
Figure 2-1
SFPUC Regional Water System



SOURCE: San Francisco Planning Department, 2008

SFPUC San Antonio Backup Pipeline Project

Figure 2-2
SFPUC Water Supply Watersheds



Legend

(Wholesale customers and members of Bay Area Water Supply and Conservation Agency)

1 Alameda County Water District
2 City of Brisbane
3 City of Burlingame
4a CWS – Bear Gulch
4b CWS – Mid-Peninsula
4c CWS – South San Francisco
5 Coastside County Water District
6 City of Daly City
7 City of East Palo Alto
8 Estero Municipal Improvement District
9 Guadalupe Valley Municipal Improvement District
10 City of Hayward
11 Town of Hillsborough
12 City of Menlo Park
13 Mid-Peninsula Water District
14 City of Millbrae
15 City of Milpitas
16 City of Mountain View
17 North Coast County Water District
18 City of Palo Alto
19 Purissima Hills Water District
20 City of Redwood City
21 City of San Bruno
22 City of San Jose (North)
23 City of Santa Clara
24 Stanford University
25 City of Sunnyvale
26 Westborough Water District

***** Portions of Coastside County Water District not served by the SFPUC regional water system.

NOTE: For the purposes of this EIR, the California Water Service (CWS) Company is a single wholesale customer with three different water service districts.

SFPUC San Antonio Backup Pipeline Project

SOURCE: BAWSCA, 2010

Figure 2-3
SFPUC Water Service Area –
San Francisco and SFPUC Wholesale Customers

2.2.2 SFPUC Water System Improvement Program

On October 30, 2008, the SFPUC adopted the Water System Improvement Program (WSIP) (known as the "Phased WSIP Variant") and the WSIP goals and objectives (SFPUC Resolution 08-200 [SFPUC, 2008]). The adopted WSIP will improve the reliability of the regional water system with respect to water quality, seismic response, and water delivery based on a planning horizon through the year 2030. The WSIP will also improve the regional system with respect to water supply to meet water delivery needs in the service area through the year 2018. The program area spans seven counties—Tuolumne, Stanislaus, San Joaquin, Alameda, Santa Clara, San Mateo, and San Francisco.

The WSIP includes a water supply strategy, modifications to system operations, and construction of a series of facility infrastructure improvement projects. The proposed SABPL project is one of several facility improvement projects that are part of the WSIP. The overall goals of the WSIP are to maintain high-quality water; reduce vulnerability to earthquakes; increase delivery reliability and improve the ability to maintain the system; meet customer purchase requests in nondrought and drought periods; enhance sustainability in all system activities; and achieve a cost-effective, fully operational system (see **Table 2-1**). To further these program goals, the WSIP also includes objectives that address system performance in the areas of water quality, seismic reliability, delivery reliability, and water supply.

The San Francisco Planning Department prepared a Program Environmental Impact Report (PEIR) to address the potential environmental impacts of the WSIP. The San Francisco Planning Commission certified the WSIP PEIR on October 30, 2008 (San Francisco Planning Department, 2008; San Francisco Planning Commission Motion No. 17734). The SFPUC approved the WSIP and made findings pursuant to the California Environmental Quality Act (CEQA), including a statement of overriding considerations, and adopted a mitigation monitoring and reporting program for the WSIP (SFPUC Resolution 08-200). The WSIP PEIR is described below in Section 2.3, Purpose of this EIR.

2.2.3 Regional Water System Facilities

The regional water system begins with Hetch Hetchy Reservoir and O'Shaughnessy Dam, which are located in Yosemite National Park on the main stem of the Tuolumne River in the Sierra Nevada. From Hetch Hetchy Reservoir, raw surface water is transported westward within a series of tunnels (Canyon Power, Mountain, and Foothill Tunnels) to the Oakdale Portal. Approximately three miles upstream from the Oakdale Portal is the Rock River Lime Facility, where chemicals are added to water in the Foothill Tunnel for corrosion control. From the Oakdale Portal, water is conveyed within the San Joaquin Pipelines to the Tesla Disinfection Facility at the Tesla Portal, where chlorine is applied in the form of sodium hypochlorite for primary disinfection. At the Tesla Portal, the chlorinated Hetch Hetchy water enters the 25-mile-long Coast Range Tunnel and is conveyed west to the Alameda East Portal in the Sunol Valley, which connects the Coast Range Tunnel to the Alameda Siphons.

TABLE 2-1
WSIP GOALS AND OBJECTIVES

Program Goal	System Performance Objective
Water Quality – *maintain high quality water*	• Design improvements to meet current and foreseeable future federal and state water quality requirements. • Provide clean, unfiltered water originating from Hetch Hetchy Reservoir and filtered water from local watersheds. • Continue to implement watershed protection measures.
Seismic Reliability – *reduce vulnerability to earthquakes*	• Design improvements to meet current seismic standards. • Deliver basic service to the three regions in the service area (East/South Bay, Peninsula, and San Francisco) within 24 hours after a major earthquake. Basic service is defined as average winter-month usage, and the performance objective for the regional system is 229 million gallon per day (mgd). The performance objective is to provide delivery to at least 70 percent of the turnouts (i.e., water diversion connecting points from the regional system to customers) in each region, with 104, 44, and 81 mgd delivered to the East/South Bay, Peninsula, and San Francisco regions, respectively. • Restore facilities to meet average-day demand of up to 300 mgd within 30 days after a major earthquake.
Delivery Reliability – *increase delivery reliability and improve the ability to maintain the system*	• Provide operational flexibility to allow for planned maintenance shutdown of individual facilities without interrupting customer service. • Provide operational flexibility to minimize the risk of service interruption due to unplanned facility upsets or outages. • Provide operational flexibility and system capacity to replenish local reservoirs as needed. • Meet estimated average annual demand of up to 300 mgd under the conditions of one planned shutdown of a major facility for maintenance concurrent with one unplanned facility outage due to a natural disaster, emergency, or facility failure/upset.
Water Supply – *meet customer water needs in nondrought and drought periods*	• Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and wholesale customers during nondrought years for system demands through 2018. • Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent systemwide reduction in water service during extended droughts. • Diversify water supply options during nondrought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.
Sustainability – *enhance sustainability in all system activities*	• Manage natural resources and physical systems to protect watershed ecosystems. • Meet, at a minimum, all current and anticipated legal requirements for the protection of fish and wildlife habitat. • Manage natural resources and physical systems to protect public health and safety.
Cost-effectiveness – *achieve a cost-effective, fully operational system*	• Ensure the cost-effective use of funds. • Maintain a gravity-driven system. • Implement a regular inspection and maintenance program for all facilities.

SOURCE: SFPUC Resolution No. 08-0200.

The Alameda Siphons are three parallel pipelines that extend approximately 3,000 feet from the Alameda East Portal across the Sunol Valley and beneath Alameda Creek to the Alameda West Portal. Under normal operating conditions, local water supplies from the Alameda watershed that have been treated at the Sunol Valley Water Treatment Plant (SVWTP) enter the regional water system and are blended with Hetch Hetchy supplies in Alameda Siphons Nos. 1 and 2. At the Sunol Valley Chloramination Facility and the fluoride facility located south of the Alameda Siphons, chloramine is added to the blended water for secondary disinfection, fluoride is added to prevent tooth decay, and the pH of the blended water is adjusted for corrosion control. The blended water exits the Sunol Valley at the Alameda West Portal, where it enters the Irvington Tunnel and is conveyed westward to Bay Area customers.

Under circumstances requiring Hetch Hetchy water to be diverted out of the regional water system, a valve in the Alameda Siphon No. 3 provides suction to the San Antonio Pump Station, thereby allowing facility operators to pump the water to San Antonio Creek, to San Antonio Reservoir for storage, or to the SVWTP for treatment, provided that flows do not exceed the capacity of the pump station. When flows exceed the pumping capacity, facility operators have no choice but to convey the water by gravity to San Antonio Creek.[4] Existing discharges to San Antonio Creek occur through a cone valve and discharge facility at the base of James Turner Dam (Turner Dam); this same cone valve and discharge facility are used to discharge water stored in San Antonio Reservoir to San Antonio Creek. Any Hetch Hetchy water that is discharged to San Antonio Reservoir or San Antonio Creek must first be dechlorinated and pH-adjusted at the existing chemical facility, which is located just west of the San Antonio Pump Station, to comply with water quality standards set by the San Francisco Bay Regional Water Quality Control Board.

Implementation of the SABPL project would upgrade the SFPUC's water facilities in the Sunol Valley by providing reliable conveyance capacity and greater operational flexibility for handling Hetch Hetchy flows that must be diverted from the regional water system. Chapter 3, Project Description, provides a detailed description of existing facility components, operations, and maintenance activities relevant to the proposed project.

2.3 Purpose of this EIR

Under the San Francisco Administrative Code, Chapter 31, the San Francisco Planning Department Environmental Planning Division (formerly the Major Environmental Analysis Division [MEA]) is the lead agency responsible for implementing CEQA requirements for all projects sponsored by the CCSF or conducted in San Francisco, including those sponsored by the SFPUC. Environmental Planning determined that preparation of this EIR for the SABPL project, for which the SFPUC is the project sponsor, is required in order to comply with CEQA. CEQA requires the preparation of an EIR when a proposed project could significantly affect the physical environment.

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4 The San Antonio Pump Station is capable of pumping up to 160 mgd to San Antonio Reservoir, the SVWTP, or San Antonio Creek. Up to 230 mgd can be transferred via gravity flow to San Antonio Creek.

Environmental Planning has prepared this EIR to provide the public and responsible and trustee agencies reviewing the SABPL project with information about the potential effects of the project on the environment. This EIR describes the potential environmental impacts resulting from implementation of the SABPL project, identifies mitigation measures for reducing impacts to a less-than-significant level where feasible, and evaluates alternatives to the project.

2.4 Public Outreach

2.4.1 Notice of Preparation

In accordance with Sections 15063 and 15082 of the CEQA Guidelines, the San Francisco Planning Department, as lead agency, sent a Notice of Preparation (NOP) to responsible and trustee agencies, as well as to interested entities and individuals, to begin the formal CEQA scoping process. These included approximately 290 local, state, and federal agencies; regional and local interest groups; and property owners within 300 feet of the project area (see **Appendix A**). The scoping period began on October 5, 2007 and ended on November 5, 2007. The NOP included a preliminary discussion of the potential environmental impacts of the project in the following resource areas: biological resources, cultural resources; geology and soils; hydrology and water quality; noise; and transportation and circulation. The NOP and other information related to the proposed project were posted on the San Francisco Planning Department website and were placed in the legal classified section of the *Examiner* (San Francisco, CA), *The Valley Times* (Pleasanton, CA), and *The Argus* (Fremont, CA).

2.4.2 Public Scoping Meeting

Pursuant to CEQA Guidelines Section 15083, the San Francisco Planning Department held a public scoping meeting on October 25, 2007 at the Sunol Glen School in Sunol, California. Notices were placed in local newspapers informing the general public of the scoping meeting, the purpose of which was to present the project to the public and to receive public input regarding the proposed scope of the EIR analysis. Attendees were provided with an opportunity to make comments or express concerns on potential effects of the project.

2.4.3 Public and Agency Comments on NOP

The scoping process provided an opportunity for governmental agencies and the public to provide comments on the issues and scope of the EIR. The Planning Department prepared a scoping report to summarize the public scoping process and the comments received in response to the NOP. **Appendix B** includes the comments received during the public scoping period, a transcript of the scoping meeting, and the scoping report. Only one member of the public attended and provided comment. Additional comments were received by San Francisco Planning Department staff via mail and email correspondence. The major environmental concerns raised during the scoping period are summarized in **Table 2-2**.

TABLE 2-2
SUMMARY OF SCOPING COMMENTS

Summary of Comments	Addressed in the EIR
Project Description • The EIR should describe the operating limitations of the existing pipeline and should provide scenarios in which the pipeline would enhance operational flexibility. • The EIR should list permits that may be needed, including the Clean Water Act Section 401 water quality certification, Section 404 Clean Water Act permit, waste discharge report, a Streambed Alteration Agreement from the California Department of Fish and Game, and an encroachment permit from the Alameda County Public Works Department.	Chapter 3, Project Description
Cultural Resources • The EIR should describe potential impacts on cultural resources. • The EIR should include documentation of a current archaeological records search from the Northwest Information Center of the California Historical Resources Information System for all work in the state's right-of-way.	Section 5.5, Cultural and Paleontological Resources
Traffic and Vehicular Access • The EIR should address potential impacts on traffic in the project area, identify any potential road closures, and describe proposed mitigation measures for the deterioration of local roads. • The EIR should address any potential access issues for residents located near the project area.	Section 5.6, Transportation and Circulation
Air Quality • The EIR should consider nearby park users as sensitive receptors.	Section 5.8, Air Quality
Recreation • The EIR should address potential impacts on access to regional parks. • The EIR should assess and mitigate potential impacts on access to and use of existing and planned trails and recreational facilities in watershed areas as a result of pipeline construction.	Section 5.11, Recreation
Biological Resources • The EIR should identify all rare, threatened, and endangered species. • The EIR should address how the project could affect the movement of steelhead and other native fish and should describe potential impacts on fisheries as a result of armoring creek bottoms. • The EIR should address operational impacts on steelhead, as these fish would eventually gain access to San Antonio Creek in the future. • The EIR should provide management and monitoring provisions for the following: yellow star thistle (an invasive weed), non-native wildlife, pond management, property management, public access, and habitat monitoring. • The project should emphasize avoidance of sensitive habitats and fully mitigate for any direct or indirect impacts on native wildlife. • The project should include mitigation measures that would avoid and compensate for impacts associated with construction of the project or its operation, including changes in water quality associated with discharges.	Section 5.14, Biological Resources
Hydrology and Water Quality • The EIR should describe how dewatering discharges would be dealt with under the SABPL project. • The EIR should describe necessary permits, including the National Pollutant Discharge Elimination System General Construction Permit, which includes preparation of a stormwater pollution prevention plan.	Section 5.16, Hydrology and Water Quality

TABLE 2-2 (Continued)
SUMMARY OF SCOPING COMMENTS

Summary of Comments	Addressed in the EIR
Hazards and Hazardous Materials • The EIR should evaluate potential impacts related to spills during chemical handling and storage and should describe what measures would be employed in the event of a chemical spill at the proposed chemical storage facility.	Section 5.17, Hazards and Hazardous Materials
Alternatives • The project should evaluate alternatives that: (1) avoid impacts on waters; (2) modify the project to minimize impacts on waters; and (3) provide mitigation, once impacts have been fully minimized, to compensate for unavoidable impacts. • The project should evaluate alternatives that avoid discharges into San Antonio Creek by retaining the discharged water within the SFPUC regional water system.	Chapter 7, Alternatives

2.5 Project Changes Subsequent to NOP Publication

This section describes the various modifications made to the SABPL project subsequent to publication of the NOP in 2007. The project evolved as more detailed information was developed during project design and the environmental review process, and in response to comments received on the NOP. The most notable project change is the relocation of the new discharge facility from the base of Turner Dam to quarry Pit F3-East; thus, a new pipeline segment extending from Calaveras Road to the base of Turner Dam is no longer proposed. This change would reroute future discharges of quality-impaired Hetch Hetchy water such that sensitive habitat at the base of Turner Dam is avoided. Other changes associated with the relocation of the discharge facility include the addition of the Alameda Creek Pump Station and wet well, transfer pipeline, and cutoff wall around Pits F3-East and F3-West. Overall, the project changes would reduce (and in some cases eliminate) environmental impacts associated with the project as described in the 2007 NOP. Chapter 3, Project Description, in this EIR provides a detailed description of the project, with these revisions.

2.6 Organization of the Draft EIR

This EIR is organized into eight chapters, as discussed below:

- **Chapter 1, Summary.** This chapter presents a summary of the proposed project, identifies potentially significant environmental impacts and mitigation measures, and describes the alternatives considered in this EIR. It also addresses areas of controversy and issues to be resolved.

- **Chapter 2, Introduction and Background.** This chapter provides project background information and describes the purpose and organization of the EIR, as well as the environmental review process.

- **Chapter 3, Project Description.** This chapter presents the proposed project description (including project objectives), a summary of project components, project variants addressing two pumping scenarios, and information about project construction. The chapter also lists required permits and approvals.

- **Chapter 4, Plans and Policies.** This chapter describes applicable land use plans and policies and their relevance to the project, and then discusses the project's consistency with those plans.

- **Chapter 5, Environmental Setting, Impacts, and Mitigation Measures.** This chapter is subdivided into sections for each environmental resource topic. Each section describes the environmental and regulatory setting, the criteria used to determine impact significance, and the approach to the analysis for that resource topic. It then presents an analysis of potential environmental impacts and the project-specific mitigation measures that have been developed to address significant and potentially significant impacts. Each section also includes an evaluation of cumulative impacts with respect to that resource topic.

- **Chapter 6, Other CEQA Issues.** This chapter discusses growth-inducing effects, summarizes the cumulative impacts, identifies the significant environmental effects that cannot be avoided if the proposed project is implemented, and describes the significant irreversible impacts.

- **Chapter 7, Alternatives.** This chapter describes the alternatives to the proposed project and compares their impacts to those of the proposed project. This chapter also summarizes the alternatives that were considered but screened from further analysis.

- **Chapter 8, EIR Authors and Consultants.** This chapter lists the authors of this EIR.

2.7 References

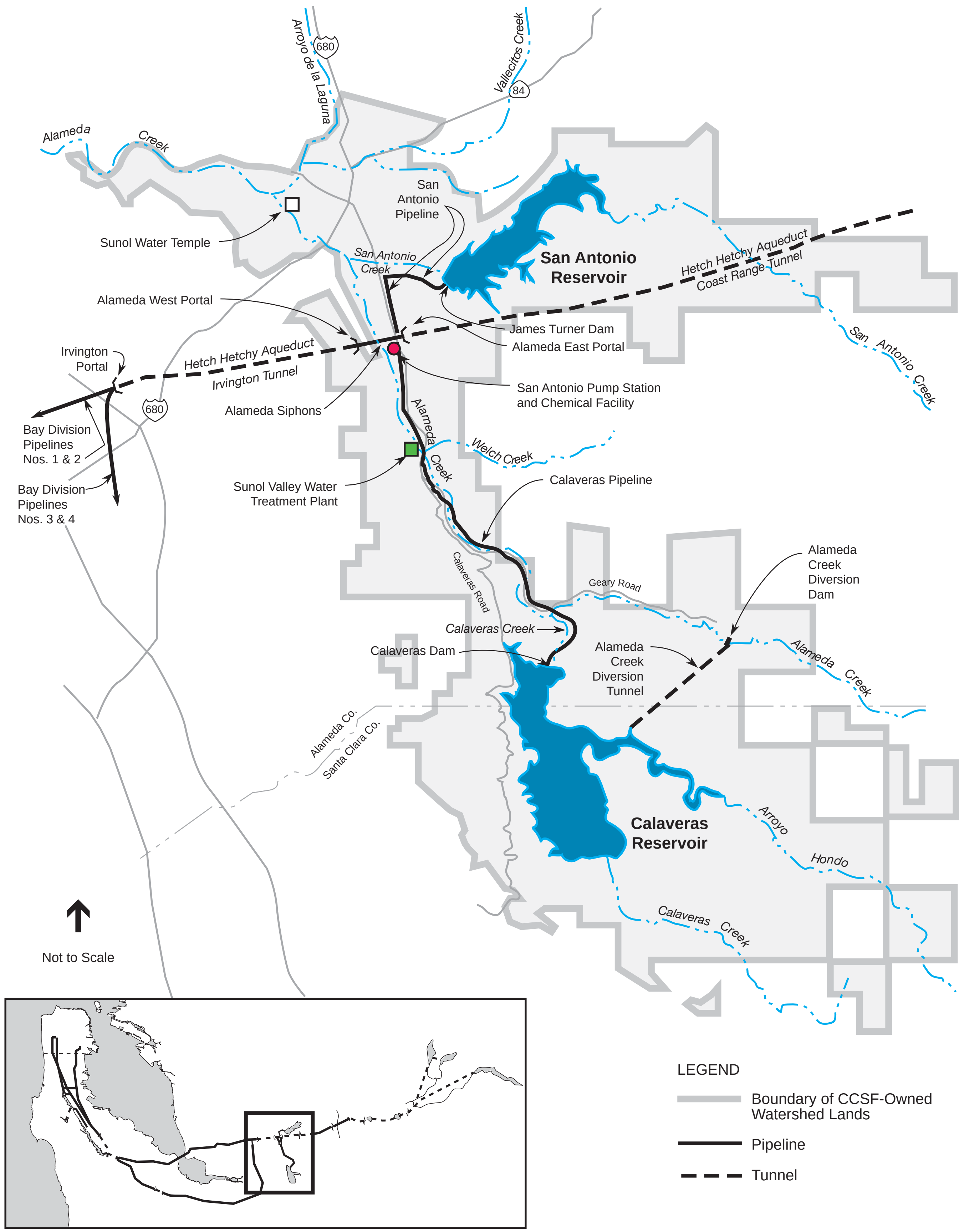
San Francisco Planning Department, *Final Program Environmental Impact Report for the San Francisco Public Utility Commission's Water System Improvement Program*, File No. 2005.0159E, State Clearinghouse No. 2005092026. Certified October 30, 2008.

San Francisco Public Utilities Commission (SFPUC), SFPUC Resolution 08-200, Water System Improvement Program California Environmental Quality Act Findings: Findings of Fact, Evaluation of Mitigation Measures and Alternatives, and Statement of Overriding Considerations. October 2008.

CHAPTER 3
Project Description

3.1 Project Location

The proposed San Antonio Backup Pipeline (SABPL) project is located in an unincorporated area of Alameda County, along the west side of Calaveras Road, south of the intersection of Interstate 680 (I-680) and State Route 84 (SR 84). **Figure 3-1** shows the regional location of the proposed project. Project construction would occur on lands owned by the City and County of San Francisco (CCSF) and managed by the San Francisco Public Utilities Commission (SFPUC) within the Sunol Valley and the Alameda watershed. The Alameda watershed, the boundaries of which are shown in Figure 3-1, refers to CCSF-owned lands managed by the SFPUC as part of the SFPUC regional water system; the Alameda watershed lands are located within the much larger hydrologic boundary of the southern Alameda Creek watershed. The nearest community is the town of Sunol, approximately one mile northwest of the project area. The project area extends roughly two miles along the west side of Calaveras Road from the San Antonio Pump Station (in the south) to the North Spoils Site just east of the I-680/SR 84 interchange (in the north). The project area (shown in **Figure 3-2**) includes quarry Pits F3-East and F3-West and surrounding areas, and is located south of the intersection of I-680 and SR 84 on CCSF-owned land that is currently leased to Hanson Aggregates and operated under Surface Mining Permit 24 (SMP-24). Quarry Pit F2, also operated by Hanson Aggregates under SMP-24, is just north of the project area. Quarry Pits F4, F5, and F6 are adjacent to the project area on CCSF-owned land that is currently leased to Oliver De Silva, Inc. and operated under Surface Mining Permit 30 (SMP-30).



SOURCE: San Francisco Planning Department, 2008

SFPUC San Antonio Backup Pipeline Project

Figure 3-1
Overview of Alameda Watershed Facilities

NOTE: SMP designations indicate areas covered by Surface Mining Permits. Surface Mining Permits are issued by Alameda County.

SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project
Figure 3-2
SABPL Project Area and Index Map

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3.2 Existing Facilities and Current Operations

The proposed project would improve the reliability of regional water system operations with respect to two existing SFPUC facilities in the Sunol Valley—the San Antonio Pipeline and the chemical facility at the San Antonio Pump Station. Neither the San Antonio Pipeline nor the chemical facility has sufficient capacity to handle the future maximum Hetch Hetchy flow of 315 million gallons per day (mgd) as provided for under the SFPUC's Water System Improvement Program (WSIP). **Figures 3-3** through **3-6** depict the locations of existing and proposed facilities.

3.2.1 San Antonio Pipeline

The San Antonio Pipeline, built in 1968, is a 60-inch-diameter prestressed-concrete cylinder pipe that extends 11,300 feet from the San Antonio Pump Station to the base of James Turner Dam (Turner Dam) at San Antonio Reservoir (see Figure 3-2). From the pump station, the pipeline parallels the west side of Calaveras Road. Approximately 1,000 feet south of San Antonio Creek and the Turner Dam access road, the San Antonio Pipeline veers diagonally northeast across Calaveras Road, traverses a hillside area, then proceeds east (generally parallel to the Turner Dam access road) to the base of Turner Dam. An existing discharge facility at the base of Turner Dam allows for emergency discharges from San Antonio Reservoir to San Antonio Creek via a pipeline beneath the dam, as well as emergency discharges of Hetch Hetchy water from the regional water system to San Antonio Creek via the San Antonio Pipeline.

Water conveyed through the San Antonio Pipeline can flow either by gravity or by pumping through the San Antonio Pump Station. Gravity flows are limited to the pipeline's capacity of 230 mgd, and flows passing through the pump station are limited to the pump station's capacity of 160 mgd.

The existing San Antonio Pipeline serves several purposes, including both planned (nonemergency) operations and emergency operations. Nonemergency operations entail the transfer of water between facilities located in the Sunol Valley. Emergency operations involve the transfer of water after an event that affects water quality (i.e., increased sediment levels) or the transfer of water during facility outages (i.e., after an earthquake). These operations are described below in more detail (also refer to **Table 3-1**).

3.2.1.1 Planned (Nonemergency) Operations

- *Recharge San Antonio Reservoir*. The SFPUC uses the San Antonio Pipeline to convey Hetch Hetchy water to San Antonio Reservoir and to convey water stored in Calaveras Reservoir to San Antonio Reservoir (via a connection to the Calaveras Pipeline [shown on Figure 3-2]).

- *Transfer Water from San Antonio Reservoir to Sunol Valley Water Treatment Plant (SVWTP)*. The SFPUC uses the San Antonio Pipeline to convey water stored in San Antonio Reservoir to the SVWTP (via a connection to the Calaveras Pipeline) for treatment prior to distribution to customers.

TABLE 3-1
EXISTING SAN ANTONIO PIPELINE OPERATIONS

	Operation	Water Source	Destination	Conveyance Pipeline	Maximum Capacity (mgd) Pumped (P) or Gravity (G)
Planned Operations	Recharge San Antonio Reservoir[a]	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir	San Antonio Pipeline	160 (P)
		Calaveras Reservoir		Calaveras Pipeline and San Antonio Pipeline	90 (G)
	Transfer Water from San Antonio Reservoir to SVWTP[b]	San Antonio Reservoir	SVWTP	San Antonio Pipeline and Calaveras Pipeline	160 (P)
					50 (G)
	Discharges Following Maintenance of San Joaquin Pipelines	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir (Preferred)	San Antonio Pipeline	160 (P)
			San Antonio Creek		230 (G)
Emergency Operations	Discharges due to Water Quality Event East of Sunol Valley	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir (Preferred)	San Antonio Pipeline	160 (P)
			San Antonio Creek	San Antonio Pipeline	230 (G)
			SVWTP	Calaveras Pipeline	160 (P)
	Discharges due to Facility Outage West of Sunol Valley	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir (Preferred)	San Antonio Pipeline	160 (P)
			San Antonio Creek		230 (G)

NOTES: SVWTP = Sunol Valley Water Treatment Plant.

a If San Antonio Reservoir is recharged with Hetch Hetchy water, the water is diverted by a valve in Alameda Siphon No. 3 and pumped through the San Antonio Pipeline to the reservoir; if the reservoir is recharged with water stored in Calaveras Reservoir, the water flows by gravity from Calaveras Reservoir via the Calaveras Pipeline to San Antonio Reservoir.

b When the water surface elevation in San Antonio Reservoir is above 445 feet mean sea level (msl), up to 50 mgd can flow by gravity from the reservoir through the San Antonio Pipeline and the Calaveras Pipeline to the SVWTP; when the reservoir water elevation is below 445 feet msl, water must be pumped from the reservoir through the San Antonio Pipeline and the Calaveras Pipeline to the SVWTP.

- *Divert Hetch Hetchy Water to San Antonio Reservoir or San Antonio Creek Following Pipeline Maintenance*. The SFPUC can also divert quality-impaired Hetch Hetchy water resulting from planned maintenance of the San Joaquin Pipelines (shown in Figure 2-1, Chapter 2, Introduction and Background). The water that flows through the pipelines immediately after maintenance is often characterized by excessive turbidity and elevated pH. The SFPUC diverts the quality-impaired water either to the San Antonio Reservoir (preferred) or to San Antonio Creek via the San Antonio Pipeline. Planned maintenance and operations activities requiring the diversion of quality-impaired Hetch Hetchy water to SFPUC facilities in the Sunol Valley occur approximately twice per year.

3.2.1.2 Emergency Operations

- *Divert Quality-Impaired Water to San Antonio Reservoir or San Antonio Creek*. Water quality events along the regional water system east of the Sunol Valley can impair Hetch Hetchy water, warranting the diversion of that water out of the system. This operating scenario is implemented when unfavorable changes in water quality are detected at the Tesla Portal (shown in Figure 2-1, Chapter 2, Introduction and Background), such as increased turbidity due to changes in flow rate and an attendant disturbance of sediment in pipelines, or a temporary loss of disinfection capabilities due to power outages or equipment failure. When water quality events occur at the Tesla Portal, the San Antonio Pipeline is used to divert the quality-impaired water out of the regional system to San Antonio Reservoir or San Antonio Creek,[1] thereby preventing the delivery of this water to retail or wholesale customers. If system operators are able to divert the quality-impaired water to San Antonio Reservoir, then the water can be conserved for future treatment and distribution to customers. The frequency of emergency operations requiring the diversion of quality-impaired Hetch Hetchy water to SFPUC facilities in the Sunol Valley is difficult to predict but is estimated to occur approximately once every two years.

- *Divert Hetch Hetchy Water from the Regional Water System Following Facility Outage*. If an earthquake or other emergency substantially damaged regional water system facilities west of the Sunol Valley such that these facilities were unable to convey Hetch Hetchy water supplies, the SFPUC might need to divert Hetch Hetchy flows to Sunol Valley facilities. Under this scenario, the SFPUC could use the San Antonio Pipeline to divert Hetch Hetchy water from Alameda Siphon No. 3 to San Antonio Creek or up to San Antonio Reservoir.

Under planned and emergency operations, the SFPUC's first priority is to conserve Hetch Hetchy water by diverting the flows to San Antonio Reservoir for subsequent treatment and delivery to customers (or, if possible, by diverting the flows to the SVWTP using the Calaveras Pipeline).[2]

3.2.1.3 Constraints to San Antonio Pipeline Operations

Several factors constrain current and future operations of the San Antonio Pipeline. First, the pipeline does not have sufficient conveyance capacity to allow for emergency discharges of the future maximum Hetch Hetchy flow of 315 mgd. Second, without a backup pipeline, the existing

[1] The location of discharge is determined by the flow rate and system capacity. The maximum capacity of the San Antonio Pump Station is 160 mgd; the maximum capacity of the existing San Antonio Pipeline is 230 mgd. Hetch Hetchy flows less than or equal to 160 mgd are generally pumped to San Antonio Reservoir; flows greater than 160 mgd and up to 230 mgd are typically discharged to San Antonio Creek.

[2] If there is sufficient lead time to adjust treatment plant operations before the quality-impaired water reaches the Sunol Valley, SFPUC system operators also have the option to divert the water to the SVWTP using the Calaveras Pipeline.

San Antonio Pipeline does not provide system operators with the flexibility to discharge quality-impaired water while simultaneously conveying water from San Antonio Reservoir to the SVWTP for treatment and distribution to SFPUC customers.

In addition, the San Antonio Pipeline is a prestressed-concrete cylinder pipeline that is susceptible to failure due to corrosion and breakage. Prestressed-concrete cylinder pipe is a composite pipe composed of a thin steel cylinder lined with concrete; it is wrapped with 1/4-inch wire and then coated with a dense mortar. A relatively small amount of corrosion can cause the 1/4-inch wire to break, compromising the structural integrity of the pipe and resulting in failure or rupture. Failure of the San Antonio Pipeline due to corrosion occurred most recently in February 2003. In response to this failure, the SFPUC will periodically need to take the San Antonio Pipeline out of service for maintenance and repairs, both with and without the proposed project, to help prevent unexpected breakage. The San Antonio Pipeline crosses the active Calaveras fault, thereby increasing the pipeline's susceptibility to damage in the event of a major earthquake (CDM, 2006). Failure of the San Antonio Pipeline would limit water management options, including the ability to conduct emergency discharges of quality-impaired Hetch Hetchy water out of the regional water system and to access the water stored in San Antonio Reservoir.

3.2.2 San Antonio Pump Station and Chemical Facility

The San Antonio Pump Station, shown in Figure 3-3, is just west of Calaveras Road and south of the Alameda Siphons.[3] The SFPUC constructed the facility in 1968 and upgraded it in 1992. Following planned maintenance of the San Joaquin Pipelines, the pump station can pump up to 160 mgd of quality-impaired Hetch Hetchy water out of the regional system to San Antonio Reservoir or to the SVWTP. The San Antonio Pump Station can also pump water that is stored in San Antonio Reservoir to the SVWTP for treatment.[4]

The existing chemical facility at San Antonio Pump Station is located immediately north of the pump station. The chemical facility was constructed in 1992. This chemical feed system includes: two 1,500-gallon sodium bisulfite storage tanks; four chemical feed pumps; and the piping, valves, and controls required to convey sodium bisulfite to the injection point on the San Antonio Pipeline. System operators rely on the chemical facility to dechlorinate and pH-adjust Hetch Hetchy water prior to discharging it to San Antonio Creek or San Antonio Reservoir. Sodium bisulfite is the chemical agent currently used for dechlorination and pH adjustment. The treatment capacity of the existing chemical facility is 240 mgd. The facility does not have sufficient treatment capacity to allow system operators to dechlorinate and pH-adjust the future maximum Hetch Hetchy flow of 315 mgd.

3 In the context of water transmission systems, a siphon is a U-shaped pipeline composed of a drop pipe, a lateral pipe, and a riser pipe. The pressure differential within the system allows the pipeline to be routed under surface features (such as rivers, creeks, railroad tracks, etc.) while continuing to operate under gravity, despite the drop in elevation. The Alameda Siphons route water beneath the ground surface of the Sunol Valley.

4 Up to 50 mgd can flow by gravity from San Antonio Reservoir to the SVWTP when the reservoir water elevation is above 445 feet msl. If SFPUC facility operators need to transfer more than 50 mgd from San Antonio Reservoir to the SVWTP, the water is pumped.

3.2.3 South Bay Aqueduct Inter-tie Pipeline

The South Bay Aqueduct, owned and operated by the California Department of Water Resources (DWR), runs east-west between quarry Pit F2, and Pits F3-East and F3-West (see Figures 3-4 and 3-5). A connection (called an inter-tie) between the SFPUC regional water system and the South Bay Aqueduct was constructed at the north end of the berm that divides Pit F3-East and F3-West in 1983 to provide a means to transfer water supplies between the two water systems during emergency conditions (such as an earthquake, or events that affect water quality upgradient of or downgradient from the connection). The inter-tie was decommissioned by DWR in January 2011 but the inter-tie pipeline, which runs east-west along the northern edge of Pit F3-West, was abandoned in place. As described in Section 3.5.7.4, below, the SFPUC proposes to remove a section of this abandoned pipeline during project construction.

3.2.4 Quarry Pits F3-East and F3-West

Quarry Pits F3-East and F3-West are located in the northern half of the project area. Ground surface elevations along the rims of quarry Pits F3-East and F3-West range from 255 to 270 feet mean sea level (msl) (URS, 2010b). The lowest points of Pits F3-East and F3-West are estimated at approximately 78 feet msl and 190 feet msl, respectively. Surveys conducted by the SFPUC and Hanson Aggregates from 2006 to 2009 indicate that water levels in Pit F3-East generally fluctuate between 163 and 220 feet msl. There are no recent surveys of water surface elevations in Pit F3-West; however, based on historical measurements, water levels in Pit F3-West are typically higher than in Pit F3-East (URS, 2010d).

3.2.4.1 Current Aggregate Mining Operations

Pits F3-East and F3-West are part of a larger quarry area permitted by Alameda County under SMP-24. Hanson Aggregates has completed gravel extractions in SMP-24 quarry Pits F3-East, F3-West, and F2, but actively mines aggregate materials from another quarry area north of I-680 that is permitted under SMP-32. Most of the SMP-24 area (including Pits F3-East, F3-West, and F2) is located east of Alameda Creek within CCSF-owned land that the SFPUC currently leases to the quarry company. However, a portion of the SMP-24 area west of Alameda Creek is owned by Hanson Aggregates, including the land in the vicinity of the existing SMP-24 aggregate processing facility, which is west of the confluence of Alameda and San Antonio Creeks (see Figure 3-2). Aggregate materials mined in the SMP-32 area are processed at this existing facility. Hanson Aggregates currently uses Pits F3-East and F3-West to manage groundwater that seeps into active mining pits in the SMP-32 area (see Section 3.2.4.2, below) and to supply water to the SMP-24 aggregate processing facility located on the west side of Alameda Creek.

Hanson Aggregates' lease for CCSF-owned land within the SMP-24 area will expire on October 31, 2012 unless the lease is extended. As discussed further in Section 3.4, below, the quarry company has indicated its desire to extend the lease and retain access to Pits F3-East and F3-West.

3.2.4.2 Current Groundwater Management Operations

To facilitate mining operations in the SMP-32 area, Hanson Aggregates pumps water that enters into active mining areas to various SMP-24 quarry pits, including Pits F3-East and F3-West. In addition to the water pumped into the pits, water also accumulates in the quarry pits from precipitation and groundwater seepage. Hanson Aggregates currently manages the water stored in Pits F3-East and F3-West by: (1) pumping it directly to a 2,000-gallon tank used to supply water for dust control and irrigation in the SMP-32 and SMP-24 areas; (2) pumping it to the "Ready Mix Pond" located west of Alameda Creek near the processing facility (see Figure 3-2), which stores water for consumptive use during quarry operations; and, (3) during wet years or following heavy precipitation periods in winter months (January to May), discharging excess water stored in the quarry pits to Alameda Creek at a discharge facility just north of the confluence with San Antonio Creek. As part of mining operations, Hanson Aggregates pumps 4,000 to 5,000 gallons per minute (gpm) of water from the Ready Mix Pond for aggregate processing. This pumping is not continuous; it is only performed during operational hours and is dependent on market demand for aggregate product (SFPUC, 2010a). Hanson Aggregates' discharges to Alameda Creek are conducted in accordance with National Pollutant Discharge Elimination System (NPDES) General Permit No. CAG982001 (Aggregate Mining, Sand Washing, and Sand Offloading General Permit). The NPDES permit allows Hanson Aggregates to discharge up to 10 mgd, or 15.5 cubic feet per second (cfs), into Alameda Creek (RWQCB, 2008).

In 1987, Hanson Aggregates installed an approximately 5,050-foot-long and 48-foot-deep slurry cutoff wall around portions of Pits F2, F3-East, and F3-West to reduce groundwater seepage into the quarry pits. However, Hanson Aggregates did not construct the cutoff wall within the DWR easement for the South Bay Aqueduct, which runs east-west between Pit F2 and Pits F3-East and F3-West. As a result, gaps exist in the cutoff wall where the South Bay Aqueduct (and the DWR easement) traverses the area between the quarry pits. Despite Hanson Aggregates' subsequent extensions of the cutoff wall parallel to the DWR easement, the existing cutoff wall has not been effective in eliminating groundwater seepage into the quarry pits because of the gaps and because the cutoff wall does not appear to be at a sufficient depth to reach the impervious layers (URS, 2010a).

3.3 Project Goals and Objectives

3.3.1 WSIP Goals and Objectives

As described in Chapter 2, Section 2.1, Introduction, the proposed project is part of the WSIP. With the exception of the water supply goal, the WSIP goals and objectives (shown in Table 2-1 in Chapter 2, Introduction and Background) are based on a planning horizon through 2030. The water supply goal is based on a planning horizon through 2018. The overall WSIP goals for the regional water system are to:

- Maintain high-quality water
- Reduce vulnerability to earthquakes
- Increase water delivery reliability

- Meet customer water supply needs
- Enhance sustainability
- Achieve a cost-effective, fully operational system

The size and design of the individual WSIP facility improvement projects are driven by the WSIP's system performance objectives and would not change as a result of the WSIP's water supply strategy. The originally proposed WSIP included multiple program goals for improving seismic reliability and water delivery reliability, meeting current and future water quality regulations, and meeting water supply reliability goals. The design and capacity of the WSIP facility improvement projects is driven by the WSIP objectives, including the need to improve system performance for seismic reliability and water delivery reliability as well as maintaining high water quality standards and meeting water supply goals. These objectives were factored into the decision on how to size the individual WSIP facilities. Even if the goal of meeting projected increases in water supply demands were dropped from the mix of program objectives, the other program goals would lead the SFPUC to design WSIP facility improvement projects of the same size. All of the WSIP facilities are sized to reliably deliver an average annual water supply of 265 mgd (and up to 300 mgd) in light of the regional system's need for seismic and delivery reliability during both drought and nondrought periods, and to meet water quality requirements (SFPUC Resolution No. 08-0200 [SFPUC, 2008]).

The WSIP identifies the SABPL project as a "key regional project." All of the key regional projects are needed to meet the overall level of service goals and system performance objectives (San Francisco Planning Department, 2008a). As described below, the SABPL project is consistent with the WSIP goals related to the water quality and delivery reliability of the regional water system.

3.3.2 SABPL Project Objectives

The following project-specific objectives were developed during the design of the SABPL project; these objectives support the water quality and delivery reliability goals of the WSIP:

- Provide reliable conveyance capacity for emergency discharges of Hetch Hetchy water supplies during events that impair water quality or during facility outages

- Increase operational flexibility and delivery reliability during emergencies and planned maintenance

The following sections describe the manner in which the SABPL project would be consistent with the goals and objectives of the WSIP.

3.3.2.1 Water Quality

To assist in fulfilling the WSIP level of service objective of meeting current and foreseeable future federal and state water quality requirements, the SABPL project would enable system operators to address emergency water quality issues that occur east of the Sunol Valley by diverting quality-impaired Hetch Hetchy water out of the regional system. The proposed project would assist the SFPUC in fulfilling the WSIP objective of providing clean, unfiltered water originating from Hetch Hetchy Reservoir. As part of the requirements for maintaining its "filtration avoidance" status (discussed in Chapter 2, Introduction and Background), the SFPUC seeks to proactively identify potential sources of quality-impaired water and develop operational procedures either to prevent contamination from occurring or to divert the water out of the system. With implementation of the SABPL project, SFPUC system operators would be able to divert quality-impaired Hetch Hetchy water out of the regional system under future flow conditions via the proposed backup pipeline to Pit F3-East, thereby maintaining the filtration avoidance status.

The proposed new chemical facility would assist the SFPUC in fulfilling the WSIP system performance objective of continuing to implement watershed protection measures by preventing discharges of treated water supplies into waters of the United States or waters of the state. The new chemical facility would increase the existing treatment capacity of the system; it would also allow for pH adjustment and the removal of chlorine residual under future maximum Hetch Hetchy flow conditions prior to discharges to Pit F3-East or diversions to San Antonio Reservoir, as well as discharges to Pit F6 (leased to Oliver De Silva, Inc. and operated under SMP-30) via the Alameda East Portal Overflow Pipeline constructed as part of a separate SFPUC WSIP project—the Alameda Siphons Seismic Reliability Upgrade (Alameda Siphons) project. (The Alameda East Portal Overflow Pipeline is shown in Figure 3-3 and described below in Section 3.3.2.2.)

An auxiliary feature of the proposed project—a 12-inch-diameter, 5,700-foot-long segment of water pipeline intended to replace an oversized 36-inch-diameter segment of a pipeline that serves the town of Sunol—would address potential water quality issues associated with "water aging." The 1991 Surface Water Treatment Rule requires that a residual disinfection level be maintained in a distribution system. Meanwhile, the Stage 2 Disinfectants and Disinfection Byproducts Rule restricts disinfection byproduct concentrations in a distribution system (effectively limiting the disinfection required by the Surface Water Treatment Rule). Water aging can occur when oversized facilities restrict flow and water exchange in the system. As water ages, its quality degrades because residual disinfectant levels decrease and the formation of some disinfection byproducts increases. Low residual chlorine levels can allow bacteria to colonize in pipes. Under the SABPL project, the 36-inch-diameter pipeline segment would be replaced with a 12-inch-diameter pipeline segment of the same length; this pipeline would be installed in a trench parallel to the proposed alignment of the backup pipeline.

3.3.2.2 Delivery Reliability

The SABPL project would improve system operators' ability to respond to emergencies, thus helping the SFPUC to fulfill the WSIP objective of minimizing the risk of service interruption due to unplanned facility upsets or outages. Both with and without project implementation, an emergency discharge of Hetch Hetchy water could be necessary following a seismic event west of the Sunol Valley (e.g., on the Hayward fault) if water facilities in this area were temporarily unable to convey system flows. Implementation of the proposed project could make it possible to simultaneously discharge quality-impaired Hetch Hetchy water as well as access water supplies stored in San Antonio Reservoir during an emergency outage along the Hetch Hetchy system, thereby helping the SFPUC to achieve the WSIP level of service objective for 2030 of providing

300 mgd[5] when one water source is unavailable. In addition, project implementation would improve response times and allow for faster redirection of flow, as described below.

As part of the Alameda Siphons project, the existing overflow pipeline for the Coast Range Tunnel (the tunnel from the Tesla Portal in the Central Valley to the Sunol Valley) was extended from the Alameda East Portal to Pit F6 to provide a means of discharging water from the Coast Range Tunnel during maintenance or emergency events (San Francisco Planning Department, 2008b). The new pipeline is referred to as the Alameda East Portal Overflow Pipeline and has a capacity of 180 mgd. As described below in Section 3.5.1.1, the proposed backup pipeline would be constructed along the Calaveras fault. If a seismic event resulted in damage to the proposed backup pipeline, emergency discharges would occur via the new Alameda East Portal Overflow Pipeline and the new Alameda Siphon No. 4. The new chemical facility would be designed with sufficient capacity to allow system operators to dechlorinate and pH-adjust water prior to discharge from the Alameda East Portal Overflow Pipeline.

Under existing conditions and without implementation of the SABPL project, during both planned and emergency operations, system operators are required to manually adjust transfer control valves to redirect flow to San Antonio Creek. In addition, if water facilities located west of the Sunol Valley were temporarily unable to convey the entire capacity of system flows following a seismic event, chlorinated Hetch Hetchy water would exit the system through the Alameda East Portal Overflow Pipeline until operators were able to redirect the flow. With the proposed project, the transfer control valves would be automated, allowing operators to more quickly redirect flow and to treat the water prior to discharge, thus minimizing the potential for chlorinated discharges to water bodies.

The SABPL project would also assist the SFPUC in achieving the WSIP objective of providing operational flexibility to allow for planned maintenance and shutdown of individual facilities, such as the San Joaquin Pipelines, without interrupting customer service. In addition, the proposed project would provide a partial backup transmission pipeline for the 5,400-foot-long segment of the existing San Antonio Pipeline along Calaveras Road. Installation of the cross-connecting air gaps between the existing San Antonio Pipeline and the proposed backup pipeline would allow sections of either pipeline to be isolated for maintenance or repairs while making it possible for system operators to direct flow to or from San Antonio Reservoir.

3.4 Proposed Water Management in Pits F3-East and F3-West

As described in greater detail in Section 3.7.2, the proposed backup pipeline would be used to divert Hetch Hetchy water to Pit F3-East following: (1) planned maintenance of the San Joaquin Pipelines, (2) water quality events occurring up-gradient of the Sunol Valley at Tesla Portal, and (3) facility outages or seismic events resulting in structural failure down-gradient of the Sunol

[5] With implementation of the SABPL project, 160 mgd would come from facilities in the Sunol Valley and 140 mgd would come from facilities in the Peninsula region (e.g., Crystal Springs Reservoir in unincorporated San Mateo County).

Valley (if the backup pipeline itself is not damaged during the seismic event). Pit F3-East would be managed to maintain water levels at or below 195 feet msl to ensure sufficient "freeboard"[6] is available to accommodate discharges from the backup pipeline. Hanson Aggregates has indicated its desire to extend the lease for the CCSF-owned portions of the SMP-24 area (the current lease expires in 2012) and retain access to Pits F3-East and F3-West to support active mining in the SMP-32 area. As a condition of the lease extension, the SFPUC and Hanson Aggregates would work cooperatively to maintain water levels in Pits F3-West and F3-East at or below 195 feet msl. Following a discharge from the backup pipeline, the SFPUC would pump discharged water up to San Antonio Reservoir for storage within 30 days or less, and the discharged water would be conserved for subsequent treatment and delivery to customers. In the event that Hanson Aggregates' lease is not extended, the SFPUC would solely manage the water levels in Pits F3-East and F3-West. (See Section 3.7.2 for additional information regarding future management of water levels in the quarry pits.)

3.5 Proposed Project Components

The SABPL project would include the following components:

- 7,000-foot-long San Antonio Backup Pipeline (backup pipeline)
- Discharge facility at Pit F3-East, including a discharge valve vault, an electrical control building, a baffled outfall, and a reinforced-concrete splash pad
- Chemical facility for dechlorination and pH adjustment
- Cutoff wall around quarry Pits F3-East and F3-West
- Dewatering facilities and related equipment
- Alameda Creek Pump Station, including a wet well (water holding tank), an electrical control building, a transfer pipeline, and a retaining wall
- Other improvements, including power supply facilities and Supervisory Control and Data Acquisition (SCADA)[7] transmitters
- Replacement of a 5,700-foot-long section of water pipeline to the town of Sunol

3.5.1 San Antonio Backup Pipeline

3.5.1.1 Pipeline Design

The proposed project includes installation of approximately 7,000 feet (1.3 miles) of pipeline from Alameda Siphon No. 3 near the San Antonio Pump Station, along the west side of Calaveras Road, beneath the San Antonio Creek channel, to the southern slope of Pit F3-East. The backup pipeline would be constructed of reinforced welded steel pipe; it would have an internal

6 In this context, freeboard is the vertical distance between the water line and the top of the pit.
7 SCADA systems allow for remote monitoring and operation of facilities.

diameter of 66 inches and a design capacity of 315 mgd, allowing it to convey the future maximum Hetch Hetchy flow under the WSIP. In accordance with typical SFPUC practice for new pipelines, a capped pipeline stub would be installed on the backup pipeline near pipeline station 62+00 (see Figure 3-4), immediately west of Calaveras Road and south of San Antonio Creek, to provide the option of a connection point for a pipeline segment to the base of Turner Dam in the event that the SFPUC identifies the need for such an extension at some point in the future.[8] At the San Antonio Creek crossing, the backup pipeline would be encased in concrete and the top of the concrete encasement buried approximately 4 feet beneath the creek channel. Although the backup pipeline would be constructed along the Calaveras fault, it would not be used to deliver water supplies to customers; therefore, the backup pipeline would not require seismic reinforcement. Auxiliary facilities related to the backup pipeline that would be constructed as part of the proposed project include three air gap systems, blowoff and air release valves, and a cathodic protection system. The backup pipeline and its auxiliary facilities are discussed below.

3.5.1.2 Proposed Alignment

Figures 3-3 through **3-5** present the proposed backup pipeline alignment on an aerial base map. The backup pipeline would generally parallel the existing San Antonio Pipeline for most of its length along Calaveras Road, offset roughly 15 feet to the west of the existing pipeline. The backup pipeline alignment begins near the San Antonio Pump Station, connecting with Alameda Siphon No. 3 (see Figure 3-3). From the San Antonio Pump Station, the backup pipeline would be routed north along the west side of Calaveras Road within the CCSF-owned lands leased to the quarry operators of SMP-30 and SMP-24. Roughly 1,000 feet south of the San Antonio Creek crossing, the backup pipeline would be routed away from the existing San Antonio Pipeline, continuing northwest under San Antonio Creek to quarry Pit F3-East. As part of the proposed discharge facility (described in Section 3.5.2, below), the SFPUC would construct a discharge valve vault along the backup pipeline alignment on the south side of San Antonio Creek. After exiting the discharge valve vault, the backup pipeline would continue underneath San Antonio Creek to a new outfall on the southern slope of Pit F3-East (SFPUC, 2011a).

3.5.1.3 Air Gap Systems at Cross-Connections

The backup pipeline has been designed with cross-connections (inter-ties with existing conveyance facilities) at three locations, each of which includes an air gap system. An air gap is a point of separation between water supplies that meet applicable standards and quality-impaired water supplies, and is designed to prevent contamination of supplies. The proposed air gap systems would allow the backup pipeline to be used as a raw water supply line in the event that the parallel segment of the existing San Antonio Pipeline were unavailable due to emergency conditions or planned maintenance. The air gaps between the proposed backup pipeline and existing pipelines would be installed aboveground at the following locations:

8 The SFPUC is not currently proposing to construct a pipeline segment to Turner Dam. If the SFPUC decided to pursue a new pipeline segment in the future, any such project would be subject to environmental review pursuant to the California Environmental Quality Act at that time.

- *Air Gap No. 1*. This air gap would connect the backup pipeline to Alameda Siphon No. 3 near the San Antonio Pump Station (shown in Figure 3-3).
- *Air Gap No. 2*. This air gap would connect the backup pipeline to the San Antonio Pipeline just south of San Antonio Creek and west of Calaveras Road near pipeline station 54+00 (shown in Figure 3-4).
- *Air Gap No. 3*. This air gap would connect the backup pipeline to the San Antonio Pipeline and the San Antonio Pump Station suction piping immediately east of Air Gap No. 1 (shown in Figure 3-3).

Each air gap would extend approximately 8 to 10 feet above the ground surface and consist of vertical pipes from the pipelines being connected and an approximately 40- to 80-foot-long pipe section connecting the vertical pipes, which would provide the space for the gap. Butterfly valves installed on either side of each angled pipe section would allow operators to divert and isolate flows. In addition, a new 66-inch-diameter transfer control valve installed on Alameda Siphon No. 3 at Air Gap No. 1 would allow SFPUC system operators to divert Hetch Hetchy water to the proposed backup pipeline. Two isolation valves would be installed on the San Antonio Pipeline (one on Air Gap No. 2 and one on Air Gap No. 3) so that the backup pipeline could be used if the San Antonio Pipeline is shut down for maintenance or repairs. Electric valve actuators would allow for remote operation of the valves via the existing SCADA system (CDM, 2006).

3.5.1.4 Blowoff Valves and Air Release Valves

Blowoff valves would be installed at low points along the backup pipeline alignment to allow SFPUC facility operators to drain and/or flush the pipeline during routine repairs. Air release valves would be installed at high points along the backup pipeline to regulate air pressure in the pipeline. Each blowoff valve and air release valve would be encased in an approximately 7-foot (outside) diameter concrete manhole riser protruding roughly 2.5 feet above grade, and would include an aluminum cover, access ladder, sump pump, and air vents to minimize moisture buildup. The section of backup pipeline beneath the valves would be encased in reinforced concrete to support the manhole structures and protect the pipeline from overlying loads (weight) (SFPUC, 2011a).

3.5.1.5 Cathodic Protection

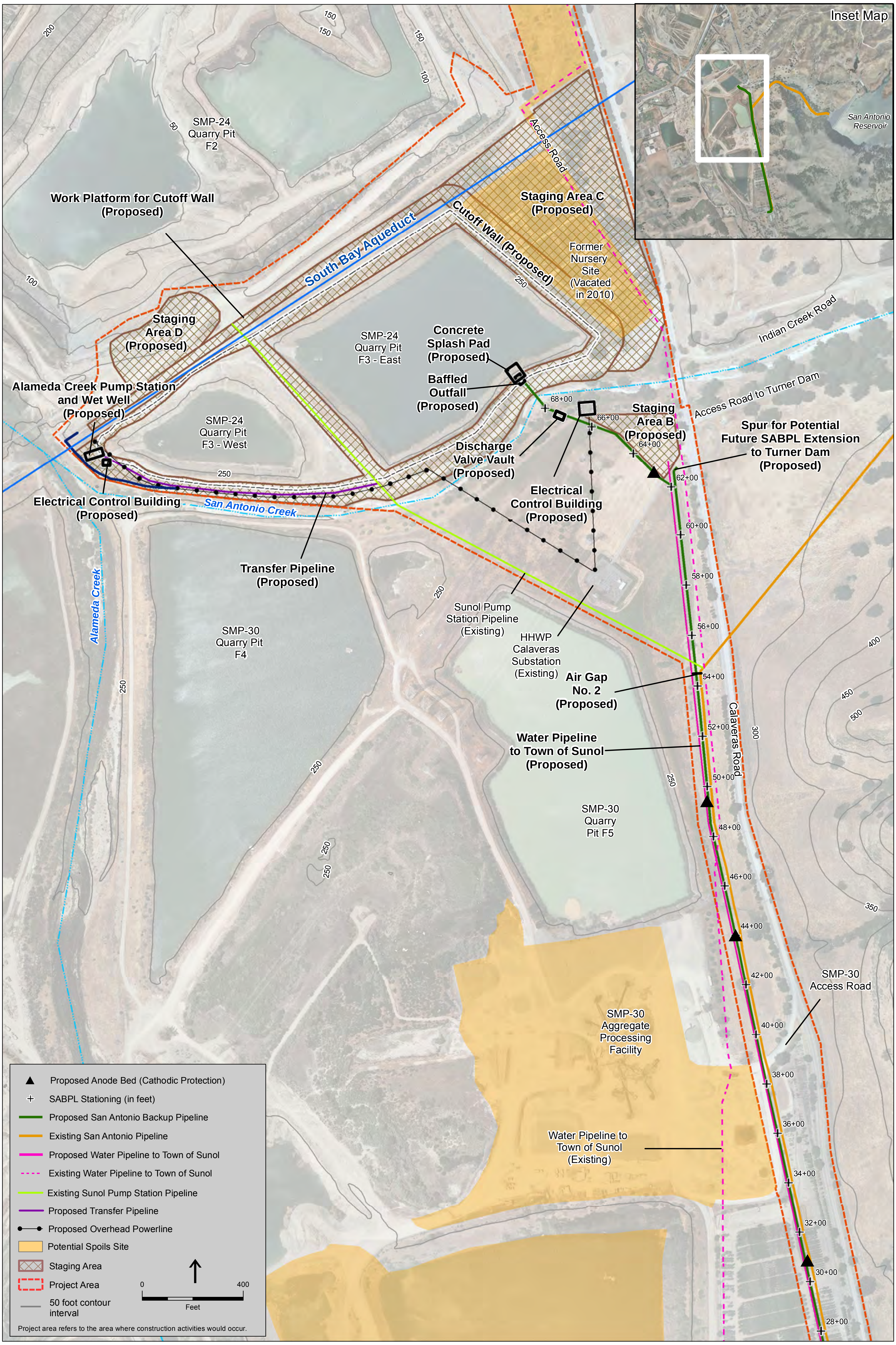
Exposure of a metal pipe to water and other corrosive elements in soil can lead to pitting and eventual failure of the pipeline. To protect against underground corrosion, the proposed backup pipeline would have a cement mortar coating or a dielectric coating (a coating that does not conduct electricity), and a passive cathodic protection system would be installed along the pipeline. The lining and coating material of the pipe would prevent corrosive soil and water from touching the pipe's interior and exterior metal surfaces.

The cathodic protection system would further protect against underground corrosion of the proposed backup pipeline. The system would consist of four anode beds placed at a minimum distance of approximately 5 feet from the backup pipeline in the vicinity of the pipeline alignment (see Figures 3-3 and 3-4). Each anode bed location would have approximately four

SOURCE: ESA+Orion, 2011; SFPUC, 2010; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

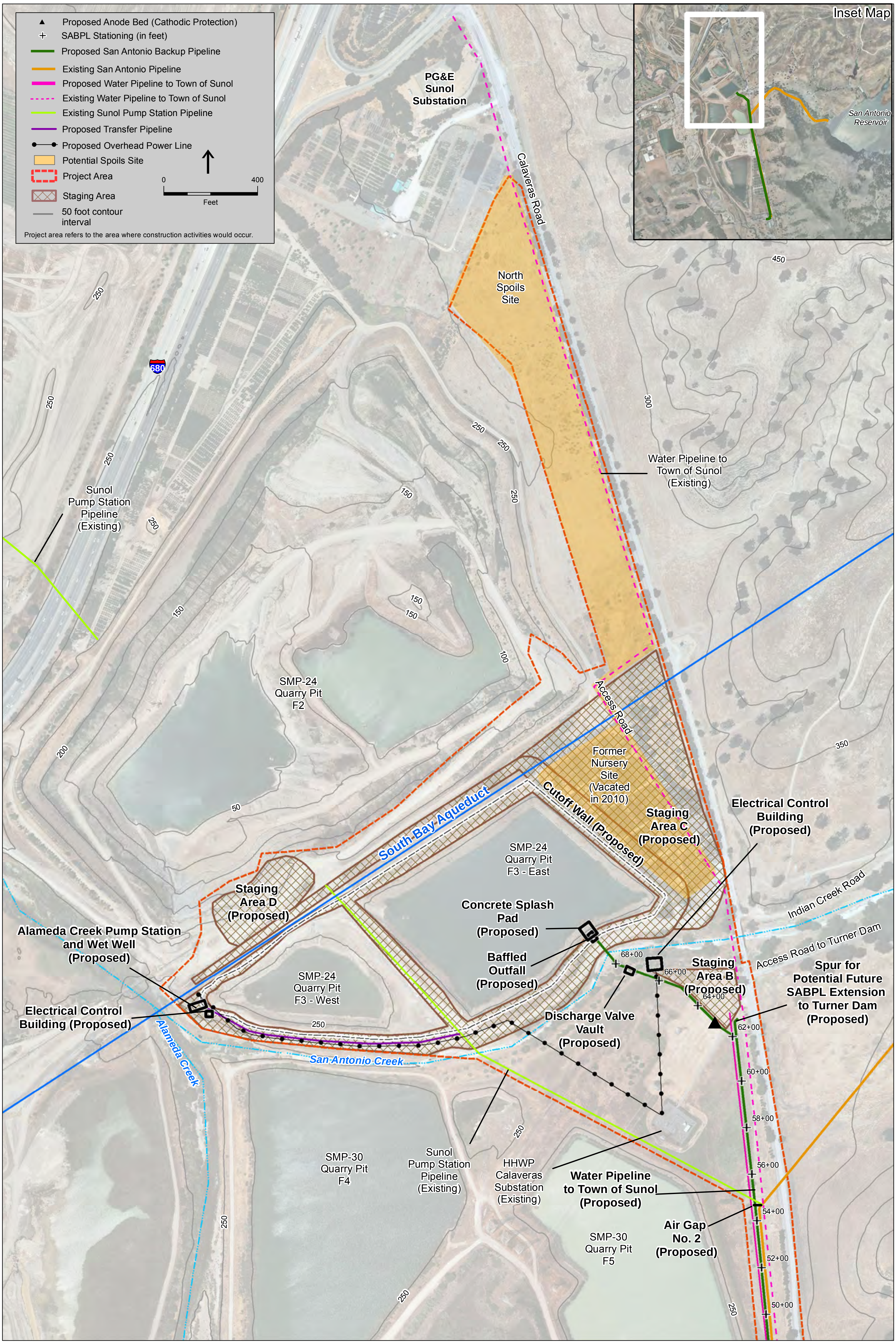
Figure 3-3
San Antonio Pump Station Vicinity



SOURCE: ESA + Orion, 2011; SFPUC, 2010; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 3-4
Northern SABPL Alignment



SOURCE: ESA + Orion, 2011; SFPUC, 2010; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project
Figure 3-5
North Spoils Site Vicinity

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anode columns, evenly spaced at 10 to 15 feet apart. Each anode column would be approximately 10 inches in diameter and 25 feet deep, with two vertical anodes in each column. The cathodic protection system would protect against corrosion by converting the anodic (active) sites on the pipeline to cathodic (passive) sites by means of an electrical current. An electrical current would be generated by connecting "sacrificial" anodes to the pipeline. Sacrificial anodes are generally made of alloys of materials such as zinc, magnesium, and aluminum that are more active than the metal of the pipe; thus, the anode corrodes instead of the pipe corroding and is consumed until eventually it has to be replaced. All elements of the cathodic protection system would be underground. Test stations along the length of the backup pipeline would allow operators to monitor the level of cathodic protection and determine when sacrificial anodes have to be replaced.

3.5.2 Discharge Facility at Pit F3-East

During future planned maintenance events and emergency conditions requiring the diversion of Hetch Hetchy water out of the regional water system (see Section 3.7.1, below, for a discussion of these future scenarios), the proposed project would enable the SFPUC to divert flows to a new discharge facility at the southern slope of Pit F3-East (shown in Figures 3-4 through 3-6). The proposed discharge facility at Pit F3-East would be comprised of a discharge valve vault, a baffled outfall, a concrete splash pad, and an electrical control building. The proposed discharge facilities could accommodate one 12-hour discharge event at a rate of 315 mgd (up to 485 acre-feet[9] of water).

3.5.2.1 Discharge Valve Vault

As part of the SABPL project, the SFPUC would construct a discharge valve vault just south of San Antonio Creek approximately 200 feet from the northern terminus of the backup pipeline (see Figure 3-5). The vault would house the valves to control the flow of discharges to the quarry pit. The discharge valve vault would include an isolation valve and a flow control valve encased within a concrete vault approximately 19 feet wide, 38 feet long, and 16 feet deep. The concrete vault would extend approximately 2 to 3 feet above the ground surface and would include an access hatch, lighting, and a ventilation fan for air circulation and cooling.

3.5.2.2 SABPL Electrical Control Building

The SABPL project would also include construction of an electrical control building adjacent to the discharge valve vault on the south side of San Antonio Creek (see Figure 3-5). The building would contain the electrical controls and instrumentation needed to operate the discharge facility and would also house a heat pump, a chlorine analyzer, and water quality sensors and transmitters. The electrical control building would be approximately 15 feet long, 15 feet wide, and 16 feet tall. The SFPUC would install an approximately 550-foot-long overhead powerline between the HHWP Calaveras Substation and the electrical control building to provide power to the discharge facility. A 1,600-square-foot asphalt parking area would be constructed next to the building. An 8- to 10-foot-high perimeter security fence would enclose a 50-foot-wide by 60-foot-long area around the electrical control building and parking area. Exterior lighting with a motion sensor would be

[9] An acre foot is a unit of volume equal to approximately 325,853 gallons.

permanently installed on the electrical control building. In addition, the existing dirt access road extending from Calaveras Road along the south side of San Antonio Creek to the discharge valve vault and the electrical control building would be improved with gravel or pervious pavement.

3.5.2.3 Baffled Outfall and Concrete Splash Pad at Pit F3-East

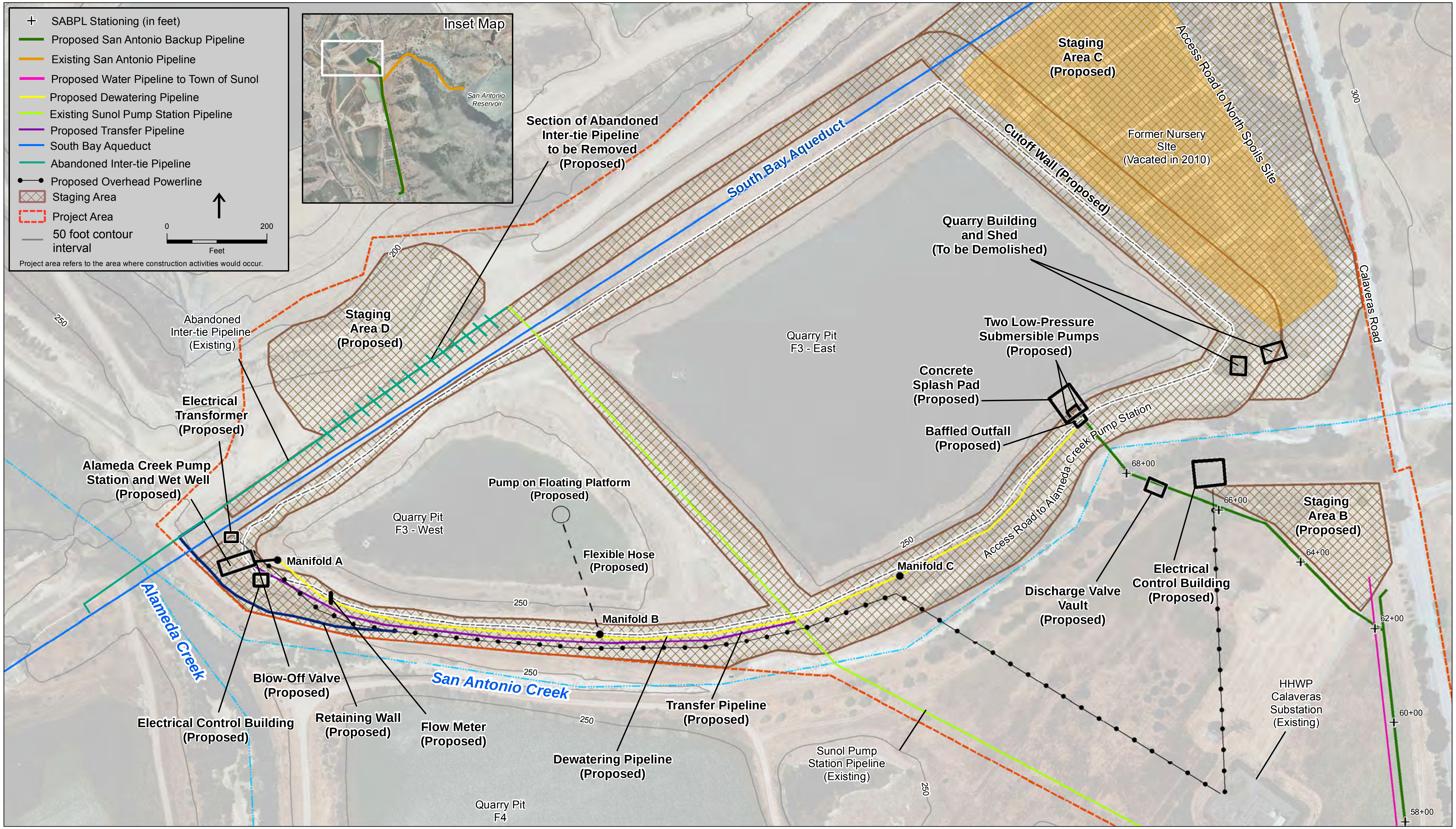
After exiting the discharge valve vault, the backup pipeline would continue under San Antonio Creek to the southern edge of quarry Pit F3-East (see **Figure 3-6**). To protect the southern slope of the quarry pit from erosion associated with project-related discharges, the backup pipeline would terminate at a baffled outfall, and a reinforced-concrete splash pad would be constructed over the slope. At the rim of Pit F3-East, the backup pipeline would discharge into the baffled outfall, which would dissipate the energy and decrease the velocity of the water stream. Water would exit the baffled outfall via a broad-crested weir that would direct the flow onto the concrete splash pad. The splash pad portion would be approximately 175 feet long and 210 feet wide at the top of the slope, narrowing to 35 feet at the bottom of the slope. The splash pad would be reinforced with steel and secured to the slope using a series of ground anchors. Discharged water would then flow over the concrete splash pad and into the quarry pit (URS, 2010b).

3.5.3 Cutoff Wall Around Pits F3-East and F3-West

At present, groundwater flows into Pits F3-East and F3-West through permeable soils. Cutoff walls are barriers constructed underground to impede groundwater flow. As part of the proposed project, the SFPUC would construct a new cutoff wall around the perimeter of Pits F3-East and F3-West to minimize the seepage of groundwater into the pits and to help maintain water levels at or below 195 feet msl. The cutoff wall would consist of a trench filled with bentonite-cement slurry. The entire cutoff wall would be approximately 5,000 feet long, 3 feet wide, and 80 feet deep (SFPUC, 2011b). The cutoff wall would fully encompass Pits F3-East and F3-West, thereby eliminating the gap at the South Bay Aqueduct that limits the effectiveness of the existing cutoff wall. A portion of the cutoff wall could be constructed within the easement of the South Bay Aqueduct. Approval from the DWR would be required for any work within the easement of the South Bay Aqueduct (e.g., the cutoff wall or construction staging within the easement). DWR's easement for the 84-inch-diameter South Bay Aqueduct is roughly 120 to 140 feet wide (URS, 2010b). To facilitate construction of the cutoff wall, two quarry buildings would be demolished—an approximately 25-foot-wide by 40-foot-long residential-type building and a 35-foot-wide by 40-foot-long shed-roofed barn structure located just east of Pit F3-East (see Figure 3-6). The two buildings are currently vacant, but were previously used by Hanson Aggregates when Pits F3-East and F3-West were actively mined.

3.5.4 Dewatering Facilities and Equipment at Pits F3-East and F3-West

The proposed dewatering facilities and equipment at Pits F3-East and F3-West would assist the SFPUC in managing water levels in the pits to accommodate future discharges from the backup pipeline. These facilities include a water level sensor, submersible pumps, portable pumps mounted on floating platforms, flexible hoses, and a dewatering pipeline and are described below.



SOURCE: ESA + Orion, 2011; SFPUC, 2010. Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 3-6
Proposed Improvements at Quarry Pits F3-East and F3-West

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3.5.4.1 Water Level Sensor

In order to provide sufficient freeboard to accommodate the 12-hour design discharge event from the proposed project, water levels in Pit F3-East would be maintained at or below 195 feet msl. The SFPUC would install a water level sensor in Pit F3-East to monitor water levels and alert the SFPUC and/or Hanson Aggregates when water levels are approaching 195 feet msl (SFPUC, 2010a).

3.5.4.2 Dewatering Pits F3-East and F3-West

As described above in Section 3.4 and below in Section 3.7.2, the SFPUC and Hanson Aggregates would work cooperatively to maintain water levels in Pit F3-East at or below 195 feet msl. As part of ongoing mining operations, Hanson Aggregates would continue current water management practices and would use utilize the quarry company's existing network of portable pumps and flexible hoses to move water: (1) out of Pits F3-East and F3-West for consumptive use in quarry operations; (2) to other SMP-24 quarry pits to maximize water storage; and (3) to Alameda Creek during very wet periods.

If, following a discharge from the backup pipeline to Pit F3-East, water levels in Pit F3-East were to rise above 195 feet msl, the SFPUC would use submersible pumps, portable pumps mounted on floating platforms, flexible hoses, a manifold system, and a dewatering pipeline to dewater Pits F3-East and F3-West[10] and convey the water to the proposed wet well beneath the Alameda Creek Pump Station; from there the water would be pumped to San Antonio Reservoir or the SVWTP. The proposed dewatering facilities are shown on Figure 3-6.

To dewater Pit F3-East, two inlet pipes built into the concrete splash pad of the new discharge facility would provide an intake for the water in the quarry pit. Up to three low-pressure submersible pumps (two active and one standby) would be installed inside a steel column mounted on the concrete splash pad. The steel column containing the submersible pumps would be connected to the inlet pipes and a dewatering pipeline. The 24-inch-diameter dewatering pipeline, made of steel, would extend from the new discharge facility at Pit F3-East, along the southern perimeter of Pits F3-East and F3-West, to the wet well beneath the Alameda Creek Pump Station. The SFPUC would use the submersible pumps to pump up to 5.25 mgd of water out of Pit F3-East and through the dewatering pipeline to the wet well.

Manifolds installed along the dewatering pipeline would provide additional connection points for flexible hoses. If needed for dewatering the quarry pits after a discharge, the SFPUC could connect flexible hoses extending from pumps mounted on floating platforms in Pit F3-East and in Pit F3-West to the dewatering pipeline at Manifolds C and B, respectively, so that water could be conveyed to the wet well beneath the Alameda Creek Pump Station (Manifold A). As described below in Section 3.5.5, the proposed transfer pipeline would then convey flows from the proposed Alameda Creek Pump Station to the existing 36-inch-diameter Sunol Pump Station

[10] As discussed in Section 5.16.1.7 in Section 5.16, Hydrology and Water Quality, Pits F3-East and F3-West are hydraulically connected when water elevations in the pits rise above the less permeable Livermore gravels to the highly permeable shallow alluvium. Thus, the SFPUC might also need to pump water out of Pit F3-West.

Pipeline, which would subsequently flow to the existing San Antonio Pipeline and other existing pipelines so that water could be pumped to San Antonio Reservoir or the SVWTP (SFPUC, 2010c).

The HHWP Calaveras Substation would provide power for the submersible pumps at the new discharge facility via 250 feet of new underground powerline installed between the electrical control building for the discharge facility and the submersible pumps. The underground powerline would be routed beneath San Antonio Creek alongside the backup pipeline. The HHWP Calaveras Substation would also provide electrical power for the portable pumps mounted on floating platforms.

In the event that Hanson Aggregates' lease is not extended, the SFPUC would be solely responsible for managing water levels in Pits F3-East and F3-West. Under these circumstances, the SFPUC may need to discharge water to Alameda Creek in order to maintain sufficient freeboard in Pit F3-East to accommodate a discharge from the backup pipeline. If it were necessary that the SFPUC discharge water from Pit F3-East to Alameda Creek, a new NPDES permit could be required. It is expected that the SFPUC would use a series of portable pumps and flexible hoses (similar to the system currently used by Hanson Aggregates), as well as Hanson Aggregates' existing outfall at Alameda Creek, to conduct these discharges. As necessary, discharges to the creek would be conducted at the existing outfall in Alameda Creek in a similar manner to discharges currently made by Hanson Aggregates, and would be conducted in accordance with regulatory requirements.

3.5.5 Alameda Creek Pump Station, Wet Well, and Transfer Pipeline

3.5.5.1 Alameda Creek Pump Station and Wet Well

The proposed Alameda Creek Pump Station and related facilities would enable the SFPUC to pump water from Pit F3-East to either San Antonio Reservoir or to the SVWTP, thereby conserving the water for subsequent treatment and delivery to customers (see Figure 3-6). As described above in Section 3.5.4.2, following a discharge from the backup pipeline that causes water elevations in Pit F3-East to rise above 195 feet msl, the SFPUC would dewater Pit F3-East and, if needed, Pit F3-West, and pump the water to the wet well beneath the Alameda Creek Pump Station using submersible pumps, pumps mounted on floating platforms, flexible hoses, a manifold system, and the dewatering pipeline.

The Alameda Creek Pump Station would be constructed at the west end of Pit F3-West, adjacent to and north of an existing access road, and northeast of the confluence of Alameda and San Antonio Creeks. A portion of these improvements would be located within the DWR easement for the South Bay Aqueduct and approval from the DWR would be required for any work and placement of improvements within the easement. Three 274-horsepower pumps (two active and one standby pump) would be housed at the Alameda Creek Pump Station for operation of the SABPL project. The pump station would withdraw water from the wet well and pump it through the proposed transfer pipeline, the existing Sunol Pump Station Pipeline, and the existing San Antonio Pipeline to San Antonio Reservoir or to the SVWTP. The Alameda Creek Pump Station is proposed as an outdoor facility (i.e., no roof and no walls). The approximately 140- by 180-foot pump station site containing the pumps, a wet well, an electrical transformer,[11] and a 15- by 15-foot metal control building housing the electrical equipment and controls for the pump station would be enclosed by a 8-foot-high security fence (URS, 2010e). The wet well would be approximately 45 feet deep, 25 feet wide, and 25 feet long. A portion of the existing access road would be extended and improved (with gravel or pervious pavement) to form a driveway and parking area. An approximately 500-foot-long, 10-foot-tall retaining wall would be constructed along the southern boundary of the pump station site adjacent to the access road. Permanent, energy-efficient exterior lighting with a motion sensor would be installed at the pump station. Construction of the Alameda Creek Pump Station, wet well, electrical control building, and electrical transformer would require the placement of approximately 100 cubic yards of new fill within the mapped 100-year flood hazard zone for Alameda Creek. The ground surface in the vicinity of the Alameda Creek Pump Station, control building, and electrical transformer would be graded at approximately 253 feet msl—over 2 feet above the 100-year flood level in this area—to elevate the floors of these facilities above the 100-year flood hazard zone for Alameda Creek (URS, 2010e).

The pump station would be operated remotely or locally from the SVWTP. Water would be pumped out of Pits F3-East and F3-West and into the wet well. The pumps would discharge the water from the proposed wet well into the transfer pipeline, described below. Electrical power for the pump motors would be provided by new overhead powerlines (described in Section 3.5.7.2) and a new electrical transformer at the site. The electrical transformer would be approximately 12 feet wide and 10 feet tall.

3.5.5.2 Transfer Pipeline

The proposed 36-inch-diameter transfer pipeline would be used to convey water from the Alameda Creek Pump Station to the existing 36-inch-diameter Sunol Pump Station Pipeline and segments of the existing San Antonio Pipeline. The transfer pipeline would be an approximately 1,250-foot-long steel pipe installed approximately 10 feet deep along the southern perimeter of Pits F3-East and F3-West. An access manhole would be constructed at each end of the transfer pipeline (URS, 2010e). The transfer pipeline would include a blowoff valve at its lowest point (at the Alameda Creek Pump Station) for discharges of stagnant water and sediment to Pit F3-West following periods when the transfer pipeline has not been in use. SFPUC system operators would address issues associated with minor contamination and stale water by flushing the Alameda Creek Pump Station and transfer pipeline through the blowoff valve. A flow meter would be installed along the transfer pipeline alignment, approximately 200 feet east of the Alameda Creek Pump Station, to measure flows from the pump station. The flow meter would be housed in a concrete vault approximately 5 feet wide, 5 feet long, and 8 feet deep. The top of the vault would consist of an access manhole at the ground surface. Similar to the backup pipeline, a cathodic protection system would be placed along the length of the transfer pipeline (see Section 3.5.1.5, above).

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[11] The main purpose of a transformer is to alter the voltage from a primary power circuit to a secondary power circuit in order to run a particular piece of electrical equipment. Electrical equipment running at a higher voltage is more efficient and requires smaller conduits.

3.5.5.3 Relationship of SABPL Project to the Upper Alameda Creek Filter Gallery Project

Certain facility components of the SABPL project are assumed to be constructed as part of the project but could be utilized by another proposed SFPUC project in the Sunol Valley—the Upper Alameda Creek Filter Gallery (Filter Gallery) project, if and when that project is approved and implemented. (Chapter 5, Section 5.1.4, Cumulative Impacts, describes the Filter Gallery project.) The facilities proposed for the SABPL project that also may be utilized by the Filter Gallery project are: (1) the Alameda Creek Pump Station, wet well, and electrical control building; (2) the transfer pipeline; (3) the overhead powerline and electrical transformer powering the pump station; and (4) the permanent access road improvements. An additional 274-horsepower vertical pump would be installed at the Alameda Creek Pump Station for the Filter Gallery project, if approved and implemented. Under both projects, these facilities would be used to pump water from the wet well to San Antonio Reservoir or the SVWTP. At any given time, the facilities could only be utilized by one of the projects; the projects could not utilize the facilities simultaneously. Assuming the SABPL project is implemented as proposed and Pumping Variant 1 is not implemented (see Section 3.8.1 below), these facilities would be constructed as part of the SABPL project, regardless of whether the Filter Gallery project is implemented.

3.5.6 New Chemical Facility

3.5.6.1 Chemical Facility

The SABPL project includes construction of a new chemical facility near the San Antonio Pump Station, just east of the existing chemical facility at the south end of the project area (see Figure 3-3). The new chemical facility would be designed with a treatment capacity of 315 mgd to treat the future maximum Hetch Hetchy flow and would replace the existing chemical facility. In accordance with effluent limitations set by the San Francisco Bay Regional Water Quality Control Board (RWQCB), the SFPUC is required to pH-adjust and dechlorinate treated water prior to discharging it to waters of the United States (i.e., San Antonio Creek, San Antonio Reservoir) or waters of the state. Quarry Pits F3-East and F3-West are not classified as waters of the United States or waters of the state because they are part of active mining activities (Corps, 2011). Regardless, the SFPUC would use the new chemical facility to dechlorinate and pH-adjust all discharges from the proposed project, including discharges to the quarry pits.

The new chemical facility would include a paved driveway and parking area, a chemical unloading area, a chemical storage and containment area, and an electrical control room. The chemical facility building would be an enclosed structure covered with a weather canopy and a metal roof (48 feet long, 42 feet wide, and 22 feet tall). The electrical control room and chemical storage and containment area would be enclosed within the canopy structure. Adjacent to the chemical storage and containment area, a paved chemical unloading area (48 feet long by 15 feet wide) would be constructed. Sumps and sump pumps within the chemical containment area and loading area would collect and contain any dechlorination chemicals accidentally released during operations. The entire chemical facility would be surrounded by an 8- to 10-foot-high fence and would have permanent exterior lighting with a motion sensor.

Hazardous chemicals to be used at the proposed chemical facility would be stored in an aboveground storage tank with secondary concrete containment. The chemical storage and containment area would house one 8,000-gallon chemical storage tank for the dechlorination process, as well as transfer pumps, metering pumps, and a chemical feed system. The chemical feed system would consist of chemical feed lines (small, flexible hoses) extending between the new chemical facility and storage tanks located at an existing fluoride facility south of the Sunol Valley Chloramination Facility (described below in Section 3.5.6.2), and between the new chemical facility and three chemical injection stations: (1) the existing chemical injection station for the San Antonio Pipeline; (2) a new chemical injection station for the backup pipeline to be constructed as part of the proposed project (see Figure 3-3); and (3) the chemical injection station for the Alameda East Portal Overflow Pipeline constructed under the SFPUC Alameda Siphons project. The HHWP Calaveras Substation would supply electrical power to the new chemical facility at the San Antonio Pump Station via 200 feet of new underground powerlines extending between the existing Sunol Valley Chloramination Facility and the new chemical facility. In addition, as part of the proposed project, the SFPUC would replace an existing 100-kilowatt (kW) diesel gas-powered generator at the fluoride facility with a 150-kW liquid propane gas-powered generator. The new generator would provide backup power for the new chemical facility during power outages. No structural improvements to the fluoride facility are needed to support the new 150-kW emergency generator. The existing chemical facility would remain operational until the new chemical facility is installed and brought online. The existing chemical facility would then be decommissioned and the building used for equipment storage. Decommissioning would involve the removal of equipment such as pumps, tanks, and piping, which would be reused where possible or recycled/disposed of as appropriate.

3.5.6.2 Flow Meter, Chemical Injection Station, and Sampling Station

The new chemical facility would include a flow meter, chemical injection station, and a sampling station along the backup pipeline alignment (see Figure 3-3). Sump pumps in the flow meter vault, chemical injection station, and sampling station would remove water that accumulates in these underground structures and would discharge it to the adjacent ground surface.

The flow meter would be housed in a vault that would extend approximately 2 to 3 feet above the ground surface. The vault would be located along the backup pipeline alignment, down-gradient of the chemical injection station. The flow meter vault would be approximately 17 feet wide, 15 feet long, and 16 feet deep and would house a multi-path flow meter. The flow meter vault would include a sump pump, aluminum cover, lighting, and vents to circulate air.

The chemical injection station for the backup pipeline would be contained in an approximately 8-foot-diameter concrete manhole riser extending approximately 2.5 feet above the ground surface. The manhole riser housing the chemical injection station would be located down-gradient of Air Gaps Nos. 1 and 3 and would extend approximately 4 feet below the ground surface to connect with the top of the backup pipeline. This station would house the injection lines for chemicals used to dechlorinate and adjust the pH of water in the backup pipeline. The chemical injection station would also have an aluminum cover and vents to circulate air and minimize moisture buildup.

The sampling station would be contained in a concrete manhole riser located along the backup pipeline alignment, down-gradient of the flow meter vault. The sampling station would be installed above grade and would house a sampling pump. Instruments to measure chlorine and pH levels would be housed inside the sampling station.

The sampling station would collect water quality samples and discharge them to the ground surface outside of the sampling station. Sampling would occur for 24 hours after an emergency water quality event, and for 12 hours after a planned maintenance event. Because the backup pipeline is a redundant facility that would not be used on a regular basis, sampling would be conducted when the backup pipeline is operated rather than on a set schedule. The water quality sampling would generate approximately 12 gallons of discharge per hour, for a total of 432 gallons per year. The discharge would be of the same quality as water within the backup pipeline and would flow to a 6- by 6-foot rock drain that would allow the water to percolate into the ground near the pipeline. The sump pump would drain to the same location, removing rain water that infiltrates the vault. Discharges from the flow meter vault, chemical injection station, and sampling station to the adjacent ground surface would be conducted in accordance with NPDES General Permit for Discharges with Low Threat to Water Quality (Order No. 2003-003-DWQ).

3.5.7 Other Improvements

In addition to the proposed backup pipeline, the discharge facility at Pit F3-East, and the new chemical facility, other related improvements proposed as part of the SABPL project include installing SCADA equipment, connecting project components to Hetch Hetchy power supplies, and replacing a segment of 12-inch-diameter water pipeline to the town of Sunol.

3.5.7.1 SCADA Transmitters

Individual monitoring and control devices that are integral to the valves along the backup pipeline, as well as water quality sensors and transmitters installed at the discharge facility at Pit F3-East, would be connected to the existing SCADA system. The SCADA system is a remote monitoring and control system that tracks flow, pressure, and the opening and closing of isolation valves. It transmits field signals by radio to the SFPUC Water Supply and Treatment Division's SCADA terminals.

3.5.7.2 Power Supplies

As discussed above, the HHWP Calaveras Substation would provide the primary source of power for: the electrical control building used to operate the discharge facility at Pit F3-East; dewatering facilities; the Alameda Creek Pump Station; and the new chemical facility. Approximately 550 linear feet of new overhead powerlines would be constructed from the HHWP Calaveras Substation to the electrical control building for the new discharge facility, and approximately 1,650 linear feet of new overhead powerlines would be constructed from the HHWP Calaveras Substation to the new electrical transformer adjacent to the Alameda Creek Pump Station (see Figure 3-6). In addition, the new chemical facility would require the installation of approximately 200 feet of new underground powerline between the Sunol Valley

Chloramination Facility and the new chemical facility, and operation of the submersible pumps at the discharge facility would require the installation of approximately 250 feet of new underground powerline between the electrical control building on the south side of San Antonio Creek and the submersible pumps.

In the event of a power outage, an uninterruptible battery power supply would provide emergency power for the proposed valves and equipment associated with the discharge facility at Pit F3-East. As described in Section 3.5.6.1, above, a 150-kW liquid propane gas-powered emergency generator would be installed at the existing fluoride facility; this generator would provide backup power for the new chemical facility when needed. Emergency power supplies are not proposed for the Alameda Creek Pump Station. If, in the event of a power outage, the Alameda Creek Pump Station were not available to pump water from the quarry pits to San Antonio Reservoir or the SVWTP, the discharged water would remain in the quarry pits until power is restored. However, it is assumed that electrical power would be restored in less than two days. Even if the water were to remain at elevations greater than 195 feet msl for several days, no imminent risk to human health and safety or damage to facilities would result.

3.5.7.3 Water Pipeline to Town of Sunol

Approximately 5,700 feet of 12-inch-diameter water pipeline would be installed about 15 feet west of the backup pipeline in a parallel trench, beginning at pipeline station 4+00 near the San Antonio Pump Station and terminating at pipeline station 61+00 (see Figures 3-3 and 3-4). This water pipeline would replace a 5,700-foot-long segment of 36-inch-diameter pipe that supplies water to the town of Sunol and the Sunol Golf Course from the Alameda Siphons. Due to low demand and the large size of the existing pipeline, water can at times sit in the piping for prolonged periods. The proposed 12-inch-diameter pipe would decrease the detention time of water in the pipe, thereby improving water quality. The SFPUC contractor would initially seal the proposed pipeline at both ends, but in the future would connect the new pipeline to an existing 12-inch-diameter pipeline at the northern terminus and disconnect the 36-inch-diameter pipeline. At that time, the disconnected pipeline would be sealed and abandoned in place (CDM, 2006).

The 12-inch-diameter replacement pipe is not needed to achieve the objectives of the SABPL; rather, the SFPUC is installing it as part of the SABPL project for cost-efficiency purposes (i.e., it is cost-effective to install this pipeline when the backup pipeline is installed since the pipelines would be parallel). The purpose of the pipeline replacement is to improve water quality. However, the SABPL project does not include connecting the new 12-inch-diameter replacement pipeline to the existing infrastructure and abandoning the existing 36-inch-diameter pipeline it would replace. At this time it is not known when the new 12-inch-diameter replacement pipeline and the existing 12-inch-diameter pipes located at either end of the replacement pipeline would be connected.

3.5.7.4 South Bay Aqueduct Inter-tie Pipeline

As described above in Section 3.2.3, an abandoned inter-tie pipeline from a former connection between the South Bay Aqueduct and the Hetch Hetchy system runs east-west along the northern edge of Pit F3-East. The inter-tie was decommissioned by DWR in January 2011. The inter-tie pipeline connected the South Bay Aqueduct to the Sunol Pump Station Pipeline at the north end of the berm that divides Pits F3-East and F3-West (see Figure 3-6). The segment of inter-tie pipe located under Staging Area D would be removed prior to construction as a part of site preparation.

3.6 Project Construction

3.6.1 Site Access, Site Preparation, and Construction Staging

3.6.1.1 Site Access

Calaveras Road would be the primary construction access route to the project area. Construction traffic would use existing gravel roads to the west of Calaveras Road to access work areas and staging areas (including the North Spoils Site). In addition, the gated entrance to the gravel access road along the north side of San Antonio Creek that runs between Calaveras Road and the area proposed for the Alameda Creek Pump Station would be widened and improved and an extension to this access road would be constructed. The new portion of access road would consist of gravel or pervious pavement. The existing dirt access road would be widened and improved with gravel or pervious pavement. In addition, the dirt access road extending between Calaveras Road along the south side of San Antonio Creek to the discharge valve vault would be improved with gravel or pervious pavement. The existing access road adjacent to the South Bay Aqueduct to the north would be re-graded and improved with gravel or pervious pavement. In addition, two temporary road crossings of the South Bay Aqueduct would be created to provide a way for trucks to turn around during construction.

Trucks would need to use Calaveras Road throughout the construction period. The contractor would maintain two-way traffic along Calaveras Road for the majority of the construction phase, but a single lane would be closed periodically if necessary. Temporary delays of up to 10 minutes might be necessary on Calaveras Road. Access to private property and local businesses would be maintained during construction through the use of trench plates.

3.6.1.2 Site Clearing and Preparation

Before construction mobilization, the contractor would clear and grade portions of the project area (including construction staging areas), removing vegetation and debris as necessary, to provide a relatively level surface for the movement of construction equipment. The segment of the abandoned South Bay Aqueduct inter-tie pipeline located under Staging Area D would be excavated, cut, and removed and the excavation backfilled to prepare the site for staging. In addition, the two quarry buildings located east of Pit F3-East would be demolished to facilitate cutoff wall construction. Prior to demolition, the SFPUC would test the buildings for lead-based paint and survey for asbestos-containing building materials to determine the appropriate procedures for handling and disposing of the construction debris. Workers would clear the construction work areas in stages as construction progresses to limit the potential for soil to be exposed to stormwater runoff, which could cause erosion. In addition to grading the ground surface, the contractor might need to mow or place gravel over staging areas for fire prevention.

Upon completion of construction activities, the construction contractor would remove any added gravel, contour the site to its original profile, and hydroseed the area.

3.6.1.3 Staging Areas

Construction workers would use four primary staging areas located strategically along the backup pipeline alignment and near the proposed improvements for vehicle and equipment parking and materials storage. In addition, construction of the cutoff wall would require a work platform along the cutoff wall alignment for backfill mixing, stockpiling, and staging. The work platform would likely encroach into the DWR easement, but the platform width could be reduced as necessary to avoid the San Antonio Creek channel and any other constraining features. To the extent feasible, construction workers would site staging areas and the work platform for the cutoff wall within previously disturbed areas on CCSF-owned lands and the DWR easement. Approximately 25.6 acres of ground surface would be disturbed for use as construction staging areas and for the work platform for the cutoff wall. The former nursery site within Staging Area C would be used for construction staging during the earlier phases of construction; however, the SFPUC also proposes to use this site for permanent disposal of excess spoils generated during construction (described in Section 3.6.9, below). **Table 3-2** and Figures 3-3 and 3-4 identify the proposed construction staging areas.

TABLE 3-2
CONSTRUCTION STAGING AREAS

Staging Area	Location	Temporary Facilities / Uses	Approximate Acreage	Description
Staging Area A	West of Sunol Valley Chloramination Facility	Field offices for contractor(s) and SFPUC staff; equipment and vehicle parking; stockpiling of pipe and other construction materials	1.1	Flat dirt and gravel area; accessible via existing access road
Staging Area B	Southwest of Calaveras Road and San Antonio Creek crossing	Equipment and vehicle parking; stockpiling of pipe and other construction materials	1.1	Large flat area (non-native grassland); accessible via existing access road and gate
Staging Area C	West of Calaveras Road and north of San Antonio Creek crossing	Equipment and vehicle parking; stockpiling of pipe and other construction materials	9.4	Large flat area (non-native grassland), approximately 5-acres of which was formerly used as a nursery; accessible via existing access road
Staging Area D	North of Pit F3-West	Equipment and vehicle parking; stockpiling of pipe and other construction materials	2.1	Flat dirt and gravel area; accessible via existing access road
Cutoff Wall Work Platform	Along the cutoff wall alignment at Pits F3-West and F3-East	Trench excavation, slurry mixing, stockpiling, and staging, and pumping operations for cutoff wall	11.9	An approximately 125-foot-wide platform situated 25 feet from one side of slurry trench centerline, and 100 feet from other side of centerline

3.6.2 Pipeline Construction

This section describes the construction activities associated with installation of the backup pipeline from its starting point at Alameda Siphon No. 3 to the proposed discharge valve vault located just south of San Antonio Creek near pipeline station 67+00. The subsections that follow discuss construction activities associated with the air gaps at cross-connections, the cathodic protection system, and the project components that would be installed within the backup pipeline trench (e.g., manhole risers, vaults, valves). Installation of the 12-inch-diameter water pipeline to the town of Sunol, the 36-inch-diameter transfer pipeline, and the 24-inch-diameter dewatering pipeline are also described.

3.6.2.1 Installation of San Antonio Backup Pipeline

The construction contractor would install the backup pipeline using traditional open-trench construction methods, including at the San Antonio Creek crossing. The construction sequence would typically include clearing and grading the ground surface along the pipeline alignments; excavating the trench; preparing and installing pipeline sections; installing vaults, manhole risers, manifolds, and other pipeline components; backfilling the trench with non-expansive fills; restoring preconstruction contours; and revegetating or paving the pipeline alignments, as appropriate. In accordance with the recommendations of the project-specific geotechnical investigation, the footings of the proposed new structures would be at least 24 inches below grade to minimize the effects of any expansive soils (URS, 2009). The trench for the backup pipeline would be excavated on relatively flat terrain, roughly 10 feet west of and parallel to the existing San Antonio Pipeline. The backup pipeline trench would be approximately 7,000 feet long and 12 to 15 feet wide; it would have a minimum depth of 13 feet along most of the pipeline alignment and a maximum depth of 20 feet where the pipeline crosses access roads or existing underground utilities.

The traditional open-trench construction method involves using a conventional backhoe, excavator, or other mechanized equipment to excavate trenches. Trench boxes, shoring, or laying back and benching slopes would stabilize the pipeline trenches and prevent the walls from collapsing during construction. After excavating the trenches, the contractor would line the trench with pipe bedding (sand or other appropriate material shaped to support the pipeline). Construction workers would then place pipe sections in the trench, weld the sections together as trenching proceeds, and then backfill the trench. Open-trench construction would generally proceed at a rate of about 100 to 150 feet per day.

In addition, the contractor would install the following components within the backup pipeline trench at the specified locations along the pipeline alignment: multiple concrete manhole risers, including the chemical injection station near Air Gaps Nos. 1 and 3, the sampling station in the vicinity of pipeline station 3+00, blowoff valves at low points along the backup pipeline, and air release valves at high points along the backup pipeline; the flow meter vault in the vicinity of pipeline station 2+00; and the vault containing the valve for the discharge facility at Pit F3-East in the vicinity of pipeline station 67+00.

The backup pipeline would be disinfected before the pipeline is connected to the regional water system and placed in operation.

3.6.2.2 Installation of Air Gap Systems along the San Antonio Backup Pipeline

The contractor would install air gaps at two points of cross-connection between the existing San Antonio Pipeline and the proposed backup pipeline, and an air gap at a cross-connection between the existing Alameda Siphon No. 3 and the proposed backup pipeline. To install the air gaps it would be necessary to temporarily shut down and dewater the San Antonio Pipeline, cut and weld pipe, and then disinfect the newly installed backup pipeline and cross-connections (air gap systems) and Alameda Siphon No. 3 before bringing the pipes into service.

3.6.2.3 Installation of Cathodic Protection System along the San Antonio Backup Pipeline

The contractor would install a cathodic protection system consisting of four anode beds at a minimum distance of 5 feet from the backup pipeline in the vicinity of pipeline stations 12+00, 31+00, 49+00, and 64+00 (see Figures 3-3 and 3-4). It would be necessary to excavate a 6-inch-wide by 3-foot-deep trench, extending from the first anode column to the last anode column, to install the electrical wiring connection for each anode bed, and an additional 6-inch-wide by 3-foot-deep trench, extending from the pipeline to the center of each anode bed, for the wiring connections between the anode beds to the pipeline. The electrical cables from each anode bed would terminate either in a test station inside a concrete box that would be flush with the ground surface or on a post that would extend approximately 4 feet above the ground surface. All elements of the cathodic protection system would be underground.

3.6.2.4 Installation of Connecting Pipelines in the Project Area

Water Pipeline to the Town of Sunol

The contractor would excavate the trench for the 12-inch-diameter water pipeline to the town of Sunol approximately 15 feet west of and parallel to the trench for the backup pipeline and would use traditional open-trench construction. The trench would be approximately 5,700 feet long, 3 feet wide, and 5 feet deep, and would extend from pipeline station 4+00 to station 61+00. The contractor would use heat fusion to join sections of the pipeline before placing the pipe into the trench and then backfilling the trench with excavated or imported material to a depth of 2.5 feet above the pipeline. The contractor would cap the pipeline in place for connection to the existing distribution system at a later date.

Transfer Pipeline

The trench for the 36-inch-diameter transfer pipeline would be approximately 1,250 feet long, 6 feet wide, and 10 feet deep. The transfer pipeline would extend from the proposed Alameda Creek Pump Station to the existing Sunol Pump Station Pipeline at the southern end of the berm between Pits F3-East and F3-West. The contractor would use the traditional open-trench construction method to lay the pipeline. Sections of the transfer pipeline would be welded together, as described above for the backup pipeline, and the trench backfilled with excavated or imported, non-expansive fill material to a depth of up to 4 feet above the pipeline. Prior to backfilling, contractors would install a flow meter vault in the trench for the transfer pipeline and a blowoff valve at the western terminus of the pipeline. The pipeline would be disinfected before it is connected to the regional water system and placed in operation.

Dewatering Pipeline

The trench for the 24-inch-diameter dewatering pipeline would be approximately 1,400 feet long, 4 feet wide, and 6 feet deep, and would extend generally parallel to the north side of the transfer pipeline, between the new discharge facility at Pit F3-East and the Alameda Creek Pump Station. The dewatering pipeline would be steel pipe, which would allow contractors to place the entire pipeline in the trench. The contractor would install three manifolds in the trench prior to backfilling the trench to a depth of 3 feet above the pipeline. The manifolds would provide additional connections for flexible hoses extending from pumps on floating platforms in Pits F3-East and F3-West (Manifolds C and D, respectively) to the Alameda Creek Pump Station at Manifold A.

3.6.3 Chemical Facility

The contractor would construct the new chemical facility just east of the existing chemical facility (see Figure 3-3). The 48-foot-long, 42-foot-wide, and 22-foot-tall building would have a concrete foundation, structural frame, and a pre-engineered weather canopy with a metal roof. The maximum excavation depth for construction of the facility would be 20 feet.

In addition to constructing the facility, workers would install underground chemical feed lines between (1) the new chemical facility and the chemical injection stations, and (2) the existing chemical storage tank at the fluoride facility at the Sunol Valley Chloramination Facility. Chemical feed lines would generally consist of 1/2- to 2-inch-diameter tubing contained in 4- to 6-inch-diameter polyvinyl chloride (PVC) and/or HDPE plastic piping.

The construction work area for the new chemical facility would be temporarily gated and fenced off during construction. Permanent gates and fencing would be placed around the facility to prevent unauthorized access during project operations.

Once the new chemical facility is installed and operational, the existing chemical facility would be decommissioned and the building used for equipment storage. Decommissioning would involve the removal of equipment such as pumps, tanks, and piping, which would be reused where possible or recycled/disposed of as appropriate.

3.6.4 Alameda Creek Pump Station and Wet Well

The contractor would construct an approximately 500-foot-long, 10-foot-tall retaining wall along the southern boundary of the pump station site to establish site grading and stabilize the slope along the existing access road. The contractor would need to perform minor grading for the proposed Alameda Creek Pump Station, parking area, and driveway. The wet well would be constructed underground and would require excavation of a pit (approximately 55 feet by 25 feet to a depth of 45 feet below grade) using sheetpiles and a clamshell excavator. The 36-inch-diameter inlet pipe to the wet well would be installed by microtunneling through the quarry pit wall and into the wet well at approximately 220 feet msl, or roughly 35 feet below grade. The contractor would place 14-inch-diameter column piping from the bottom of the wet well up to the vertical turbine pumps of the Alameda Creek Pump Station.

The contractor would install the vertical turbine pumps using a mobile crane, and then install the electric pump motors and connect them to the control equipment. Workers would construct an 8-foot-high fence around the pump station site.

3.6.5 Electrical Control Buildings

The contractor would construct two electrical control buildings: one for the proposed discharge facility at Pit F3-East on the south side of San Antonio Creek adjacent to the discharge valve vault, and one for the Alameda Creek Pump Station. The electrical control buildings would each occupy a 15- by 15-foot poured concrete pad and would be 16 feet tall. Workers would pave a 1,600-square-foot asphalt parking area adjacent to the electrical control building for the discharge facility; the larger parking area for the Alameda Creek Pump Station would be made of gravel or pervious pavement. An 8- to 10-foot-high perimeter fence would enclose an approximately 3,000-square-foot area around the electrical control building and parking area for the discharge facility. At the Alameda Creek Pump Station site, 8-foot-high security fencing would enclose an approximately 11,500-square-foot (0.25-acre) area around the pump station, electrical control building, and the electrical transformer. Exterior lighting with motion sensors would be permanently installed on each of the electrical control buildings.

3.6.6 Construction Activities at Pits F3-East and F3-West

3.6.6.1 Baffled Outfall and Concrete Splash Pad at Pit F3-East

The contractor would construct the baffled outfall at the terminus of the backup pipeline near pipeline station 70+10, as well as the 175-foot-long reinforced-concrete splash pad over the southern slope of Pit F3-East from the baffled outfall to pipeline station 72+00 (see Figure 3-5). Construction of the reinforced-concrete splash pad would require that the contractor establish access to the quarry pit slope by either excavating a series of temporary paths and benches or setting up temporary work platforms in the slope itself. At least 20 feet would be needed on either side of the splash pad for construction access.

Workers would prepare the slope surface by removing loose/weak material, organic soils, and vegetation. Ground anchors would be constructed to secure the splash pad to the quarry slope; to accomplish this, workers would drill holes, install steel rods or tendons into the slope, and then grout the anchors in place. Construction workers would place temporary plywood or metal forms on the slope where the concrete splash pad would be constructed in place. Workers would position steel bars, tie them together to provide permanent reinforcement, pour the concrete slab in batches from a concrete pump truck at the top of the slope, and then remove the forms after the concrete had hardened. Workers would then mount the baffled outfall onto a pile foundation at the top of the slope and connect it to the end of the backup pipeline using short segments of steel pipe (URS, 2010b).

3.6.6.2 Cutoff Wall

The contractor would construct an approximately 125-foot-wide work platform along the cutoff wall alignment to provide a temporary working surface for conducting trench excavation, bentonite-cement slurry mixing, and slurry pumping operations. Timber crane mats would be placed adjacent to the work platform to provide a surface from which the excavators could operate. The contractor would construct earthen containment dikes along the work platform to prevent bentonite-cement slurry from flowing outside of the work area.

A long-reach excavator would be used to excavate an approximately 5,000-foot-long, 3-foot-wide, and 80-foot-deep trench along the perimeter of Pits F3-East and F3-West. To stabilize the trench walls and prevent collapse during excavation, the bentonite-cement slurry would be pumped from a mix plant on the work platform into the trench through temporary tubing as excavation proceeds (SFPUC, 2011b). Once the cutoff wall is emplaced, workers would place a 1-foot-deep layer of non-compacted soil over the cutoff wall to prevent desiccation of the underlying material (URS, 2010a). Extensive dewatering of the trench might be necessary to facilitate cutoff wall construction. As described below in Section 3.6.7.1, dewatering effluent from excavated areas, including the trench for the cutoff wall, would be treated and discharged to vegetated upland areas, San Antonio Creek, or Alameda Creek in accordance with regulatory requirements.

3.6.6.3 New Powerlines

As described in Section 3.5.7.2, a 1,650-foot-long overhead powerline would be constructed from the HHWP Calaveras Substation to a new electrical transformer adjacent to the Alameda Creek Pump Station, and a 550-foot-long overhead powerline would be constructed between the HHWP Calaveras Substation and the electrical control building for the discharge facility at Pit F3-East. The power poles would be sited approximately 300 feet apart, for a total of approximately seven or eight poles. Construction of overhead powerlines would occur in two phases: (1) installing the poles, and (2) installing and tensioning the powerline. Access to each pole would be needed at least twice. It is assumed the poles would be set by mechanically digging a hole up to 10 feet deep, placing the pole in the hole, and backfilling. At each of the pole locations, an approximately 50-by-50-foot area would be needed for laydown and assembly, and a limited amount of vegetation might require removal, but the need for grading is not expected. Construction workers would use standard rubber-tired line trucks to access the alignment and to install and tension the new overhead powerlines. The puller/tensioner would be mounted on a utility truck or on a double-axle trailer. Workers might need to trim and/or remove some vegetation along the alignment to keep vegetation away from the overhead powerlines.

A 200-foot-long underground powerline would be installed between the Sunol Valley Chloramination Facility and the chemical facility, and one 250-foot-long underground powerline would be installed between the electrical control building for the discharge facility at Pit F3-East and the submersible pumps installed in the concrete splash pad. Installation of the new underground powerlines would require excavation of a 1-foot-wide, 3-foot-deep trench along their alignments. After installing each underground powerline in the trench, construction workers would backfill the trench and restore the ground surface.

3.6.7 General Construction Activities

3.6.7.1 Construction Dewatering

Three types of dewatering discharges would be necessary during project construction: (1) dewatering of groundwater and surface water from excavated areas (if needed); (2) dewatering of existing pipelines before new connections are made; (3) dewatering of Pit F3-East to a level that allows for construction of the proposed discharge facility; and (4) discharges of water following the disinfection of newly installed pipes before they are connected to the regional water system. The contractor would treat water from excavated areas as necessary and discharge it to a containment facility (which could include dewatering tanks, filter bags, etc.) to allow sediment to settle out prior to discharge. Water from excavated areas would be discharged to vegetated upland areas (so it could infiltrate naturally into the ground) or would be discharged to San Antonio Creek (or Alameda Creek after treatment for sediment, if necessary) in accordance with regulatory requirements. The contractor would dechlorinate water from existing pipelines and discharge it to Pit F3-East, San Antonio Creek, or Alameda Creek before new connections were made. Disinfection water from newly installed pipes would also be dechlorinated and discharged to Pit F3-East, San Antonio Creek, or Alameda Creek.

Dewatering of excavated areas would be temporary and would only be necessary when surface water or groundwater was encountered. Workers would be more likely to encounter groundwater in areas where deeper excavations are needed, such as for the cutoff wall, wet well, and transfer pipeline and near San Antonio Creek. In addition, surface water from precipitation or drainage structures could enter trenches and other excavations. If necessary, surface water or groundwater from the trenches and excavations would be treated and discharged to a containment facility (i.e., dewatering tanks, filter bags) to allow sediment to settle out prior to discharge.

For construction activities associated with pipeline connections (i.e., air gap systems), system operators would need to isolate ("valve off"), shut down, and dewater (drain) the backup pipeline and Alameda Siphon No. 3, dechlorinate and adjust the pH of the treated water being drained from the pipes, and then discharge the water to Pit F3-East, San Antonio Creek, or Alameda Creek. Upon completing construction activities, system operators would disinfect the newly installed backup pipeline, transfer pipeline, and cross-connections (air gap systems) and Alameda Siphon No. 3 before bringing the pipes into service. The SFPUC would similarly treat this water prior to discharge (i.e., dechlorinate the water and adjust it for pH). This disinfection process would take five to seven days. The discharge would be covered under the existing Waste Discharge Requirements for the SFPUC Drinking Water Transmission System (RWQCB Order No. R2-2008-0102).

3.6.7.2 SFPUC Standard Construction Measures and Greenhouse Gas Reduction Measures

The SFPUC has established Standard Construction Measures (SFPUC, 2007) for all WSIP projects; these measures would be implemented as part of the proposed project. The main objective of these measures is to reduce impacts on existing resources to the extent feasible. The Standard Construction Measures include such activities as early identification of sensitive environmental resources in the WSIP project areas, and notification of business owners and residents near the WSIP projects, about the nature, extent, and duration of construction activities. The SFPUC would ensure that the SABPL project's contract specifications contain uniform minimum provisions to address these issues.

The SFPUC would also include the following measures in all SABPL project contractor specifications, which, in addition to having other environmental benefits, would help reduce greenhouse gas emissions:

- The SFPUC would require that all contractors maintain tire inflation to the manufacturers' inflation specifications.
- The SFPUC would require that all contractors minimize idling time for construction equipment (including vehicles) by either shutting off equipment when not in use or reducing the maximum idling time to two minutes. This measure is consistent with Mitigation Measure M-AQ-1a (BAAQMD Basic Construction Measures) (see Section 5.8, Air Quality).
- The SFPUC would implement a construction worker education program for the proposed SABPL project.

3.6.8 Site Cleanup and Restoration

After construction activities in the project area are completed, the SFPUC's contractor(s) would restore disturbed areas to their preconstruction conditions, including replacing topsoil that was removed during excavation and earthwork activities. Restoration measures for the disturbed project areas, including the San Antonio Creek crossing, would include reestablishing preconstruction contours and drainage patterns, revegetating disturbed areas, and installing erosion and sedimentation controls to minimize post-construction erosion. Since construction activities associated with other SFPUC projects in the Sunol Valley would overlap in footprint and could overlap in schedule, the construction contractor for the last project to be completed would perform these duties within the overlapping areas (see Section 5.1.4, Cumulative Impacts, for a discussion of other projects occurring in the Sunol Valley).

3.6.9 Spoils Management and Disposal

Excavation and construction activities under the proposed project would generate excess soil and rock material. The total volume of these spoils would be approximately 118,250 cubic yards. Strategies for managing excess excavated material include: (1) placing spoils in a temporary location, which might include quarry Pit F6 or the aggregate processing facility located immediately north of Pit F6—both of which are operated under SMP-30—for subsequent processing, resale, and reuse; (2) permanently placing the spoils in an earthen berm at the North Spoils Site or at the former nursery site within Staging Area C;[12] or (3) hauling the spoils offsite to an appropriate landfill facility (SFPUC, 2010b). As indicated above in Section 3.6.1.3, the former nursery site within Staging Area C would be used for construction staging for the earlier phases of construction before being used as a permanent spoils disposal site.

It might be necessary to temporarily stockpile spoils in construction work areas within the project area, such as alongside the backup pipeline trench or in the vicinity of Pits F3-East and F3-West, so that topsoil and subsoil could be retained to backfill excavations and restore the site. Temporary spoils stockpiling in the project area might be necessary for other purposes, such as to allow the SMP-30 quarry operator to evaluate soil quality before the spoils are transported to Pit F6 or the SMP-30 aggregate processing facility for temporary storage. Spoils might also be temporarily stockpiled in construction staging areas or within the highly disturbed footprint of the active quarry operations. The construction contractor would use existing quarry access roads to access Pit F6 and would place the spoils in an unvegetated area of the quarry pit that contains no standing water.

The North Spoils Site covers 12 acres and is located immediately south of the I-680/SR 84 interchange on the west side of Calaveras Road (see Figure 3-5). The North Spoils Site is on CCSF-owned property that was previously leased to a nursery operation but has reverted to non-native grassland. If this site is used for spoils management during construction of the SABPL project, spoils would be permanently placed in this area to a maximum height of approximately 20 feet above the elevation of Calaveras Road with 2:1 (horizontal:vertical) slopes to create a permanent berm with a 20-foot setback from Calaveras Road. The berm would be vegetated to protect the berm from erosion. Trees along this section of Calaveras Road would be preserved. In addition to using the North Spoils Site to dispose of spoils from the SABPL project, the SFPUC is also using this site for spoils disposal and placement for other SFPUC facility improvement projects in the Sunol Valley, including the SVWTP Expansion and Treated Water Reservoir, Alameda Siphons Seismic Reliability Upgrade, and New Irvington Tunnel projects. For more information on these projects, refer to Chapter 5, Section 5.1.

Excess spoils could also be placed at the former nursery site located within Staging Area C. The berm at this site would cover approximately 5 acres (the rest of Staging Area C, located between the former nursery site and Calaveras Road, is not a proposed permanent spoils disposal site) (see Figures 3-5 and 3-6). Spoils would be piled to a maximum height of 25 feet with 2:1 (horizontal:vertical) slopes to create a permanent berm. Like the berm at the North Spoils Site, the berm at the former nursery site would be vegetated to protect the berm from erosion.

In addition, spoils determined to be of poor quality, or excess spoils that could not be reused at the project site or in the permanent berm along Calaveras Road in the North Spoils Site, would be hauled out of the Sunol Valley and disposed of at an appropriate landfill facility, such as the Altamont Landfill, Vasco Road Sanitary Landfill, or other landfills and disposal facilities in Alameda and Santa Clara Counties.

[12] A small portion of the former nursery site and the proposed earthen berm is located within the proposed work platform for the cutoff wall.

3.6.10 Construction Equipment and Workforce

Table 3-3 summarizes the construction activities and workforce associated with the various project components. The equipment needed for earthwork activities and installation of the project components would typically include backhoes, excavators, bulldozers, loaders, boom trucks, drill rigs, concrete transport trucks, concrete pump trucks, water trucks, air compressors, generators, and pipe cutting/welding equipment. A long-armed excavator would be necessary for excavation of the cutoff wall trench. The contractor would use pavers and rollers to restore any paved roadways along the backup pipeline following installation, and to pave the new parking area for the electrical control building as well as the driveway and parking area for the new chemical facility. Heavy equipment such as bulldozers, loaded trucks, or vibratory compactors would not be operated during the more sensitive nighttime hours (10 p.m. to 7 a.m.).

Individual crew sizes would range from 2 to 30 workers. Based on the assumption that construction of up to three project components could overlap at any one time, up to 89 construction workers would access the project area on a daily basis, depending on the phase of construction and the construction activities taking place.

3.6.11 Construction Schedule

Project construction is expected occur from October 2012 through June 2014, resulting in an overall construction period of approximately 21 months. Table 3-3 shows the construction durations for each of the project components. Project construction would generally occur on weekdays and Saturdays during the daytime hours, 7 a.m. to 7 p.m.; however, extended construction hours and Sunday work would be necessary during certain phases of construction, including air gap construction and connection with the proposed backup pipeline (four weeks), and connection of the backup pipeline to Alameda Siphon No. 3 (two weeks).

Spoils disposal would occur over 20 months between November 2012 and June 2014. Haul trips to transport construction materials to the project area and excavated spoils to landfill facilities would be limited to weekdays between 7 a.m. and 7 p.m. Truck deliveries and hauling to and from the site would not occur on weekends or during nighttime hours.

3.7 Operations and Maintenance

3.7.1 Proposed Future Operations

Table 3-4 summarizes proposed future operations of the existing San Antonio Pipeline and proposed backup pipeline (as well as other operations for diverting Hetch Hetchy flows out of the regional water system), which are described below.

- *Recharge San Antonio Reservoir (Planned Operations)*. The SFPUC would continue to use the San Antonio Pipeline to convey Hetch Hetchy water to San Antonio Reservoir, and to convey water stored in Calaveras Reservoir to San Antonio Reservoir. If the 5,400-foot-long segment of the San Antonio Pipeline along Calaveras Road were taken out of service for maintenance and repairs or if it were to fail, SFPUC system operators would use the backup pipeline in place of the San Antonio Pipeline.

TABLE 3-3
SUMMARY OF CONSTRUCTION ACTIVITIES AND EQUIPMENT

Project Component(s)	Proposed Construction Activities	Excess Spoils Volume (cubic yards)	Construction Equipment		Construction Crew	Site Access	Construction Duration
Backup Pipeline and 12-inch Water Pipeline to Town of Sunol (Installation of Pipelines, Vaults, Manhole Risers, Air Gap Systems, and Cathodic Protection)	Vegetation removal; grading and trench excavation; construction dewatering; trench preparation; pipeline installation; pipeline cutting and welding; construction of air gaps and cathodic protection system; installation of vaults and manhole risers; backfilling; disinfection of new pipelines and air gaps; soil compaction; and resurfacing, vegetation plantings, and repaving, as appropriate.	31,300	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment	• Baker tank(s) • Pickup trucks • Arch welding machine • Generators • Air compressors • 80-ton crane • Drill rig • Skip loader • Pavers and rollers	15 to 30 workers per day	Calaveras Road and existing access roads	15 months
Discharge Facility at Pit F3-East (Outfall, Concrete Splash Pad, Electrical Control Building)	Vegetation removal; grading and excavation; construction dewatering; installation of anchors; formwork for concrete splash pad and foundation of electrical control building; installation of pre-engineered structural frame, weather canopy, and metal roof for electrical control building; and paving of the parking area for the electrical control building.	15,000	• Sheetpile driver • Flatbed trucks • Excavators • Backhoe • Boom truck • Air compressors • Baker tank(s) • Drill rig • Generators • Arch welders • Timber crane mats	• Trucks for materials delivery • Dump trucks • Pickup trucks • Concrete transport trucks • Concrete pump truck • Water trucks • Pavers and rollers • Work platform	2 to 15 workers per day	Existing access roads	6 months
Cutoff Wall	Preparation of the work platform; trench excavation; slurry mixing; and demolition of the two quarry buildings located east of Pit F3-East.	60,750	• Long-reach excavators • Regular excavators • Bulldozers • Desander plant • Haul trucks for spoils transport	• Slurry mixing plant • Forklift • Dump trucks • Slurry pumps • Timber crane mats	Generally 15 workers per day	Existing access roads	16 months

TABLE 3-3 (Continued)
SUMMARY OF CONSTRUCTION ACTIVITIES AND EQUIPMENT

Project Component(s)	Proposed Construction Activities	Excess Spoils Volume (cubic yards)	Construction Equipment		Construction Crew	Site Access	Construction Duration
Transfer Pipeline and Dewatering Pipeline	Vegetation removal; grading and trench excavation; construction dewatering; trench preparation; pipeline installation; installation of manifold system for dewatering pipeline; and pipeline cutting and welding.	4,300	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment	• Baker tank(s) • Pickup trucks • Arch welding machine • Generators • Air compressors • Crane • Drill rig • Skip loader	17 to 25 workers per day	Calaveras Road and existing access roads	3 months
Alameda Creek Pump Station and Wet Well (including Electrical Control Building)	Trench excavation for wet well; installation of wet well; grading for pump station; concrete formwork; installation of pre-engineered metal building; installation of pumps and electrical equipment; and access driveway improvements and paving of the parking area.	6,000	• Sheetpile driver • Excavators • Bulldozers • Concrete truck • Flatbed truck • Mobile crane	• Graders • Dump trucks • Welding equipment • Haul trucks for spoils transport	Generally 18 workers per day	Calaveras Road and existing access roads	5 months
New Chemical Facility (Chemical Facility Building and Chemical Feed Lines)	Grading and excavation; installation of chemical feed system and pumps; concrete formwork; installation of prefabricated storage tanks; construction of chemical facility building; and paving of the driveway and parking area.	900	• Excavator • Backhoe • Air compressors • Loader • Boom truck or small crane • Pavers and rollers	• Concrete transport trucks • Concrete pump truck • Flatbed truck • Generators • Pickup trucks • Trucks for materials delivery	Generally 2 to 10 workers per day	San Antonio Pump Station access road	5 months
Spoils Disposal	Spoils testing; hauling spoils; dust control; soil compaction; and grading.	Project Total = 118,250 cubic yards	• Backhoes • Haul trucks • Water trucks		Up to 4 workers per day, continuously throughout project construction	Calaveras Road and existing access roads	November 2012 through June 2014 – 20 months

TABLE 3-4
FUTURE OPERATIONS UNDER THE PROPOSED PROJECT

	Proposed Future Operations					
	Operation	**Water Source**	**Destination**	**Pipeline**	**Maximum Capacity (mgd) Pumped (P) or Gravity (G)**	**Change from Existing Operations**[a]
Planned Operations	Discharges Following Maintenance of the San Joaquin Pipelines	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir	San Antonio Pipeline (Preferred)	160 (P)	No change.
			San Antonio Creek	San Antonio Pipeline	N/A	Discharges to San Antonio Creek via the San Antonio Backup Pipeline would be eliminated.
			SVWTP	Calaveras Pipeline	160 (P)	No change.
			Pit F3-East	San Antonio Backup Pipeline	315 (G)	If system operators were unable to conserve the initial 160 mgd, then they would discharge the water to Pit F3-East via the backup pipeline. Discharges to Pit F3-East via the backup pipeline could occur simultaneously with transfers of water stored in San Antonio Reservoir to the SVWTP via the San Antonio Pipeline. The SFPUC would work cooperatively with Hanson Aggregates to maintain water levels in Pit F3-East at or below 195 feet msl. After a discharge event that raises water levels above 195 feet msl, the SFPUC would pump water out of the pit and route it to San Antonio Reservoir or the SVWTP.
			SMP-30	Alameda East Portal Overflow Pipeline	180 (G)	If the backup pipeline were damaged and could not be used to discharge the water to Pit F3-East, up to 180 mgd could be discharged into SMP-30 Pit F6 via the Alameda East Portal Overflow Pipeline constructed under the SFPUC Alameda Siphons project.
Emergency Operations	Discharges due to Water Quality Event East of the Sunol Valley	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir	San Antonio Pipeline (Preferred)	160 (P)	No change.
			San Antonio Creek	San Antonio Pipeline	N/A	Discharges to San Antonio Creek via the San Antonio Backup Pipeline would be eliminated.
			SVWTP	Calaveras Pipeline	160 (P)	No change.
			Pit F3-East	San Antonio Backup Pipeline	315 (G)	Same as for planned operations described above.
			SMP-30	Alameda East Portal Overflow Pipeline	180 (G)	Same as for planned operations described above.

TABLE 3-4 (Continued)
FUTURE OPERATIONS UNDER THE PROPOSED PROJECT

	Proposed Future Operations					
	Operation	Water Source	Destination	Pipeline	Maximum Capacity (mgd) Pumped (P) or Gravity (G)	Change from Existing Operations[a]
Emergency Operations (cont.)	Discharges due to Facility Outage West of the Sunol Valley	Hetch Hetchy – Alameda Siphon No. 3	San Antonio Reservoir	San Antonio Pipeline	160 (P)	No change.
			San Antonio Creek	San Antonio Pipeline	N/A	Discharges to San Antonio Creek via the San Antonio Backup Pipeline would be eliminated.
			Pit F3-East	SABPL	315 (G)	Same as for planned operations described above.
			SMP-30	Alameda East Portal Overflow Pipeline	180 (G)	Same as for planned operations described above.

NOTES: N/A= Not Applicable; SVWTP = Sunol Valley Water Treatment Plant.

[a] If the segment of the existing San Antonio Pipeline that parallels the backup pipeline were unavailable due to a planned or emergency outage, the backup pipeline could be used instead.

- *Transfer from San Antonio Reservoir to SVWTP (Planned Operations)*. Similar to operations for recharging San Antonio Reservoir, the SFPUC would continue to use the San Antonio Pipeline to convey water from San Antonio Reservoir to the SVWTP. If the 5,400-foot-long segment of the San Antonio Pipeline along Calaveras Road were taken out of service for maintenance and repairs, or if it were to fail, system operators would use the backup pipeline in place of the San Antonio Pipeline.

- *Discharge to Pit F3-East from Hetch Hetchy System (Planned or Emergency Conditions)*. With project implementation, discharges of Hetch Hetchy flows to San Antonio Creek via the existing San Antonio Pipeline would no longer occur.[13] Instead, system operators would use the backup pipeline to discharge the Hetch Hetchy flows (if the water could not be conserved) to Pit F3-East following: (1) planned maintenance of the San Joaquin Pipelines; (2) water quality events occurring up-gradient and east of the Sunol Valley; and (3) facility outages and seismic events resulting in structural failure down-gradient of the Sunol Valley (if the backup pipeline itself is not damaged during the seismic event).[14] The SFPUC estimates that discharges to Pit F3-East could occur approximately two to three times per year (SFPUC, 2009b). As described in the next section, water levels in Pit F3-East would be managed to maintain the surface water elevation at or below 195 feet msl to ensure sufficient capacity for subsequent discharges.

In general, the SFPUC would continue to use the San Antonio Pipeline to move water into and out of San Antonio Reservoir but would use the proposed backup pipeline to discharge Hetch Hetchy flows from planned maintenance activities and emergencies. Similar to existing operations, the first priority for discharges from both planned and emergency operations would be to conserve the Hetch Hetchy flows by diverting the initial 160 mgd to San Antonio Reservoir for subsequent treatment and delivery to customers, or diverting the flows to the SVWTP using the Calaveras Pipeline if there is sufficient lead time to adjust treatment plant operations. If the water cannot be conveyed to either San Antonio Reservoir or the SVWTP due to operational constraints, facility outages, or flow volumes (i.e., flows exceeding 160 mgd), system operators would divert the Hetch Hetchy flows via the backup pipeline to Pit F3-East.

A fundamental benefit of the proposed project would be to provide system operators with the ability to simultaneously discharge quality-impaired Hetch Hetchy water to Pit F3-East via the proposed backup pipeline while conveying water from San Antonio Reservoir to the SVWTP via the San Antonio Pipeline and Calaveras Pipeline. This operational flexibility would enable the SFPUC to meet the WSIP level of service objective of providing 300 mgd of water to customers when one water source is unavailable (described in Section 3.3.2.2, above). As described in Section 3.5.6, prior to discharging water into San Antonio Reservoir or Pit F3-East via the proposed backup pipeline, system operators would use the new chemical facility to dechlorinate and pH-adjust the water. Discharges from Pit F3-East to San Antonio Reservoir would require prior authorization from the San Francisco Bay RWQCB through either a new or amended NPDES permit. The new or amended permit would be issued in consideration of existing water

[13] Discharges from the reservoir to San Antonio Creek would continue to occur through the existing outlet structure and discharge facility at the base of Turner Dam.

[14] Because the proposed backup pipeline is not a distribution pipeline (i.e., used to deliver water supplies to customers), it would not be constructed with seismic considerations and could be damaged during a seismic event. If the backup pipeline were damaged during a seismic event, emergency discharges would occur via the Alameda East Portal Overflow Pipeline, which was designed for seismic reliability.

quality conditions in Pit F3-East and would rely on ongoing water quality testing to ensure discharges from Pit F3-East to San Antonio Reservoir would only occur in compliance with requirements of the NPDES permit.

3.7.2 Management of Water Levels in Pits F3-East and F3-West

3.7.2.1 Management of Water Levels in Pits F3-East and F3-West Prior to Discharge Event

Hanson Aggregates' lease of the SMP-24 area owned by the CCSF expires on October 31, 2012. While SMP-24 is no longer being actively mined, Hanson Aggregates has expressed a desire to continue leasing the SMP-24 area to manage water produced from dewatering activities and to store the water needed to support active SMP-32 mining operations. Discussions between the SFPUC and Hanson Aggregates indicate that SABPL project operations could coexist with Hanson Aggregates' continued water management operations in SMP-24. As part of the lease extension with Hanson Aggregates, the SFPUC would request that Hanson Aggregates keep water levels in Pits F3-East and F3-West at or below 195 feet in order to maintain sufficient capacity[15] to accommodate discharges from the backup pipeline (SFPUC, 2010a). As discussed above in Section 3.5.4.2, in the event the lease is not extended, the SFPUC would manage water levels in Pits F3-East and F3-West.

3.7.2.2 Basis for Maintaining Water Elevation in Pit F3-East at 195 Feet MSL

On the basis of surveys performed by the SFPUC and Hanson Aggregates in 2006 and 2009, the SFPUC determined that keeping Pit F3-East water levels at or below 195 feet msl would maintain sufficient freeboard to accommodate proposed future emergency discharges, which could occur at up to 315 mgd for up to 12 hours (equal to 487 cfs and a total of 158 million gallons, or 485 acre-feet, per discharge event) (SFPUC, 2009a). A new water level sensor installed in Pit F3-East as part of the proposed project would automatically monitor water levels and notify system operators when water levels approach 195 feet msl.

3.7.2.3 Management of Water Levels Following a Discharge Event

Hetch Hetchy water discharged from the backup pipeline to Pit F3-East would remain in the pit unless water levels increased above 195 feet msl. If, after a discharge event from the backup pipeline, water levels exceeded 195 feet msl, the SFPUC system operators would recover water from the pit within 30 days of the discharge event via the inlet pipes in the concrete splash pad (to be located at 190 feet msl). The SFPUC would pump the recovered water to San Antonio Reservoir or to the SVWTP using a two-step pumping process:

[15] Due to the permeability of the uppermost alluvial deposits in the project area, Pits F3-East and F3-West are hydraulically connected when water levels in the quarry pits are roughly 50 feet below the ground surface or higher.

- ***Step 1: Pump to Wet Well***. SFPUC system operators would use the low-pressure submersible pumps at the discharge facility to pump water out of Pit F3-East and into the dewatering pipeline. Discharged water that seeps into Pit F3-West would also be pumped from Pit F3-West into a manifold in the dewatering pipeline using pumps mounted on floating platforms and flexible hoses. The dewatering pipeline would then discharge the water into the wet well below the Alameda Creek Pump Station.

- ***Step 2: Wet Well to San Antonio Reservoir or SVWTP***. System operators would use the Alameda Creek Pump Station to pump the water from the wet well, through the transfer pipeline and other existing pipelines to either San Antonio Reservoir or the SVWTP.

The volume of water recovered by the SFPUC would not exceed the volume of water discharged from the backup pipeline. Any discharged water below the level of 190 feet msl would remain in the quarry pit.

If the SFPUC is unable to recover some or all of the discharged water due to equipment failure or other unforeseen circumstances, it might be necessary for Hanson Aggregates to discharge water from Pit F3-East to Alameda Creek. Hanson Aggregates would conduct all creek discharges in accordance with the quarry company's NPDES permit, which allows discharges of up to 10 mgd to Alameda Creek. Under this scenario, Hanson Aggregates could discharge the full maximum future SABPL project discharge volume of 485 acre-feet to Alameda Creek over a period of 16 days without violating NPDES permit requirements.

3.7.2.4 Alameda Creek Pump Station Operations with Implementation of the Upper Alameda Creek Filter Gallery Project

As previously indicated, the Alameda Creek Pump Station, wet well, and transfer pipeline would also be utilized by the Filter Gallery project if that project is implemented. Typically, these facilities would be used by the Filter Gallery project as part of normal operations. Use of these facilities for SABPL project operations would be less frequent. However, following a discharge from the backup pipeline if water levels in Pit F3-East exceed 195 feet msl, SFPUC facility operators would temporarily stop operating the Filter Gallery project and use the facilities to pump water from the wet well to San Antonio Reservoir or the SVWTP; the facilities could not be used simultaneously for Filter Gallery project operations.

3.8 SABPL Pumping Variants

This section describes two variations of the proposed project that are under consideration by the SFPUC. These variants address two pumping scenarios (one-step vs. two-step pumping) for dewatering Pit F3-East after a discharge of quality-impaired Hetch Hetchy water, and provide the SFPUC with flexibility as it further considers pumping methods and construction of the Alameda Creek Pump Station. Both pumping variants are the same as the proposed project except for the specific variations described; under either pumping variant, the SFPUC would conserve the discharged water for subsequent treatment and distribution to customers. During the project approval process, the SFPUC could select the proposed project or one of the pumping variants for implementation. **Figure 3-7** illustrates the infrastructure associated with each pumping variant. Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, provides an evaluation of the environmental impacts of each pumping variant and compares these impacts to those of the proposed project.

3.8.1 Pumping Variant 1

3.8.1.1 Design and Operation

Pumping Variant 1 would pump water using a one-step process directly from Pit F3-East to San Antonio Reservoir or the SVWTP via submersible pumps mounted to the concrete splash pad of the new discharge facility (these pumps would not be part of the Alameda Creek Pump Station). Pumping Variant 1 would involve installation of two submersible high-pressure pumps adjacent to the new discharge facility at Pit F3-East (instead of the two submersible low-pressure pumps under the proposed project) to pump water from Pit F3-East through the proposed dewatering pipeline and other existing pipelines to San Antonio Reservoir or the SVWTP. Unlike the proposed project, Pumping Variant 1 would not include the dewatering facilities to enable the SFPUC to dewater Pit F3-West; this variant would only construct the facilities to dewater Pit F3-East. Pumping Variant 1 would not include construction of the Alameda Creek Pump Station and associated facilities (the wet well, electrical control building, overhead powerline between the HHWP Calaveras Substation to the pump station, and electrical transformer) or the transfer pipeline.

3.8.1.2 Construction

Construction activities associated with Pumping Variant 1 would be similar to those under the proposed project, except that neither the Alameda Creek Pump Station (and associated facilities) nor the transfer pipeline would be constructed. Removing these facilities from the project would eliminate the need to construct a retaining wall along the southern boundary of the pump station site. This variant would generate an estimated 108,750 cubic yards of excess spoils, which is 9,500 cubic yards less than the proposed project. Overall, the construction schedule for Pumping Variant 1 would be similar to that of the proposed project (21 months).

3.8.2 Pumping Variant 2

3.8.2.1 Design and Operation

Pumping Variant 2 includes all of the same facilities as the proposed project, except that one submersible high-pressure pump and one submersible low-pressure pump would be constructed adjacent to the new discharge facility at Pit F3-East. The SFPUC would use either the high-pressure pump to convey discharged water directly to San Antonio Reservoir or the SVWTP (via the same one-step process described above for Pumping Variant 1), or the low-pressure pump to convey discharged water to the Alameda Creek Pump Station and subsequently to San Antonio Reservoir or the SVWTP (via the same two-step process that would be conducted under the proposed project). Like the proposed project, Pumping Variant 2 would include flexible hoses

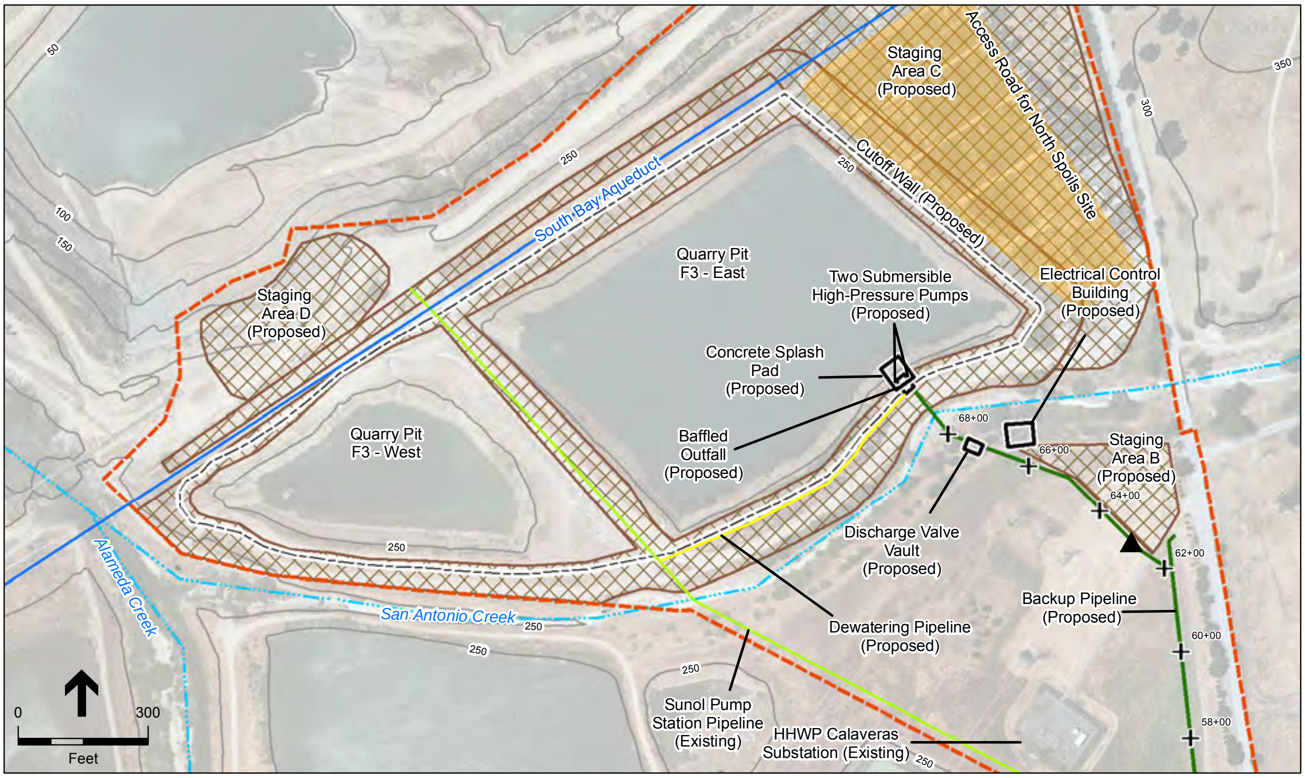

Figure 3-7a: Pumping Variant 1

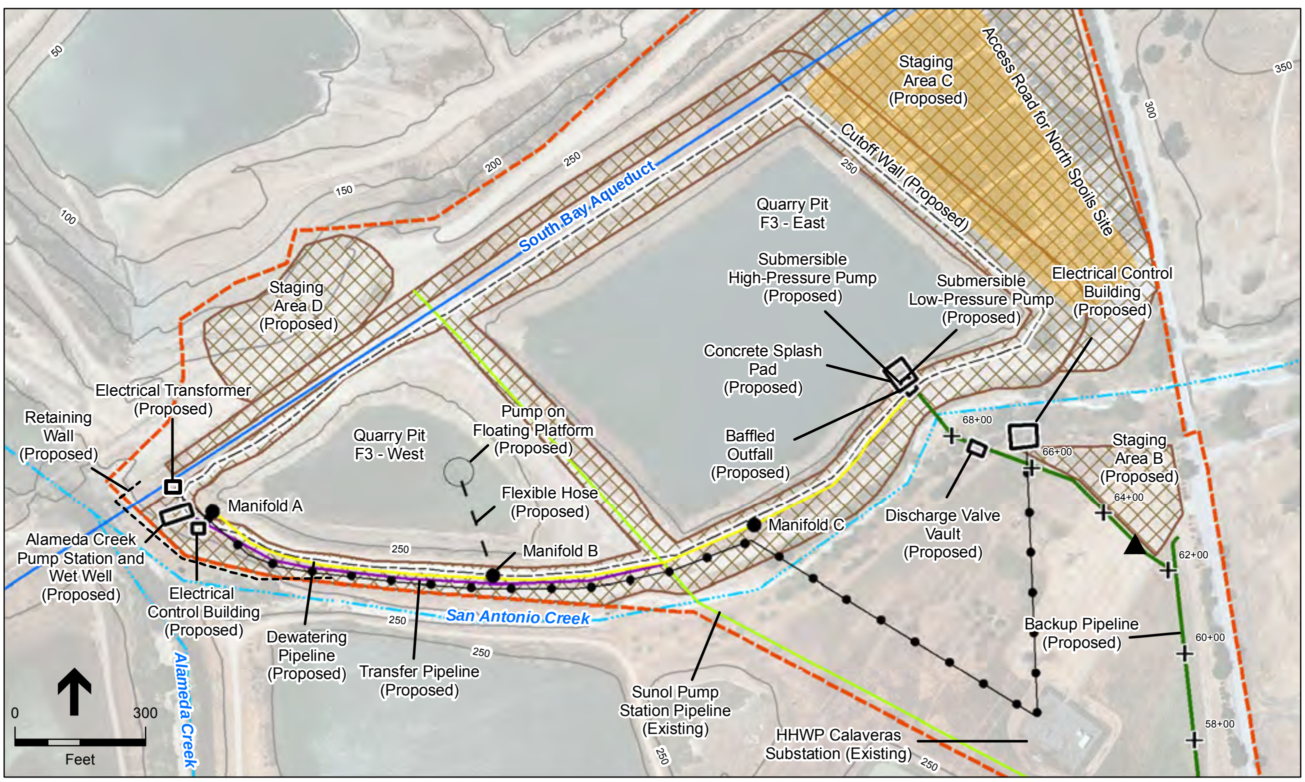

Figure 3-7b: Pumping Variant 2

SOURCE: ESA + Orion, 2011; SFPUC, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 3-7

SABPL Pumping Variants

and a pump mounted on a floating platform in Pit F3-West to enable the SFPUC to dewater Pit F3-West if water discharged by the backup pipeline seeps into the adjacent pit.

3.8.2.2 Construction

Construction of Pumping Variant 2 would be essentially the same as construction of the proposed project, except that the SFPUC would install one high-pressure submersible pump and one low-pressure submersible pump adjacent to the discharge facility at Pit F3-East, instead of the two submersible low-pressure pumps to be installed under the proposed project. This variant would generate an estimated 118,250 cubic yards of excess spoils—the same as the proposed project. Overall, the construction schedule for Pumping Variant 2 would be similar to that of the proposed project (21 months).

3.9 Required Permits and Approvals

This Environmental Impact Report (EIR) is intended to inform decision-makers of the environmental consequences associated with approval of the construction, operation, and maintenance of the proposed project. The project could be subject to various regulations and/or encroachment permits from various federal, state, and local jurisdictions. However, under California Government Code Section 53090 et seq., the SFPUC receives intergovernmental immunity from the local zoning and building laws of other cities and counties for activities on CCSF lands; therefore, certain local land use regulations may not be applicable to the SFPUC.

The anticipated permits and authorizations from federal, state, and local agencies are listed below.

3.9.1 Federal

- U.S. Army Corps of Engineers – Section 404 Clean Water Act permit
- U.S. Fish and Wildlife Service – Federal Endangered Species Act Section 7 consultation

3.9.2 State/Regional

- State Water Resources Control Board (SWRCB) – Section 401 Water Quality Certification (or waiver) / Waste Discharge Requirements
- SWRCB and San Francisco Bay Regional Water Quality Control Board – NPDES General Construction Permit
- SWRCB and San Francisco Bay Regional Water Quality Control Board - Amendment of the Waste Discharge Requirements for the SFPUC Drinking Water Transmission System (RWQCB Order No. R2-2008-0102), or issuance of new discharge permit, for discharges of water pumped from quarry Pit F3-East to San Antonio Reservoir
- California Department of Fish and Game (CDFG) – Compliance with California Endangered Species Act Section 2080.1 or 2081

- CDFG – Section 1602 Streambed Alteration Agreement
- State Historic Preservation Office – Compliance with Section 106 of the National Historic Preservation Act
- California DWR – Written approval for any work and construction improvements within portions of the South Bay Aqueduct right-of-way, including removal of a segment of inter-tie pipeline, temporary use of Staging Area D, and construction of the cutoff wall, pump station, and associated improvements
- Bay Area Air Quality Management District – Authorization to construct permit and permit to operate liquid propane-powered generator

3.9.3 Local

- Alameda County Public Works Department – Encroachment permits for construction within the Calaveras Road right-of-way
- San Francisco Planning Commission – Certification of Final EIR
- SFPUC – Adoption of CEQA Findings and Mitigation Monitoring and Reporting Program; project approval; approval of contracts for project construction
- SFPUC – Agreement regarding the extension of Hanson Aggregates' lease for CCSF-owned land within SMP-24 area, including Pits F3-East and F3-West, to address SFPUC water discharges to quarry Pit F3-East, water management obligations, demolition of the existing residential-style building and barn structure, construction of improvements and project spoils placement within the SMP-24 area
- San Francisco Board of Supervisors – Consideration of appeals of the Planning Commission's certification of the Final EIR; appropriation of funding for implementation of the project; approval of lease or easement amendments, if necessary

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3.10 References

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CHAPTER 4
Plans and Policies

Sections

4.1 Overview

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15125(d), this chapter describes land use plans and policies and the manner in which they apply to the San Antonio Backup Pipeline (SABPL) project, and then discusses the project's consistency with applicable plans. The plans and policies addressed in this section include:

City and County of San Francisco (CCSF). San Francisco General Plan, Accountable Planning Initiative, Sustainability Plan, and Municipal Green Building Program.

San Francisco Public Utilities Commission (SFPUC). Alameda Watershed Management Plan (Alameda WMP), Water Enterprise Environmental Stewardship Policy, Right-of-Way Integrated Vegetation Management Policy, and Right-of-Way Encroachment Policy.

Local Agencies. Alameda County General Plan and East County Area Plan.

The project is located entirely on extraterritorial lands owned by the CCSF in unincorporated Alameda County. Hanson Aggregates operates quarry Pits F3-East and F3-West within the project area as part of the gravel mining operation authorized under Surface Mining Permit 24 (SMP-24), which was issued by Alameda County pursuant to the Alameda County Surface Mining Ordinance and the California Surface Mining and Reclamation Act; however, there are no federal or state land use plans that directly apply to the proposed project. Since the SABPL project does not propose activities on land subject to federal or state jurisdiction, federal and state plans and policies are not discussed further in this chapter.

Section 3.9 of Chapter 3, Project Description, describes the permits and approvals required for the project. Sections 5.2 through 5.19 of Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, describe pertinent resource-specific plans (e.g., air quality management plans are discussed in Section 5.8, Air Quality; plans to reduce greenhouse gas emissions are discussed in Section 5.9, Greenhouse Gas Emissions; and habitat conservations plans are discussed in Section 5.14, Biological Resources).

4.2 Plans and Policies Relevant to the SABPL Project

4.2.1 City and County of San Francisco Plans and Policies

The CCSF land use plans and policies are primarily applicable to projects within the jurisdictional boundaries of the city of San Francisco, although in some cases they may apply to projects outside of these boundaries. These plans include the San Francisco General Plan, which sets forth the city's comprehensive, long-term land use policy; the San Francisco Accountable Planning Initiative, which serves as the basis for resolving inconsistencies in the San Francisco General Plan; the San Francisco Sustainability Plan, which addresses the city's long-term sustainability;[1] and the San Francisco Municipal Green Building Program, which establishes green building standards for municipal projects. In addition, the SFPUC has adopted various plans and policies that further direct its activities, including the Alameda WMP and the Water Enterprise Environmental Stewardship Policy.

4.2.1.1 Extraterritorial Lands

The CCSF has authority (San Francisco Charter, Section 4.112) over the management, use, and control of land it owns outside of the city, subject to the SFPUC's exclusive responsibility for the construction, management, use, and control of the city's water supplies and utilities (San Francisco Charter, Section 8B.121). Accordingly, the CCSF relies on its own plans and policies with respect to extraterritorial lands, as applicable.

Under California Government Code, Section 53090, the SFPUC receives intergovernmental immunity from the building and zoning laws of other cities and counties. The SFPUC seeks to work cooperatively with local jurisdictions where CCSF-owned facilities are sited outside of San Francisco to avoid conflicts with local building and zoning codes. Also, the SFPUC is required under Government Code Section 65402(b) to inform local governments of its plans to construct projects. The local governments have a 40-day review period to determine project consistency with their general plans. Under this requirement, the cities' or counties' determinations of consistency are advisory to the SFPUC rather than binding.

4.2.1.2 San Francisco General Plan

The San Francisco General Plan (CCSF, 1988), as amended, sets forth the comprehensive, long-term land use policies for San Francisco. One of the basic goals of the general plan is "coordination of the growth and development of the city with the growth and development of adjoining cities and counties and of the San Francisco Bay Region." The general plan consists of 10 issue-oriented plan

1 Sustainability or sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs.

elements: Air Quality, Arts, Commerce and Industry, Community Facilities, Community Safety, Environmental Protection, Housing, Recreation and Open Space, Transportation, and Urban Design. The plan elements that may be relevant to the project are briefly described below.

Air Quality Element. This element promotes the goal of clean air planning through objectives and policies aimed at adhering to air quality regulations.

Commerce and Industry Element. This element serves as a guide for decisions related to economic growth and change in San Francisco. The three goals of the element are: continued economic vitality; social equity (with respect to employment opportunities); and environmental quality. These goals address general citywide objectives as well as objectives for each of the major sectors of San Francisco's economy.

Community Safety Element. This element addresses the potential for geologic, structural, and nonstructural hazards to affect city-owned structures and critical infrastructure. The goal of this element is to protect human life and property from hazards.

Environmental Protection Element. This element addresses the impact of urbanization on the natural environment. The element promotes the protection of plant and animal life and freshwater sources, and speaks to San Francisco's responsibility to provide a permanent, clean water supply to meet present and future needs and to maintain an adequate water distribution system.

Urban Design Element. This element promotes the preservation of landmarks and structures with notable historic, architectural, or aesthetic value, and seeks to balance development with its natural environmental and visual features.

4.2.1.3 Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added Section 101.1 to the Planning Code to establish eight Priority Policies as a preamble to the San Francisco General Plan. The Priority Policies serve as the basis upon which inconsistencies in the general plan are resolved. Of the eight Priority Policies, only the sixth and seventh policies are relevant to the proposed project:

1. Neighborhood-serving retail uses shall be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses enhanced.

2. Housing and neighborhood character shall be conserved and protected in order to preserve the cultural and economic diversity of the neighborhoods.

3. The City's supply of affordable housing shall be preserved and enhanced.

4. Commuter traffic shall not impede the Muni transit service or overburden streets or neighborhood parking.

5. Diverse economic base shall be maintained by protecting industrial and service sectors from displacement by commercial office development, and future opportunities for resident employment and ownership in these sectors be enhanced.

6. The City shall achieve the greatest possible preparedness to protect against injury and loss of life in an earthquake.

7. Landmarks and historic buildings shall be preserved.

8. Parks and open space and their access to sunlight and vistas shall be protected from development.

4.2.1.4 San Francisco Sustainability Plan

The San Francisco Board of Supervisors endorsed the Sustainability Plan (CCSF, 1997) in 1997, although the Board has not committed the CCSF to perform the actions addressed in the plan. The plan serves as a blueprint for sustainability, with many of its individual proposals requiring further development and public comment. The plan's underlying goals are to maintain the physical resources and systems that support life in San Francisco and to create a social structure that will allow for such maintenance. It is divided into 15 topic areas. Ten of these areas address specific environmental issues: air quality; biodiversity; energy; climate change and ozone depletion; food and agriculture; hazardous materials; human health; parks; open spaces and streetscapes; solid waste; transportation; and water and wastewater. Five of these areas are broader in scope and cover many issues, including the economy and economic development, environmental justice, municipal expenditures, public information and education, and risk management. Each topic area has a set of indicators to be used over time in determining whether San Francisco is moving in a direction that supports sustainability for each particular area.

4.2.1.5 San Francisco Municipal Green Building Program

San Francisco's Green Building Program was founded in 1999 when the CCSF adopted the Resource Efficient Building Ordinance, which established green building standards for municipal buildings to increase energy efficiency, conserve CCSF financial resources, create safe workplaces for CCSF employees and visitors, and reduce the environmental impacts of demolishing, constructing, and operating buildings. The ordinance created the interdepartmental Resource Efficient Building (REB) Task Force and charged the San Francisco Department of the Environment with implementing the ordinance in partnership with the Department of Public Works and other REB Task Force departments. In 2004, amendments to Chapter 7 of the Environment Code set LEED (Leadership in Energy and Environmental Design) Silver Certification by the U.S. Building Council as the minimum environmental performance requirement for all municipal projects that would involve buildings with areas of over 5,000 square feet. The REB Task Force assists city departments in complying with the LEED Silver Certification requirement and helps to determine which projects are subject to LEED standards. For all municipal construction projects, including those projects that do not involve buildings and are not required to obtain LEED Silver Certification, the REB Task Force provides recommended best practices and sample specifications for building materials such as recycled steel and concrete (CCSF, 2004–2007).

4.2.1.6 San Francisco Floodplain Management Ordinance

The 2008 San Francisco Floodplain Management Ordinance, approved by San Francisco's mayor and Board of Supervisors as Chapter 2A, Article XX, Sections 2A.280-2A.285 of the City's Administrative Code, requires that new or substantially improved structures in special flood hazard areas be protected against flood damage, and prohibits uses that would increase flood risks. In general, the Ordinance requires the first floor of structures in flood zones to be constructed above the floodplain or be flood-proofed, and be consistent with applicable federal and state floodplain management regulations. The Ordinance applies to construction on CCSF-owned property located outside the boundaries of San Francisco (CCSF, 2010).

4.2.2 SFPUC Plans and Policies

4.2.2.1 Alameda Watershed Management Plan

The Alameda watershed encompasses 36,000 acres of CCSF-owned lands within the much larger hydrologic boundaries of the Alameda Creek watershed, including lands within the drainage areas of San Antonio and Calaveras Reservoirs as well as lands that drain to Alameda Creek in the Sunol Valley. The SFPUC adopted the Alameda WMP for the Alameda watershed to provide a policy framework for the SFPUC to make decisions about activities that are appropriate on watershed lands. The Alameda WMP provides goals, policies, and management actions that address watershed activities and reflect the unique qualities of the watershed. The Alameda WMP is also intended for use by the SFPUC as watershed management implementation guidelines. Alameda watershed lands are managed by the SFPUC Natural Resources Division, Watershed Resource Management Section (SFPUC, 2001). All of the proposed project components are within the plan boundaries of the Alameda WMP.

As part of implementation of the Alameda WMP, the SFPUC reviews all plans, projects, and activities that occur within the Alameda watershed for conformity with the management plan and for compliance with environmental codes and regulations. To accomplish this, the SFPUC has established a project review team with members from various SFPUC departments as well as the City Attorney's office. Appropriate SFPUC personnel review proposals for new facilities, structures, roads, trails, projects, and leases or for improvements to existing facilities. Projects subject to this review include those that involve construction, digging or earthmoving, clearing, installation, use of hazardous materials, or other disturbance to watershed resources. In addition, projects that involve the issuance of new or revised leases and permits are subject to this review procedure.

The SFPUC considers water quality protection to be the first and foremost goal of the Alameda WMP. The goals and policies are organized around the primary goal of water quality protection and secondary goals pertaining to the local water supply, natural resources, watershed protection, land use compatibility, fiscal management, and public awareness. The primary and secondary goals of the Alameda WMP are listed below.

- <u>Primary Goal</u>: Maintain and improve source water quality to protect public health and safety.

- *Secondary Goals*:
  - Maximize water supply.
  - Preserve and enhance the ecological and cultural resources of the watershed.
  - Protect the watersheds, adjacent urban areas, and the public from fire and other safety hazards.
  - Continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational, and scientific uses.
  - Provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits and an administrative framework that allows implementation of the watershed management plans.
  - Enhance public awareness of water quality, water supply, conservation, and watershed protection issues.

The Sunol Valley Resources Management (SVRM) Element is part of the Alameda WMP. The goals and subgoals contained in the SVRM Element are incorporated into the goals and management actions set forth in the Alameda WMP. The SVRM Element addresses the integrated management of water resources, gravel mining resources, SFPUC facilities, cultural resources, agricultural resources, economic resources, park facilities, recreational resources, and fishery enhancement within the SFPUC Alameda watershed lands (SFPUC, 1998).

4.2.2.2 Water Enterprise Environmental Stewardship Policy

Adopted in June 2006, the Water Enterprise Environmental Stewardship Policy established the long-term management direction for CCSF-owned lands and natural resources affected by operation of the SFPUC regional water system within the Tuolumne River, Alameda Creek, and Peninsula watersheds (SFPUC, 2006). It also addresses rights-of-way and properties in urban surroundings under SFPUC management. The policy includes the following:

- The SFPUC will proactively manage the watersheds under its responsibility in a manner that maintains the integrity of the natural resources, restores habitats for native species, and enhances ecosystem function.

- To the maximum extent practicable, the SFPUC will ensure that all operations of the SFPUC water system (including water diversion, storage, transport, and discharges of water); construction and maintenance of infrastructure; land management policies and practices; purchase and sale of watershed lands; and lease agreements for watershed lands protect and restore native species and the ecosystems that support them.

- The SFPUC will operate the SFPUC water system in a manner that protects and restores native fish and wildlife downstream of SFPUC dams and water diversions, within SFPUC reservoirs, and on SFPUC watershed lands.

- The SFPUC will actively monitor the health of terrestrial and aquatic habitats, both under SFPUC ownership and affected by SFPUC operations, in order to continually improve ecosystem health.

- The SFPUC will manage rights-of-way and properties in urban surroundings under its management in a manner that protects and restores habitat value where available and encourages community participation in decisions that significantly interrupt or alter current land use in these parcels.

Key implementation strategies of the Environmental Stewardship Policy include: implementation and update of the Alameda WMP; development of a conservation plan for the Alameda watershed; development of the Watershed and Environmental Improvement Program (WEIP),[2] which includes the Alameda watershed; and integration of the Environmental Stewardship Policy into the Water System Improvement Program (WSIP) and individual WSIP infrastructure projects.

4.2.2.3 Right-of-Way Integrated Vegetation Management Policy

In February 2007, the SFPUC adopted the Right-of-Way Integrated Vegetation Management Policy to manage vegetation that poses a threat or hazard to the regional water system's operation, maintenance, and infrastructure throughout the SFPUC water distribution and collection systems. The roots of large woody vegetation can damage transmission pipelines by causing corrosion of the outer casements. Trees and other vegetation directly adjacent to pipelines can also make repairs and emergency and annual maintenance difficult, hazardous, and expensive, and can increase concerns for public safety. Fire danger within the SFPUC right-of-way is also an issue, as the SFPUC is required to comply with local fire ordinances by identifying, reducing, and managing existing vegetation to prevent potential disruption to fire protection services. Another objective of this plan is to reduce and eliminate, to the degree practicable, the use of herbicides on vegetation within the right-of-way. Specific elements of the Vegetation Management Policy address the management and removal of vegetation (including trees), annual grasses, and weeds within the SFPUC right-of-way and the management and removal of vegetation and trees on land leased or permitted by the SFPUC (SFPUC, 2007a).

4.2.2.4 Right-of-Way Encroachment Policy

In February 2007, the SFPUC approved a revised Right-of-Way Encroachment Policy that clarifies how it will handle encroachments by others into its rights-of-way (SFPUC, 2007b). The policy guides and outlines the procedures for prioritizing and implementing encroachment removal efforts, focusing specifically on encroachments that would:

- Endanger water, sewer, or electrical transmission lines and appurtenances;
- Impair access to facilities for emergency repair, maintenance, or operational activity;
- Be detrimental to the efficient and effective maintenance of vegetation in the right-of-way in accordance with the SFPUC Vegetation Management Policy described above;

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2 The purpose of the WEIP is to identify, prioritize, protect, and restore lands and natural resources in the vicinity of the SFPUC's regional water system and includes ecosystem and habitat protection, improvement, and restoration projects.

- Obstruct the inspection and monitoring of equipment or the collection of land survey, corrosion control, and water quality data; or
- Increase the SFPUC's liability.

4.2.3 Alameda County Land Use Plans and Policies

The project is located entirely on extraterritorial lands owned by the CCSF in unincorporated Alameda County. This section describes the local land use policies of Alameda County that are relevant to the proposed project. The SFPUC is not legally bound by the land use plans and policies of Alameda County (see Section 4.2.1.1. for a discussion of intergovernmental immunity); however, these plans and policies are discussed to the extent that they provide pertinent planning information with respect to evaluating the project under CEQA

The following factors affect the application of the Alameda County General Plan and East County Area Plan to the proposed project:

> <u>*Local Agency Project Approval*</u>. The SABPL project would require a local encroachment permit from Alameda County.
>
> <u>*Building and Zoning Ordinances*</u>. Building and zoning ordinances are the most specific expressions of general plan goals, objectives, and policies. State law and judicial interpretations of state law (California Government Code Section 53090 et seq.) mutually exempt cities and counties from complying with each other's building and zoning ordinances. The SFPUC, which is part of the CCSF, is therefore exempt from complying with the building and zoning ordinances of other cities and counties (California Government Code Section 53091). State law also exempts public utilities and special-purpose local agencies (such as water districts) from complying with local building and zoning ordinances when locating or constructing facilities for the production, generation, storage, treatment, or transmission of water. Therefore, the facilities and improvements proposed under the SABPL project are not subject to the building and zoning ordinances of Alameda County.
>
> <u>*Local Government Notification and Consistency Determination Requirements*</u>. California Government Code Section 65402(b) requires that the SFPUC inform cities and counties of its plans to construct projects or acquire or dispose of extraterritorial property within their jurisdictions. The local governments then have 40 days to determine whether the project is consistent with their general plans, although these consistency determinations are advisory to the SFPUC rather than binding. Prior to implementation of the SABPL project, Alameda County would be notified pursuant to California Government Code Section 65402(b). Notwithstanding the above, where CCSF-owned facilities are sited outside of San Francisco, the SFPUC seeks to work cooperatively with local jurisdictions to avoid conflicts with local land use plans and building and zoning codes.

The Alameda County General Plan governs land use planning and development in unincorporated Alameda County. Alameda County divides its general plan into area plans and functional elements. Area plans address area-specific issues (i.e., land use, open space, circulation, noise, seismic hazards, public facilities and services) that affect both unincorporated and incorporated areas, but these plans have legal regulatory effect only within currently unincorporated areas. Functional elements address broader issues on a countywide basis and provide a comprehensive and consistent policy framework for the more specific area plans (Alameda County, 2002).

The East County Area Plan (ECAP) governs land use planning for eastern Alameda County. The East County planning area, which includes the SABPL project area, extends from the San Joaquin County line east to the city of Fremont boundary. The project area is within the county's unincorporated rural area, outside of the urban growth boundary. The ECAP designates land uses on SFPUC Alameda watershed lands as Resource Management, Water Management, and Parklands. The project area is designated as Water Management land. The Water Management designation permits watershed management, gravel quarries, agricultural uses, recreational uses, and habitat protection. Generally, this land use designation and pertinent policies of the ECAP that cover this part of the county discourage intensive development; discourage encroachment of urban uses and access roads; encourage preservation of cultural resources; and encourage protection of open space, agricultural land, visual features, and natural resources, specifically on SFPUC watershed lands. The ECAP supports interjurisdictional coordination among various landowners to carry out resource preservation and protection goals.

Overall, the ECAP seeks to protect environmental and human health and safety by incorporating measures to minimize exposure to excessive noise levels and air pollutants, and by designing and constructing critical facilities to reduce seismic hazards and service disruption. It is also the intent of the ECAP to discourage land use activities that adversely affect the watershed protection objectives and purposes of the SFPUC.

4.3 Plan Consistency Evaluation

4.3.1 Approach to Analysis

The evaluation of plan consistency is based on the applicability of relevant land use plans and policies to the SABPL project as they relate to:

- The underlying goals of the San Francisco General Plan and Sustainability Plan; the principal goals of the SFPUC Alameda WMP, Water Enterprise Environmental Stewardship Policy, Right-of-Way Integrated Vegetation Management Policy, and Right-of-Way Encroachment Policy; and the requirements of the Municipal Green Building Program and San Francisco Floodplain Management Ordinance

- Plans and policies of local jurisdictions

For these plans, a determination of consistency was made as required by Section 15125(d) of the CEQA Guidelines. However, because the policy language found in a land use plan is susceptible to varying interpretations, it is often difficult to determine whether a proposed project is consistent or inconsistent with such policies. Furthermore, because land use plans often contain numerous policies emphasizing differing legislative goals, a project may be consistent with a general plan, taken as a whole, even though it may appear to be inconsistent with specific policies within the plan. The board or commission that enacted the plan or policy generally determines the meaning of such policies; these interpretations prevail if they are "reasonable," even though other reasonable interpretations may also exist. In light of these considerations, the consistency evaluation in this Environmental Impact Report (EIR) represents the best attempt to advise the decision-makers as to whether the project is consistent with applicable land use plans and policies. Direct and indirect physical impacts resulting from project implementation are not addressed in this section, but in the appropriate technical sections of the EIR.

As stated above, the San Francisco General Plan and Sustainability Plan are primarily applicable to projects located in San Francisco; however, they may also be applicable to projects on CCSF extraterritorial lands.

The consistency of the SABPL project (including Pumping Variants 1 and 2) with the plans and policies of San Francisco, the SFPUC, and Alameda County is discussed below.

4.3.2 Consistency with San Francisco Plans and Policies

4.3.2.1 San Francisco General Plan

The San Francisco General Plan sets forth the CCSF's comprehensive, long-term land use policy and, as such, is primarily applicable to projects within its jurisdictional boundaries. The proposed project, which is located outside the CCSF boundaries, involves new facilities and related improvements that would provide reliable conveyance capacity during planned and emergency discharges of water out of the SFPUC regional water system. In addition, the proposed project would increase operational flexibility and delivery reliability during emergencies and planned maintenance activities, thereby minimizing the risk of service interruption. Thus, the project would support the health and safety of SFPUC water customers within the region and the CCSF. The project would not affect land uses within the boundaries of the CCSF and, overall, would be consistent with the spirit and intent of the San Francisco General Plan.

Any conflict between the project and San Francisco General Plan policies that relates to physical environmental issues are discussed in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures. The compatibility of the project with San Francisco General Plan policies that do not relate to physical environmental issues will be considered by decision-makers as part of their decision whether to approve or disapprove the proposed project. Any potential conflicts identified as part of the process would not alter the physical environmental effects of the proposed project.

4.3.2.2 San Francisco Accountable Planning Initiative

Of the eight Priority Policies, Policy 6 (concerning earthquake preparedness) and Policy 7 (concerning landmarks and historic buildings) are relevant to the proposed project. The other policies are not relevant because the project would be constructed outside of San Francisco, away from San Francisco neighborhoods; in addition, the project would have no effect on nor create the need for affordable housing; would not result in any commuter automobiles; would not result in commercial office development; and would have no long-term effect on open space. Project implementation would minimize the risk of water service interruption due to an earthquake by improving SFPUC system operators' ability to respond to emergencies and by making it possible to simultaneously discharge quality-impaired Hetch Hetchy while accessing water supplies stored in San Antonio Reservoir for delivery to customers. Implementation of Mitigation Measure M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3), identified in Section 5.12, Utilities and Service Systems, would minimize potential impacts on historic resources by protecting Alameda Siphons Nos. 1, 2, and 3 from damage during project construction activities. No other historic resources were identified within the project footprint. Thus, the proposed project would be consistent with Policies 6 and 7 with respect to earthquakes and historic resources and, on the whole, would be consistent with the San Francisco Priority Policies. Since Pumping Variants 1 and 2 would result in impacts that are very similar to or the same as those of the proposed project, the pumping variants would also be generally consistent with the San Francisco Priority Policies.

4.3.2.3 San Francisco Sustainability Plan

The San Francisco Sustainability Plan was developed for the purpose of addressing San Francisco's long-term environmental sustainability. The proposed project, as well as Pumping Variants 1 and 2, would support the goals of the Sustainability Plan because it would increase the overall reliability of the regional water system for SFPUC water users. The proposed project (and Pumping Variants 1 and 2) would also be consistent with goals related to ensuring an adequate water supply system.

4.3.2.4 San Francisco Municipal Green Building Program

The San Francisco Municipal Green Building Program was developed for the purpose of improving the environmental performance of municipal buildings. The program sets minimum environmental performance requirements for municipal buildings with floor plan areas that are over 5,000 square feet. The floor plan of the electrical control building for the new discharge facility at Pit F3-East would be 225 square feet; the new chemical facility would be 2,016 square feet; the Alameda Creek Pump Station would be 625 square feet; and the control building for the pump station would be 225 square feet. Since none of the buildings proposed under the SABPL project would be greater than 5,000 square feet, the project would not be required to meet the LEED Silver Certification requirement.

Similarly, Pumping Variants 1 and 2 would not include any structures that are greater than 5,000 square feet; thus, the LEED Silver Certification requirement also would not apply to the pumping variants.

4.3.2.5 San Francisco Floodplain Management Ordinance

The San Francisco Floodplain Management Ordinance was enacted to ensure that structures constructed in floodplains are protected from flood hazards as well as to avoid exacerbating preexisting flood problems. As part of the SABPL project, the ground surface in the vicinity of the project components to be constructed within the 100-year flood hazard zone of Alameda Creek (i.e., the Alameda Creek Pump Station, control building, and electrical transformer) would be elevated above the 100-year flood zone (see Impact HY-6 in Section 5.16, Hydrology and Water Quality). Thus, the project would be consistent with this ordinance.

Since Pumping Variant 2 would construct all of the same facilities as the proposed project, this pumping variant would also be consistent with the San Francisco Floodplain Management Ordinance. Pumping Variant 1 would not construct the Alameda Creek Pump Station, control building, and electrical transformer within the 100-year flood hazard zone of Alameda Creek, and therefore would not require the placement of fill to raise these facilities above the 100-year flood zone. Thus, Pumping Variants 1 and 2 would both be consistent with the ordinance.

4.3.3 Consistency with SFPUC Plans and Policies

4.3.3.1 Alameda Watershed Management Plan

The Alameda WMP is designed to improve the SFPUC's ability to protect the overall watershed as well as the specific resources that make up the watershed. The SABPL project would directly address both the primary goal of the Alameda WMP—to maintain and improve water quality to protect public health and safety—and the secondary goal—to preserve the ecological and cultural resources of the watershed. The SFPUC Natural Resources Division would review the proposed SABPL project for conformity with the Alameda WMP as well as for compliance with environmental codes and regulations. As part of project implementation, the SFPUC would coordinate internally with its Natural Resources Division to carry out the project in conformance with the appropriate goals, policies, and implementation actions of the Alameda WMP, including those pertaining to water supply protection, and the secondary goals of natural resource protection, watershed protection, and land use compatibility.

While the proposed project could have adverse construction and operational impacts related to sensitive species and habitats, hydrology, water quality, slope instability, hazardous materials, cultural resources, visual resources, traffic, air quality, noise, and energy resources, it would reduce all but two significant impacts to a less-than-significant level through the implementation of mitigation measures identified in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures. Project-specific and cumulative air quality impacts associated with construction-related emissions of criteria pollutants would remain significant and unavoidable, even after mitigation. Implementation of mitigation measures identified in this EIR and compliance with project permitting requirements would be integrated with the SFPUC's ongoing environmental protection and enhancement efforts, such as the Water Enterprise Environmental Stewardship Policy. The proposed project would protect the ecological resources of the Alameda watershed by constructing a new chemical facility with the capacity to dechlorinate and pH-adjust treated water supplies before they are discharged to open waters of the United States and of the state. Taken as a whole, the proposed project would be consistent with the Alameda WMP. Since Pumping Variants 1 and 2 would result in impacts that are very similar to or the same as those of the proposed project, the pumping variants would also be generally consistent with the Alameda WMP.

4.3.3.2 Water Enterprise Environmental Stewardship Policy

The proposed project could affect the integrity of natural resources, habitats for native species, and ecosystem functions in the Alameda watershed. However, the implementation strategies of the Water Enterprise Environmental Stewardship Policy specifically require the integration of the policy into individual WSIP facility improvement projects such as the SABPL project. As discussed in Sections 5.14, Biological Resources, and 5.16, Hydrology and Water Quality, significant impacts on natural resources, habitats, or ecosystems could be mitigated to a less-than-significant level through mitigation measures identified in this EIR. Thus, the proposed project would be consistent with the underlying goals of the Water Enterprise Environmental Stewardship Policy. Since Pumping Variants 1 and 2 would result in impacts on natural resources that are very similar to or the same as those of the proposed project, the pumping variants would also be consistent with the Environmental Stewardship Policy.

4.3.3.3 Right-of-Way Integrated Vegetation Management Policy

Under the proposed project, the SFPUC would remove vegetation, including trees, within the SFPUC right-of-way along the proposed alignments of the backup pipeline and 12-inch-diameter water pipeline to the town of Sunol. Such removal would be required for project construction activities and to maintain the safety and operation of the SFPUC's regional water system. Part of the overall goal of the Vegetation Management Policy is to manage vegetation that poses a threat or hazard to the regional water system's operation, maintenance, and infrastructure. Vegetation removal for the SABPL project would be accomplished in a manner consistent with this policy. Impacts related to vegetation and tree removal are discussed in Section 5.3, Aesthetics, and Section 5.14, Biological Resources. Thus, the proposed project would be consistent with the goals of the Vegetation Management Policy. Since Pumping Variants 1 and 2 would also require vegetation removal to protect new pipelines from damage, the pumping variants would also be consistent with the Vegetation Management Policy.

4.3.3.4 Right-of-Way Encroachment Policy

Potential conflicts with the utilities of other agencies within the SFPUC rights-of-way for the backup pipeline and 12-inch-diameter water pipeline to the town of Sunol are addressed in Section 5.12, Utilities and Service Systems. Section 5.12 identifies mitigation measures related to utility protection and relocation; implementation of these measures would ensure that potential impacts related to the endangerment of water, sewer, or electrical transmission lines and appurtenances would be reduced to a less-than-significant level. Thus, the proposed project would be consistent with the Right-of-Way Encroachment Policy. Since all of the potential utility conflicts and associated mitigation measures identified for the proposed project would also apply to Pumping Variants 1 and 2, and impacts could be reduced to a less-than-significant level with implementation of mitigation, the pumping variants would also be consistent with the Right-of-Way Encroachment Policy.

4.3.4 Consistency with Alameda County Land Use Plans and Policies

4.3.4.1 Alameda County General Plan and East County Area Plan

As described above, the SFPUC is not legally bound by the land use policies of other local governments, including Alameda County. Determinations of project consistency with the Alameda County General Plan and ECAP would be made by Alameda County following preparation of this EIR, and through notification by the SFPUC pursuant to state law.

The Alameda County General Plan and ECAP contain land use policies applicable to the SABPL project that address environmental resources, including locating utilities to avoid or minimize damage from hazards; protecting sensitive wildlife habitats and plants; implementing erosion control measures and stormwater quality controls; conserving and protecting cultural resources; implementing air quality controls, such as dust abatement measures during construction; limiting the hours of construction to minimize noise impacts on surrounding uses; and maintaining adequate roadway capacity for traffic, emergency services, bicycles, and pedestrians. The proposed project's consistency with the land use policies of the Alameda County General Plan and ECAP has been addressed through an evaluation of the project's environmental impacts and identification of feasible measures to avoid or substantially lessen significant and potentially significant impacts. Such impacts and mitigations are discussed in the individual resource sections of Chapter 5, Environmental Setting, Impacts, and Mitigation Measures.

As described previously in Section 4.2.3, the ECAP designates the project area as Water Management land, which specifically allows activities related to watershed management on SFPUC Alameda watershed lands. The proposed project would not involve development of new land use activities on SFPUC watershed lands, except for facilities and activities related to water conveyance and maintenance. The SABPL project would involve occasional discharges of quality-impaired Hetch Hetchy water into quarry Pit F3-East and proposes to construct a new discharge facility, cutoff wall, pump station, two electrical control buildings, and related facilities on CCSF-owned land that is currently leased to Hanson Aggregates; however, the project would not interfere or otherwise conflict with Hanson Aggregates' mining operations. Active mining has been completed in quarry Pits F3-East and F3-West, and these pits are now used for water storage and management by the quarry operator. Since the SFPUC intends to work cooperatively with Hanson Aggregates to manage water in the quarry pits to accommodate future discharges from the backup pipeline, the proposed project (and Pumping Variants 1 and 2) would be consistent with this use.

Overall, the SABPL project and Pumping Variants 1 and 2 would be consistent with the objectives and policies of the Alameda County General Plan and ECAP. With the exception of impacts related to air pollutant emissions during project construction, which would remain significant and unavoidable even with mitigation, implementation of the mitigation measures identified in Sections 5.2 through 5.19 would avoid or reduce all other significant impacts to a less-than-significant level. The proposed project would also protect the quality of life for the populations served by the SFPUC by increasing the reliability of the regional water system and maintaining a high-quality water supply.

4.4 References

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CHAPTER 5

Environmental Setting, Impacts, and Mitigation Measures

5.1 Overview

This chapter provides a project-level impact analysis of the physical environmental effects of implementing the San Antonio Backup Pipeline (SABPL) project. This chapter describes the environmental setting, assesses impacts, and identifies mitigation measures for significant impacts.

5.1.1 Scope of Analysis

This chapter is organized by environmental resource topic, as follows:

Sections	
5.1 Overview	5.11 Recreation
5.2 Land Use	5.12 Utilities and Service Systems
5.3 Aesthetics	5.13 Public Services
5.4 Population and Housing	5.14 Biological Resources
5.5 Cultural and Paleontological Resources	5.15 Geology and Soils
5.6 Transportation and Circulation	5.16 Hydrology and Water Quality
5.7 Noise and Vibration	5.17 Hazards and Hazardous Materials
5.8 Air Quality	5.18 Mineral and Energy Resources
5.9 Greenhouse Gas Emissions	5.19 Agriculture and Forest Resources
5.10 Wind and Shadow	

Each section of Chapter 5 contains the following elements, based on requirements of the California Environmental Quality Act (CEQA):

- **Setting.** This subsection presents a description of the existing physical environmental conditions in the vicinity of the project with respect to each resource topic at an appropriate level of detail to allow the reader to understand the impact analysis.

- **Regulatory Framework.** This subsection describes the relevant laws and regulations that apply to protecting the environmental resources within the proposed project area, and the governmental agencies responsible for enforcing those laws and regulations.

- **Impacts and Mitigation Measures.** This subsection evaluates the potential for the proposed project to adversely affect the physical environment described in the setting. Significance criteria for evaluating environmental impacts are defined at the beginning of each impact analysis section, followed by a discussion (the Approach to Analysis) that explains how the significance criteria are applied in evaluating the SABPL project. The conclusion of each impact analysis is expressed in terms of impact significance, which is discussed further in Section 5.1.2 below.

  This subsection also identifies mitigation measures for all of the impacts considered significant or potentially significant, consistent with the CEQA Guidelines (Section 15126.4[a][1]), which state that an environmental impact report (EIR), "shall describe feasible measures which could minimize significant adverse impacts…"

- **Cumulative Impacts and Mitigation Measures.** Cumulative impacts are discussed in each environmental resource section immediately following the description of the direct project-specific impacts and identified mitigation measures. The analyses of cumulative impacts, described at the end of each section in Chapter 5, consider the effects of the proposed project together with those of other past, present, or reasonably foreseeable future projects proposed by the SFPUC or other entities. The analysis of cumulative impacts under each resource topic is based on the same setting, regulatory framework, and significance criteria as the direct impacts. Additional mitigation measures are identified if the analysis determines that the SABPL project's contribution to a significant adverse cumulative impact is cumulatively considerable and therefore significant.

5.1.2 Significance Determinations

The significance criteria used in this EIR are based on the San Francisco Planning Department's Environmental Planning Division (formerly Major Environmental Analysis Division [MEA]) guidance regarding the thresholds of significance used to assess the severity of the environmental impacts of the proposed project. The San Francisco Planning Department's guidance is based on CEQA Guidelines Appendix G, with some modifications. The significance criteria used to analyze the various environmental resource topics are presented in each section of Chapter 5 before the discussion of impacts. An impact described as "potentially" significant indicates there is a potential for the impact to occur, but there is either not enough project information or site-specific information to determine definitively whether or not it qualifies under the significance criteria as significant; an impact identified as "potentially significant" is treated the same as significant impacts in this EIR. The categories used to designate impact significance are:

- **No Impact (NI).** An impact is considered not applicable (no impact) if there is no potential for impacts or the environmental resource does not occur within the project area or the area of potential effect. For example, there would be no impacts related to tree removal if there is no tree removal proposed at a project site.

- **Less than Significant impact, no mitigation required (LS).** This determination applies if there is a potential for some limited impact, but not a substantial adverse effect that qualifies under the significance criteria as a significant impact.

- **Less than Significant impact with Mitigation (LSM).** This determination applies if the project would result in an adverse effect that meets the significance criteria, but feasible mitigation is available that would reduce the impact to a less-than-significant level.

- **Significant and Unavoidable impact for which feasible mitigation is not available (SU).** This determination applies if the project would result in an adverse effect that meets the significance criteria, but for which there appears to be no feasible mitigation available to reduce the impact to a less-than-significant level. Therefore, the impact is significant and unavoidable.

- **Significant and Unavoidable impact with implementation of feasible Mitigation (SUM).** This determination applies if it is certain that the project would result in an adverse effect that meets the significance criteria and mitigation is available to lessen the impact, but the residual effect after implementation of the measure would remain significant. Therefore, the impact is significant and unavoidable with mitigation.

Within each environmental resource section in this chapter, a summary table is provided at the beginning of the impact discussion to summarize the potential impacts and indicate the level of impact significance. Environmental impacts are numbered throughout this EIR, using the section number followed by sequentially numbered impacts. Mitigation measures are numbered to correspond with the impact numbers; for example, Mitigation Measure M-LU-1 addresses Impact LU-1.

5.1.3 WSIP Water Supply and Operations Strategy Impacts and Mitigation Measures

As discussed in Chapter 2, Introduction and Background, the proposed project, in addition to several other facility improvement projects, are components of the SFPUC's Water System Improvement Program (WSIP). The Program EIR (PEIR),[1] which was certified by the San Francisco Planning Commission on October 30, 2008, addresses the potential environmental impacts of constructing and operating the key regional facility improvement projects in the WSIP and as well as the impacts of the proposed systemwide water supply and operations strategy. Because the proposed project is a component of the WSIP, the project would also contribute to the WSIP's systemwide water supply and operations impacts.

The PEIR analyzed potential water supply and system operations impacts (separate from environmental impacts associated with the facility improvements) within the following geographic regions: the Tuolumne River, Alameda and Peninsula watersheds, and the Westside Groundwater Basin. The PEIR also identified the cumulative effects of implementing the WSIP and associated changes in system operations in combination with other past, present, and

[1] The WSIP PEIR is available for public review at the San Francisco Planning Department, 1650 Mission Street, San Francisco, CA, 94103, and can be found on the San Francisco Planning Department's website at http://www.sfgov.org/planning/mea. The State Clearinghouse number for the WSIP PEIR is 2005092026.

reasonably foreseeable future projects within each of these watersheds. It also discussed the potential effects of climate change and global warming on the predicted impacts of the WSIP.

The PEIR concluded that the WSIP would result in changes in reservoir levels and associated changes in downstream flows in rivers and creeks in the three affected watersheds (Tuolumne River, Alameda, and Peninsula watersheds), potentially causing impacts on groundwater, water quality, fisheries, and terrestrial biological resources in these watersheds. The PEIR determined that in the event that water supply deliveries to customers (average annual) from the watersheds exceed current levels, stream flow changes in the Tuolumne River watershed could affect fisheries and terrestrial biological resources. In the Alameda watershed, the WSIP (which includes restoring the historical storage capacity of Calaveras Reservoir) could affect water levels in Calaveras and San Antonio Reservoirs; flow in Alameda, Calaveras, and San Antonio Creeks; and the fisheries and terrestrial biological resources of the reservoirs and creeks. In the Peninsula watershed, the WSIP (which includes restoring the historical storage capacity of Crystal Springs Reservoir) could affect water levels in Crystal Springs, San Andreas, and Pilarcitos Reservoirs; flow in lower San Mateo and Pilarcitos Creeks; and the fisheries and terrestrial biological resources of these reservoirs and creeks. In addition, the WSIP includes development of groundwater supplies in the North Westside Groundwater Basin and a conjunctive-use program in the South Westside Groundwater Basin that could result in basin overdraft, seawater intrusion, and changes in the water levels of surface water bodies.

As stated above, the SABPL project is a component of the WSIP and therefore would also contribute to the water supply and system operations impacts identified in the PEIR. **Tables 5.1-1** through **5.1-5** summarize the WSIP water supply and system operations impacts and the associated mitigation measures for each geographic region as presented in the PEIR. The reader is referred to the complete WSIP PEIR for a detailed explanation of these summary tables. Note that the categories of significance used in the PEIR are slightly different than those used in this EIR (see table footnotes in Tables 5.1-1 through 5.1-5).

In addition to water supply impacts and mitigation measures, the PEIR provides a program-level analysis of the impacts associated with key regional WSIP facility improvement projects, including construction and operations impacts. This EIR addresses the same issues for the SABPL project as were addressed in the PEIR, but at a project (rather than program) level of detail; it provides more project-specific and site-specific descriptions and analysis of project effects based on a more detailed project description and additional information about the project area. **Appendix C** of this project-level EIR presents a comparison between the programmatic mitigation measures identified for the SABPL project in the WSIP PEIR and the mitigation measures identified for the SABPL project in this EIR.

The PEIR also analyzed the growth-inducement impacts of the WSIP's systemwide operations. The proposed project, as a facility improvement project under the WSIP, would be a contributing factor in the growth-inducing potential of the WSIP and the associated indirect effects of growth. The growth-inducing impacts of the WSIP are briefly summarized in Section 5.4, Population and Housing, and discussed in Chapter 6, Other CEQA Issues, of this EIR.

TABLE 5.1-1
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
STREAM FLOW						
Impact 5.3.1-1: Effects on flow along the Tuolumne River below O'Shaughnessy Dam.	LS					None required.
Impact 5.3.1-2: Effects on flow along Cherry Creek below Cherry Dam.	LS					None required.
Impact 5.3.1-3: Effects on flow along Eleanor Creek below Eleanor Dam.	LS					None required.
Impact 5.3.1-4: Effects on flow along the Tuolumne River below La Grange Dam.	LS					None required.
Impact 5.3.1-5: Effects on flow along the San Joaquin River and the Sacramento–San Joaquin Delta.	LS					None required.
GEOMORPHOLOGY						
Impact 5.3.2-1: Effects on sediment transport and channel characteristics between O'Shaughnessy Dam and Don Pedro Reservoir.	LS					None required.
Impact 5.3.2-2: Effects on sediment transport and channel characteristics below La Grange Dam.	LS					None required.

<u>PEIR Significance Categories</u>:
NA = Not Applicable or no impact
LS = Less than Significant
PSM = Potentially Significant impact with Mitigation
SU = Significant and Unavoidable, even with mitigation
PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-1 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
SURFACE WATER QUALITY						
Impact 5.3.3-1: Effects on water quality in Hetch Hetchy Reservoir and along the Tuolumne River below O'Shaughnessy Dam.	LS					None required.
Impact 5.3.3-2: Effects on water quality in Don Pedro Reservoir and along the Tuolumne River below La Grange Dam.	LS					None required.
Impact 5.3.3-3: Effects on water quality along the San Joaquin River and the Sacramento–San Joaquin Delta.	LS					None required.
SURFACE WATER SUPPLIES						
Impact 5.3.4-1: Effects on Tuolumne River, San Joaquin River, and Stanislaus River water users.	LS					None required.
Impact 5.3.4-2: Effects on Delta water users.	LS					None required.
GROUNDWATER						
Impact 5.3.5-1: Alteration of stream flows along the Tuolumne River, which could affect local groundwater recharge and groundwater levels.	LS					None required.

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NA = Not Applicable or no impact
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TABLE 5.1-1 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
GROUNDWATER (cont.)						
Impact 5.3.5-2: Alteration of stream flows along the Tuolumne River, which could affect local groundwater quality.	LS					None required.
FISHERIES						
Impact 5.3.6-1: Effects on fishery resources in Hetch Hetchy Reservoir.	LS					None required.
Impact 5.3.6-2: Effects on fishery resources along the Tuolumne River between Hetch Hetchy Reservoir and Don Pedro Reservoir.	LS					None required.
Impact 5.3.6-3: Effects on fishery resources in Don Pedro Reservoir.	LS					None required.
Impact 5.3.6-4: Effects on fishery resources along the Tuolumne River below La Grange Dam.	LS when average annual deliveries from the watersheds are maintained at 265 million gallons per day (mgd) or less; PSM if deliveries exceed 265 mgd					**Measure 5.3.6-4a, Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water:** The SFPUC will pursue a water transfer arrangement with the Modesto Irrigation District or Turlock Irrigation District and/or other water agencies to offset the WSIP's effects on water storage in Don Pedro Reservoir and minimize WSIP-induced changes in releases from La Grange Dam. **If Measure 5.3.6-4a proves to be infeasible, the SFPUC will implement Measure 5.3.6-4b.

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NA = Not Applicable or no impact
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PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-1 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

Impact	Significance Determination: All Impacts (except Biological Resources)	Biological Resource Impacts: Sensitive Habitats	Biological Resource Impacts: Key Special-Status Species	Biological Resource Impacts: Other Species of Concern	Biological Resource Impacts: Common Habitats and Species	Mitigation Measures
FISHERIES (cont.)						
Impact 5.3.6-4 (cont.)						**Measure 5.3.6-4b, Fishery Habitat Enhancement:** The SFPUC will implement or fund one of two fishery habitat enhancement projects that are consistent with the Lower Tuolumne River Restoration Plan: augmentation of spawning gravel at three selected sites or the filling or isolation from the river of one of the existing inactive quarry pits.
Impact 5.3.6-5: Effects on fishery resources along the San Joaquin River.	LS					None required.
TERRESTRIAL BIOLOGY						
Impact 5.3.7-1: Impacts on riparian habitat and related biological resources in Hetch Hetchy Reservoir and along the bedrock channel portions of the Tuolumne River from O'Shaughnessy Dam to Don Pedro Reservoir.		LS	LS	LS	LS	None required.
Impact 5.3.7-2: Impacts on alluvial features that support meadow and riparian habitat along the Tuolumne River from O'Shaughnessy Dam to Don Pedro Reservoir.		PSM	PSM	PSM	PSM	The SFPUC will implement Measure 5.3.7-2 to reduce adverse impacts on sensitive habitats, key special-status species, other species of concern, and common habitats and species to a less-than-significant level.

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NA = Not Applicable or no impact
LS = Less than Significant
PSM = Potentially Significant impact with Mitigation
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TABLE 5.1-1 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
TERRESTRIAL BIOLOGY (cont.)						
Impact 5.3.7-2 (cont.)						**Measure 5.3.7-2, Controlled Releases to Recharge Groundwater in Streamside Meadows and Other Alluvial Deposits:** The SPPUC will manage releases to the Tuolumne River from Hetch Hetchy Reservoir during the spring with the goal of recharging groundwater that supports meadow and riparian habitat. The SFPUC will periodically survey meadow habitat to determine the efficacy of release management and will modify releases as necessary to sustain meadow habitat.
Impact 5.3.7-3: Impacts on biological resources in Lake Eleanor and along Eleanor Creek.		LS	LS	LS	LS	None required.
Impact 5.3.7-4: Impacts on biological resources in Lake Lloyd and along Cherry Creek.		LS	LS	LS	LS	None required.
Impact 5.3.7-5: Impacts on biological resources in Don Pedro Reservoir.		LS	LS	LS	LS	None required.

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TABLE 5.1-1 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

<table>
<tr><th rowspan="3">Impact</th><th colspan="5">Significance Determination</th><th rowspan="3">Mitigation Measures</th></tr>
<tr><th rowspan="2">All Impacts
(except Biological Resources)</th><th colspan="4">Biological Resource Impacts</th></tr>
<tr><th>Sensitive Habitats</th><th>Key Special-Status Species</th><th>Other Species of Concern</th><th>Common Habitats and Species</th></tr>
<tr><td colspan="7">TERRESTRIAL BIOLOGY (cont.)</td></tr>
<tr><td>Impact 5.3.7-6: Impacts on biological resources along the Tuolumne River below La Grange Dam.</td><td></td><td>LS when average annual deliveries from the watersheds are maintained at 265 mgd or less; PSM if deliveries exceed 265 mgd</td><td>LS when average annual deliveries from the watersheds are maintained at 265 mgd or less; PSM if deliveries exceed 265 mgd</td><td>LS when average annual deliveries from the watersheds are maintained at 265 mgd or less; PSM if deliveries exceed 265 mgd</td><td>LS when average annual deliveries from the watersheds are maintained at 265 mgd or less; PSM if deliveries exceed 265 mgd</td><td>The SFPUC will implement Measures 5.3.6-4a or 5.3.7-6 to reduce adverse impacts on sensitive habitats, key special-status species, other species of concern, and common habitats and species to a less-than-significant level.

Measure 5.3.6-4a, Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water – see description above.

**If Measure 5.3.6-4a proves to be infeasible, the SFPUC will implement Measure 5.3.7-6.

Measure 5.3.7-6, Lower Tuolumne River Riparian Habitat Enhancement: Consistent with the Lower Tuolumne River Restoration Plan, the SFPUC will protect and enhance 1 mile of riparian vegetation within the contemporary floodplain.</td></tr>
<tr><td>Impact 5.3.7-7: Conflicts with the provisions of adopted conservation plans or other approved biological resources plans for the Tuolumne Wild and Scenic River.</td><td></td><td colspan="4">LS</td><td>None required.</td></tr>
</table>

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TABLE 5.1-1 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
RECREATIONAL AND VISUAL RESOURCES						
Impact 5.3.8-1: Effects on reservoir recreation due to changes in water system operations.	LS					None required.
Impact 5.3.8-2: Effects on river recreation due to changes in water system operations.	LS					None required.
Impact 5.3.8-3: Effects on the aesthetic values of the Tuolumne Wild and Scenic River.	LS					None required.
ENERGY RESOURCES						
Impact 5.3.9-1: Effects on hydropower generation at facilities along the Tuolumne River.	B					None required.

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TABLE 5.1-2
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – ALAMEDA CREEK WATERSHED

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special Status-Species	Other Species of Concern	Common Habitats and Species	
STREAM FLOW						
Impact 5.4.1-1: Effects on flow along Calaveras Creek below Calaveras Reservoir.	LS					None required.
Impact 5.4.1-2: Effects on flow along Alameda Creek below the diversion dam.	LS[a] **[NOTE: Subsequent to certification of the WSIP PEIR this determination was changed to LS.]**					**Measure 5.4.1-2, Diversion Tunnel Operation:** The SFPUC will implement operational criteria for the diversion dam requiring that water not needed to fill Calaveras Reservoir would be released to Alameda Creek below the diversion dam. **[NOTE: Because Impact 5.4.1-2 was determined to be LS subsequent to certification of the WSIP PEIR, this mitigation measure is no longer required for program implementation.]**
Impact 5.4.1-3: Effects in San Antonio Reservoir and along San Antonio Creek.	LS					None required.
Impact 5.4.1-4: Effects on flow along Alameda Creek below the confluence of San Antonio Creek.	LS					None required.

[a] Based on the best available information at that time, the PEIR made the conservative determination that the WSIP would result in a significant and unavoidable impact related to flow along Alameda Creek below the Alameda Creek Diversion Dam ("Alameda Creek Hydrologic Impact") (see PEIR Chapter 4, Section 5.4.1, Impact 5.4.1-2). Based upon more detailed site-specific data and analysis, the project-level analysis in the Calaveras Dam Replacement Project EIR modified this PEIR impact determination to be less than significant (San Francisco Planning Department, 2011).

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TABLE 5.1-2 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – ALAMEDA CREEK WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special Status-Species	Other Species of Concern	Common Habitats and Species	
GEOMORPHOLOGY						
Impact 5.4.2-1: Effects on channel formation and sediment transport along Calaveras Creek.	LS					None required.
Impact 5.4.2-2: Effects on channel formation and sediment transport along Alameda Creek downstream of the diversion dam and downstream of the San Antonio Creek confluence.	LS					None required.
Impact 5.4.2-3: Effects on channel formation and sediment transport along San Antonio Creek downstream of San Antonio Reservoir.	LS					None required.
SURFACE WATER QUALITY						
Impact 5.4.3-1: Effects on water quality in Calaveras Reservoir.	LS					None required.
Impact 5.4.3-2: Effects on water quality in San Antonio Reservoir.	LS					None required.
Impact 5.4.3-3: Changes in water quality along Calaveras, San Antonio, and Alameda Creeks.	LS					None required.
GROUNDWATER BODIES						
Impact 5.4.4-1: Changes in groundwater levels, flows, quality, and supplies.	LS					None required.

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TABLE 5.1-2 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – ALAMEDA CREEK WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special Status-Species	Other Species of Concern	Common Habitats and Species	
FISHERIES						
Impact 5.4.5-1: Effects on fishery resources in Calaveras Reservoir.	B					None required.
Impact 5.4.5-2: Effects on fishery resources along Calaveras Creek below Calaveras Dam and along Alameda Creek below confluence with Calaveras Creek.	B					None required.
Impact 5.4.5-3: Effects on fishery resources along Alameda Creek downstream of Alameda Creek Diversion Dam.	PSM					**Measure 5.4.5-3a, Minimum Flows for Resident Trout in Alameda Creek:** The SFPUC will release a minimum flow of approximately 10 cubic feet per second from the diversion dam and monitor the effects of the release on resident trout spawning and egg incubation. ** If monitoring results for Measure 5.4.5-3a indicate the measure is unsuccessful, the SFPUC will implement Measure 5.4.5-3b. **Measure 5.4.5-3b, Alameda Diversion Dam Restrictions or Fish Screens:** If after 10 years the minimum release does not sustain the resident trout population, the SFPUC will either increase releases from the diversion dam or install a fish passage barrier on the diversion tunnel.
Impact 5.4.5-4: Effects on fishery resources in San Antonio Reservoir.	B					None required.
Impact 5.4.5-5: Effects on fishery resources along San Antonio Creek below San Antonio Reservoir.	LS					None required.
Impact 5.4.5-6: Effects on fishery resources along Alameda Creek below confluence with San Antonio Creek.	LS					None required.

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TABLE 5.1-2 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – ALAMEDA CREEK WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special Status-Species	Other Species of Concern	Common Habitats and Species	
TERRESTRIAL BIOLOGY						
Impact 5.4.6-1: Effects on riparian habitat and related biological resources in Calaveras Reservoir.		PSM	PSM	LS	LS	The SFPUC will implement Measure 5.4.6-1 to reduce adverse impacts on sensitive habitats and key special-status species to a less-than-significant level. **Measure 5.4.6-1, Compensation for Impacts on Terrestrial Biological Resources:** The SFPUC will protect, restore, and enhance existing riparian habitat and/or create new habitat that compensates for WSIP-induced habitat losses at Calaveras Reservoir. Compensatory habitat may be provided as part of the SFPUC's Habitat Reserve Program.
Impact 5.4.6-2: Effects on riparian habitat and related biological resources along Alameda Creek, from below the diversion dam to the confluence with Calaveras Creek.		LS	PSM	LS	N/A	The SFPUC will implement Measures 5.4.1-2 and 5.4.5-3a to reduce adverse impacts on key special-status species to a less-than-significant level. **Measure 5.4.1-2, Diversion Tunnel Operation** – see description above. **Measure 5.4.5-3a, Minimum Flows for Resident Trout in Alameda Creek** – see description above.
Impact 5.4.6-3: Effects on riparian habitat and related biological resources along Calaveras Creek, from Calaveras Reservoir to the confluence with Alameda Creek.		LS	PSM	LS	LS	The SFPUC will implement Measure 5.4.6-3 to reduce adverse impacts on key special-status species to a less-than-significant level. **Measure 5.4.6-3, Operational Procedures for Calaveras Dam Releases:** The SFPUC will manage releases from Calaveras Reservoir to mimic a more natural hydrologic regime in the creek for the benefit of terrestrial biological resources. The specifics of this mitigation measure will be determined as part of project-level CEQA review.

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TABLE 5.1-2 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – ALAMEDA CREEK WATERSHED

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special Status-Species	Other Species of Concern	Common Habitats and Species	
TERRESTRIAL BIOLOGY (cont.)						
Impact 5.4.6-4: Effects on riparian habitat and related biological resources along Alameda Creek, from the confluence with Calaveras Creek to the confluence with San Antonio Creek.		LS	PSM	LS	LS	The SFPUC will implement Measures 5.4.6-3 and 5.4.5-3a to reduce adverse impacts on key special-status species to a less-than-significant level. **Measure 5.4.6-3, Operational Procedures for Calaveras Dam Releases** – see description above. **Measure 5.4.5-3a, Minimum Flows for Resident Trout on Alameda Creek** – see description above.
Impact 5.4.6-5: Effects on riparian habitat and related biological resources in San Antonio Reservoir.		LS	LS	LS	LS	None required.
Impact 5.4.6-6: Effects on riparian habitat and related biological resources along San Antonio Creek between Turner Dam and the confluence with Alameda Creek.		LS	LS	LS	N/A	None required.
Impact 5.4.6-7: Effects on riparian habitat and related biological resources along Alameda Creek below the confluence with San Antonio Creek.		LS	LS	LS	N/A	None required.
Impact 5.4.6-8: Conflicts with the provisions of adopted conservation plans or other approved biological resources plans.		LS				None required.

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TABLE 5.1-2 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – ALAMEDA CREEK WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special Status-Species	Other Species of Concern	Common Habitats and Species	
RECREATIONAL AND VISUAL RESOURCES						
Impact 5.4.7-1: Effects on recreational facilities and/or activities.	LS					None required.
Impact 5.4.7-2: Visual effects on scenic resources or visual character of the water bodies.	LS					None required.

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PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-3
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – PENINSULA WATERSHED

Impact	Significance Determination					Mitigation Measures
	All Impacts (except Biological Resources)	Biological Resource Impacts				
		Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
STREAM FLOW						
Impact 5.5.1-1: Effects on flow along San Mateo Creek.	LS					None required.
Impact 5.5.1-2: Effects on flow along Pilarcitos Creek.	LS					None required.
GEOMORPHOLOGY						
Impact 5.5.2-1: Changes in sediment transport and channel morphology in the Peninsula watershed.	LS					None required.
WATER QUALITY						
Impact 5.5.3-1: Effects on water quality in Crystal Springs Reservoir, San Andreas Reservoir, and San Mateo Creek.	LS					None required.
Impact 5.5.3-2: Effects on water quality in Pilarcitos Reservoir and along Pilarcitos Creek.	PSM					**Measure 5.5.3-2a, Low-head Pumping Station at Pilarcitos Reservoir:** The SFPUC will install a permanent low-head pumping station at Pilarcitos Reservoir that would enable the SFPUC to access and use an additional 350 acre-feet of water from Pilarcitos Reservoir. In years when the WSIP would cause releases from Pilarcitos Reservoir to Pilarcitos Creek to be reduced to reservoir inflow earlier in the summer than under the existing condition (about 25 percent of years in the hydrologic record), the SFPUC will use the pumping station to augment flow in Pilarcitos Creek with water from the reservoir. The pumping station will draw water from the cool pool of water below the thermocline during times when the reservoir is stratified. The pumping station outlet will be designed to ensure that water discharged to the creek is adequately aerated.

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TABLE 5.1-3 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – PENINSULA WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
WATER QUALITY (cont.)						
Impact 5.5.3-2 (cont.)						**Measure 5.5.3-2b, Aeration System at Pilarcitos Reservoir:** The SFPUC will install a permanent aeration system at Pilarcitos Reservoir. The SFPUC will operate the aeration system as necessary to avoid anoxic conditions and maintain good water quality conditions at the reservoir.
GROUNDWATER						
Impact 5.5.4-1: Alteration of stream flows along Pilarcitos Creek, which could affect groundwater levels and water quality.	LS					None required.
FISHERIES						
Impact 5.5.5-1: Effects on fishery resources in Crystal Springs Reservoir (Upper and Lower).	PSU					**Measure 5.5.5-1, Create New Spawning Habitat Above Crystal Springs Reservoir:** The SFPUC will survey the extent and quality of fish spawning habitat lost due to inundation and, if feasible, create new spawning habitat at a higher elevation. The specifics of this mitigation measure will be determined as part of project-level CEQA review.
Impact 5.5.5-2: Effects on fishery resources in San Andreas Reservoir.	LS					None required.
Impact 5.5.5-3: Effects on fishery resources along San Mateo Creek.	LS					None required.
Impact 5.5.5-4: Effects on fishery resources in Pilarcitos Reservoir.	PSM					**Measure 5.5.3-2b, Aeration System at Pilarcitos Reservoir** – see description above.

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NA = Not Applicable or no impact
LS = Less than Significant
PSM = Potentially Significant impact with Mitigation
SU = Significant and Unavoidable, even with mitigation
PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-3 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – PENINSULA WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
FISHERIES (cont.)						
Impact 5.5.5-5: Effects on fishery resources along Pilarcitos Creek below Pilarcitos Reservoir.	PSM[a] **[NOTE: Subsequent to certification of the WSIP PEIR this determination was changed to LS.]**					**Measure 5.5.3-2a, Low-head Pumping Station at Pilarcitos Reservoir** – see description above. **Measure 5.5.5-5, Establish Flow Criteria, Monitor and Augment Flow:** The SFPUC will develop a monitoring and operations plan for Stone Dam to ensure WSIP-related flow reductions downstream of Stone Dam do not impair steelhead passage and spawning during the winter months of normal and wetter hydrologic years. **[NOTE: Because Impact 5.5.5-5 was determined to be LS subsequent to certification of the WSIP PEIR, this mitigation measure is no longer required for program implementation.]**
TERRESTRIAL BIOLOGY						
Impact 5.5.6-1: Impacts on biological resources in Upper and Lower Crystal Springs Reservoirs.		PSM	PSM	PSM	PSM	The SFPUC will implement Measures 5.5.6-1a and 5.5.6-1b to reduce adverse impacts on sensitive habitats, key special-status species, other species of concern, and common habitats and species to a less-than-significant level. In addition, the SFPUC will implement Measure 5.5.6-1c to mitigate adverse impacts on key special-status plant species (i.e., fountain thistle) adapted to serpentine seeps. **Measure 5.5.6-1a, Adaptive Management of Freshwater Marsh and Wetlands at Upper and Lower Crystal Springs Reservoirs:** The SFPUC will develop an adaptive management plan to minimize adverse effects of the WSIP-

[a] Based on the best available information at that time, the PEIR made the conservative determination that the WSIP could result in a significant and unavoidable impact on fishery resources in Crystal Springs Reservoir related to inundation of spawning habitat upstream of the reservoir (see PEIR Chapter 5, Section 5.5.5, Impact 5.5.5-1). Project-level review of updated, site-specific information that was developed following certification of the PEIR was incorporated into the project-level EIR for the Lower Crystal Springs Dam Improvements Project, and the project-level analysis determined that impacts on fishery resources due to inundation effects would be less than significant (San Francisco Planning Department, 2010).

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TABLE 5.1-3 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – PENINSULA WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
TERRESTRIAL BIOLOGY (cont.)						
Impact 5.5.6-1 (cont.)						induced rise in average water levels, and the periodic drawdown of reservoir water levels for maintenance, on San Francisco garter snakes and California red-legged frogs. **Measure 5.5.6-1b, Compensation for Impacts on Terrestrial Biological Resources:** The SFPUC will protect, restore, and enhance existing wetland and upland habitat and/or create new habitat that compensates for WSIP-induced habitat losses at Crystal Springs Reservoir. Compensatory habitat may be provided as part of the SFPUC's Habitat Reserve Program. **Measure 5.5.6-1c, Compensation for Serpentine Seep-Related Special-Status Plants:** The SFPUC will protect, restore, and enhance existing habitat and/or create new habitat that compensates for WSIP-induced habitat losses for plant species adapted to serpentine seeps.
Impact 5.5.6-2: Impacts on biological resources in San Andreas Reservoir.		LS	PSM	LS	LS	None required.
Impact 5.5.6-3: Impacts on biological resources along San Mateo Creek below Lower Crystal Springs Dam.		LS	LS	LS	LS	None required.
Impact 5.5.6-4: Impacts on biological resources in Pilarcitos Reservoir.		LS	PSM	LS	LS	**Measure 5.5.3-2c, Habitat Monitoring and Compensation:** The SFPUC will protect, restore, and enhance existing habitat and/or create new habitat that compensates for WSIP-induced habitat losses at Pilarcitos Reservoir. Compensatory habitat may be provided as part of the SFPUC's Habitat Reserve Program.
Impact 5.5.6-5: Impacts on biological resources along Pilarcitos Creek below Pilarcitos Reservoir.		LS	LS	LS	LS	None required.

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PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-3 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – PENINSULA WATERSHED

Impact	Significance Determination					Mitigation Measures
		Biological Resource Impacts				
	All Impacts (except Biological Resources)	Sensitive Habitats	Key Special-Status Species	Other Species of Concern	Common Habitats and Species	
TERRESTRIAL BIOLOGY (cont.)						
Impact 5.5.6-6: Impacts along Pilarcitos Creek below Stone Dam.		LS	LS	LS	LS	None required.
Impact 5.5.6-7: Conflicts with the provisions of adopted conservation plans or other approved biological resource plans.		LS				None required.
RECREATIONAL AND VISUAL RESOURCES						
Impact 5.5.7-1: Effects on recreational facilities and/or activities.	LS					None required.
Impact 5.5.7-2: Visual effects on scenic resources or the visual character of water bodies.	LS					None required.

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TABLE 5.1-4
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – WESTSIDE GROUNDWATER BASIN

Impact	Significance Determination: North Westside Groundwater Basin	Significance Determination: South Westside Groundwater Basin	Mitigation Measures
RECREATIONAL AND VISUAL RESOURCES			
Impact 5.6-1: Basin overdraft due to pumping from the Westside Groundwater Basin.	PSM	LS	The SFPUC will implement Measure 5.6-1 to reduce adverse impacts on the North Westside Groundwater Basin to a less-than-significant level. **Measure 5.6-1, Groundwater Monitoring to Determine Basin Safe Yield:** The SFPUC will continue ongoing groundwater and lake level monitoring programs to determine the safe yield of the North Westside Groundwater Basin in order to avoid overdraft and associated effects, including adverse effects on surface water features and seawater intrusion.
Impact 5.6-2: Changes in water levels in Lake Merced and other surface water features, including Pine Lake, due to decreased groundwater levels in the Westside Groundwater Basin.	PSM	N/A	The SFPUC will implement Measures 5.6-1 and 5.6-2 to reduce adverse impacts on the North Westside Groundwater Basin to a less-than-significant level. **Measure 5.6-1, Groundwater Monitoring to Determine Basin Safe Yield** – see description above. **Measure 5.6-2, Implementation of a Lake Level Management Plan:** The SFPUC will develop and implement a lake level management plan identifying strategies for altering pumping patterns or augmenting lake levels to maintain Lake Merced water levels within the desired long-term range.
Impact 5.6-3: Seawater intrusion due to decreased groundwater levels in the Westside Groundwater Basin.	PSM	LS	The SFPUC will implement Measure 5.6-1 to reduce adverse impacts on the North Westside Groundwater Basin to a less-than-significant level. **Measure 5.6-1, Groundwater Monitoring to Determine Basin Safe Yield** – see description above.
Impact 5.6-4: Land subsidence due to decreased groundwater levels in the Westside Groundwater Basin if the historical low water levels are exceeded.	LS	LS	None required.
Impact 5.6-5: Contamination of drinking water due to groundwater pumping in the Westside Groundwater Basin.	PSM	PSM	The SFPUC will implement Measure 5.6.5 to reduce adverse impacts on the North Westside and South Westside Groundwater Basins to a less-than-significant level. **Measure 5.6-5, Drinking Water Source Assessments for Groundwater Wells:** The SFPUC will develop and implement a source water protection program for wells constructed under the Local and Regional Groundwater Projects that are considered vulnerable to contamination on the basis of the drinking water source assessment prepared in accordance with Department of Health Services regulations.

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LS = Less than Significant
PSM = Potentially Significant impact with Mitigation
SU = Significant and Unavoidable, even with mitigation
PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-4 (Continued)
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – WESTSIDE GROUNDWATER BASIN

Impact	Significance Determination		Mitigation Measures
	North Westside Groundwater Basin	South Westside Groundwater Basin	
RECREATIONAL AND VISUAL RESOURCES (cont.)			
Impact 5.6-6: Drinking water contaminants above maximum contaminant levels and adverse effects of adding treated groundwater to the distribution system.	LS	LS	None required.

PEIR Significance Categories:
NA = Not Applicable or no impact
LS = Less than Significant
PSM = Potentially Significant impact with Mitigation
SU = Significant and Unavoidable, even with mitigation
PSU = Potentially Significant and Unavoidable, even with mitigation

TABLE 5.1-5
SUMMARY OF WSIP WATER SUPPLY IMPACTS AND MITIGATION MEASURES – CUMULATIVE WATER SUPPLY

	Cumulative Impact Significance Determination							
Cumulative Water Supply Impact	**Hydrology**	**Geomorphology**	**Surface Water Quality**	**Groundwater**	**Fisheries**	**Terrestrial Biology**	**Recreational / Visual Quality**	**Mitigation Measures**
Impact 5.7.2-1: Tuolumne River – Hetch Hetchy Reservoir to Don Pedro Reservoir.	LS	LS	LS	LS	LS	LS	LS	None required.
Impact 5.7.2-2: Tuolumne River – Don Pedro Reservoir to the San Joaquin River.	LS	LS	LS	LS	LS	LS	LS	None required.
Impact 5.7.2-3: San Joaquin River, Stanislaus River, and the Delta.	LS	LS	LS	LS	LS	LS	LS	None required.
Impact 5.7.3-1: Alameda Creek watershed.	N/A	LS	LS	LS	LS	LS	LS	None required.
Impact 5.7.4-1: San Mateo Creek watershed.	LS	LS	LS	LS	LS	LS	LS	None required.
Impact 5.7.4-2: Pilarcitos Creek watershed.	LS	LS	LS	LS	LS	LS	LS	None required.
Impact 5.7.5-1: North Westside Groundwater Basin.	LS							None required.
Impact 5.7.5-2: South Westside Groundwater Basin.	LS							None required.

NOTE: Significance determinations presented in this table assume implementation of all mitigation measures presented in WSIP PEIR Chapter 5, Section 5.6, and in PEIR Chapter 6.

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This project-level EIR tiers from the WSIP PEIR and also incorporates by reference the relevant analyses of the PEIR with respect to the impacts and mitigation measures, as applicable to the SABPL project. CEQA permits tiering from a program EIR in order to allow agencies to broadly consider the environmental effects of a series of actions and/or policies and then to provide a more detailed examination of project-specific impacts in project-level EIRs. The SABPL project was identified and analyzed as part of the WSIP in the PEIR. This project-level EIR provides more detailed information about the proposed project, its impacts, and project-specific mitigation measures. This EIR summarizes and incorporates by reference the WSIP PEIR's analysis of the impacts associated with the WSIP's water supply strategy, including the WSIP PEIR analysis and conclusions regarding impacts on the CCSF's watersheds and growth-inducement impacts.

5.1.4 Cumulative Impacts

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of the project when added to those of other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is described in each subsection of this chapter, immediately following the description of direct project impacts and identified mitigation measures. A summary of all cumulative impacts is provided in Chapter 6, Section 6.2.

5.1.4.1 Approach to Cumulative Impact Analysis

Two approaches to a cumulative impact analysis are discussed in CEQA Guidelines Section 15130(b) (1): (a) the analysis can be based on a list of past, present, and probable future projects producing related or cumulative impacts, or (b) a summary of projections contained in a general plan or related planning document or in an adopted or certified environmental document that described or evaluated regional or areawide conditions contributing to the cumulative impact can be used to determine cumulative impacts. For the purpose of this EIR, the analysis employs the list-based approach. The following factors were used to determine an appropriate list of projects to be considered in this cumulative analysis:

- *Similar Environmental Impacts* – A relevant project would contribute to effects on resources also affected by the SABPL project. A relevant future project is defined as one that is "reasonably foreseeable," such as a proposed project that has approved funding or for which an application has been filed with the approving agency.
- *Geographic Scope and Location* – A relevant project is located within the defined geographic scope for the cumulative effect.
- *Timing and Duration of Implementation* – Effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with the effects of the SABPL project.

Similar Environmental Impacts

Projects that are relevant to the cumulative analysis include those that could contribute incremental effects on the same environmental resources and would have similar environmental impacts to those discussed in this EIR. The cumulative impact discussions in Sections 5.2 through 5.19 of this chapter analyze the cumulative impacts that could occur when the impacts of the SABPL project are considered in combination with the impacts of other past, present, and reasonably foreseeable future projects, which are generally subject to independent environmental review and consideration by the approving agencies. Consequently, it is possible that some of the reasonably foreseeable future projects will not be approved or will be modified prior to approval (e.g. as a result of the CEQA alternatives analysis process or permitting requirements). For the purpose of assessing worst-case cumulative impacts, however, the cumulative impact analysis is premised on the approval and construction of all of the reasonably foreseeable projects identified in this analysis.

Geographic Scope and Location

The geographic scope of cumulative projects is dependent on the resource topic affected and is specifically described under each topical section below. In general, the geographic scope includes the areas within and adjacent to the project area. However, for some resource topics, the geographic scope can extend further, such as the greater hydrologic Alameda Creek watershed, the regional roadway network, or the regional air basin.

Timing and Duration of Implementation

Construction of the SABPL project would span 21 months, between October 2012 and June 2014 (refer to Section 3.6.11 in Chapter 3, Project Description). For temporal impacts such as noise and traffic, cumulative effects from other projects are considered if the planned construction of those projects could overlap with SABPL project construction, or could occur immediately prior to or after construction of the SABPL project, and would affect the same environmental resources. Cumulative effects related to operations, such as operational energy consumption, are also considered if SABPL project operations would affect the same resources as the operations of other projects and have the potential to occur within a similar timeframe.

5.1.4.2 List of Relevant Projects

Table 5.1-6 lists the past, present, and reasonably foreseeable projects and activities within and near the project area and provides a brief description of the projects and their expected schedules. The table also identifies the areas of potential cumulative effects associated with each of the cumulative projects. **Figure 5.1-1** shows the general location of the cumulative projects listed. The cumulative impact analysis is presented under each resource topic in the subsections that follow. A summary of all cumulative impacts is provided in Chapter 6, Section 6.2. The projects listed in Table 5.1-6 include projects proposed by the SFPUC and other parties that would potentially contribute to cumulative impacts when considered together with the SABPL project. The list of projects was developed through: personal communications with Alameda Creek Water District (ACWD) staff; reviewing available information on the California Department of Transportation (Caltrans) website; reviewing available information on the Alameda County Planning Department website; reviewing information provided by the SFPUC regarding their upcoming projects in the Sunol Valley; reviewing the final lease agreement between the SFPUC and Oliver De Silva, Inc., including provisions for the proposed expansion of the SMP-30 area (SFPUC, 2009); and reviewing recent environmental documents for nearby projects. These environmental documents include the *Alameda Siphons Seismic Reliability Upgrade Project Initial Study/Mitigated Negative Declaration* (San Francisco Planning Department, 2008); the *New Irvington Tunnel Final Environmental Impact Report* (San Francisco Planning Department, 2009a); the *Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir Final Environmental Impact Report* (San Francisco Planning Department, 2009b); the *Calaveras Dam Replacement Project Final Environmental Impact Report* (San Francisco Planning Department, 2011); the *Niles Canyon Safety Improvement Project Draft Environmental Impact Report / Environmental Assessment* (Caltrans, 2010); the *State Route 84 Expressway Widening Project Initial Study with Negative Declaration/ Environmental Assessment with Finding of No Significant Impact* (Caltrans, 2008); and the Notice of Preparation of an Environmental Impact Report for the proposed Sunol Valley Aggregate Quarry Revised SMP-30 in Alameda County (ACCDA, 2011).

As indicated in Table 5.1-6, seven projects that are planned or proposed by the SFPUC, adjacent quarry operators, or PG&E would be conducted in the general vicinity of the SABPL project and have project areas that intersect geographically with the SABPL project area (project numbers 1 through 6, and 11, as indicated by shaded rows in Table 5.1-6). In addition, ten of the projects in Table 5.1-6 have tentative construction schedules that could overlap with construction of the SABPL project (project numbers 1, 3, 4, 6, 8, 9, 11, 13, 15, and 17,[4] as indicated by **bold** text on Table 5.1-6). Five projects (numbers 1, 3, 4, 6, and 11 on Table 5.1-6) intersect geographically with the SABPL project area and could also have overlapping construction schedules. The projects with the greatest potential to contribute to cumulative impacts in combination with the identified impacts of the SABPL project are discussed below and described further in Table 5.1-6.

4 Although the construction schedule for the Rubber Dam No. 1 and BART Weir Fish Passage project could overlap with the construction schedule for the SABPL project, due to the distance between these two projects (approximately 8 creek miles), cumulative construction impacts are not expected to result.

TABLE 5.1-6
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
SFPUC Projects					
1	**Upper Alameda Creek Filter Gallery** **(SFPUC)**	**The Filter Gallery project would recover water released from or bypassed around Calaveras Reservoir (pursuant to the instream flow schedules for the Calaveras Dam Replacement project) and relocate the point of diversion for water diverted at the Sunol Filter Galleries, and reintroduce the recaptured water into the regional water system. The Filter Gallery project would be comprised of the following facility components:** • **An approximately 1,400-foot-long filter gallery beneath the streambed of Alameda Creek between the PG&E gas pipeline crossing and San Antonio Creek. The filter gallery would be installed using open-trench construction methods.** • **A new pump station (Alameda Creek Pump Station) and wet well at the northeast corner of the Alameda Creek and San Antonio Creek confluence. A new electrical transformer and overhead power lines would be needed to power the pump station.** • **A new treatment facility adjacent to the Alameda Creek Pump Station to treat the recaptured water prior and introduce it into the regional water system.** • **A 36-inch-diameter, 1,250-foot-long transfer pipeline extending between the Alameda Creek Pump Station and the existing Sunol Pump Station Pipeline.** • **Post-construction restoration of Alameda Creek in the vicinity of the Filter Gallery project to enhance aquatic and riparian habitat.** **(URS, 2010)**	**Aesthetics, cultural resources, air quality, utilities and service systems, biological resources, topsoil, hydrology and water quality, hazardous materials, energy resources**	**The SABPL project also proposes construction of the Alameda Creek Pump Station, wet well and associated improvements, and assumes the Filter Gallery would add one additional pump. In the event these improvements are not constructed under the SABPL project, they would be constructed under the Filter Gallery project. Unless SABPL Pumping Variant 1 is implemented, and the Alameda Creek Pump Station, wet well, and electrical control building are not constructed or utilized by the SABPL project, only the Filter Gallery project would use the pumps at the Alameda Creek Pump Station. If the Filter Gallery project is approved, its operation would utilize the Alameda Creek Pump Station, wet well, and electrical control building; the transfer pipeline; and the overhead powerline and electrical transformer to power the Alameda Creek Pump**	**2014 to 2016**

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
SFPUC Projects (cont.)					
1 (cont.)				**Station. In addition to intersecting geographically, including use of the North Spoils Site and former nursery site for permanent spoils disposal, as well as some of the same construction staging areas, the timing of construction activities could also overlap.**	
2	Alameda Siphons Seismic Reliability Upgrade (SFPUC)	The Alameda Siphons project extends approximately 3,000 feet from the Alameda East Portal across the Calaveras fault and from Alameda Creek to the Alameda West Portal. The project includes: • A new siphon (Alameda Siphon No. 4) comprised of a 66-inch-diameter welded steel pipeline with 310 feet of a seismically designed special trench and thicker-walled pipe in the fault rupture zone, and a tunnel crossing under Alameda Creek. Alameda Siphon No. 4 was connected with the Coast Range Tunnel near the Alameda East Portal. • Seismic reinforcement of the Alameda Siphon No. 2 by installing 300 feet of engineered foundation treatment at the Calaveras fault crossing. • Seismic upgrades and improvements to vaults and valve houses at the Alameda East Portal, and a new connection to the Coast Range Tunnel. • Replacing and extending the Alameda East Portal Overflow Pipeline and installing a new outlet structure at the southern end of quarry Pit F6 for discharges of water through the Alameda East Portal. (For information regarding future operation of the Alameda East Portal Overflow Pipeline, refer to Sections 3.3.2.2 and 3.7.1 in Chapter 3, Project Description, of this EIR.)	Construction-related traffic, aesthetics, cultural resources, noise, air quality, recreational resources, utilities and service systems, biological resources, topsoil, hydrology and water quality, hazardous materials, energy resources	The Alameda Siphons project area intersects with the SABPL project area in the vicinity of the Sunol Pump Station. Both projects include the temporary placement of spoils within Pit F6 and permanent placement of spoils at the North Spoils Site.	Completed in 2011

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
SFPUC Projects (cont.)					
2 (cont.)		• Straightening of Calaveras Road in the vicinity of the Alameda Siphons, improvements to existing access roads, a new access road along the north side of the Alameda Siphon No. 4, and retrofit of the bridges across Alameda Creek near the Alameda West Portal. (San Francisco Planning Department, 2008)			
3	**New Irvington Tunnel** **(SFPUC)**	**The NIT project would construct a new tunnel parallel to and just south of the existing Irvington Tunnel to convey water from the Hetch Hetchy system and the SVWTP to the Bay Area. The project would include the following components:** • **A new 18,200-foot-long, 10-foot-diameter tunnel.** • **A new portal at the east end adjacent to the existing Alameda West Portal in the Sunol Valley with connections to the existing and proposed Alameda Siphons.** • **A new portal in Fremont at the west end of the NIT, adjacent to the existing Irvington Portal with connections to Bay Division Pipeline Nos. 1, 2, 3, 4, and 5.** **The tunnel is being excavated using conventional mining methods, such as using a "road-header" and/or "drill-and-blast." A portion of the tunnel might also be excavated using a tunnel boring machine. Excess spoils generated during project construction would be placed into permanent berms at the South and North Spoils Sites.** **(San Francisco Planning Department, 2009a)**	**Construction-related traffic, aesthetics, cultural resources, noise, air quality, recreational resources, utilities and service systems, biological resources, topsoil, hydrology and water quality, hazardous materials, energy resources**	**Some overlap in construction activities (i.e., staging areas and access roads). Both projects could include the permanent placement of spoils at the North Spoils Site.**	**Mid-2010 to mid-2014**
4	**SVWTP Expansion and Treated Water Reservoir** **(SFPUC)**	**The SVWTP Expansion project includes the following improvements:** • **Increase in the sustainable capacity of the Sunol Valley Water Treatment Plant to 160 million gallons per day by adding a new flocculation/sedimentation basin and by retrofitting some of the existing filters.** • **A new 17.5-million-gallon circular treated water reservoir and a new 3.5-million-gallon rectangular chlorine contact tank on**	**Construction-related traffic, aesthetics, cultural resources, noise, air quality, utilities and service systems, biological resources, topsoil, hydrology and water quality, hazardous materials, energy resources**	**This project includes the option of permanently placing spoils generated during construction at the North Spoils Site. The timing of construction activities could overlap with construction of the SABPL project.**	**2010 to mid-2013**

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
SFPUC Projects (cont.)					
4 (cont.)		**the northern portion of the existing plant site. Roughly 350,000 cubic yards of excavated material would be removed from the plant for disposal.** • **New chemical storage and feed facilities for disinfection, including sodium hypochlorite and ammonia as well as new fluoride facilities.** • **Construction of approximately 2,700 feet of 78-inch-diameter pipe to connect the new treated water reservoir to the existing plant discharge pipeline, which would require a tunnel crossing of Alameda Creek.** • **Miscellaneous plant improvements, including: a new emergency generator and improvements to the plant electrical system and substation; an upgrade of the instrumentation and controls; a new filter washwater recovery basin; improvements to the flow distribution structure and associated facilities; improvements to the influent chemical mixing system; and replacement in-kind of existing chemical tanks.** • **Habitat creation and restoration actions on CCSF-owned lands that are zoned for agricultural uses and/or leased for grazing lands.** **(San Francisco Planning Department, 2009b)**			
5	San Antonio Pump Station Upgrade (SFPUC)	This project would replace three corroded electrical pumps with three 1,000-horsepower electrical pumps; install two 1.5-megawatt standby electrical generators and seismically retrofit the existing pump station building by extending the foundation and shotcreting the building exterior. Two temporary staging areas would be located adjacent to the San Antonio Pump Station and the Sunol Valley Chloramination Facility. No grading or excavation is necessary to accommodate the proposed staging areas. (SFPUC, 2010c)	Construction-related traffic, noise, air quality, biological resources, hydrology and water quality, hazardous materials, energy resources	This project is located within the SABPL project area at the southern end of the proposed backup pipeline alignment.	Completed in late 2010

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
SFPUC Projects (cont.)					
6 [Various locations; not shown on Figure 5.1-1]	**Various Pipeline Inspection Projects (SFPUC)**	**SFPUC pipeline inspections consist of internal evaluations of the pipe network. Pipelines are accessed via existing access ports. It is necessary to dewater the pipe before the inspection, and later disinfect the pipe before refilling it. The pipes are typically dewatered through existing air valves, and discharges are made in accordance with an existing National Pollutant Discharge Elimination System permit for the SFPUC drinking water transmission system (Regional Water Quality Control Board Order No. R2-2008-0102) and would be subject to inspection and water quality best management practices. In rare cases, a minor amount of excavation may be necessary to gain access to the pipeline. Pipelines that could require inspection in the Sunol Valley include the San Antonio Pipeline, Calaveras Pipeline, and Alameda Siphons Nos. 1, 2, and 3, with dewatering discharges to either San Antonio or Alameda Creeks.** **(San Francisco Planning Department, 2009b)**	**Hydrology and water quality, hazards and hazardous materials, traffic**	**The existing San Antonio Pipeline and the proposed backup pipeline would be subject to these periodic inspection activities.**	**Ongoing**
7	San Antonio Reservoir Hypolimnetic Oxygenation System (SFPUC)	This project is designed to reduce excessive buildup of nutrients in the deepest layer of water in San Antonio Reservoir, thereby inhibiting future algal blooms; reduce the formation of iron, manganese, and hydrogen sulfide that results from a lack of oxygen in the reservoir; and maintain necessary oxygen concentration in the deepest layers of the reservoir to increase the usable habitat for coldwater fish. Project components include concrete pads for facilities, parking, and access roads; tanks; vaporizers; valves; piping and other associated structures; underground electrical supply line; and oxygen lines and diffusers suspended at specified depths within the reservoir. (San Francisco Planning Department, 2009a)	Biological resources, hydrology and water quality	None	Completed late 2009

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
SFPUC Projects (cont.)					
8	**Calaveras Dam Replacement** **(SFPUC)**	**The project would provide for planning, design, and construction of a replacement dam at the Calaveras Reservoir to meet seismic safety requirements. The new dam would provide for a reservoir with the same storage capacity as the original reservoir (96,850 acre-feet), but the replacement dam would be designed to accommodate a potential enlargement of the dam in the future. The project would include the following improvements:** • **Regrading of the existing dam and construction of a new earth and rock-fill dam.** • **Replacing the existing spillway, stilling basin, and intake tower to increase seismic safety and improve operations and maintenance.** • **Installation of new outlet valves at the base of the dam for fishery releases and installation of fish screens on the existing adits.** • **Construction of a bypass tunnel at the Alameda Creek Diversion Dam (ACDD), a fish screen on the Alameda Creek Diversion Tunnel, and a fish ladder around the ACDD.** • **New or rehabilitated outlet works.** • **Electrical distribution line upgrade between Milpitas and Calaveras Dam.** • **Long-term implementation of minimum instream flow schedules for Alameda Creek below the ACDD and for Calaveras Creek below Calaveras Dam.** • **Habitat creation and restoration actions on CCSF-owned lands that are zoned for agricultural uses and/or leased for grazing lands.** **(San Francisco Planning Department, 2011; SFPUC, 2011)**	**Construction-related traffic, cultural resources, air quality, biological resources, fisheries, water quality**	**Construction schedule would overlap with the SABPL project.**	**2011 to 2016**

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
Non-SFPUC Projects					
9	**Geary Road Bridge Replacement** **(SFPUC)**	**Replacement of the existing timber bridge and construction of a new steel bridge at the end of Geary Road crossing Alameda Creek in the Sunol Regional Wilderness on lands owned by the CCSF and operated by the East Bay Regional Park District.** **(San Francisco Planning Department, 2011)**	**Air quality, biological resources, hydrology and water quality, energy resources**	**None**	**2014**
10	Stream Management Master Plan Improvements (Zone 7 Water Agency)	The Stream Management Master Plan includes implementation of 49 projects over the next 20 years throughout the Zone 7 service area (in the Tri-Valley Area). Reach 10 includes Arroyo de la Laguna; proposed activities include bank stabilization and protection features, grading and terracing of eroded banks, riparian corridor enhancement for 3,000 feet, and removal of barriers to steelhead fish migration. (San Francisco Planning Department, 2009a)	Air quality, biological resources, hydrology and water quality, energy resources	None	Construction of the projects in Reach 10 occurred in 2008 to 2010.
11	**SMP-30 Quarry Expansion and Cutoff Wall** **(Oliver De Silva, Inc.)**	**This project proposes to expand the active mining area permitted under SMP-30 by 58 acres, for a total of 367 acres. A new asphalt batch plant and new concrete plant would be constructed on-site for processing and production of the mined materials. In addition, the quarry operator would install an approximately 7,800-foot-long, 35- to 45-foot-deep cutoff wall along the west bank of Alameda Creek and the south bank of San Antonio Creek to reduce the lateral flow of water from surface waters into active mining areas. The quarry operator would also restore the same banks of Alameda and San Antonio Creeks by planting native vegetation. This project is contingent upon extension of the existing lease agreement between the SFPUC and Oliver De Silva, Inc., and permit approvals from Alameda County for the expanded mining area.** **(SFPUC, 2009; ACCDA, 2011)**	**Aesthetics, cultural resources, air quality, biological resources, topsoil, hydrology and water quality, hazardous materials, energy resources**	**The existing SMP-30 area and the proposed SMP-30 expansion area intersect geographically with the SABPL project area. It is possible that construction activities associated with the proposed improvements would coincide with the timing of construction for the SABPL project.**	**The construction schedule for the proposed improvements is unknown.** **Active mining would be extended 30 years, from 2021 to 2039.**

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
Non-SFPUC Projects (cont.)					
12	State Route 84 Safety Project (Alameda County)	Roadway improvements along State Route 84 (SR 84) between the Rosewarnes Bridge and Farwell Bridge include: widening road shoulders; improving site distance and vertical clearances at bridges; and installing a retaining wall along a section of Alameda Creek. (San Francisco Planning Department, 2009a)	Air quality, biological resources, hydrology and water quality, energy resources	None	Completed in 2009
13	**State Route 84 Expressway Widening Project** **(Alameda County)**	**Widening of SR 84 (Isabel Avenue) from four to six lanes from Jack London Boulevard in Livermore through the Isabel Avenue/Vallecitos Road intersection. Project would add capacity, reduce congestion, improve local circulation, and eventually tie into the Isabel Avenue/I-580 interchange project.** **(Caltrans, 2008; ACTIA, 2010a)**	**Air quality, biological resources, hydrology and water quality, energy resources**	**None**	**2011 to 2013**
14	I-680 High Occupancy Vehicle (HOV) Lane (Alameda County)	Construction of a southbound and northbound HOV lane on the I-680 Sunol grade with ramp metering and an auxiliary lane from SR 84 to the Montague Expressway. This project would alleviate traffic congestion along I-680. (San Francisco Planning Department, 2009a; ACTIA, 2010b)	Air quality, biological resources, hydrology and water quality, energy resources	None	Completed in 2010
15	**Niles Canyon Safety Improvement** **(Alameda County)**	**This project would widen and straighten a 4.4-mile segment of SR 84 between the Alameda Creek Bridge and I-680. The project would improve traffic safety by improving sight distances and providing a standard road shoulder width.** **(Caltrans, 2010)**	**Traffic, air quality, hydrology and water quality, biological resources, energy resources**	**This project is located less than 1 mile north of the SABPL project. Construction schedule would overlap with construction of SABPL project.**	**2012 to 2014**
16	PG&E Gas Pipeline Crossing (PG&E)	Modify the cement-armored PG&E gas pipeline crossing of Alameda Creek in the Sunol Valley above the confluence of San Antonio Creek, which would eliminate a barrier to fish migration at most creek flow levels. The project involves modification of the concrete mat or construction of a fish ladder to allow fish passage. (San Francisco Planning Department, 2011)	Aesthetics, air quality, biological resources, hydrology and water quality, energy resources	None	TBD

NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

TABLE 5.1-6 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Impact Topics	Potentially Affected Project Components/ Areas of Overlap	Estimated Construction Schedule
Non-SFPUC Projects (cont.)					
17	**Rubber Dam No. 1 and BART Weir Fish Passage Project**[a] **(ACWD and Alameda County Flood Control and Water Conservation District)**	**This project, located approximately 8 miles downstream of the SABPL project area in Fremont, would install a fish ladder at the ACWD's Rubber Dam No. 1 and Bay Area Rapid Transportation (BART) weir to facilitate fish migration in lower Alameda Creek.** **(Wooding, 2011)**	**Biological resources**	**None**	**2014 to 2015**

[a] Implementation of this cumulative project, in combination with implementation of the SABPL project, would not be expected to result in adverse cumulative effects due to the limited scale and distance from the SABPL project. However, the Rubber Dam No. 1 and BART Weir Fish Passage project is relevant to the cumulative impact analysis for biological resources because implementation of this project would facilitate the restoration of steelhead along Alameda Creek in the SABPL project vicinity.

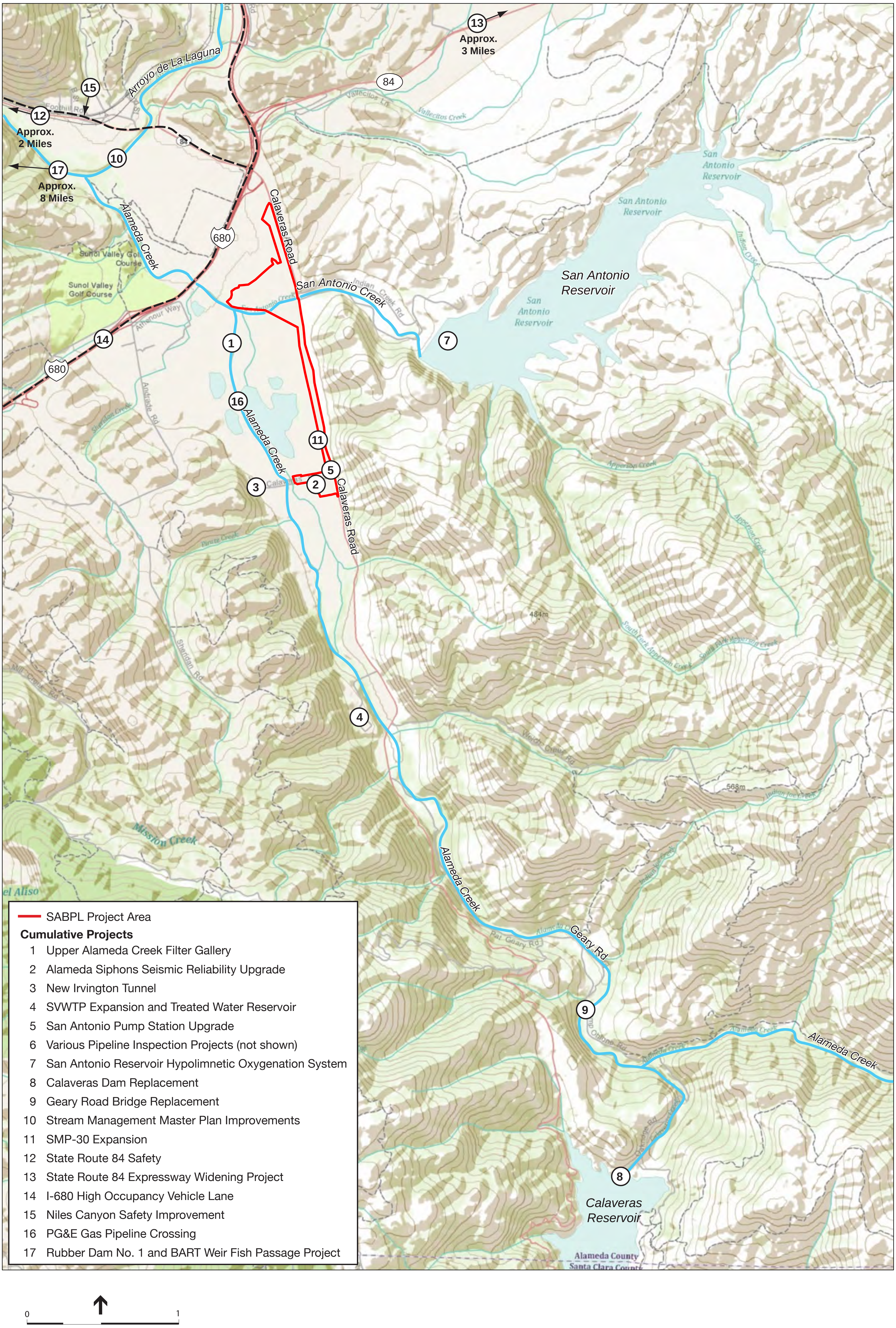
NOTES: Shaded rows indicate cumulative projects that would intersect geographically with the SABPL project area.
Bold text indicates that a cumulative project's construction schedule could overlap with the SABPL construction schedule.

- *SFPUC Upper Alameda Creek Filter Gallery (Filter Gallery project).* This SFPUC project proposes to construct an infiltration gallery beneath the streambed of Alameda Creek, between the San Antonio Creek confluence and the PG&E gas pipeline crossing, to recover water that will be released from or bypassed around Calaveras Reservoir. Although the two projects have independent utility and have different objectives, the Filter Gallery project also proposes to construct the following facility components proposed under the SABPL project, including: the proposed Alameda Creek Pump Station (including the wet well and electrical control building, powered by overhead lines and electrical transformer); the transfer pipeline; and permanent access road improvements. For the purpose of this analysis, these proposed SABPL project components would also be utilized for operation of the Filter Gallery project, if implemented.

  The Filter Gallery project area intersects geographically with the SABPL project area in the vicinity of quarry Pits F3-East and F3-West. Both projects would use Staging Areas C and D and could include the permanent placement of spoils in earthen berms at the North Spoils Site and former nursery site located east of Pit F3-East (URS, 2010). The preliminary construction schedule for the Filter Gallery project indicates construction would occur for approximately 1.5 years, between 2014 and 2016. Therefore, construction activities associated with the Filter Gallery project are anticipated to overlap with construction of the SABPL project.

- *SFPUC Alameda Siphons Seismic Reliability Upgrade Project (Alameda Siphons project)*. This SFPUC project includes construction of a new siphon (Alameda Siphon No. 4) between the Alameda East and West Portals; seismic reinforcement of the Alameda Siphon No. 2 at the Calaveras fault; seismic improvements at the Alameda East Portal; straightening of Calaveras Road in the vicinity of the Alameda Siphons; and extension of the Alameda East Portal Overflow Pipeline to quarry Pit F6. Like the SABPL project, spoils generated during construction of the Alameda Siphons project could be permanently placed in the North Spoils Site or temporarily stored in the SMP-30 area (Pit F6) for subsequent resale and reuse. The Alameda Siphons project area intersects geographically with the SABPL project area in the vicinity of the San Antonio Pump Station and the proposed chemical facility. Construction of the Alameda Siphons project began in 2009 and is expected to be complete in late 2011, before construction of the SABPL project begins (San Francisco Planning Department, 2008). Construction activities associated with the Alameda Siphons project have changed the physical conditions in some portions of the SABPL project area as a result of site clearing, tree removal, grading, etc. In addition, spoils generated during construction of the Alameda Siphons project have been placed in an earthen berm at the North Spoils Site.

- *SFPUC New Irvington Tunnel Project (NIT project)*. The NIT project includes construction of a new 3.5-mile water transmission tunnel between the Alameda West Portal in the Sunol Valley and the Irvington Portal in Fremont. Most of the construction activities for the NIT project would occur west of the SABPL project, with the closest permanent improvements located at the Alameda West Portal, approximately 700 feet to the west of the southern backup pipeline alignment. Construction activities in the immediate vicinity of the SABPL project area include construction of new permanent access roads and bridges across Alameda Creek, and installation of a temporary bridge at San Antonio Creek for access to the North Spoils Site during construction. The proposed backup pipeline alignment would traverse a staging area and a permanent spoils disposal site (South Spoils Site) associated with the NIT project, and the temporary access road to the North Spoils Site for the NIT project would traverse the SABPL project area. Like the SABPL project, the NIT project includes the permanent placement of spoils at the North Spoils Site (San Francisco Planning Department, 2009a). Construction of the NIT project began in 2010 and is



SOURCE: ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.1-1
Cumulative Projects

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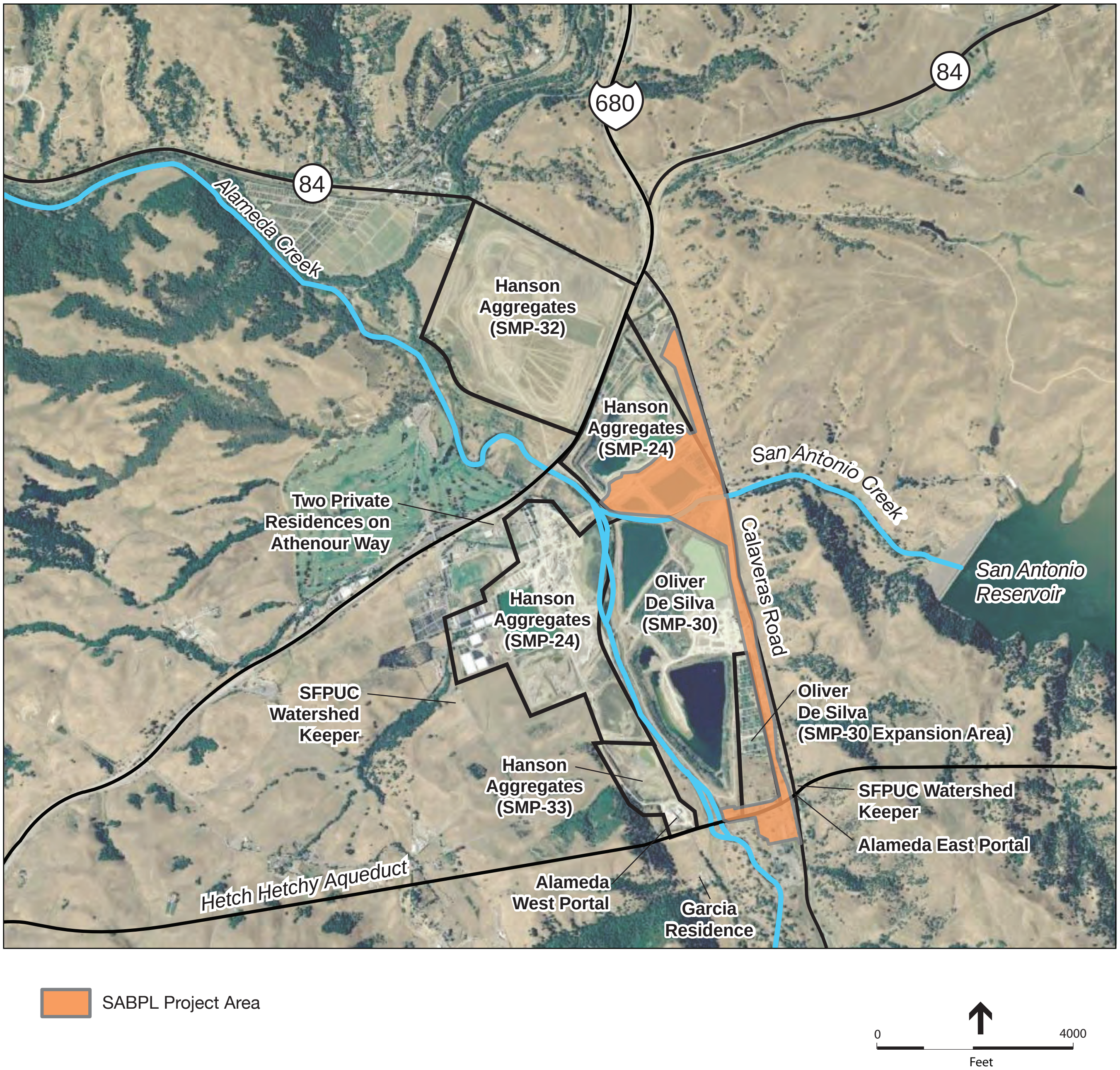
expected to be complete in 2014 (SFPUC, 2010a). Thus, construction of the NIT project is anticipated to overlap with construction of the SABPL project. Construction activities associated with the NIT project have changed the physical conditions in some portions of the project area as a result of site clearing, tree removal, grading, etc. In addition, spoils generated during construction of the NIT project have been placed in an earthen berm at the North Spoils Site.

- *SFPUC Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir Project (SVWTP Expansion project)*. This SFPUC project includes construction of a treated water reservoir and improvements to the SVWTP to increase treatment capacity. The SVWTP Expansion project is located on Calaveras Road, approximately 1 mile south of the SABPL project. Like the SABPL project, spoils generated during construction of the SVWTP Expansion project could be permanently placed at the North Spoils Site. In addition, the SVWTP Expansion project also analyzed the option of placing spoils in Pit F3-West and Pit F2-West, assuming the lease between the SFPUC and Hanson Aggregates for the SMP-24 area is terminated before construction is completed. Since the SFPUC intends to extend this lease (discussed in Section 3.4 of Chapter 3, Project Description, of this EIR), the cumulative analysis in this EIR assumes that spoils will not be placed in these quarry pits but rather at one of the two additional spoils disposal sites near the SVWTP (San Francisco Planning Department, 2009b). Construction of the SVWTP Expansion project began in 2010 and is expected to be complete in 2013 (SFPUC, 2010b); thus, the construction schedule is anticipated to overlap with construction of the SABPL project. Spoils generated during construction of the SVWTP Expansion project have been placed in an earthen berm at the North Spoils Site.

- *SFPUC San Antonio Pump Station Upgrade*. This SFPUC project includes internal upgrades to the pump station and seismic retrofits to the pump station building (i.e., reinforcing the interior walls with shotcrete, extending the foundation, and connecting the roof to the walls). Construction of the San Antonio Pump Station Upgrade project began in early 2010 and is expected to be complete by late 2011 (SFPUC, 2010c), before construction of the SABPL project begins. The San Antonio Pump Station is located within the SABPL project area at the southern terminus of the proposed backup pipeline; thus, this project could contribute to cumulative impacts at the southern portion of the project area.

  SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion project). The SMP-30 area is within CCSF-owned land that is currently leased to, and operated by, Oliver de Silva, Inc. The quarry company is seeking to expand the sand and gravel mining area currently permitted under SMP-30 by 58 acres, for a total of 367 acres, as well as construct an asphalt batch plant and concrete batch plant onsite. Implementation of the project is contingent on an extension of a lease agreement between the SFPUC and Oliver de Silva, Inc. for the SMP-30 expansion area and permit approvals from Alameda County for the expanded mining area. As conditions of the extended lease agreement and expansion, the quarry operator would be required to construct a cutoff wall along the western and northern boundaries of the SMP-30 area to reduce the inflow of water from Alameda and San Antonio Creeks into active SMP-30 mining pits, and also to implement creek restoration improvements along the same creek banks (SFPUC, 2009). **Figure 5.1-2** shows the existing SMP boundaries and the planned SMP-30 expansion area. Although the construction schedule for the improvements proposed under the SMP-30 Expansion project is not known at this time, it is possible that construction activities could overlap with construction of the SABPL project. Furthermore, due to the close proximity of the two projects and the potential for the project areas to intersect geographically at the location where the proposed backup pipeline crosses San Antonio Creek, this project could affect similar resources and contribute to cumulative impacts.



SOURCE: ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.1-2
Surface Mining Permit Areas

5.1.5 References

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5.2 Land Use

This section describes existing land uses in the vicinity of the proposed San Antonio Backup Pipeline (SABPL) project and evaluates the potential land use impacts of the proposed project. Mitigation measures to avoid or reduce adverse impacts are identified, as appropriate. Impacts on recreational land uses are evaluated in Section 5.11, Recreation.

5.2.1 Setting

5.2.1.1 Existing Land Use

The project site is located within the Sunol Valley in unincorporated Alameda County, east of Interstate 680 (I-680) and south of the junction of I-680 and State Route 84 (SR 84) on Alameda watershed lands owned by the City and County of San Francisco (CCSF) and managed by the SFPUC. The Alameda watershed is largely undeveloped and consists primarily of rolling grassland and scattered oak woodlands. Existing SFPUC facilities within the Sunol Valley include water supply storage facilities (Calaveras and San Antonio Reservoirs); numerous transmission facilities (including the Alameda Siphons, Coast Range and Irvington Tunnels, Calaveras Pipeline, San Antonio Pipeline, and San Antonio Pump Station); and water treatment facilities (Sunol Valley Water Treatment Plant [SVWTP], Sunol Valley Chloramination Facility, a fluoride facility, and the existing chemical facility) (see Figures 3-1 and 3-2 in Chapter 3, Project Description).

Other land uses in the vicinity of the proposed project include gravel mining operations, commercial nurseries, grazing land, and regional open space. Two commercial gravel quarries, operated by Hanson Aggregates and Oliver De Silva, Inc. under Surface Mining Permit 24 (SMP-24) and Surface Mining Permit 30 (SMP-30), respectively, are located along Alameda Creek between the Alameda Siphons to the south and I-680 to the north. Both Hanson Aggregates and Oliver De Silva lease Alameda watershed lands from the CCSF. There are two former commercial nursery sites within the project area: the former nursery within Staging Area C and the work platform for the cutoff wall was vacated in 2010 (see Figures 3-4 through 3-6), and the former nursery between Pit F6 and Calaveras Road was vacated in 2009 (see Figure 3-3). As described in Section 5.19, Agriculture and Forest Resources, the California Department of Conservation has mapped a portion of the SABPL project area (i.e., the former nursery within Staging Area C) as Unique Farmland and the remainder of the project area as Grazing Land and Other Land[1] (CDC, 2011). In addition, there are two private residences in the immediate project vicinity: a SFPUC watershed keeper's residence near the Alameda East Portal, approximately 225 feet east of Calaveras Road and the project area; and a private ranch residence (Garcia residence), approximately 1,300 feet southwest of the project area. Three public parks and open space areas managed by the East Bay Regional Park District (EBRPD) are located within 5 miles of the project area. The Sunol Regional Wilderness is the closest EBRPD park to the project area; the closest

[1] This classification is used for predominantly undeveloped land that is not considered suitable for agriculture or grazing and can include brush, timber, wetlands, confined livestock areas, strip mines, gravel pits, and other land types.

hiking trail is approximately 1.2 miles to the southeast. The nearest urban areas are the unincorporated town of Sunol, approximately 1 mile northwest of the project area, and the city of Fremont, approximately 4 miles to the west.

5.2.2 Regulatory Framework

5.2.2.1 Federal Regulations

No federal land use regulations directly apply to the proposed project.

5.2.2.2 State Regulations

No state land use regulations directly apply to the proposed project.

5.2.2.3 Local Regulations

Under California Government Code Section 53090, et seq., the SFPUC receives intergovernmental immunity from city and county zoning and building ordinances. Refer to Chapter 4, Plans and Policies, for a discussion of the regulatory setting related to land use plans and policies and more detailed information concerning intergovernmental immunity.

5.2.3 Impacts and Mitigation Measures

5.2.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to land use, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Have a substantial impact on the existing character of the vicinity; or
- Substantially disrupt or displace existing land uses or land use activities.

5.2.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the first significance criterion; therefore, no impact discussion is provided for this topic for the reasons described below. In addition, there would be no long-term or operational impacts related to the second significance criterion for the reasons described below; therefore, the impact discussion for this topic focuses on the potential effects of project construction. The criterion related to conflicts with land use plans, policies, or regulations is applicable to the proposed project but is evaluated in Chapter 4, Plans and Policies.

- *Physically Divide an Established Community*. The project area is located in a largely undeveloped area of the Sunol Valley and is not within an established community. The proposed backup pipeline alignment, 12-inch-diameter water pipeline to the town of Sunol, transfer pipeline, and dewatering pipeline would be constructed underground. Aboveground structures that would be constructed under the proposed project include the new chemical facility, Alameda Creek Pump Station, two electrical control buildings, discharge facility at Pit F3-East, electrical transformer, overhead powerlines, and various access manholes and vaults. None of the project components would divide an established community or divide established land uses. Thus, the criterion related to the division of an established community is not applicable to the proposed project and is not discussed further.

- *Substantially Disrupt or Displace Existing Land Uses or Land Use Activities During Project Operations*. Long-term impacts related to land use disruption would occur if the SABPL project permanently displaced or disrupted established land uses due to project siting or operation. Most of the proposed facilities and improvements would be constructed underground and would not permanently displace existing land uses nor disrupt access to existing land uses. The aboveground facilities near the southern terminus of the backup pipeline would be within an area already used for SFPUC water supply facilities. The discharge valve vault and electrical control building would share a parcel with another CCSF-owned facility—the HHWP Calaveras Substation—and would not displace existing land uses. Pits F3-East and F3-West, where all other aboveground facilities are proposed, are no longer actively mined; the pits are used by Hanson Aggregates for water storage and management to support active mining operations in the SMP-32 area. As discussed in Section 3.4 in Chapter 3, Project Description, the SFPUC would work cooperatively with Hanson Aggregates to manage water levels in the quarry pits. Therefore, no impact related to the permanent disruption or displacement of existing land uses would result from facility siting. Periodic operations review and maintenance of the proposed facilities would be similar to existing conditions and also would not disrupt or displace existing land uses or land use activities. Therefore, there would be no impact related to the permanent disruption or displacement of existing land uses resulting from facility siting or operations. Thus, the criterion related to the displacement or disruption of established land uses or land use activities is not applicable to facility siting or project operations, and is discussed below only as it relates to project construction (see Impact LU-2).

This analysis considers the proposed project's potential to adversely affect the existing character of the vicinity and the project's potential to substantially disrupt or displace existing land uses or land use activities. It evaluates the potential for temporary, indirect impacts on land use during construction as well as long-term impacts resulting from project siting and operations. Construction activities could generate a combination of short-term effects, including emissions of criteria air pollutants, increased noise levels, traffic safety hazards, and impeded access related to traffic congestion and detours. These effects could indirectly disturb or disrupt land uses in the vicinity of the project area in a way that substantially alters the land use character. The direct physical impacts related to each of these topics are discussed separately in Sections 5.6, Transportation and Circulation; 5.7, Noise and Vibration; and 5.8, Air Quality. Long-term effects on the existing land use character in the project vicinity could occur if the project resulted in a long-term change in land use that was incompatible or conflicted with established land uses.

5.2.3.3 Summary of Impacts

Table 5.2-1 lists the project's land use impacts and significance determinations.

TABLE 5.2-1
SUMMARY OF IMPACTS – LAND USE

Impacts	Significance Determinations
Impact LU-1: Project construction would not have a substantial impact on the existing character of the vicinity.	LS
Impact LU-2: Project construction could substantially disrupt or displace existing land uses or land use activities.	LSM
Impact LU-3: Project operations would not result in substantial long-term or permanent impacts on the existing character of the vicinity.	LS
Impact C-LU: Project construction would result in a cumulatively considerable contribution to cumulative impacts on existing land uses.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.2.3.4 Construction Impacts and Mitigation Measures

Impact LU-1: Project construction would not have a substantial impact on the existing character of the vicinity. (Less than Significant)

Temporary adverse impacts on the character of the project area could occur if the project substantially disturbed existing land uses or impeded access to land uses during construction.

Project construction activities would take place over an approximately 21-month period. Construction activities associated with the proposed project would involve the operation of diesel-powered construction equipment and vehicles and would increase noise, traffic, and emissions of criteria air pollutants. However, these disruptions would be temporary, and the types of construction equipment and vehicles would be similar to those being used for existing operations at the adjacent aggregate quarries. Thus, the land use character of the project vicinity during construction of the SABPL project would be similar to, and consistent with, the existing land use character of the vicinity. The closest sensitive residential receptor, the SFPUC watershed keeper's residence near the Alameda East Portal, is 225 feet from the project area. Project construction activities would result in short-term noise increases and emissions of criteria pollutants (refer to the discussions under Impact NO-1 in Section 5.7, Noise and Vibration, and under Impact AQ-1 in Section 5.8, Air Quality); however, due to the distance between project activities and sensitive receptors and because the types of equipment used for SABPL project construction would be similar to the equipment used for operations at the adjacent quarries, these indirect noise and air quality impacts would not substantially alter the land use character of the project vicinity.

Project construction activities would result in construction vehicles traveling to and from the project area along Calaveras Road during construction. Construction vehicle traffic could result in increased traffic safety hazards for automobiles, bicyclists, and pedestrians traveling along Calaveras Road, as well as temporary traffic delays associated with construction vehicles—which have a wider turning radius than automobiles—as they turn west into the quarry access roads. As discussed under Impact TR-1 in Section 5.6, Transportation and Circulation, short-term increases in traffic volumes on Calaveras Road during construction of the SABPL project would not substantially affect existing traffic levels or roadway capacity. Although construction-related vehicle trips would increase traffic safety hazards for pedestrians and bicyclists on Calaveras Road (see Impact TR-3 in Section 5.6), this effect would not substantially change the land use character of the vicinity, because the potential for conflicts and increased traffic safety hazards would have a limited effect on land use. Therefore, the indirect effects of project-related construction noise, emissions of criteria pollutants, traffic safety hazards, and construction traffic would not substantially alter the existing character of the project vicinity. This land use impact would be less than significant, and no mitigation is necessary.

Impact LU-2: Project construction could substantially disrupt or displace existing land uses or land use activities. (Less than Significant with Mitigation)

Temporary land use disturbance adjacent to construction activities could result from a combination of effects, including noise, vibration, dust, traffic delays, and/or access disruption. Each of these potential construction effects is evaluated separately in Sections 5.6, Transportation and Circulation; 5.7, Noise and Vibration; and 5.8, Air Quality; however, the intensity or potential combination of these construction effects is considered in this section as a land use disruption issue. Land use displacement would occur if implementation of the project required temporary relocation of existing land uses to accommodate construction, or temporarily restricted land use activities.

As described in Section 5.2.1, above, existing land uses in the vicinity of the project area include SFPUC water supply facilities, two gravel quarries (the SMP-30 and SMP-24 areas), private residences, the Hetch Hetchy Water & Power (HHWP) Calaveras Substation, grazing land, and regional open space. The proposed facilities, most of which would be constructed underground, are located among other SFPUC facilities or within vacant areas. Construction staging areas would be located on CCSF-owned lands that are bordered by SFPUC facilities and active quarry areas, or are in proximity to private residences.

Throughout the approximately 21-month construction period, temporary disruption of existing land uses could occur from adjacent construction activities and associated effects, such as increases in noise, traffic safety hazards, and emissions of criteria pollutants. The combination of construction-related noise and dust/exhaust emissions could adversely affect daytime land use activities (i.e., reading or watching television) at the nearby residences. In addition, project construction would increase vehicle and truck traffic along Calaveras Road, which would generate noise and diesel emissions and potentially increase traffic safety risks for adjacent land uses (due to the increased potential for conflicts between construction vehicles and non-construction-related automobiles, as discussed under Impact TR-3 in Section 5.6, Transportation and Circulation).

Construction-related noise, air quality, and traffic safety effects along Calaveras Road could combine to substantially disrupt existing land uses, and the impact on existing land uses would be potentially significant. However, temporary disruption impacts could be reduced to a less-than-significant level through implementation of the mitigation measures identified below.

Mitigation Measure M-TR-3: Traffic Control Plan.

(See Impact TR-3 in Section 5.6, Traffic and Circulation, for description.)

Mitigation Measure M-NO-1: Administrative and Source Controls.

(See Impact NO-1 in Section 5.7, Noise and Vibration, for description.)

Mitigation Measure M-AQ-1a: BAAQMD Basic Construction Measures.

(See Impact AQ-1 in Section 5.8, Air Quality, for description.)

Mitigation Measure M-AQ-1b: BAAQMD Additional Construction Measures for NOx Reduction.

(See Impact AQ-1 in Section 5.8, Air Quality, for description.)

These measures would reduce the potential for land use disruption by addressing: traffic hazards through safety protocols and traffic control measures to maintain safe traffic flow along Calaveras Road; indirect noise impacts through implementation of noise control measures during construction; and temporary increases in air emissions for nearby residences by requiring construction practices that limit fugitive dust and exhaust emissions. Therefore, this impact would be less than significant with mitigation.

5.2.3.5 Operational Impacts and Mitigation Measures

Impact LU-3: Project operations would not result in substantial long-term or permanent impacts on the existing character of the vicinity. (Less than Significant)

Impacts on the existing land use character in the project vicinity could occur if the SABPL project resulted in a long-term change in land use that would be incompatible or conflict with established land uses.

The proposed SABPL project would be constructed entirely within lands owned by the CCSF. Project components that would be installed below ground would not be visible and therefore would not substantially alter the existing character of the project area. For instance, the backup pipeline, water pipeline to the town of Sunol, transfer pipeline, dewatering pipeline, and cutoff wall around quarry Pits F3-East and F3-West would be constructed underground and would not be visible upon the completion of construction. Underground project components would not result in long-term or permanent impacts on the existing land use character of the vicinity.

Some aboveground facilities of the proposed project would be visible and could potentially affect the existing character of the project vicinity. Project facilities that would rise approximately one story above ground include: the new chemical facility, Alameda Creek Pump Station; two electrical control buildings; three air gaps; electrical transformer; and overhead powerlines between the HHWP Calaveras Substation and the Alameda Creek Pump Station, and between the substation and the electrical control building for the discharge facility at Pit F3-East. Elements that would rise no higher than 3 feet above ground include the blowoff valves, air release valves, flow meter, sampling station, and portions of the discharge facility at Pit F3-East.

All of these aboveground elements would be located near other SFPUC water infrastructure and would be relatively small in scale when compared to existing features in the area, such as SFPUC water supply facilities (e.g., Sunol Valley Chloramination Facility, existing fluoride facility, San Antonio Pump Station, Alameda East Portal) and the large quarry pits and equipment associated with the gravel quarries. More specifically, the new chemical facility would be adjacent to other SFPUC buildings of similar size and appearance, and therefore would not substantially affect the character of the vicinity. The new 15-foot-long, 15-foot-wide, and 16-foot-tall electrical control building on the south side of San Antonio Creek would be near several existing overhead electrical transmission towers and the HHWP Calaveras Substation, all of which are larger and more prominent than the proposed electrical control building, and therefore this building would not substantially alter the character of the project vicinity.

A portion of the excess spoils generated during project construction could be permanently placed in an earthen berm at the North Spoils Site and in an earthen berm at the former nursery site located to the east of Pit F3-East within Staging Area C. Because the earthen berms would be set back from Calaveras Road and would not tower over the road, and because they would be vegetated with grass varieties that occur in the surrounding area, the earthen berms would not substantially alter the character of the project vicinity. Thus, the land use character of the vicinity following implementation of the proposed project would be similar to and consistent with the existing land use character of the immediate vicinity. Therefore, the proposed project would not substantially affect the character of the vicinity; permanent impacts on the existing character of the project area would be less than significant. No mitigation is required.

5.2.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Pumping Variant 1 would not include construction of the Alameda Creek Pump Station, wet well, control building for the pump station, retaining wall along the southern boundary of the pump station site adjacent to the access road, or the transfer pipeline; thus, the total excavation and volume of excess spoils under this variant would be less (108,750 cubic yards of soils versus 118,250 cubic yards of soil) than that of the proposed project. However, daily truck trips related to offsite spoils disposal would be the same as the proposed project. When compared to the proposed project, which would include construction of the above-mentioned facilities over approximately five months, Pumping Variant 1 could also result in a slight reduction in construction worker vehicle traffic during these same five months due to the elimination of these facilities, and an overall slight reduction in haul truck traffic due to the reduction in excess spoils associated with the elimination of these facilities. The elimination of these facilities would also slightly reduce noise generated by construction equipment, traffic noise, traffic safety hazards, and emissions of criteria pollutants. However, despite the reduction in these impacts, and the associated reduction in secondary effects on land use, the overall impact conclusions and mitigation measures identified in Section 5.2.3.4, above, would not change.

As with the proposed project, Pumping Variant 1 would not result in substantial long-term effects on land use character because project facilities would be similar to and consistent with existing land uses in the immediate vicinity. Although Pumping Variant 1 would result in a slight reduction in operational noise due to the elimination of the Alameda Creek Pump Station (noise generated by the submersible pumps would be attenuated because these pumps would be underground), overall operational noise impacts associated with this variant would be similar to the proposed project. Thus, implementation of Pumping Variant 1 would not change the analysis and conclusions presented in Section 5.2.3.5, above.

Pumping Variant 2

While the proposed project would install two low-pressure submersible pumps adjacent to the new discharge facility at Pit F3-East, Pumping Variant 2 would include one high-pressure and one low-pressure submersible pump at this same location. Overall, Pumping Variant 2 would include construction of the same facilities as with the proposed project, would involve the same construction activities and equipment, and would have the same construction schedule as the proposed project. Thus, Pumping Variant 2 would result in the same construction-related impacts on land use character and disruption of land uses as those described for the proposed project in Section 5.2.3.4, above. In addition, as with the proposed project, Pumping Variant 2 would not result in substantial long-term effects on land use character because project facilities would be similar to and consistent with existing land uses in the immediate vicinity. Thus, implementation of Pumping Variant 2 would not change the analysis and conclusions presented in Section 5.2.3.5, above.

5.2.3.7 Cumulative Impacts and Mitigation Measures

Impact C-LU: Project construction would result in a cumulatively considerable contribution to cumulative impacts on existing land uses. (Less than Significant with Mitigation)

The geographic scope for potential cumulative land use impacts encompasses land uses in the vicinity of the SABPL project area. This area generally includes the SFPUC Alameda watershed lands east of I-680 and south of the I-680 and SR 84 junction.

Construction-Related Effects on Existing Land Use Character of the Vicinity

Cumulative impacts on the existing character of the project vicinity resulting from increases in construction-related noise, traffic congestion, traffic safety hazards, or emissions of criteria air pollutants could be significant if the construction schedule for the proposed project overlapped with the schedules for other projects in the same vicinity. As described above in Impact LU-1, the SABPL project would not substantially alter the existing character of the project vicinity during construction because of the temporary nature of the construction activities and because the types of construction equipment and vehicles would be similar to those being used for current operations at the adjacent aggregate quarries. Construction of five of the cumulative projects identified in Table 5.1-6 would be located adjacent to or near the SABPL project area and could overlap in schedule: the Upper Alameda Creek Filter Gallery (Filter Gallery) project, New Irvington Tunnel (NIT) project, the Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir (SVWTP Expansion) project, Various Pipeline Inspection projects, and the SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project. Although construction of these projects could overlap with construction of the SABPL project, cumulative impacts related to the existing character of the project vicinity would remain less than significant because, as with the proposed project, the construction activities would be temporary and the types of construction equipment and vehicles would be similar to those used for existing operations at the adjacent aggregate quarries. Thus, cumulative land use impacts related to the existing character of the project vicinity during construction would be less than significant. No mitigation is necessary.

Land Use Disruption during Construction

As described in Impact LU-2, the SABPL project would have a potentially significant impact related to land use disruption due to the effects of construction-related noise, air quality, and traffic safety hazards along Calaveras Road. Construction of six cumulative projects identified in Table 5.1-6 could overlap in schedule with construction of the SABPL project and affect construction-related traffic, noise, dust, and/or diesel emissions in the Sunol Valley: the Filter Gallery project, the NIT project, the SVWTP Expansion project, the Calaveras Dam Replacement project, the SMP-30 Expansion project, and various pipeline inspection projects. Because these projects could cumulatively increase construction-related traffic, noise, dust, and diesel emissions in the Sunol Valley, cumulative impacts related to disruption of land uses in the Sunol Valley during construction of these projects would be significant, and the SABPL project's contribution to this cumulative impact would be cumulatively considerable. As described in Impact LU-2, the SABPL project's impact related to land use disruption would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-TR-3 (Traffic Control Plan)** (see Section 5.6, Traffic and Circulation, for description); **M-NO-1 (Administrative and Source Controls)** (see Section 5.7, Noise and Vibration, for description); and **M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for** NO_x **Reduction)** (see Section 5.8, Air Quality, for descriptions). These mitigation measures include provisions to reduce construction-related noise, air emissions, traffic, and traffic safety hazards during construction of the SABPL project. However, even with implementation of these mitigation measures, the SABPL project's contribution to cumulative land use disruption impacts could remain cumulatively considerable due to the cumulative increase in traffic safety hazards. Implementation of **Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan)**, described in Section 5.6, Traffic and Circulation, would specifically address cumulative land use disruption impacts associated with increased traffic safety hazards by requiring the SFPUC to coordinate the project-specific traffic control plans of SFPUC construction projects in the Sunol Valley and identify measures to minimize cumulative traffic-related impacts. Therefore, with the implementation of mitigation, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Long-Term Effects on Existing Land Use Character of the Vicinity

Long-term or permanent cumulative impacts on the existing character of the project vicinity could occur if the proposed project and cumulative projects in the Sunol Valley involved the construction of permanent aboveground facilities or altered the landscape in the same area. As described under Impact LU-3, above, the SABPL project would not result in long-term adverse effects on the existing character of the project vicinity because all of the proposed aboveground structures would be of similar size and appearance as other SFPUC water supply facilities and adjacent mining facilities. The Filter Gallery project, NIT project, SVWTP Expansion project, Alameda Siphons Seismic Reliability Upgrade project, and San Antonio Pump Station Upgrade project all involve construction or alteration of water supply facilities that may be publicly visible. However, these improvements would take place in proximity to other SFPUC water supply facilities and would be relatively small in scale when compared to existing water supply infrastructure in the area, such as the Sunol Valley Chloramination Facility, fluoride facility, San Antonio Pump Station, and Alameda East Portal, and when compared to the large quarry pits, equipment, and improvements associated with the gravel quarries. The SMP-30 Expansion project also involves the construction of permanent aboveground facilities. However, these aboveground improvements would not contribute to cumulative impacts related to the existing land use character of the project vicinity because quarries and related facilities already exist in the Sunol Valley. Further, the earthen berms at the North Spoils Site and at the former nursery site located within Staging Area C would be set back from Calaveras Road, would not tower over the road, and would be vegetated with grass varieties that occur in the surrounding area. Thus, no significant cumulative land use impacts related to the existing character of the project vicinity would occur. No mitigation is necessary.

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are similar to or the same as those of the proposed project (refer to Section 5.2.3.6, Impact Analysis for Pumping Variants), the cumulative impact analysis and related conclusions provided above would not change if either project variant is implemented.

5.2.4 References

California Department of Conservation (CDC), Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Alameda County Important Farmland 2010 (vector digital data). Published April 2011.

5.3 Aesthetics

This section addresses the potential aesthetic and visual quality impacts associated with implementation of the proposed San Antonio Backup Pipeline (SABPL) project. Aesthetic resources, commonly referred to as visual resources, are defined as the visible natural and built landscape features that surround a project site. This section describes the existing visual setting in the project vicinity and evaluates the potential effects of the proposed project on visual resources, including views from designated scenic roads, scenic areas, and public view corridors.

5.3.1 Setting

The discussion below defines the terms used in the aesthetics evaluation and identifies scenic resources, scenic routes, scenic vistas, and public view corridors in the project vicinity. For the purpose of the aesthetics evaluation, the physical setting includes work areas, spoils sites, staging areas, and surrounding areas from which there are views that could be affected by implementation of the SABPL project.

5.3.1.1 Definitions

Visual character, visual quality, and visual sensitivity are three terms used throughout this section. *Visual character* is the unique set of landscape features that combines to make a view, including native landforms, water, and vegetation patterns as well as built features such as buildings, roads, and other structures. *Visual quality* is the intrinsic appeal of a landscape or scene due to the combination of natural and built features in the landscape. Natural and built features combine to form unique perspectives with varying degrees of visual quality, which is rated in this analysis as high, medium, or low. *Visual sensitivity* reflects the level of interest or concern that the viewer has for a particular visual resource. Visual sensitivity is a measure of how noticeable proposed changes might be in a particular setting and is determined based on the distance from a viewer, the proposed changes, and the duration that a particular view would be available to the viewer. Areas such as scenic vistas, parks, trails, and scenic roadways typically have high visual quality and sensitivity because these locales appear natural, view durations are typically long, and close-up views are more commonly available.

5.3.1.2 Regional Setting

The SABPL project is located in the Sunol Valley in unincorporated Alameda County, within Alameda watershed lands owned by the City and County of San Francisco (CCSF) and managed by the SFPUC. The SFPUC Alameda watershed encompasses approximately 36,000 acres of rolling grassland and native oak woodland within the much larger hydrologic boundary of the Alameda Creek watershed, east of the westernmost ridgeline of the Diablo Range. Regional and local access to the project area is provided by Calaveras Road, which runs in a north-south direction throughout the Sunol Valley. Other major roadways in the project vicinity include Niles

Canyon Road[1] northwest of the project area, and Interstate 680 (I-680) and State Route 84 (SR 84), just north of the project area. Alameda County has designated Calaveras Road and Niles Canyon Road as scenic roads, and the portion of I-680 nearest the project area is a state-designated scenic highway (Alameda County, 2002). Alameda Creek flows in a northerly direction parallel to and approximately 1,000 to 1,200 feet west of Calaveras Road (SFPUC, 2001). Because this largely undeveloped area offers views of rolling hills, the visual quality of the Sunol Valley region is considered high.

5.3.1.3 Project Vicinity

Figure 5.3-1 provides a key to photographs of the project vicinity from multiple vantage points. In the southern portion of the project area, the SFPUC currently operates several water facilities that have visible aboveground components; these include the San Antonio Pump Station, an existing chemical facility, and the Sunol Valley Chloramination Facility. The SFPUC leases land in the Sunol Valley for gravel mining and livestock grazing. Several high-voltage transmission towers traverse the project area, and overhead electricity lines parallel Calaveras Road. To the east of Calaveras Road the land is largely undeveloped, consisting of grass-covered hills interspersed with native trees such as oaks and sycamores. One private ranch residence (Garcia residence) is located on the valley floor approximately 1,300 feet southwest of the project area, and the SFPUC watershed keeper occupies a residence just north of the Alameda East Portal, approximately 225 feet east of the project area and Calaveras Road. There are no other private residences in the project vicinity with views of the proposed facilities. Although the project area is largely disturbed (e.g., gravel quarries, transmission towers, electricity lines, SFPUC water supply facilities), the visual quality in the Sunol Valley is considered high because long-range views of hills and native vegetation are available from Calaveras Road.

Public View Corridors

From I-680 and the Sunol Valley Golf Course, views of the project area are very distant and indistinct, as shown in **Figure 5.3-2** (Photo 1). Motorists on I-680 in the project vicinity have partial views of the quarries and overhead transmission lines along the valley floor; however, views predominantly consist of rolling, grass-covered hills and intervening vegetation. Because views from I-680 are distant, indistinct, and fleeting, the viewer sensitivity from this highway is considered low.

As previously mentioned, Calaveras Road is a county scenic road that provides primary access throughout the project area and is heavily used by motorists and bicyclists. On the eastern side of Calaveras Road, motorists and cyclists are afforded scenic views of rolling grasslands. Views of the project area from Calaveras Road primarily consist of multiple transmission lines, aggregate quarries, and SFPUC water supply facilities, as shown in Photo 2 in Figure 5.3-2, and Photos 3 and 4 in **Figure 5.3-3**. The project area is not visible from Niles Canyon Road.

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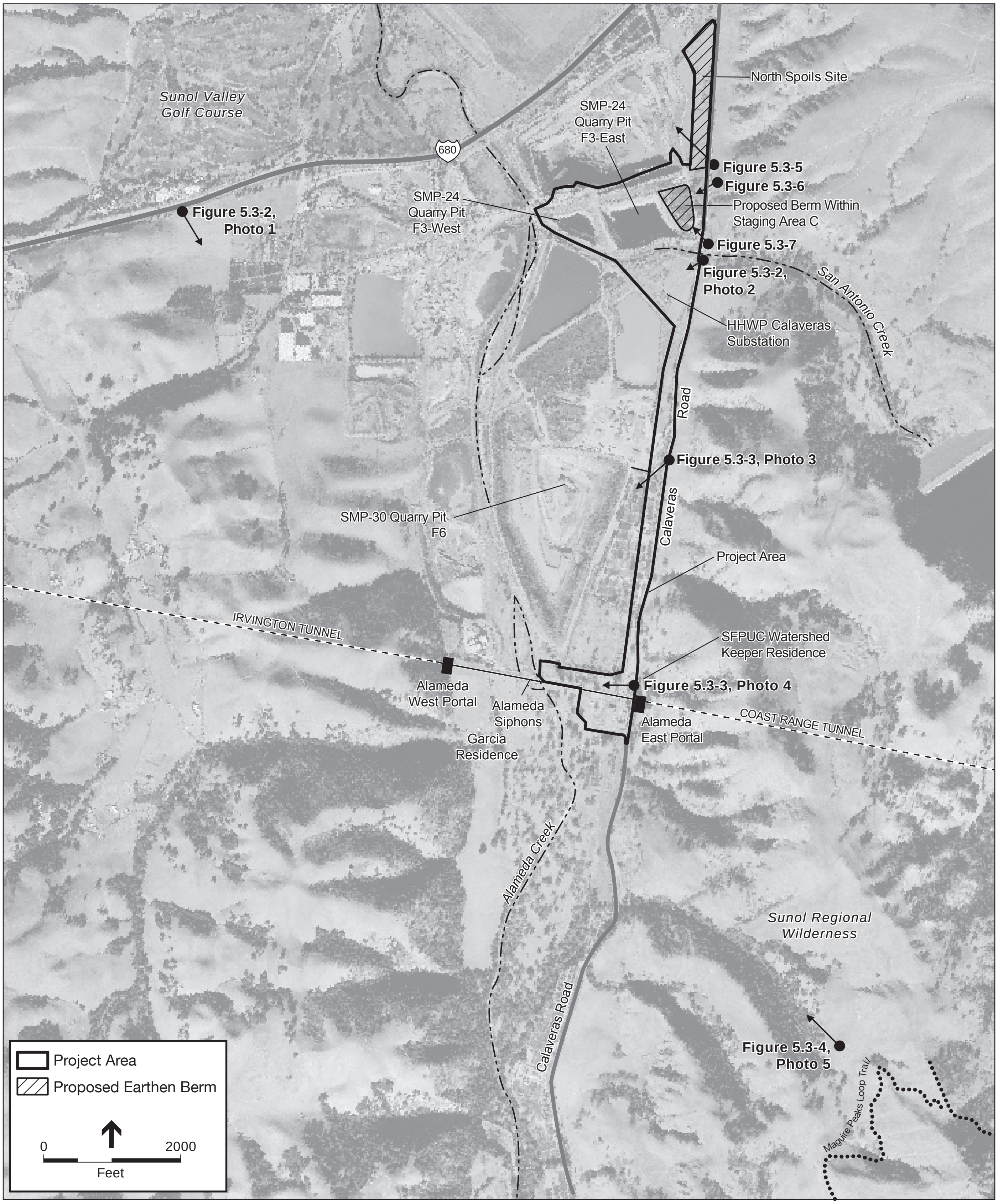
1 Calaveras Road becomes Niles Canyon Road after it crosses Interstate 680.



SOURCE: San Francisco Planning Department, 2009; ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.3-1
Vantage Points for Photos and Simulations

Photo 1 - View looking southeast from I-680 towards the Sunol Valley.

Photo 2 - View of Staging Area B looking southwest from Calaveras Road.

SOURCE: San Francisco Planning Department, 2009; ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.3-2
Representative Photos from Public Viewing Locations in Sunol Valley (Photos 1 and 2)

Photo 3 - View looking west at quarry Pit F6 from Calaveras Road.

Photo 4 - View of proposed chemical facility site looking west from Calaveras Road.

SOURCE: San Francisco Planning Department, 2009; ESA+Orion, 2011

Figure 5.3-3
Representative Photos from Public Viewing Locations in Sunol Valley (Photos 3 and 4)

Views from the Garcia residence, located approximately 1,900 feet west of Calaveras Road and approximately 1,300 feet southwest of the project area, consist of aggregate quarries and SFPUC water facilities (such as the Sunol Valley Chloramination Facility and San Antonio Pump Station) in the foreground and rolling hills in the background. Because the setting surrounding this residence is already disturbed, the viewer sensitivity is considered low. Views from the SFPUC watershed keeper's residence (which is approximately 225 feet east of the project area and Calaveras Road, just north of the Alameda East Portal) also include aggregate quarries and SFPUC facilities in the foreground and hillsides in the background. Because this viewer is accustomed to the ongoing operation of SFPUC facilities, viewer sensitivity is considered low.

The Maguire Peaks Loop Trail, located approximately 1.2 miles southeast of the project area within the Sunol Regional Wilderness, is the nearest recreational trail to the project area. The trail offers views of the Sunol Valley, including the southern portion of the project area and quarry Pit F6, as shown in **Figure 5.3-4** (Photo 5). Although the quarry pits operated under Surface Mining Permit 30 (SMP-30) are partially visible, the project area is largely obscured by intervening topography. Since views are relatively distant and intervening topography obstructs views of the project area, viewer sensitivity from the Sunol Regional Wilderness is considered low.

5.3.2 Regulatory Framework

5.3.2.1 Federal Regulations

No federal regulations related to aesthetics apply to the proposed project.

5.3.2.2 State Regulations

In 1963, the state legislature established the California Scenic Highway Program, a provision of the Streets and Highways Code, to preserve and enhance the natural beauty of California (Caltrans, 1996). The State Highway System includes highways that are either eligible for designation as scenic highways or have been designated as such. I-680, located approximately 0.75 mile north of the project area, is the only state-designated scenic highway in the project vicinity.

5.3.2.3 Local Policies

Alameda Watershed Management Plan

The *Alameda Watershed Management Plan* (Alameda WMP) guides the management of land in the SFPUC Alameda watershed. The WMP contains design guidelines for construction activities as well as policies aimed at protecting and restoring the vegetation of the watershed. The following guidelines and policies relate to visual resources and are applicable to the SABPL project:

- *Action des 5A*: Where grading is necessary, contour slopes and landforms to mimic the surrounding environment as much as possible.

Photo 5 - View from Maguire Peaks Loop Trail, looking northwest towards Pit F6

SOURCE: San Francisco Planning Department, 2009; ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.3-4
Partial View of Quarry Pit F6 from
Sunol Regional Wilderness (Maguire Peaks Loop Trail)

- *Action des 5B*: Design and site new roads and trails to minimize grading and the visibility of cut banks and fill slopes.

- *Action des 5D*: Incorporate architectural siting/design elements that are compatible with the applicable surroundings (i.e., style, scale, form, texture, color).

- *Action des 5E*: Eliminate, wherever possible, the use of unpainted metallic surfaces and other sources that may cause increased levels of reflectivity.

- *Action des 5F*: Exterior lighting shall be directed downward and sited and shielded such that it is not highly visible or obtrusive.

- *Action des 5G*: The silhouette of new structures shall remain below the skyline of bluffs, cliffs, and ridges.

- *Action veg 4*: Prior to initiation of any construction project involving grading, a grading plan shall be prepared by the project proponent and approved by appropriate SFPUC staff. Revegetation of all graded areas shall be required to the maximum extent practicable.

Alameda County General Plan and East County Area Plan

The Scenic Route Element of the Alameda County General Plan designates both Calaveras Road and Niles Canyon Road (SR 84) as scenic roads (Alameda County, 2002). The East County Area Plan provides land use goals and policies relevant to sensitive viewsheds, which are considered "special land uses" within the eastern portion of Alameda County. Relevant policies include:

- *Policy 110:* Requiring that developments be sited to avoid or minimize disturbance of large stands of mature, healthy trees and/or healthy individual trees of notable size and age.

- *Policy 114:* Requiring the use of landscaping to enhance scenic quality and to screen undesirable views; avoiding the alteration of natural topography and vegetation.

- *Policy 166:* Requiring landscaping to reduce the visibility of mining activity and ancillary uses during all phases of quarry operations. Such landscaping should approximate as closely as possible the pre-existing natural conditions (Alameda County, 2002).

5.3.3 Impacts and Mitigation Measures

5.3.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to aesthetics and visual resources, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Have a substantial adverse effect on a scenic vista;

- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting;

- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area or substantially affect other people or properties.

5.3.3.2 Approach to Analysis

This section evaluates potential impacts on visual resources that could occur during project construction and operations. For the purpose of the analysis, the visual setting is generally defined by the natural and built landscape features that can be seen from public and private vantage points. The overall visual character of a given area results from the unique combination of natural landscape features including landform, water, and vegetation patterns, as well as built features such as buildings, roads, and other structures.

The visual analysis is based on: field observations of the project area and surrounding vicinity; review of project development plans and drawings; review of existing CEQA documentation for other SFPUC projects in the Sunol Valley; evaluations of aerial and ground-level photographs of the project area; and review of relevant planning documents. The evaluation of temporary or short-term visual impacts considers whether construction activities could substantially degrade the existing visual character or quality of the site or surrounding area, as well as the duration over which any such changes would take place. Construction activities occurring in an area for less than one year are typically considered temporary and thus have a less-than-significant impact on visual quality. However, construction activities occurring in an area for over one year could result in significant visual impacts, particularly if scenic vistas are adversely affected.

Permanent visual impacts were assessed based on the project's potential to substantially alter scenic vistas and scenic resources (through such actions as removing trees, introducing new sources of light and glare, or permanently altering the landscape) in a manner that would adversely affect the visual character or quality of the area. In determining impact potential, the assessment also considered the visual sensitivity of the project area. Since damage to scenic resources such as trees, rock outcroppings, and other features of the built or natural environment would typically constitute a long-term effect, the potential for project implementation to damage scenic resources was evaluated solely as a long-term impact and is not included in the analysis of construction-related impacts.

5.3.3.3 Summary of Impacts

Table 5.3-1 lists the proposed project's visual impacts and significance determinations.

TABLE 5.3-1
SUMMARY OF IMPACTS – AESTHETICS

Impacts	Significance Determinations
Impact AE-1: Project construction could result in substantial adverse effects on scenic vistas and temporarily degrade the visual character of the site and its surroundings.	LSM
Impact AE-2: Project construction would not result in significant impacts related to a new source of substantial light or glare.	LS
Impact AE-3: Implementation of the proposed project could result in long-term adverse effects on scenic vistas and scenic resources, and degradation of the visual character of the site and its surroundings.	LSM
Impact AE-4: The proposed project would not create a new permanent source of substantial light or glare.	LS
Impact C-AE: Implementation of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on scenic vistas, scenic resources, and visual character.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.3.3.4 Construction Impacts and Mitigation Measures

Impact AE-1: Project construction could result in substantial adverse effects on scenic vistas and temporarily degrade the visual character of the site and its surroundings. (Less than Significant with Mitigation)

The SABPL project could result in temporary construction-related impacts on scenic vistas and the visual character of the project area and vicinity. Direct views of the project area, including views of construction work areas, are available from Calaveras Road. Distant views of construction activities around the perimeter of Pits F3-East and F3-West could also be available from I-680, a state-designated scenic highway; however, these views are greatly limited due to the distance from the highway as well as the presence of vegetation and topography, which screen views of the project area. There are no other designated scenic roadways or scenic viewpoints from which views of the project area can be seen. Views of construction activities would not likely be noticeable from nearby recreational trails (i.e., the Maguire Peaks Trail) due to their distance from the project area as well as the screening effects provided by vegetation and topography. Potential impacts on scenic vistas and visual character as a result of construction activities are described below.

Construction Activities Along Calaveras Road

For the purpose of this analysis, construction activities along Calaveras Road are those activities that would occur immediately adjacent to the Calaveras Road right-of-way, including installation of the backup pipeline and the 12-inch-diameter water pipeline to the town of Sunol, demolition of the two quarry buildings, and construction staging at Staging Areas B and C. Construction and installation of these pipelines and associated components would be performed using traditional open-trench construction methods and would include clearing and grading the ground surface along the pipeline alignments, excavating the trenches, preparing and installing the pipeline sections, backfilling the trenches, and revegetating or paving the area, as needed. Several work crews would work simultaneously along the length of the pipeline alignments. Installation of the backup pipeline and the 12-inch water pipeline would progress at a rate of approximately 100 to 150 feet per day and would occur over a 15-month period.

In addition, construction staging at Staging Areas B and C,[2] which border the Calaveras Road right-of-way just south and north of the San Antonio Creek crossing, respectively, would occur for the full 21-month project construction period. In general, Staging Areas B and C, and all other staging areas, would be used to store equipment, vehicles, pipe, and other construction materials throughout the construction period.

Motorists and bicyclists traveling on Calaveras Road would have brief views of pipeline construction throughout the duration of pipeline installation activities (15 months), and of Staging Areas B and C throughout the 21-month construction period. However, because these activities would be visible for short durations and would be located against a backdrop of quarry pits, aggregate processing plants, and SFPUC facilities, temporary construction activities would not substantially change the overall visual character of the project vicinity or compromise scenic vistas available from Calaveras Road. Construction activities along Calaveras Road would not be visible from I-680—the closest state-designated scenic highway—due to the distance and intervening topography.

Construction Activities in the Vicinity of the San Antonio Pump Station

Construction activities associated with the new chemical facility would occur just north and northwest of the existing San Antonio Pump Station, approximately 200 feet from Calaveras Road (see Photo 4 in Figure 5.3-3). Construction of the chemical facility would occur over a five-month period. Staging Area A would be sited on the west side of the existing Sunol Valley Chloramination Facility and fluoride facility and therefore would be mostly obscured from public view.

Due to the proximity of this work area to Calaveras Road, construction activities would be visible to motorists and bicyclists traveling on this county-designated scenic road. Construction activities in the vicinity of the San Antonio Pump Station would also be visible from the SFPUC watershed keeper's residence located just north of the Alameda East Portal (approximately 225 feet east of the project area and Calaveras Road) and from the Garcia residence (approximately 1,300 feet southwest of the project area). Views of construction activities from Calaveras Road would be temporary and fleeting, whereas views from the two nearby residences could be seen by only a few individuals in a private setting. Construction activities along Calaveras Road and in the

[2] The former nursery site located within Staging Area C would be used for permanent spoils disposal during the later phases of construction. However, the rest of Staging Area C would be used for staging throughout the 21-month construction duration.

vicinity of the San Antonio Pump Station would not be visible from I-680 due to the distance and intervening topography.

Construction Activities in the Vicinity of Pits F3-East and F3-West

Construction activities in the vicinity of Pits F3-East and F3-West would be associated with the new discharge facility and electrical control building, the cutoff wall, the Alameda Creek Pump Station, wet well, and control building, the transfer pipeline, dewatering facilities, the new electrical transformer and overhead powerlines, dewatering facilities and equipment at Pits F3-East and F3-West, demolition of the two quarry buildings, and related improvements. In general, construction activities would include vegetation removal, grading and excavation, concrete formwork, pipeline cutting, pipeline installation, and backfilling. Large equipment such as long-reach excavators, backhoes, generators, cranes, and bulldozers would be required for the various project components in this area. Construction of the cutoff wall would require an approximately 125-foot-wide work platform along the perimeter of Pits F3-East and F3-West. It is anticipated that Staging Area D, located just north of Pit F3-West, would be used to store equipment, vehicles, pipe, and other construction materials for approximately 16 months during construction for the cutoff wall and pump station.

From Calaveras Road, motorists and bicyclists would have fleeting views of construction activities in the immediate vicinity of Pit F3-East. Views of construction activities associated with the discharge facility, overhead powerlines, and certain sections of the cutoff wall could be visible from some vantage points along Calaveras Road. However, these temporary and intermittent views would be visible in the context of quarry pits and aggregate processing facilities. From Calaveras Road, most views of project areas located west of Pit F3-East would be distant and largely obscured by topography and vegetation.

From I-680, a state-designated scenic highway, motorists could potentially see construction equipment and construction activities occurring in the vicinity of Pits F3-East and F3-West. As described in Section 5.3.1.3 and shown in Figure 5.3-2 (Photo 1), motorists from I-680 have partial views of the quarries and overhead transmission lines in the Sunol Valley; however, these views predominantly consist of rolling, grass-covered hills and intervening buildings and vegetation.

Spoils Management and Disposal

Spoils temporarily placed in Pit F6 would be obscured by the intervening topography and vegetation and would not be distinguishable from existing mining activities in Pit F6. If spoils are temporarily placed at the aggregate processing facility, they could be visible from Calaveras Road; however, views of spoils would be consistent with the visual character of this particular area. A portion of the excess spoils could be placed permanently in an earthen berm at the North Spoils Site, a 12-acre area located immediately south of the I-680/SR 84 interchange on the west side of Calaveras Road, or in an earthen berm at the 5-acre former nursery site located within Staging Area C. Although the North Spoils Site and the former nursery site are both largely obscured from direct view by a row of mature trees along Calaveras Road, earthwork activities and equipment associated with the berms would be intermittently visible from certain vantage points. The permanent visual effects associated with both of these berms are discussed below under Impact AE-3.

Impact Conclusion

Construction activities in the vicinity of Pits F3-East and F3-West could be visible from certain vantage points along I-680. However, views of this work area are fleeting (due to the rate of speed), relatively distant, and largely obscured by topography, vegetation, and structures. Furthermore, Pit F3-West is surrounded on all four sides by quarry operations. Thus, project construction activities would not substantially degrade views from I-680, and the impact would be less than significant.

Although construction activities associated with individual project components would be short term (i.e., would be completed within one year), overall construction is expected to last 21 months. Throughout this time, construction activities, equipment, and materials in work areas and staging areas would be visible from Calaveras Road. Because construction activities would be visible from this scenic route throughout the 21 months of construction, the visual character of the area could be substantially degraded, resulting in a significant impact. However, the impact could be reduced to a less-than-significant level with implementation of Mitigation Measure M-AE-1.

> **Mitigation Measure M-AE-1: Site Maintenance.**
>
> The SFPUC shall require the contractor to ensure that construction-related activity is as clean and inconspicuous as practical by storing construction materials and equipment at the proposed construction staging areas or in areas that are generally away from public view, and by removing construction debris promptly at regular intervals. This measure does not apply to temporary spoils placement in quarry Pit F6, at the SMP-30 aggregate processing facility, or alongside pipeline trenches.

With implementation of Mitigation Measure M-AE-1, the visibility of construction activities at the project site would be reduced for viewers along Calaveras Road. To the extent that construction activities are visible, the project area would be maintained such that the existing visual character would not be substantially degraded. Therefore, this impact would be less than significant with mitigation.

Impact AE-2: Project construction would not result in significant impacts related to a new source of substantial light or glare. (Less than Significant)

As discussed in Section 3.6.11 in Chapter 3, Project Description, for the majority of the 21-month construction duration, construction activities would occur on weekdays and Saturdays from 7 a.m. to 7 p.m.; however, extended construction hours would be necessary for a combined total of six weeks during certain phases of construction: air gap construction and connection with the proposed backup pipeline (four weeks), and connection of the backup pipeline to Alameda Siphon No. 3 (two weeks). Temporary lighting for nighttime construction activities near Air Gap Nos. 1

and 3, and Alameda Siphon No. 3 could be visible from the SFPUC watershed keeper's residence, located 490 feet east of Air Gap No. 3, the Garcia residence, located 1,900 feet southwest of Air Gap No. 1, and from nearby public viewing areas including Calaveras Road and to a lesser extent the Sunol Regional Wilderness. However, due to the short durations of nighttime construction activities, and the distance between these locations and nighttime construction activities, any adverse effects would not be substantial. Therefore, impacts related to nighttime construction lighting would be less than significant.

5.3.3.5 Operational Impacts and Mitigation Measures

Impact AE-3: Implementation of the proposed project could result in long-term adverse effects on scenic vistas and scenic resources, and degradation of the visual character of the site and its surroundings. (Less than Significant with Mitigation)

Once constructed, the proposed project pipelines (the backup pipeline, 12-inch-diameter water pipeline to the town of Sunol, transfer pipeline, and dewatering pipeline) would be underground and would not be visible. The cutoff wall around quarry Pits F3-East and F3-West would also be constructed below the ground surface. These underground components would not be visible once constructed and would have no impact on scenic vistas or the visual character of the area.

Dewatering pumps mounted on floating platforms in Pit F3-East and suction hoses placed over the edge of the quarry pit for dewatering Pit F3-East after a discharge from the backup pipeline could be visible from certain vantage points immediately adjacent to Pits F3-East and F3-West. However, these facilities would not be visible from Calaveras Road or any other public areas and would have no impact on scenic vistas or the visual character of the area.

Demolition of the two quarry buildings would alter views of the project area from Calaveras Road. Although these buildings contribute to the visual character of the project area, the removal of these buildings would incrementally open up views of the scenic rolling hills in the background. Also, given that these buildings are not currently used and thus not maintained for regular occupancy, the long-term impact on scenic vistas or the visual character of the area resulting from demolition of these buildings would be less than significant.

Permanent aboveground components of the SABPL project include: the new chemical facility; the electrical control building for the new discharge facility; the discharge valve vault; the baffled outfall and reinforced-concrete splash pad at the southern slope of Pit F3-East; the Alameda Creek Pump Station and control building; the new electrical transformer and overhead powerlines; air gaps at cross-connections; blowoff valves; air release valves; flow meters; the chemical injection station; and the sampling station. Aboveground project components could adversely affect scenic vistas and degrade the visual character of the site and surroundings, as described in detail below.

Project implementation could also result in long-term impacts on scenic resources through the permanent placement of excess spoils generated during construction in an earthen berm at the

North Spoils Site or in an earthen berm at the former nursery site located within Staging Area C, and through the removal of trees and vegetation during project construction. Project-related effects on scenic resources could, in turn, affect scenic vistas and visual character. Potential impacts on scenic resources and associated effects on scenic vistas and visual character are described in detail below.

New Chemical Facility

The new chemical facility would be installed near the San Antonio Pump Station, approximately 200 feet west of Calaveras Road. The building would have a pre-engineered weather canopy with a metal roof. The dimensions of the chemical storage and containment area would be 48 feet long, 42 feet wide, and 22 feet tall. The electrical control room would be enclosed within the canopy structure. The building and loading area would be surrounded by an 8- to 10-foot-high security fence. In addition, a newly paved driveway and parking area for the facility would be constructed. As shown in Figure 5.3-3 (Photo 4), the new chemical facility would be sited within the context of other SFPUC water supply facilities and would be visible from Calaveras Road. The new chemical facility would be visible from the Garcia residence and from the SFPUC watershed keeper's residence, since these nearby residences are located at higher elevations and have relatively unobstructed views of the southern project area. Although the new chemical facility would be visible from a scenic roadway and two nearby residences, the facility would be partially screened by existing trees and would have a similar appearance as the surrounding SFPUC water infrastructure facilities. Thus, long-term impacts on scenic vistas and visual character associated with the new chemical facility would be less than significant.

Discharge Facility near Quarry Pit F3-East

The proposed discharge facility at Pit F3-East would include a discharge valve vault, an electrical control building, a baffled outfall, and a concrete splash pad. The discharge valve vault and electrical control building would be installed approximately 500 and 400 feet west of Calaveras Road, respectively. The baffled outfall and concrete splash pad would be installed at the northern terminus of the backup pipeline and southern slope of quarry Pit F3-East, over 600 feet west of Calaveras Road.

The 19-foot-wide, 38-foot-long, and 16-foot-deep concrete discharge valve vault would extend approximately 2 to 3 feet above the ground surface. Because the vault would only extend 2 to 3 feet above the ground surface, would be distant from Calaveras Road, and would be partially screened by vegetation and trees, this project component would not be readily visible from Calaveras Road and would not substantially affect scenic vistas or visual character. The electrical control building for the discharge facility could be partially visible to motorists and bicyclists. The control building would be 15 feet long, 15 feet wide, and 16 feet tall. A 1,600-square-foot asphalt parking area would be built adjacent to the control building, and a security fence would enclose the control building and parking area. Given the scale of this facility, distance from Calaveras Road, and presence of existing vegetation, and because the electrical control building would have a similar appearance to other nearby water facilities in the Sunol Valley, the electrical control building would not substantially affect scenic vistas or visual character. Views of the baffled outfall and concrete splash pad would only be available from limited viewing locations in the immediate vicinity of Pits F3-East and F3-West; views from Calaveras Road would be obstructed by topography and existing vegetation.

For the reasons described above, long-term impacts on scenic vistas and the visual character associated with the discharge facility at Pit F3-East would be less than significant.

Alameda Creek Pump Station, Electrical Control Building, and Electrical Transformer

The proposed Alameda Creek Pump Station, control building, and electrical transformer would be constructed at the west end of Pit F3-West. The pump station would occupy a roughly 140-foot by 180-foot area and would be enclosed by an 8-foot-high security fence. The control building for the Alameda Creek Pump Station would be a 15-foot by 15-foot, single-story metal building. The new electrical transformer would be approximately 12 feet wide and 10 feet tall. A portion of the existing access road to the pump station would be paved to form a driveway and parking area, and an approximately 500-foot-long, 10-foot-tall retaining wall would be constructed along the southern boundary of the pump station site and along the northern edge of the access road. Because these facilities would be approximately 0.25 mile from I-680 and approximately 0.4 mile from Calaveras Road, and public views from these designated scenic roadways would be distant and largely obscured by existing trees and vegetation. Thus, the long-term impact on scenic vistas and visual character resulting from these project components would be less than significant.

Overhead Powerlines

Approximately 1,650 linear feet of new overhead powerlines would extend between the Hetch Hetchy Water & Power (HHWP) Calaveras Substation and the Alameda Creek Pump Station, and an additional 550 linear feet of new overhead powerlines would extend between the HHWP Calaveras Substation and the electrical control building for the discharge facility at Pit F3-East. Once constructed, the overhead powerlines would be similar to multiple existing overhead powerlines that traverse the Sunol Valley and the SABPL project area (see Figure 5.3-2, Photo 2). Also, as described above in Section 5.3.1.3, the existing visual character of the project vicinity has been highly disturbed by active mining activities. Because the new overhead powerlines would be consistent with the visual setting of the area, they would not substantially degrade scenic vistas or the visual character of the area. This impact would be less than significant.

Air Gap Systems at Cross-Connections

Air gap systems would be installed at three cross-connections along the backup pipeline. The air gaps would extend approximately 8 to 10 feet above ground surface from the pipelines being connected. Air Gaps Nos. 1 and 3 would be installed near the existing San Antonio Pump Station, and Air Gap No. 2 would be installed near pipeline station 54+00, approximately 70 feet west of Calaveras Road. Since Air Gaps Nos. 1 and 3 would be installed near existing water infrastructure facilities, the air gaps would not substantially change the appearance of this particular area. Installation of Air Gap No. 2 would not substantially alter views from Calaveras Road, as this component is relatively small in size and would likely not be noticeable due to the typical speed of travel on this road. As such, impacts on scenic vistas and visual character associated with the air gap systems would be less than significant.

Blowoff Valves, Air Release Valves, Flow Meter, Chemical Injection Station, and Sampling Station

Blowoff valves and air release valves would be installed in manhole risers at low points along the backup pipeline alignment. The chemical injection station and sampling station would also be housed in manhole risers. The flow meter would be installed in a concrete vault. The manhole risers and vault enclosing these facilities would extend between 2 and 3 feet above grade. Due to their height, these structures would not substantially alter scenic views from Calaveras Road, as these small structures would likely be obscured by topography and vegetation. Therefore, the long-term visual impact associated with these minor components would be less than significant.

Earthen Berms

A portion of the excess spoils generated during project construction could be permanently placed in an earthen berm at the North Spoils Site and/or in an earthen berm at the former nursery site located within Staging Area C. The 12-acre North Spoils Site is approximately 40 feet west of Calaveras Road. The former nursery site encompasses approximately 5 acres and ranges from approximately 200 feet west of Calaveras Road at the southern portion of the former nursery site to 400 feet west of the road at the northern portion of the site. The earthen berms at these permanent spoils disposal sites would be constructed with 2:1 slopes.

Neither berm would be visible from I-680 due to topography and intervening vegetation; thus, no permanent impact to scenic vistas along I-680 would result.

In the vicinity of the North Spoils Site, the west side of Calaveras Road is bordered by an almost continuous line of mature trees that screen the adjacent quarries and long-range views of the hills to the west, except for brief gaps (see **Figure 5.3-5**, top photo). Through these gaps, brief views of quarry activities, overhead powerlines, and I-680 in the distance can be seen by motorists and bicyclists along Calaveras Road. Spoils at the North Spoils Site would be placed to a maximum height of approximately 20 feet above the elevation of Calaveras Road, and set back west of the trees and approximately 40 feet from the road. A simulated view of the elevated berm at the North Spoils Site is shown in Figure 5.3-5 (bottom photo). Views of the North Spoils Site from Calaveras Road would be limited and relatively fleeting, the height of the berm would not tower over the road, and the permanent earthen berm would help obscure gravel mining activities to the west of the berm; therefore, the impact related to the earthen berm at the North Spoils Site on scenic resources and the associated effects on scenic vistas and the visual character surrounding the site would be less than significant.

Spoils at the former nursery site would be placed at a maximum height of 25 feet above the adjacent ground surface. Similar to the vegetation bordering the North Spoils Site, the west side of Calaveras Road along the former nursery site is bordered by shrubs and mature trees that screen the adjacent quarry pits and long-range views of the hills to the west (see **Figure 5.3-6**).

Existing View (1-15-08)

Simulated View

SFPUC San Antonio Backup Pipeline Project

SOURCE: San Francisco Planning Department, 2009

Figure 5.3-5
Existing and Simulated Views of North Spoils Site from Calaveras Road

Existing View (11-28-11)

Simulated View

SOURCE: ESA + Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.3-6
Existing and Simulated Views of
Former Nursery Site – North End of Berm from Calaveras Road

However, due to an approximately 150-foot gap in vegetation near the gated access road located just north of the San Antonio Creek crossing, motorists and bicyclists traveling north on Calaveras Road would have a fleeting but direct view of the southern end of the berm (see **Figure 5.3-7**). Views of the former nursery site from Calaveras Road are generally limited. Further, the berm would be set back 200 to 400 feet from the road, and the berm would help obscure gravel mining activities to the west of the berm. Therefore, the impact related to this earthen berm on scenic resources and the associated effects on scenic vistas and the visual character surrounding the site would also be less than significant.

Tree and Vegetation Removal

As part of construction mobilization activities for the proposed project, much of the project area (including construction staging areas) would be cleared of vegetation and debris and then graded, as necessary, to provide a relatively level surface for the movement of construction equipment. As described in Chapter 3, Section 3.6.8, Site Cleanup and Restoration, upon the completion of construction activities, the SFPUC's contractor(s) would restore all disturbed areas to their preconstruction conditions. Such restoration measures would include re-establishing preconstruction contours, revegetating cleared areas, and installing erosion and sedimentation controls.

Dozens of small (2- to 6-inch dbh, or diameter at breast height) native and non-native trees located along the backup pipeline alignment and within the Calaveras Road right-of-way would be removed during construction. Isolated, mature native trees, such as the valley oaks and California sycamores present along the southern and northern portions of the backup pipeline alignment and in the vicinity of Staging Areas A, B, and C, could also require removal during construction. These trees along the backup pipeline alignment provide partial screening of active quarry operations and SFPUC water supply facilities. Upon the completion of project construction activities, and consistent with the SFPUC Right-of-Way Integrated Vegetation Management Policy, the SFPUC would manage vegetation within its right-of-way for the backup pipeline and the water pipeline to the town of Sunol to protect the pipelines from damage (see Chapter 4, Plans and Policies), which could interfere with the replacement of these trees in several locations along Calaveras Road.

The loss of native and non-native trees along the Calaveras Road right-of-way would be noticeable from Calaveras Road, a county-designated scenic roadway. If these trees are not replaced, active mining operations and existing and proposed SFPUC water supply facilities would be more visible to motorists or bicyclists traveling along Calaveras Road, which could be a significant impact. However, this impact would be reduced to a less-than-significant level with implementation of the Mitigation Measure M-BI-1f.

Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation.

(See Impact BI-1 in Section 5.14, Biological Resources, for description.)


Existing View (11-28-11)


Simulated View

SOURCE: ESA + Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.3-7
Existing and Simulated Views of
Former Nursery Site – South End of Berm from Calaveras Road

Mitigation Measure M-BI-1f would address impacts on scenic roadways and scenic vistas related to tree removal by providing for tree replacement to compensate for the loss of mature native trees as well as smaller trees along the Calaveras Road right-of-way. This measure also requires preparation of a vegetation restoration plan with detailed specifications for restoration of all areas disturbed during construction. Therefore, this impact would be less than significant with mitigation.

Impact AE-4: The proposed project would not create a new permanent source of substantial light or glare. (Less than Significant)

The SFPUC would install exterior nighttime lighting at the proposed chemical facility, electrical control building for the discharge facility, and the Alameda Creek Pump Station. The nearest sensitive receptors are the Garcia residence and the SFPUC watershed keeper's residence near the Alameda East Portal. In accordance with Alameda WMP *Action des 5F*, permanent lighting at these facilities would be equipped with motion-sensors, directed downward, and sited and shielded such that it would not be highly visible or obtrusive to nearby residences. As a result, permanent lighting would not be a constant source of light and glare, and the impact related to new permanent sources of light or glare would be less than significant.

5.3.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Since Pumping Variant 1 does not include construction of the Alameda Creek Pump Station, retaining wall, wet well, control building for the pump station, or electrical transformer, the short- and long-term effects of this variant on visual resources would be somewhat reduced compared to those of the proposed project. Because the facilities eliminated under this variant are farthest from Calaveras Road, and because all other permanent aboveground facilities and improvements under the proposed project would still be constructed, the overall impacts on visual resources (including scenic vistas and scenic resources as well as the visual character of the site) would be similar to those associated with the proposed project, and this variant would not change the conclusions or mitigation measures identified in Sections 5.3.3.4 and 5.3.3.5, above.

Pumping Variant 2

Since Pumping Variant 2 would construct all of the same aboveground facilities and improvements as the proposed project, the construction-related and long-term impacts on scenic vistas, scenic resources, and visual character resulting from implementation of Pumping Variant 2 would be the same or very similar to those of the proposed project. Thus, implementation of Pumping Variant 2 would not change the analysis or conclusions identified in Sections 5.3.3.4 and 5.3.3.5.

5.3.3.7 Cumulative Impacts and Mitigation Measures

Impact C-AE: Implementation of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on scenic vistas, scenic resources, and visual character. (Less than Significant with Mitigation)

The geographic scope of potential cumulative impacts on aesthetic resources encompasses the project work areas and immediately adjacent areas. The SABPL project, as well as other projects listed in Table 5.1-6, would result in a significant cumulative impact on scenic resources and the visual character of the area if the SABPL project if they adversely affect the same scenic resources or views from Calaveras Road. It should be noted that the aesthetic and visual quality of these project areas (the portion of the Sunol Valley between the Alameda West Portal and I-680) has been substantially affected by past activities, including mining operations and roadway development, and as such the visual quality of the area has been degraded.

Temporary Construction-Related Impacts on Scenic Vistas, Scenic Resources, or the Visual Character of the Site and its Surroundings

As discussed in Impact AE-1, the SABPL project would have a significant impact on the visual character of the project area because construction of the various project components would be visible from Calaveras Road. Construction of four of the cumulative projects identified in Table 5.1-6 would also be visible from Calaveras Road and have construction schedules that could overlap with the SABPL project schedule, including the Upper Alameda Creek Filter Gallery (Filter Gallery), New Irvington Tunnel (NIT), Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir project (SVWTP Expansion), and SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) projects. While this portion of the Sunol Valley has been substantially affected by past projects, motorists and bicyclists traveling on Calaveras Road would have views of construction activities and staging areas associated with these overlapping projects, a potentially significant cumulative impact; further, the SABPL project's contribution to this cumulative impact is considered cumulatively considerable based on the project-level significance determination for Impact AE-1.

As discussed in Impact AE-1, the SABPL project's impact on the visual character of the area would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-AE-1 (Site Maintenance)** (see Impact AE-1, above, for description). Implementation of this measure would ensure that the contractor maintains construction areas as clean and inconspicuous as practical by storing construction materials and equipment within the proposed construction staging areas or in areas that are generally located away from public view, and by removing construction debris promptly at regular intervals. Implementation of Mitigation Measure M-AE-1 would reduce the impact such that the SABPL project's contribution to this cumulative impact on visual resources would not be cumulatively considerable (less than significant).

Operational Impacts on Scenic Vistas, Scenic Resources, or the Visual Character of the Site and its Surroundings

As discussed in Impact AE-3, the SABPL project would have a significant impact on scenic resources and the visual character of the site and its surroundings due to removal of up to dozens of small (2- to 6-inch dbh) native and non-native trees along the backup pipeline alignment and within the Calaveras Road right-of-way, as well as removal of several mature native trees along the backup pipeline alignment. These trees provide partial screening of active quarry operations and SFPUC water supply facilities, and removal of these trees would make these features more visible to motorists and bicyclists traveling along Calaveras Road. Certain components of the cumulative projects would also be visible from Calaveras Road, such as the Alameda East Portal Overflow Pipeline constructed at the southern end of Pit F6 and a new access road constructed along the north side of Alameda Siphon No. 4 under the SFPUC Alameda Siphons Seismic Reliability Upgrade (Alameda Siphons) project. Four cumulative SFPUC projects in the SABPL project vicinity also involve removal of trees and other vegetation, including the Alameda Siphons, NIT, San Antonio Pump Station Upgrade, and Filter Gallery projects. As multiple SFPUC projects would construct new aboveground structures in the vicinity of the SABPL project area and/or remove trees that screen existing views of the quarry operations and SFPUC water supply facilities, the long-term cumulative impact on the visual character of this area would be significant. The SABPL project's contribution to this cumulative impact would be cumulatively considerable, based on the project-level significance determination for Impact AE-3.

However, as discussed in Impact AE-3. with implementation of **Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)** (see Impact BI-1 in Section 5.14, Biological Resources, for description), the proposed project's long-term impact on the visual character of the area would be reduced to a less-than-significant level. This mitigation measure includes provisions for tree replacement to compensate for the loss of mature native trees as well as smaller trees along the Calaveras Road right-of-way, which would once again screen views of the active quarry operations and SFPUC water supply facilities once construction is completed. Therefore, with implementation of this mitigation measure, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Under the SABPL project, excess spoils could be permanently placed in an earthen berm at the North Spoils Site or in an earthen berm at the former nursery site within Staging Area C. Both of the proposed permanent spoils disposal sites are located along the west side of Calaveras Road. The Alameda Siphons project, the NIT project, and the SVWTP Expansion project might also place excess spoils at the North Spoils Site. The former nursery site within Staging Area C could also be used by the Filter Gallery project for disposal of excess spoils. Although both of the permanent earthen berms would be partially visible from Calaveras Road, the long-term cumulative impact on scenic resources would be similar to that described above under Impact AE-3. Specifically, accounting for the spoils generated during construction of the other cumulative SFPUC projects in the Sunol Valley, spoils would be piled no higher than 20 feet above the height of Calaveras Road at the North Spoils Site, and no higher than 25 feet above the adjacent ground surface at the former nursery site. Furthermore, existing trees and vegetation would screen most views of the two earthen berms from Calaveras Road, except for brief glimpses through gaps in the trees. Because the earthen berms would not tower over Calaveras Road and would be minimally visible from Calaveras Road, there would be no substantial change in the visual character of the Sunol Valley. Therefore, the cumulative impact associated with the permanent placement of spoils at the North Spoils Site and at the former nursery site would be less than significant.

Permanent Sources of Light or Glare

The new chemical facility and electrical control building would include exterior lighting that would be visible from Calaveras Road. If any of the six cumulative projects planned in the vicinity including the Alameda Siphons, San Antonio Pump Station Upgrade, Filter Gallery, NIT, SVWTP Expansion, and SMP-30 Expansion projects included new exterior lighting or a source of glare that would also be visible from Calaveras Road, implementation of the SABPL project and the cumulative projects could result in a potentially significant cumulative impact related to permanent sources of light or glare. However, as described in Impact AE-4, the exterior lighting for the new chemical facility, electrical control building for the discharge facility, and Alameda Creek Pump Station would be directed downward and sited and shielded such that it is not highly visible or obtrusive, in accordance with Alameda WMP Action des 5f. Furthermore, the lighting would be triggered by motion detectors and would not be a constant source of light and glare. With implementation of these lighting design measures as part of the project, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable. This cumulative light and glare impact would be less than significant.

Cumulative Impacts of Pumping Variants

Because implementation of Pumping Variant 1 or Pumping Variant 2 would result in aesthetics impacts that are very similar to or the same as those of the proposed project (refer to Section 5.3.3.6, Impacts of Pumping Variants), the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.3.4 References

Alameda County, *East County Area Plan, A Portion of the Alameda County General Plan, Volume I: Goals, Policies, and Programs*. May 2002.

California Department of Transportation (Caltrans), *Guidelines for the Official Designation of Scenic Highways.* 1996.

San Francisco Public Utilities Commission (SFPUC), *Alameda Watershed Management Plan*. April 2001.

5.4 Population and Housing

This section discusses the potential for the proposed San Antonio Backup Pipeline (SABPL) project to induce substantial population growth, displace housing, create a substantial demand for additional housing in the project area, or necessitate the construction of housing outside of the project area. The growth-inducement effects of the SABPL project within the context of the SFPUC's Water System Improvement Program (WSIP) and the overall regional water system, as well as the indirect effects of that growth, are analyzed in the Program EIR (PEIR) on the WSIP, which is incorporated into this EIR by reference (San Francisco Planning Department, 2008), and are summarized in Chapter 1, Section 1.2.2, SFPUC Water System Improvement Program, and in Chapter 6, Section 6.1, Growth-Inducing Impacts.

5.4.1 Setting

The proposed project is located in the Sunol Valley of unincorporated Alameda County, east of Interstate 680 (I-680) and south of the I-680 and State Route (SR) 84 junction, within Alameda watershed lands. These lands are owned by the City and County of San Francisco (CCSF) and managed by the SFPUC. The Alameda watershed encompasses 56 square miles (36,000 acres) of largely undeveloped, rolling grassland and scattered oak woodlands that drain to San Antonio Reservoir, Calaveras Reservoir, and Alameda Creek.

In the vicinity of the proposed project, two gravel mining companies lease land from the SFPUC. Other nearby land uses include cattle grazing, open space, and recreation. In addition, there are four private residences in the immediate project vicinity: an SFPUC watershed keeper's residence, approximately 225 feet east of the project area and Calaveras Road near the Alameda East Portal; and a private ranch residence (Garcia residence), approximately 1,300 feet southwest of the project area. The nearest urban areas are the unincorporated town of Sunol, approximately 1 mile northwest of the project area, and the city of Fremont, approximately 4 miles to the west. (See Section 5.2, Land Use, for additional information regarding land uses in the project vicinity.)

In 2009, Alameda County was home to approximately 1,556,657 residents and had approximately 573,111 housing units. Between 2000 and 2009, the total population of Alameda County increased by approximately 8.0 percent, and the total number of housing units increased by approximately 6.1 percent (State of California, Department of Finance, 2009a, 2009b).

5.4.2 Regulatory Framework

There are no federal, state, or local regulations governing population and housing that apply to the proposed project.

5.4.3 Impacts and Mitigation Measures

5.4.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to population and housing, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- 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);
- Displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

5.4.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for these topics for the reasons described below:

- *Induce Substantial Population Growth in an Area, Either Directly or Indirectly*. During the approximately 21-month construction period, up to 89 construction workers would be employed (see Chapter 3, Section 3.6.10, Construction Equipment and Workforce). It is expected that regional Bay Area labor could meet the construction workforce requirements. While some workers might temporarily relocate from other areas, the increase would be minor (fewer than 100 workers) and temporary (approximately 21 months). Existing SFPUC staff would conduct long-term operation and maintenance of the project, and additional personnel would not be hired. The proposed SABPL project would not result in the construction of new homes or businesses in the area or extend new roads or other infrastructure into undeveloped areas. Therefore, construction and operational activities associated with the proposed project would not in themselves result in a substantial increase in the local population, and there would be no growth-inducement impacts associated with the project.

  As a WSIP facility improvement project, the SABPL project would be a contributing factor in the growth-inducement potential of the overall WSIP. Growth inducement under the proposed project within the context of the WSIP and the regional water system is discussed in Chapter 6, Section 6.1, Growth-Inducing Impacts. Indirect effects on population and housing due to the project's growth-inducement potential, as well as the secondary effects of growth, are discussed in Chapter 6, Section 6.1.4, Indirect Effects of Growth.

- *Displace Substantial Numbers of Housing Units or Create Demand for Additional Housing*. The proposed project would improve the SFPUC's water supply infrastructure in the Sunol Valley and would not displace any housing units. Up to 89 construction workers organized in crews ranging from 2 to 30 workers would be employed as part of the proposed project (see Chapter 3, Section 3.6.10, Construction Equipment and Workforce); however, it is expected that local laborers could meet the construction workforce requirements and would not create a long-term demand for additional housing. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.

- <u>Displace Substantial Numbers of People</u>. The proposed project would improve the SFPUC's water supply infrastructure in the Sunol Valley, and project construction and operation would not displace housing units or people or necessitate the construction of replacement housing elsewhere. Therefore, this significance criterion is not applicable and is not discussed further.

5.4.3.3 Impacts and Mitigation Measures

As described above, there would be no growth-inducement impacts due solely to the SABPL project, and implementation of the project would not result in impacts related to housing. Therefore, there would be no impacts related to this resource topic. No mitigation measures are required.

As discussed in Chapter 6, Section 6.1, Growth-Inducing Impacts, the SABPL project—as a WSIP facility improvement project—would contribute to the WSIP's growth-inducement potential and the associated significant and unavoidable indirect effects of growth. The indirect effects of the growth anticipated in the general plans of jurisdictions in the SFPUC service area have been identified in the EIRs prepared for those general plans, and the mitigation measures specified in the general plan EIRs to reduce the impacts of growth also address the growth impacts of the WSIP. No mitigation measures are required for project-specific effects related to growth inducement and housing. (For additional information on this topic, refer to the WSIP PEIR, Chapter 7 and Appendix E.)

5.4.3.4 Impact Analysis for Pumping Variants

Pumping Variant 1 and Pumping Variant 2

Pumping Variant 1 would construct most of the same facilities and permanent improvements as the proposed project, but would eliminate the Alameda Creek Pump Station, wet well, control building for the pump station, retaining wall along the southern boundary of the pump station site adjacent to the access road, and transfer pipeline. Pumping Variant 1 would also replace the two low-pressure submersible pumps adjacent to the proposed discharge facility at Pit F3-East with two high-pressure submersible pumps. Pumping Variant 2 would construct all of the same facilities as the proposed project except that one of the low-pressure submersible pumps adjacent to the proposed discharge facility would be replaced with a high-pressure submersible pump. The number of construction workers needed to implement either pumping variant would be the same as or very similar to those required for the proposed project. The construction duration of both pumping variants is expected to be the same as the proposed project—approximately 21 months. Furthermore, as with the proposed project, existing SFPUC staff would conduct long-term operation and maintenance of either project variant, and additional personnel would not be hired. Thus, the growth-inducement potential of the pumping variants are considered to be the same as under the proposed project and would not change the analysis or conclusions presented in Section 5.4.3.3, above.

5.4.3.5 Cumulative Impacts and Mitigation Measures

Because the SABPL project would not result in any project-specific impacts related to growth inducement and housing, implementation of the project would not result in cumulative impacts beyond the secondary and indirect impacts of growth associated with the proposed project within the context of the WSIP, as described in this EIR in Chapter 6, Section 6.1, Growth-Inducing Impacts.

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would have the same growth-inducement potential as the proposed project, the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.4.4 References

San Francisco Planning Department, *Final Program Environmental Impact Report for the San Francisco Public Utilities Commission's Water System Improvement Program*, File No. 2005.0159E, State Clearinghouse No. 2005092026. October 30, 2008.

State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001–2009, with 2000 Benchmark. Sacramento, CA. May 2009a.

State of California, Department of Finance, California County Population Estimates and Components of Change by Year, July 1, 2000–2009. Sacramento, CA. December 2009b.

5.5 Cultural and Paleontological Resources

Cultural resources include historical resources, unique archaeological resources, paleontological resources, and human remains. This section evaluates the potential for implementation of the proposed San Antonio Backup Pipeline (SABPL) project to result in adverse effects on historic-period architectural, archaeological, and paleontological resources. Mitigation measures to reduce impacts to a less-than-significant level are identified, where appropriate.

5.5.1 Setting

5.5.1.1 CEQA Area of Potential Effects

For the purpose of environmental review under the California Environmental Quality Act (CEQA), the definition of the CEQA Area of Potential Effects (C-APE) presented below is modeled after that of the federal Area of Potential Effects (APE) described in the Code of Federal Regulations (36 CFR 800.16[d]):

> The C-APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historical resources (i.e., California Register–eligible resources), if any such properties exist. The C-APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

A Section 404 permit from the U.S. Army Corps of Engineers (Corps) would be required for the SABPL project; therefore, the project is subject to review under Section 106 of the National Historic Preservation Act, as amended. It is expected that the architectural, archaeological, and paleontological C-APE would be identical to the federal APE. (See Section 5.14, Biological Resources, for a discussion of Section 404 permits.)

Architectural C-APE

The architectural C-APE encompasses all areas of potential ground disturbance and areas near ground-disturbing activities, including: pipeline construction corridors (the backup pipeline, water pipeline to Sunol, transfer pipeline, dewatering pipeline, and appurtenant facilities such as the discharge valve vault, other vaults, and the cathodic protection system); cutoff wall; new chemical facility site; Alameda Creek Pump Station site; and staging, work area, and spoils sites. It is assumed that surface effects could occur anywhere within the architectural C-APE. The boundaries of the C-APE are identical to the project area shown in Chapter 3, Project Description, Figures 3-2 to 3-5.

Archaeological C-APE

The archaeological C-APE is identical to the architectural C-APE in terms of areas subject to surface disturbance. Because archaeological resources typically occur at or below the ground surface, the archaeological C-APE also includes a vertical dimension intended to capture effects on all potential subsurface archaeological resources. The depth of construction associated with project components ranges from 45 feet (wet well) and 80 feet (cutoff wall) to as little as 3 feet (grading and staging areas), although shallow (less than 1-foot deep) subsurface effects are assumed to occur anywhere within the archaeological C-APE. Typical pipeline excavations would range from 6 to 20 feet in depth.

Paleontological C-APE

The C-APE for paleontological resources includes all areas that could potentially experience subsurface excavation into fossil-bearing geologic units during project construction. The paleontological C-APE is similar to the archaeological C-APE, except that activities that disturb only the ground surface are excluded. Surface-disturbing activities (e.g., grading at staging areas, soil stockpiles, and other work areas) would affect surface soils only and not the underlying fossil-bearing geologic units, and therefore are not considered to be within the paleontological C-APE. The paleontological C-APE includes all proposed pipeline alignments; the proposed chemical facility; the discharge facility at Pit F3-East; the cutoff wall around Pits F3-East and F3-West (80-foot excavation); and the Alameda Creek Pump Station and transfer pipeline (45-foot excavation).

5.5.1.2 Paleontological Setting

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the location, topographic setting, and particular geologic formation in which they are found. Fossil discoveries not only provide a historical record of past plant and animal life but can assist geologists in dating rock formations. In addition, fossil discoveries can expand our understanding of the time periods and the geographic range of existing and extinct flora or fauna.

Paleontological Assessment Standards

The Society of Vertebrate Paleontology (SVP) has established guidelines for the identification, assessment, and mitigation of adverse impacts on nonrenewable paleontological resources (SVP, 1995, 1996). Most practicing paleontologists in the United States adhere closely to the SVP's assessment, mitigation, and monitoring requirements as outlined in these guidelines, which were approved through a consensus of professional paleontologists and are the standard against which all paleontological monitoring and mitigation programs are judged. Many federal, state, county, and city agencies have either formally or informally adopted the SVP's standard guidelines for the mitigation of adverse construction-related impacts on paleontological resources. The SVP has helped define the value of paleontological resources and, in particular, indicates the following:

- Vertebrate fossils and fossiliferous (fossil-containing) deposits are considered significant nonrenewable paleontological resources and are afforded protection by federal, state, and local environmental laws and guidelines.

- A paleontological resource is considered to be older than recorded history, or 5,000 years before present, and is not to be confused with an archaeological resource.
- Invertebrate fossils are not significant paleontological resources unless they are present within an assemblage of vertebrate fossils or they provide undiscovered information on the origin and character of the plant species, past climatic conditions, or the age of the rock unit itself.
- A project paleontologist, special interest group, lead agency, or local government can designate certain plant or invertebrate fossils as significant.

In accordance with these principles, the SVP (1995) outlined criteria for screening the paleontological potential of rock units and established assessment and mitigation procedures tailored to such potential. **Table 5.5-1** lists the criteria for high-potential, undetermined, and low-potential rock units.

TABLE 5.5-1
CRITERIA FOR DETERMINING PALEONTOLOGICAL POTENTIAL

Paleontological Potential	Description
High	Geologic units from which vertebrate or significant invertebrate or plant fossils have been recovered. Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant.
Undetermined	Geologic units for which little to no information is available.
Low	Geologic units that are not known to have produced a substantial body of significant paleontological material.

SOURCE: SVP, 1995, 1996.

Although not discussed in the SVP standards, artificial fills, surface soils, and high-grade metamorphic rocks do not contain paleontological resources. While such materials were originally derived from rocks, they have been altered, weathered, or reworked such that fossils are not likely to have been preserved.

Paleontological Potential

The following discussion of paleontological resources divides the rock units underlying the project area into geologic units with a high and low potential to yield significant fossils. Information was compiled based on a review of published geologic maps, geologic unit descriptions, and a fossil collections database at the University of California Museum of Paleontology (UCMP). No new mapping or field study for paleontological resources was conducted during the preparation of this EIR.

Section 5.15, Geology and Soils, discusses the geologic units and their distribution within the project area; the italicized symbols in the following discussion identify the units as described in

Section 5.15. The surface soils of the C-APE for the SABPL project consist of Holocene-active alluvium and artificial fills. Older, well-consolidated alluvium and the Briones Formation are present near the project area and may underlie the Holocene alluvium at shallow depths. The paleontological potential of each of these units is discussed below.

Holocene Alluvium

Holocene alluvium in the project area consists of loose deposits of sand, silt, and gravel and includes active stream channels (*Qhsc*), alluvial fans (*Qha*), and young stream terraces (*Qt*) of the Alameda Creek drainage. These geologic units form the flat base of the Sunol Valley and directly underlie the entire area that would be disturbed by the SABPL project (in addition to fill materials). Information on fossil resources in Holocene deposits of the Sunol Valley is not readily available, but known fossil resources from the Holocene of the greater East Bay are sparse and represent common taxa. The UCMP database contains only two records from the Holocene of the greater East Bay—a specimen of the pine *Pinus attenuata* from a site in Oakland, and one of the oyster *Ostrea lurida* from a site offshore of Alameda (UCMP, 2009). Holocene units in California are typically considered to be of low sensitivity unless known otherwise. Based on the criteria in Table 5.5-1, the Holocene alluvium in the project area is rated as having a low paleontological potential.

Older Alluvium

Older alluvium consists of non-marine sediments of the Livermore Gravels (*QTl*) as well as latest Pleistocene alluvial deposits (*Qpa*). In contrast to the Holocene alluvium, these deposits are Pliocene to Pleistocene in age (5.3 million to 10,000 years old) and have undergone a greater degree of hardening and consolidation. These geologic units record episodes of fluvial (stream) deposition prior to 10,000 years ago that have since ceased. The fossil content (if any) of the older alluvium within the project boundaries is unknown. However, the Pleistocene units of central California are rich in vertebrate remains. The UCMP database contains more than 1,000 entries for fossil localities in the Pleistocene of Alameda County alone, the majority of which are vertebrate fauna (UCMP, 2009). Locally, a fossil of a mastodon from the Pleistocene epoch was discovered in Sunol (UCMP Locality No. V6535), while an unidentified vertebrate fossil was discovered at Calaveras Dam (UCMP Locality No. V3937) (UCMP, 2009). In addition, geologic maps identify older alluvium as containing fossils of extinct vertebrate fauna (Helley and Graymer, 1997). Based on the criteria in Table 5.5-1, all older alluvium is rated as having a high paleontological potential.

Briones Formation

The Briones Formation (*Tbr*) consists of Miocene-age sandstone, pebbly sandstone/conglomerate, shell breccia, and siltstone formed in a shallow marine environment (Graymer et al., 1996). Distinctive resistant beds of conglomerate and coquina (fossil shells) occur in the middle part of the formation and form short cliffs in the hillside above the Alameda East Portal. Fossil shells are not usually considered unique or significant, because they are abundant in similar outcrops in other areas of the East Bay. Other fossils in the Briones Formation include a diverse assemblage of shallow marine invertebrates, as well as teeth from an extinct hippopotamus-like creature

(*Desmostylus*) from two localities in Alameda County (UCMP Locality Nos. V3108 and V65415) (UCMP, 2009). Because the Briones Formation is known to have yielded significant vertebrate remains, the rock unit as a whole is rated as having a high paleontological potential based on the criteria in Table 5.5-1.

5.5.1.3 Prehistoric Setting

The following discussion is adapted from the *Historic Context and Archaeological Survey Report for the San Antonio Backup Pipeline Project, Alameda County, California* (Wohlgemuth and Kaijankoski, 2009) and the *Addendum to the Historic Context and Archaeological Survey Report for the San Antonio Backup Pipeline Project, Alameda County, California* (Wohlgemuth, 2011).

Geoarchaeological Context

Many significant archaeological sites in the interior East Bay region have been buried by natural deposition or by artificial fill, and are found only in deep excavations during construction or archaeological investigations (e.g., Fredrickson, 1966; Meyer and Rosenthal, 1997; Wiberg, 1988, 1996). Historic-period and modern sediments that are less than 150 years in age, such as active stream channel bottoms or recent construction fill, have no potential to contain buried prehistoric cultural resources. Similarly, ancient sediments identified as latest Pleistocene have very little potential for buried resources, since they predate any known human occupation of the region. The most sensitive locations are in Holocene stream deposits along San Antonio Creek, as these areas are adjacent to a permanent water source and may contain buried archaeological sites formed on earlier soil surfaces. Holocene sediments south of San Antonio Creek along Calaveras Road are substantially less sensitive due to their distance from the creek. The most sensitive locations along Calaveras Road are the small alluvial fans emanating from the hills to the east, which may contain archaeological sites located on now-buried soils.

Prehistoric Context

To date, evidence of the Lower Archaic Period (10,000–7,000 years ago) has been found only at Los Vaqueros Reservoir east of Mount Diablo, where sites CA-CCO-637 and -696 have produced artifact assemblages and human remains dated to between 9,870 and 6,600 years ago (Meyer and Rosenthal, 1997). Characteristic artifacts include handstones and millingslabs, cobble-core tools, and wide-stem dart and spear points. The subsequent Initial Middle Archaic Period, dating to 6,000–4,500 years ago, is similarly documented only at the Los Vaqueros locality, again at CCO-637. This component featured a grinding assemblage exclusively composed of mortars and pestles, and an early *Olivella* shell-bead lot (Meyer and Rosenthal, 1997).

In contrast to the scant earlier record, several Terminal Middle Archaic (4,500–2,500 years ago) sites have been documented. Initial use of the large shell-mound sites along the bay shore began during this period, and interior habitats are also well represented, including CCO-308 and -309 in San Ramon Valley (Fredrickson, 1966; Price et al., 2006). All of these sites have produced human remains. Artifacts associated with this period include side-notched and stemmed dart/spear points, rectangular *Haliotis* ornaments, mortars and pestles, and rectangular *Olivella* shell beads.

Upper Archaic (2,500–1,000 years ago) sites are found throughout the lowland valleys and along bay shores, and may reflect a population increase in the area. Upper Archaic sites usually have well-developed midden deposits with abundant human burials and residential features, both indicating use of these sites as sedentary or semi-sedentary residential villages. Artifacts typical of this period include saucer and saddle *Olivella* beads, numerous and varied bone tools and ornaments, shouldered lanceolate projectile points, and mortars and pestles. Large bay-shore shell-mound occupations flourished during this period.

Emergent Period (1,000–225 years ago) sites have been documented within most interior valleys, bay-shore locations, and upland contexts. Artifacts characteristic of the Emergent Period include small, arrow-sized projectile points, well-made "fancy" mortars, flanged pestles, flanged soapstone pipes, and bird-bone tubes with intricate chevron designs. Sites usually feature well-developed middens, human burials and cremations, and residential features such as house floors (Rosenthal, 2002; Rosenthal and Byrd, 2006).

Ethnographic Context

Several ethnographies have been written about the peoples of the San Francisco Bay Area, notably by Kroeber (1925), Levy (1978), Margolin (1978), and Milliken (2006). Milliken's detailed study of native ethnogeography places the proposed project C-APE in the territory of the Taunan and Asirin, speakers of a Costanoan or Ohlone language who lived in the Sunol Valley (Milliken, 2006). These inhabitants were organized as an independent sociopolitical group known to anthropologists as a tribelet—a group of allied villages controlling a territory and its resources (Kroeber, 1962). Tribelet territories in the Bay Area were some 6 to 10 miles in diameter (Milliken, 2006).

The principal village of a tribelet was the home of the chief. Chieftainship was patrilineally inherited but could be passed to a man's sister or daughter if there was no male heir. It was the chief's responsibility to provide for visitors and the poor, to direct ceremonial activities, and to arrange expeditions and labor for hunting, fishing, gathering, and warfare (Levy, 1978). The Ohlone were organized in households of patrilineally extended families ranging in size from 10 to 15 members. Houses were usually dome-shaped structures constructed of willow poles and thatched with leaves and grasses.

The historic-era Alisal Indian community in Pleasanton was formed after mission secularization in 1834. This was a multi-ethnic community comprised mostly of former neophytes from Mission San Jose, primarily Costanoan, Plains Miwok, and Northern Valley Yokuts. Alisal flourished throughout the 19th century due in large part to sympathetic landowners such as the Hearst family. Several ethnographers conducted extensive research in the early 20th century, but the native community disbanded soon thereafter (Bean, 1995).

5.5.1.4 Historic-Period Setting

A brief history of SFPUC water supply facilities in the Sunol Valley, including the James H. Turner Dam, San Antonio Reservoir, and the existing San Antonio Pipeline, is provided below.

History of Sunol Valley

The following historical overview of the Sunol Valley is summarized from the *Historic Context and Archaeological Survey Report for the San Antonio Backup Pipeline Project* (Far Western, 2009):

> The Sunol Valley was a remote interior area in the early Mission Period, but was ultimately controlled by Mission San Jose after the mission was founded in 1797. Neophyte recruitment into the mission was complete in the East Bay by 1810, after which no Costanoan Indian villages maintained traditional lifeways.
>
> The town of Sunol was named for Antonio Sunol, a Spaniard who deserted a French ship in 1818, and in 1839 through marriage became part owner of the Rancho El Valle de San José, a 48,000-acre (19,400 hectares) land grant. Sunol controlled some 14,000 acres (5,660 hectares), including the Sunol Valley and the location of the present-day town of Sunol. Sunol's son Antonio built a palisade structure in 1839 and later an adobe near the present site of the Sunol Water Temple. Grazing was the primary economic activity, with herds of 10,000 cattle, 500 horses, and 5,000 sheep during the period from 1839 to 1849. During the 1850s, the rancho was broken up through split inheritance and parcel sales. Wheat production then began in the Sunol Valley bottom, but it was largely still a rural ranching area beset by squatters and cattle thieves into the 1860s. In the later 1860s, most of the former Sunol rancho passed into the hands of Charles Hadsell. The Central Pacific Railroad was completed in this area after 1869, linking Sunol to other Bay Area towns, but the area remained a rural agricultural and ranching region through the end of the 19th century.
>
> In the 20th century, water supply development became a key industry in the Sunol Valley. The Spring Valley Water Company, a private entity, had been established in 1865 to provide water to the San Francisco Peninsula. In 1900, the company completed facilities in the Sunol Valley to collect groundwater for delivery to the peninsula. The Sunol Water Temple, designed in 1910 by Willis Polk, was erected at the juncture of the three East Bay components of the company: Alameda Creek, the Sunol filter beds, and the Pleasanton wells. The City of San Francisco's Hetch Hetchy project, which delivers water to the Bay Area from the Tuolumne River in the Sierra Nevada, was begun in 1914 and completed in 1934. The Hetch Hetchy project was augmented with East Bay supplies when the City of San Francisco acquired the Spring Valley Water Company in 1930. Several projects were built in the Sunol Valley in support of the Hetch Hetchy system, including the Alameda West Portal, the Alameda East Portal, and the Alameda Siphons, which serve to convey water from the Coast Range Tunnel to the east to the Bay Division Tunnel west of Sunol.

James H. Turner Dam and the San Antonio Reservoir

The following overview of Turner Dam and San Antonio Reservoir is based on *A History of the Municipal Water Department and Hetch Hetchy System*, prepared by W.D. Hansen for the SFPUC in 2005:

> The San Francisco Water Department completed construction of Turner Dam and San Antonio Reservoir in 1965 at a cost of $9.4 million, which included the dam, outlet works, spillway, and related equipment and accessories. The dam is named for James H. Turner, the former general manager and chief engineer of Hetch Hetchy Water and Power, and the former general manager of public utilities for San Francisco.

> Originally sited by the Spring Valley Water Works in 1875 and mentioned in the 1912 Freeman Report to provide storage adjacent to the Hetch Hetchy Aqueduct, the reservoir is situated on La Costa (San Antonio) Creek, a tributary of Alameda Creek about 3 miles southeast of Sunol. The reservoir impounds 16.5 billion gallons of water (50,650 acre-feet), the runoff from a 40-square-mile watershed yielding over 1.7 billion gallons of water annually. Additionally, the reservoir can provide storage for water from Hetch Hetchy and other sources to meet high periodic demands in the South Bay area and assure water service during possible interruptions of Hetch Hetchy supply. Turner Dam is a compacted, earth-fill structure; it is 195 feet high, 2,160 feet long, and 1,075 feet wide at the base. As with Calaveras Reservoir supplies, water from San Antonio Reservoir is sent to the Sunol Valley Water Treatment Plant (SVWTP) for filtration before entering the Hetch Hetchy Aqueduct at the Alameda Siphons.

History of the San Antonio Pipeline

The San Antonio Pipeline was constructed in 1968 to convey Hetch Hetchy water from the regional water system to San Antonio Reservoir and to convey stored water from Calaveras Reservoir to San Antonio Reservoir. The pipeline was built as part of the SFPUC's incremental improvements to the water supply system associated with Turner Dam and San Antonio Reservoir, described above. The San Antonio Pipeline is a 60-inch-diameter prestressed-concrete cylinder pipe located entirely underground, and extends 11,300 feet (approximately 2.1 miles) from the San Antonio Pump Station to the base of Turner Dam at San Antonio Reservoir. The San Antonio Pipeline transports water stored in San Antonio Reservoir to the SVWTP for treatment prior to distribution to customers, and diverts quality-impaired Hetch Hetchy water either to San Antonio Reservoir or to San Antonio Creek (Circa, 2009).

Associated with the San Antonio Pipeline is a collection of nearby SFPUC treatment and distribution facilities. These include the San Antonio Pump Station (1968), the existing chemical facility at San Antonio Pump Station (1992), the Sunol Valley Chloramination Facility (2003), and a fluoride plant and chemical feed lines (Circa, 2009). The San Antonio Pump Station pumps water from San Antonio Reservoir to the SVWTP when the water cannot flow by gravity, and also pumps Hetch Hetchy water to either San Antonio Reservoir or the SVWTP when it does not meet water quality standards for delivery or is required for reservoir replenishment. The existing chemical facility at San Antonio Pump Station is located just north of the pump station. This facility dechlorinates and pH-adjusts Hetch Hetchy water prior to discharge to San Antonio Creek or San Antonio Reservoir in order to meet the water quality requirements set by the San Francisco Bay Regional Water Quality Control Board.

5.5.1.5 Archaeological Methods, Survey, and Results

Records Search and Literature Review

A records search conducted by Far Western Anthropological Research Group, Inc. (Far Western) in January 2008 at the Northwest Information Center of the California Historical Resources Information System at Sonoma State University revealed that 14 cultural resource inventory studies have been conducted within 1 mile of the project area (Northwest Information Center File Number 07-596). Two additional inventories conducted more recently for other SFPUC projects overlap portions of the current project C-APE (ICF Jones & Stokes, 2009; Jones & Stokes, 2008). These latter two inventories were based on intensive surveys, with surface transects spaced 10 to 15 meters apart. None of the inventory studies identified archaeological resources within the project C-APE. Only one other inventory (Busby, 1998) covered any portion of the current C-APE. This survey encompassed a narrow corridor paralleling Calaveras Road, and a small area at the intersection of Calaveras Road and the Turner Dam Access Road. No cultural resources were found.

Only one of the previous inventories documented archaeological or historic-era finds within 1 mile of the C-APE. Dispersed and sparse historic-era artifacts were found in backhoe trenching for the Mission Valley Rock Company gravel quarry in 1992. The quarry area covered more than 400 acres of Sunol Valley bottom, with the eastern border more than 0.5 mile northwest of the C-APE. Most artifacts, which seem to date to the early and late 19th century, were found in the western portion of the quarry. Three artifacts dating to the late 19th century were found in the southeast quarter of the quarry (Ambro, 1992).

In addition to prior inventories, the records search included 19th century General Land Office plats and 1953 U.S. Geological Survey topographic quadrangles. These maps revealed seven buildings located within 1 mile of the C-APE; due to their minimum age of 55 years, all building plots are considered potential historic-period resources. In sum, the records search and background documents reviewed show the C-APE has some sensitivity for both prehistoric and historic-era resources. The most sensitive locations in the vicinity for prehistoric sites are in open, elevated portions of San Antonio Creek canyon. A sparse record of 19th-century occupation is documented west of (outside) the C-APE.

Native American Contacts

Prior to conducting fieldwork, Far Western contacted the Native American Heritage Commission (NAHC) to request a search of Sacred Lands files and to obtain the names of local Native Americans who might have knowledge of cultural resources in the C-APE. The NAHC records indicate that no sacred lands have been identified within or near the C-APE, but the records provided contact information for eight individuals listed as Native American contacts in Alameda County. After the first field studies in February 2008, a letter describing the project and survey findings, accompanied by a project location map, was sent to each individual. After additional land area was added to the C-APE and the initial field studies were completed in March 2008, a second letter was sent to each individual to provide updated information on the C-APE and findings. Follow-up phone calls were made one week later. A third set of letters was sent following the field inventory in May 2009.

NAHC contacts Ms. Katherine Perez, Ms. Irenne Zwierlein, and Mr. Andrew Galvan all expressed concerns about the great potential for archaeological sites that could be affected by project construction. Ms. Perez and Ms. Zwierlein each requested that Native American and archaeological monitors be present during all phases of construction. Ms. Rosemary Cambra, Chairwoman of the Muwekma Ohlone Indian Tribe of the San Francisco Bay, requested the tribe be informed if ancestral remains or artifacts were encountered. She also requested that Native American monitors for the project be documented as aboriginal to their tribal area.

The only response received after the May 2009 field study was from Ms. Anne-Marie Sayers, who requested more information about the project, and asked that the geoarchaeological extended survey trenching include a Native American monitor. CCSF staff determined that no monitor was necessary since the trenching took place outside of known archaeological site boundaries and thus constituted an exploration rather than an evaluative investigation. Ms. Sayers was contacted after trenching to inform her that no buried artifacts or remains were encountered. She requested that she be notified if any finds were unearthed during project construction, and that she receive a copy of the final inventory study report for the proposed project (Wohlgemuth and Kaijankoski, 2009).

Far Western updated correspondence with Native American contacts in March 2011. Anne-Marie Sayers of the Indian Canyon Mutsun Band of Costanoan requested that Native American and archaeological monitors be present at all project-related earthmoving activities, and that a reburial location be specified in the event that human remains were encountered during construction activities. No other responses were received from the individuals and groups contacted (Wohlgemuth, 2011).

Archaeological Field Survey Methods

Far Western performed a surface field inventory and two phases of extended archaeological surveys within the SABPL project area. The first phase of the extended archaeological survey consisted of a series of shovel test pit excavations to define the boundaries of archaeological site SA-1 (temporary number), which was located during the surface field inventory. SA-1 is located in an area that was previously considered for staging but has since been removed as a project option. The second phase consisted of geoarchaeological trenching in archaeologically sensitive areas to search for buried archaeological deposits.

Surface Survey

Far Western conducted surface surveys on February 19, 2008, March 21, 2008, May 19, 2009, and March 9, 2011. Field surveys were conducted using transects spaced at 20-meter intervals or less. As the surveys were conducted during late winter, much of the C-APE was covered with a dense vernal growth of herbaceous plants, and surface visibility was limited. Rodent backdirt piles were examined wherever visible. To allow visibility of the mineral soil surface, short-handled hoes were used to clear plant cover at 10- to 20-meter intervals where necessary. Archaeological sites were defined as three or more cultural objects in association.

The May 2009 survey targeted the C-APE in the Hanson Aggregates quarry north of San Antonio Creek and west of Calaveras Road. Because virtually all of this area has been excavated as huge quarry pits hundreds of feet below the former landform surface, or piled up in berms around the pits, the area was traversed in an automobile to locate intact landform surfaces. The few intact areas found were surveyed on foot at 20-meter intervals (Wohlgemuth and Kaijankoski, 2009).

The March 2011 surface survey was conducted after minor modifications were made to the SABPL project that expanded the C-APE in the northern portion of the project area. The purpose of the March 2011 survey was to evaluate the potential presence of buried cultural resources in the expanded C-APE. Areas examined included the former nursery site located east of Pit F3-East and west of Calaveras Road, the northeastern and northwestern walls of Pit F3-East, and other selected areas around Pits F3-East and F3-West (Wohlgemuth, 2011).

Subsurface Investigations

Upon discovery of an isolated surface flake during the surface survey, a series of 13 shovel probes was performed in an attempt to locate any other material beneath the dense grass cover. The probes yielded additional cultural materials, and the location was identified as archaeological site SA-1. The artifacts were described and photographed, and the shovel probes were backfilled with the excavated sediment (Wohlgemuth and Kaijankoski, 2009).

Extended Archaeological Survey

During the May 2009 fieldwork, the boundaries of archaeological site SA-1 were further defined by performing intensive surface reconnaissance of recently disked fire-control strips, close to but beyond the previously defined site boundaries. The disked strips provided an extensive clearing in the dense surface vegetation that approximated shovel testing of hundreds of cubic meters of near-surface sediment. Only one surface artifact, a cryptocrystalline silicate flake, was found in the disked areas.

Following the revision in the project C-APE, Far Western excavated four shovel probes in May 2009 to ascertain whether site SA-1 extended into the C-APE. No artifacts were found in the probes within the C-APE. The finds from shovel tests and reconnaissance of recently disked areas showed that site SA-1 does not extend into the C-APE.

Far Western conducted exploratory testing in the C-APE on June 24 and 25, 2009. The testing targeted five areas of the C-APE determined to have the greatest potential for buried archaeological sites based on the presence of Holocene-age alluvial deposits mapped at the surface, as well as the proximity to water sources. Fifteen subsurface exploration trenches were excavated using a tractor-mounted backhoe. The exact location and size of each trench were determined in the field based on existing conditions, physical constraints, and the ongoing results of trenching. As deposits were removed from the trenches, they were examined and raked by hand in an effort to identify archaeological materials, and the walls of the trenches were examined. The trench locations were plotted using a GPS device, and the depth and general nature of the exposed geologic deposits were recorded, with additional attention given to deposits that appeared to contain Holocene-age buried soils. The project geoarchaeologist supervised all trenching (Wohlgemuth and Kaijankoski, 2009).

Field Survey Results

Prehistoric archaeological site SA-1 was recorded outside of but near the C-APE in an area previously considered as a potential construction staging area for the SABPL project. The site consists of a low-density concentration of fire-altered rock (cooking stone debris), cryptocrystalline stone debitage (flaking debris), and one millingslab fragment. All but one flake and the millingslab were discovered in subsurface shovel probes. Three unidentified animal bone fragments were found in one probe, but it is uncertain whether these are associated with the prehistoric artifacts or are modern intrusive specimens, as occasional fragments of recent historic-era ceramic (white improved earthenware) and modern green glass were also found. Except for the existing San Antonio Pipeline along the southern site margin, no obvious disturbances to the site were noted. A rock layer was found in several shovel probes at a depth of 25 centimeters below ground surface; this indicates that the site deposit is less than 25 centimeters deep, consistent with the lower sensitivity for buried sites found in Pleistocene landforms. The site measures 130 meters north-south by 90 meters east-west (Wohlgemuth and Kaijankoski, 2009).

Subsurface exploratory trenches were excavated within the five areas of the C-APE determined to have the greatest potential to contain buried prehistoric archaeological deposits. A total of 15 trenches were excavated in these five areas, and no artifacts or buried archaeological deposits were found; therefore, it appears unlikely that a large or substantial archaeological site is buried in the C-APE. While there is a possibility that isolated, discrete, and/or highly localized archaeological materials have been buried by Holocene-age alluvium in unexplored portions of the C-APE, the likelihood seems relatively low, since the remainder of the C-APE does not feature known water sources and thus is less archaeologically sensitive (Wohlgemuth and Kaijankoski, 2009).

Intensive surface inventory and subsurface geoarchaeological trenching for cultural resources identified no archaeological sites within the C-APE (Wohlgemuth and Kaijankoski, 2009; Wohlgemuth, 2011).

Prehistoric archaeological site SA-1 has not been evaluated for its eligibility to the California Register of Historical Resources or the National Register of Historic Places, but is assumed to be eligible for listing on both registers and to constitute a historical resource for the purpose of CEQA due to its ability to yield information important to prehistory (Wohlgemuth and Kaijankoski, 2009).

5.5.1.6 Architectural Methods, Survey, and Results

Records Search and Literature Review

Circa: Historic Property Development (Circa) conducted a records search and literature review for the project area. This research included reviewing previous historical resource inventory and evaluation reports and other documentation provided by the SFPUC, Far Western, and the California Department of Transportation (Caltrans). Circa also consulted state and federal lists to determine the location of any known historical resources within the project area. In addition, historical and modern maps were reviewed and additional background research was undertaken at the following repositories:

- Archives, San Francisco Public Utilities Commission, San Francisco, CA
- California Historical Society, San Francisco, CA
- History Center, San Francisco Public Library, San Francisco, CA
- Oakland History Room, Oakland Public Library, Oakland, CA

Two features of the SFPUC's Alameda watershed area are listed as notable historic resources, as described below under the heading Records Search and Survey Results.

Field Survey Methods

Circa conducted field surveys of the C-APE in March 2008 and May 2009. As part of both field efforts, survey work was conducted on foot for all areas not visible by car. Any potential resources estimated to be more than 45 years old were examined, photographed, and recorded in accordance with the standards of the California Department of Parks and Recreation, Office of Historic Preservation.

Records Search and Survey Results

The records search identified two features within the SFPUC Alameda watershed that are listed as notable historic resources. The Sunol Water Temple, designed by Willis Polk and built in 1900–1910, is listed in the California Inventory of Historic Resources and the Historic Civil Engineering Landmarks. This neoclassical structure marks the confluence of waters from Calaveras Reservoir, the Sunol gravel beds, and the Pleasanton wells. The Hetch Hetchy Coast Range Tunnel is recognized as a Historic Civil Engineering Landmark of San Francisco and Northern California and consists of 29 miles of tunnels, siphons, and pipelines. Neither of these historic resources is located within the C-APE.

The records search identified two historic inventories that were conducted for other SFPUC projects—the Alameda Siphons Seismic Reliability Upgrade project (2008) and the New Irvington Tunnel project (2009)—both of which overlap portions of the project C-APE. Of the architectural properties identified in the Alameda Siphons report, only the Alameda Siphons Nos. 1, 2, and 3 are located within the proposed project's C-APE. These are described below. The remaining resources identified in that report, as well as resources identified in the inventory for the New Irvington Tunnel project, are located outside of the C-APE.

Three Alameda Siphons run underground from the Alameda East Portal to the Alameda West Portal, conveying water under Alameda Creek. Alameda Siphon No. 1 was constructed in 1934; it is 2,942 feet long and is made of 69-inch-diameter steel cylinder reinforced-concrete pipe. Alameda Siphon No. 2 was constructed in 1953 and is a 91-inch-diameter pipeline comprised of a steel plate with coat-tar lining and coating; this siphon is felt wrapped and 2,972 feet long. Alameda Siphon No. 3 was constructed in 1967 and is comprised of a 96-inch-diameter prestressed-concrete cylinder pipe, 2,694 feet in length. The evaluation completed for the Alameda Siphons Seismic Reliability Upgrade Project concluded that Alameda Siphons No. 1 and No. 2 were eligible for listing in the National Register and the California Register for their association with the Hetch Hetchy system and for their architecture/workmanship, while Alameda Siphon No. 3 is not eligible for either the National Register or California Register (Jones & Stokes and Carey & Company, 2008).

Only one other inventory overlapped with the project C-APE. This survey encompassed a narrow corridor paralleling Calaveras Road, and a small area at the intersection of Calaveras Road and the Turner Dam Access Road. No cultural resources were found as part of this inventory.

The architectural field survey completed by Circa for the proposed project identified three architectural properties and a pipeline within the C-APE. The architectural properties included a small gabled residential-style building just east of Hanson Aggregates' quarry Pit F3-East, which was built in about 1970; a grouping of industrial and storage buildings along the northern border of the Oliver De Silva, Inc. (De Silva) quarry Pit F6, all constructed post-1964; a grouping of industrial facilities associated with the San Antonio Pump Station and existing chemical facility, all constructed post-1964; and the San Antonio Pipeline, which was constructed in 1968. Circa surveyed and evaluated each of these facilities, and none were recommended for listing in the National Register or California Register due to their recent construction dates and lack of historical and/or architectural significance (Circa, 2009). The results of the evaluations found that none of these properties would be considered: (1) exceptionally important under National Register Criterion G for properties that have achieved significance within the past 50 years, or (2) significant under the California Register special consideration for resources achieving significance within the past 50 years.

Adjacent to the residential-type building located east of Pit F3-East is an open wood frame, shed-roofed barn structure set on a concrete pad. When Pits F3-East and F3-West were being actively mined, Hanson Aggregates employees used this shed for vehicular storage. However, like the adjacent residential-type building, the shed is no longer in use. This shed was surveyed by Environmental Science Associates for another SFPUC project. Like the residential-type building, the shed was also constructed circa 1970 and thus does not meet the 45 year age criteria for consideration as a historical resource (1965 or earlier). The shed exhibits no notable architectural merit, stylistic elements, construction techniques or craftsmanship. Furthermore, it does not appear to display the exceptional significance required for a recently constructed resource under National Register Criteria Consideration G, and does not meet the standards for significance under the California Register special consideration for resources that have achieved significance within the past 50 years (ESA, 2011).

Historical Contacts

Prior to fieldwork, Circa contacted a number of historical organizations to request information about potential cultural resources in the project area. The organizations contacted were the Pacific Locomotive Association in Sunol; the Alameda County Historical Society in Oakland; Save Our Sunol (SOS) in Sunol; and the Museum of Local History in Fremont. Copies of the letters are provided in the Historic Resources Inventory and Evaluation Report (Circa, 2009). To date, no responses have been received.

5.5.2 Regulatory Framework

5.5.2.1 Federal Regulations

National Historic Preservation Act

Cultural resources are protected through the National Historic Preservation Act (NHPA) of 1966, as amended (16 United States Code 470f), and its implementing regulations. Before a federal agency can engage in an "undertaking" that would, for example, require federal funding or a federal permit, Section 106 of the NHPA requires the agency to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register), and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect historic properties. Under the NHPA, a property is considered significant if it meets the National Register listing criteria at 36 Code of Federal Regulations (CFR) 60.4,[1] as stated below:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> a) Are associated with events that have made a significant contribution to the broad patterns of our history, or
>
> b) Are associated with the lives of persons significant in our past, or
>
> c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
>
> d) Have yielded, or may be likely to yield, information important in prehistory or history.

Federal review of undertakings is referred to as the Section 106 process. This process is the responsibility of the federal lead agency. The Section 106 review typically involves a four-step procedure, which is described in detail in the implementing regulations (36 CFR 800):

- Identify historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties;
- Assess the effects of the undertaking on historic properties;
- Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation; and
- Proceed with the project according to the conditions of the agreement.

5.5.2.2 State Regulations

California Office of Historic Preservation

The State of California implements the NHPA through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation is an office of the California Department of Parks and Recreation, and implements the policies of the NHPA on a statewide level. The Office of Historic Preservation also maintains the California

[1] Guidelines for applying the National Register criteria are in National Park Service bulletins, including U.S. Department of the Interior, National Park Service, "Guidelines for Applying the National Register Criteria for Evaluation," *National Register Bulletin 15* (Washington D.C., U.S. Government Printing, 1991, revised 1995 through 2002).

Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdiction and is housed at the California Office of Historic Preservation.

California Environmental Quality Act

CEQA, as codified in California Public Resources Code (PRC) Section 21000 et seq., is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a proposed project would have a significant effect on historical resources and unique archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k), or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083 regarding unique archaeological resources. A unique archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC Section 21083.2 [g]).

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility to the California Register are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register as a historical resource, a prehistoric or historic-period resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history (CEQA Guidelines Section 15064.5 [a][3]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

California Public Resources Code

As part of the determination made pursuant to PRC Section 21080.1, the lead agency must determine whether the project would have a significant effect on archaeological and paleontological resources.

Several sections of the PRC protect cultural resources. Under Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor. Section 5097.98 states that if Native American remains are identified within a project area, the lead agency must work with the appropriate Native Americans as identified by the NAHC and develop a plan for the treatment or disposition of, with appropriate dignity, the human remains and any items associated with Native American burials. These procedures are also addressed in Section 15046.5 of the CEQA Guidelines. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

In addition, several sections of the PRC that are relevant for the project area protect paleontological resources. Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontologic feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

5.5.2.3 Local Regulations

San Francisco Historic Preservation Commission and Planning Code, Articles 10 and 11

The San Francisco Historic Preservation Commission is a newly created seven-member body that makes recommendations on the designation of landmark buildings, historic districts, and significant buildings. The Historic Preservation Commission replaces and retains most of the responsibilities of the Landmarks Preservation Advisory Board (Landmarks Board). The Landmarks Board was a nine-member body appointed by the Mayor that served as an advisory board to the San Francisco Planning Commission and San Francisco Planning Department. The Landmarks Board was established in 1967 with the adoption of Article 10 of the Planning Code. The work of the Landmarks Board, San Francisco Planning Department, and San Francisco Planning Commission has increased public awareness about the need to protect the CCSF's architectural, historical, and cultural heritage.

The Historic Preservation Commission makes recommendations to the San Francisco Board of Supervisors on landmark designations, historic district designations, and individual resource designations within historic districts. The Historic Preservation Commission may also review and comment on projects affecting historical resources that are subject to environmental review under CEQA, or projects subject to review under Section 106 of the NHPA. The Historic Preservation Commission also approves Certificates of Appropriateness for Landmarks and properties within Article 10 Historic Districts.

The State Office of Historic Preservation has included the CCSF on its list of Certified Local Governments, which means that San Francisco has an approved historic preservation ordinance, Historic Preservation Commission, and other formal processes related to historic preservation and cultural resources management. The CCSF reviews the historical resources designated under Articles 10 and 11 of the San Francisco Planning Code when it evaluates project impacts on historical resources. Article 10 describes procedures regarding the preservation of sites and areas of special character or special historical, architectural, or aesthetic interest or value, such as officially designated city landmarks and buildings included within locally designated historic districts. Article 11 of the Planning Code designated six downtown conservation districts. There are no CCSF-designated landmarks or properties that contribute to designated historic districts in the project C-APE.

5.5.3 Impacts and Mitigation Measures

5.5.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to cultural resources, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code;
- Cause a substantial adverse change in the significance of a historical or unique archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature; or
- Disturb any human remains, including those interred outside of formal cemeteries pursuant to California Health and Safety Code Section 7050.5.

5.5.3.2 Approach to Analysis

The potential for the SABPL project to adversely affect cultural resources would be limited to construction activities. Ground disturbance and excavation during construction activities could disturb or destroy known and previously unrecorded buried cultural resources, including archaeological and paleontological resources and human remains. Project construction activities could also generate vibrations through the use of vibratory equipment, such as large bulldozers and vibratory compactors, or through high-impact construction methods, such as pile driving and sheetpile driving, that could cause cosmetic, architectural, and structural damage to nearby historic buildings and structures, if present. Operation of the proposed project would have no effect on cultural resources because project operations would not cause additional ground disturbance or generate strong vibrations. Thus, the analysis below focuses on construction-related impacts on cultural resources.

Architectural Resources

Potential impacts on historic architectural resources were assessed by determining whether proposed project activities could cause a substantial adverse change in the significance of any such resources within the C-APE. A substantial adverse change in the significance of a historic architectural resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired" (CEQA Guidelines Section 15064.5[b][1]). A historic architectural resource can be materially impaired through demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in the California Register (CEQA Guidelines Section 15064.5[b][2][A]).

Archaeological Resources

The significance of most prehistoric and historic-period archaeological sites is usually determined based on National Register and California Register Criterion 4, presented above. This criterion stresses the importance of the information potential contained within the site rather than its significance as a surviving example of a type or its association with an important person or event. Archaeological resources may also be assessed under CEQA as unique archaeological resources, defined as archaeological artifacts, objects, or sites that contain information needed to answer important scientific research questions.

Paleontological Resources

For this analysis, “unique paleontological resource” is deemed to include resources that qualify as significant under SVP criteria (see Section 5.5.1.2, above). Potential project effects on paleontological resources are limited to construction-related disturbance and are discussed below under Impact CP-3. Operation of the proposed project would not result in impacts on paleontological resources. There are no unique geological features within the area that could be affected by the project.

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including PRC Section 5097.98 and Health and Safety Code Section 7050.5. Impacts include intentional disturbance, mutilation, or removal of interred human remains.

5.5.3.3 Summary of Impacts

Table 5.5-2 lists the proposed project’s cultural and paleontological impacts and significance determinations.

TABLE 5.5-2
SUMMARY OF IMPACTS – CULTURAL AND PALEONTOLOGICAL RESOURCES

Impacts	Significance Determinations
Impact CP-1: Project construction could cause a substantial adverse change in the significance of a historical resource.	LSM
Impact CP-2: Project construction could cause a substantial adverse change in the significance of a historical or unique archaeological resource.	LSM
Impact CP-3: Project construction could result in a substantial adverse effect by directly or indirectly destroying a unique paleontological resource or site.	LSM
Impact CP-4: Project construction could result in a substantial adverse effect related to the disturbance of human remains.	LSM
Impact C-CP: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on historical, archaeological, or paleontological resources, or human remains.	LSM

LSM = Less than Significant impact with Mitigation

5.5.3.4 Construction Impacts and Mitigation Measures

Impact CP-1: Project construction could cause a substantial adverse change in the significance of a historical resource. (Less than Significant with Mitigation)

Two historic-period architectural resources identified in the C-APE could be affected by the proposed SABPL project: Alameda Siphons Nos. 1 and 2. Alameda Siphons Nos. 1 and 2 are considered historical resources for the purposes of CEQA evaluation. The backup pipeline would be connected to Alameda Siphon No. 3, which is not considered a historical resource, but the connection would entail construction within approximately 10 feet of Alameda Siphon No. 2 and 20 feet of Alameda Siphon No. 1. Figure 3-3 in Chapter 3, Project Description, shows the numbers and locations of the Alameda Siphons; as shown, No. 1 is the southernmost siphon and No. 3 is between No. 1 and No. 2. The backup pipeline would be constructed above ground where it would pass over Alameda Siphon No. 2, thus limiting the potential for construction activities to damage Alameda Siphon No. 2. Although the backup pipeline would have no physical connection with Alameda Siphons Nos. 1 and 2, construction activities could result in damage to these historical resources due to the project's proximity to the siphons, which could be a significant impact. However, with implementation of Mitigation Measure M-UT-1h, the impact on the historical significance of an individual facility would be reduced to a less-than-significant level.

Mitigation Measure M-UT-1h: Measures to Protect Alameda Siphons Nos. 1, 2, and 3.
(See Impact UT-1 in Section 5.12, Utilities and Service Systems, for description.)

Implementation of Mitigation Measure M-UT-1h would require that protective measures be taken during construction of the SABPL project to protect the Alameda Siphons from damage, including Alameda Siphons Nos. 1 and 2, which are historical resources. This measure requires that the SFPUC or its contractor(s) prepare a plan establishing procedures to protect the siphons from damage during operation of construction equipment, vibration-inducing activities, and other construction activities such as materials staging or storage. Therefore, this impact would be less than significant with mitigation.

Also as part of the proposed project, two quarry buildings—the single-story residential-type building and the shed-roofed barn structure located just east of quarry Pit F3-East—would be demolished to facilitate construction of the cutoff wall. As indicated above in Section 5.5.1.4, these buildings are estimated to have been constructed circa 1970 and thus do not meet the 45 year age criteria for consideration as a historical resource (1965 or earlier), and have no notable architectural merit, stylistic elements, construction techniques or craftsmanship. Thus, the two quarry buildings are not historical resources. Therefore, no impact to historical resources would result from demolition of these two buildings.

Impact CP-2: Project construction could cause a substantial adverse change in the significance of a historical or unique archaeological resource. (Less than Significant with Mitigation)

This impact analysis addresses impacts on archaeological sites that qualify as either historical resources or unique archaeological resources. No archaeological resources were recorded within the C-APE for the proposed project; however, prehistoric archaeological site SA-1 is located immediately east and adjacent to the project area. Subsurface investigations indicate that this archaeological site does not extend into the project C-APE. Given the negative subsurface survey results—particularly with respect to trenching in the areas considered most sensitive for buried archaeological sites—no active archaeological monitoring of project activities is warranted. However, avoidance measures would be applied. Specifically, while archaeological site SA-1 has not been evaluated for its eligibility to the California Register or the National Register, it is assumed to be eligible for the purpose of this analysis. Although impacts are not anticipated, any disturbance to this resource during project construction activities could result in a significant impact. However, implementation of Mitigation Measure M-CP-2a would reduce this impact to a less-than-significant level.

> **Mitigation Measure M-CP-2a: Site Protection Measures for Prehistoric Archaeological Site SA-1.**
>
> All archaeological work performed under this mitigation measure shall be subject to review by the Environmental Review Officer (ERO) or designee. To protect prehistoric archaeological site SA-1, the SFPUC shall place exclusionary signage on the existing locked gate(s) and install orange-barrier construction fencing between archaeological site SA-1 and the construction work areas. Construction personnel shall be informed that, due to the sensitive nature of the area, it is off-limits to all equipment, staging, and other activities. The exclusionary signage and fencing required by this measure shall be maintained throughout project-related construction activities.

Implementation of Mitigation Measure M-CP-2a would ensure that archaeological site SA-1 is not inadvertently affected by construction activities associated with the SABPL project. Therefore, this impact would be less than significant with mitigation.

Although the surface inventory and extended archaeological surveys found no cultural resources within the C-APE, it is possible that previously unrecorded and buried (or otherwise obscured) archaeological deposits could be discovered during project construction. Excavation, grading, and the movement of heavy construction vehicles and equipment could expose and disturb or damage previously unrecorded archaeological resources, a significant impact. However, implementation of Mitigation Measure M-CP-2b would reduce any impact on previously unrecorded archaeological resources to a less-than-significant level.

> **Mitigation Measure M-CP-2b: Accidental Discovery of Archaeological Resources.**
>
> To avoid any potential adverse effects on accidentally discovered buried cultural resources, as defined in CEQA Guidelines Section 15064.5(a)(c), the SFPUC shall distribute the San Francisco Planning Department's archaeological resource "ALERT" sheet to the project prime contractor; to any subcontractors (including firms subcontracted to perform

demolition, excavation, grading, foundation, pile driving, etc.); and/or to any utilities firm involved in soil-disturbing activities within the project area. Prior to any soil-disturbing activities, each contractor shall be responsible for ensuring that the ALERT sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The SFPUC shall provide the ERO with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) confirming that all field personnel have received copies of the ALERT sheet.

If the ERO determines that an archaeological resource may be present within the project area, the SFPUC shall retain the services of a qualified archaeological consultant. The archaeological consultant shall advise the ERO as to whether the discovery is an archaeological resource that retains sufficient integrity and is of potential scientific/historical/ cultural significance. If an archaeological resource is present, the consultant shall identify and evaluate the archaeological resource. The archaeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the SFPUC.

Measures might include: preservation in situ of the archaeological resource; an archaeological monitoring program; or an archaeological evaluation program. If an archaeological monitoring program or archaeological testing program is required, it shall be subject to review by the ERO. The ERO may also require that the SFPUC immediately implement a site security program if the archaeological resource is at risk from vandalism, looting, or other damaging actions.

For any accidental discovery, the archaeological consultant shall submit an archaeological data recovery report (ADRR) to the ERO which, in addition to the usual contents of the ADRR, shall include an evaluation of the historical significance of any discovered archaeological resource; describe the archaeological and historical research methods employed in the archaeological monitoring/data recovery program(s) undertaken; and present, analyze, and interpret the recovered data. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the final report.

Once approved by the ERO, copies of the ADRR shall be distributed as follows: the relevant California Historical Resources Information System Information Center shall receive one copy, and the ERO shall receive one copy of the transmittal letter of the ADRR to the Information Center. The San Francisco Planning Department, Environmental Planning Division shall receive three copies of the ADRR along with copies of any formal site recordation forms (California Department of Parks and Recreation Form 523 series) and/or documentation for nomination to the National Register/California Register. The SFPUC shall receive copies of the ADRR in the number requested. In instances of high public interest in or high interpretive value of a resource, the ERO may require a different final report content, format, and distribution than that presented above. All archaeological work performed under this mitigation measure shall be subject to review by the ERO or designee.

Implementation of Mitigation Measure M-CP-2b would address impacts on any previously unrecorded and buried (or otherwise obscured) archaeological deposits by requiring the SFPUC and its contractors to adhere to the appropriate procedures and protocols in the event that a possible archaeological resource is discovered during construction activities associated with the SABPL project. Therefore, this impact would be less than significant with mitigation.

Impact CP-3: Project construction could result in a substantial adverse effect by directly or indirectly destroying a unique paleontological resource or site. (Less than Significant with Mitigation)

The paleontological C-APE for the SABPL project is underlain by Holocene alluvium, artificial fills, and gravel quarries and quarry pits. Older alluvium and the Briones Formation are present in the project vicinity and may underlie the Holocene alluvium at shallow depths. As recorded in the UCMP database, no paleontological resources are known to exist within the project C-APE, but such resources have been found in the Sunol Valley and in the Alameda Creek watershed. Fossils are typically a buried resource, and impacts on them are therefore determined based on the probability or potential that fossils may be present within a rock unit. **Table 5.5-3** summarizes the rock units in the project area, their paleontological potential, and their potential to be disturbed by project construction activity.

TABLE 5.5-3
DISTURBANCE/DAMAGE POTENTIAL FOR SIGNIFICANT PALEONTOLOGICAL RESOURCES

Geologic Unit	Paleontological Potential	Project Components that Could Disturb the Geologic Unit	Potential Disturbance of Significant Paleontological Resource?
Holocene Alluvium (*Qhsc*, *Qha*, and *Qt*)	Low	All components that involve trenching, excavation, and grading	No
Latest Pleistocene Alluvium (*Qpa*)	High	• Pipeline alignments involving excavation activities greater than 5 feet in depth • Blowoff valves and air release valves • Chemical facility (16-foot-deep excavation for flow meter) • Discharge facility at Pit F3-East (20-foot-deep excavation for outlet structure) • Cutoff wall around Pits F3-East and F3-West (excavations up to 80 feet deep) • Alameda Creek Pump Station and transfer pipeline (45-foot-deep excavation for wet well)	Yes
Briones Formation (*Tbr*)	High	• Pipeline alignments involving excavation activities greater than 10 feet in depth • Chemical facility (16-foot-deep excavation for flow meter) • Cutoff wall around Pits F3-East and F3-West (excavations up to 80 feet deep) • Alameda Creek Pump Station and transfer pipeline (45-foot-deep excavation for wet well)	Yes

Holocene alluvium in the project area includes active stream channels (*Qhsc*), alluvial fans (*Qha*), and young stream terraces (*Qt*) of the Alameda Creek drainage in the Sunol Valley. These geologic units form the flat base of the Sunol Valley and directly underlie the entire area to be disturbed by the SABPL project. All project-related earthmoving activities are likely to disturb Holocene alluvium; however, this is a unit of low paleontological potential. Therefore, it is unlikely that construction activity within this geologic unit would disturb or destroy a unique or significant paleontological resource.

Older alluvium does not occur at the surface within the project area, but areas of latest Pleistocene alluvial deposits (*Qpa*) have been mapped along the outer margins of the Alameda Creek drainage near the Alameda West Portal and immediately east of the project area near the proposed chemical facility (see Section 5.15, Geology and Soils). Although site profiles in the geotechnical report prepared for the project did not differentiate between Holocene and Pleistocene alluvium (URS, 2009), it is probable that Pleistocene alluvium exists within the project area at relatively shallow depths beneath the ground surface. This determination is based on the fact that the unit occurs in close proximity to the project area, and Holocene alluvium typically thins out toward valley margins. Thus, in the absence of site-specific stratigraphic information demonstrating otherwise, it is assumed that Pleistocene alluvium could be encountered beneath the Holocene alluvium during excavations beyond a few feet in depth. Because Pleistocene alluvium has a high paleontological potential, disturbance or destruction of a unique paleontological resource could occur if this unit is encountered beneath the Holocene alluvium during excavation or trenching.

The Briones Formation (*Tbr*) is the bedrock unit that forms the hill immediately east of Calaveras Road. While this bedrock unit does not occur at the surface within the project area, subsurface investigations conducted in the area have shown that the unit would likely be encountered during pipeline excavations, particularly on the southern end of the alignment near the proposed chemical facility (URS, 2009). In this area, the Briones Formation was found to exist approximately 10 feet below the ground surface (bgs). Based on a geologic profile created by URS (2009), the Briones Formation may be found at depths up to and in excess of 35 feet bgs northward along the proposed backup pipeline alignment. The presence of and/or depth to the Briones Formation at the discharge facility, cutoff wall, Alameda Creek Pump Station, and transfer pipeline have not been determined, but this formation could be encountered in excavations deeper than 35 feet. Thus, because the Briones Formation has a high paleontological potential, a unique paleontological resource could be disturbed or destroyed during excavation or trenching for the project.

While the C-APE for the SABPL project is underlain by Holocene alluvium and artificial fills—both of which have a low paleontological potential—unique and significant fossils could be disturbed or destroyed if either Pleistocene alluvium or the Briones Formation is encountered at greater depths during pipeline trenching and other project-related excavations listed in Table 5.5-3. Thus, the construction-related impact on paleontological resources is considered potentially significant. However, implementation of Mitigation Measure M-CP-3 would reduce the impact on paleontological resources to a less-than-significant level.

Mitigation Measure M-CP-3: Paleontological Resources Mitigation Program.

Prior to the initiation of any site preparation or start of construction, the SFPUC shall retain a qualified professional paleontologist or a California Registered Professional Geologist (California RPG) with appropriate paleontological expertise, as defined by the Society of Vertebrate Paleontology's Conformable Impact Mitigation Guidelines Committee (SVP 1995 Guidelines), to carry out a paleontological resources training program for construction workers and to develop a paleontological mitigation program. The SFPUC shall require the paleontologist to be "on-call" throughout the duration of ground-disturbing activities. At a minimum, the mitigation program shall include:

- *Preparation of a Preconstruction Paleontological Assessment Based on Final Project Design*. The professional paleontologist shall prepare a preconstruction assessment, including a review of the information presented in this EIR, existing fossil localities in the region, and project geological/geotechnical reports, to determine with greater precision the depth and extent of geologic units of high paleontological potential (Pleistocene alluvium and Briones Formation) within the areas to be excavated. The results shall be documented in a report along with recommendations for appropriate and feasible procedures to avoid or minimize damage to any paleontological resources present. Based on the volume and depth of soil excavations and the professional judgment of the paleontologist, he or she shall make recommendations regarding the need, if any, for paleontological monitoring of ground-disturbing activities in geologic units of high paleontological potential. The SFPUC shall review and approve the report in consultation with the ERO.

- *Paleontological Resources Training.* All construction forepersons and field supervisors shall be trained in the recognition of potential fossil materials prior to the initiation of any site preparation or start of construction. Training on paleontological resources shall also be provided to all other construction workers, but may include videotape of the initial training and/or the use of written materials rather than in-person training by the qualified paleontologist. In addition to fossil recognition, the training shall convey procedures to follow if construction crews encounter potential fossil materials in the course of earthwork, excavation, or grading, as described below.

- *Assessment and Salvage of Potential Fossil Finds*. If construction crews discover potential fossils, all earthwork or other types of ground disturbance within 50 feet of the find shall stop immediately until the qualified professional paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the monitor may record the find and allow work to continue, or recommend salvage and recovery of the fossil. The monitor may also propose modifications to the stop-work radius based on the nature of the find, site geology, and the activities occurring on the site. Recommendations for any necessary treatment shall be consistent with the SVP 1995 Guidelines (SVP Conformable Impact Mitigation Guidelines Committee, 1995) and currently accepted scientific practices. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation and publication of a report describing the finds. The monitor's recommendations shall be subject to review and approval by the ERO or designee. The SFPUC shall be responsible for ensuring that treatment is implemented and reported to the San Francisco Planning Department. If no report is required, the SFPUC shall nonetheless ensure that information on the nature, location, and depth of all finds is readily available to the scientific community through university curation or other appropriate means.

- *Active Monitoring of Construction Sites for Paleontological Resources, if Recommended in the Preconstruction Paleontological Assessment*. Paleontological monitoring shall consist of periodically inspecting disturbed, graded, and excavated surfaces, as well as soil stockpiles and disposal sites. The monitor (i.e., the professional paleontologist or a designee of the paleontologist) shall have authority to divert grading or excavation away from exposed surfaces temporarily in order to examine disturbed areas more closely and/or recover fossils. The monitor shall coordinate with the construction manager to ensure that monitoring is thorough but does not result in unnecessary delays. If the monitor encounters a paleontological resource, he or she shall assess the fossil, and record or salvage it, as described above.

Implementation of Mitigation Measure M-CP-3 would address the SABPL project's construction-related impacts on paleontological resources by requiring: a preconstruction paleontological assessment based on the final project design to more precisely determine the depth and extent of geologic units of high paleontological potential within the areas to be excavated; paleontological resources training for all construction forepersons and field supervisors; construction monitoring (if recommended in the paleontological assessment); and adherence to appropriate protocols for assessing and salvaging any potential fossil finds. Therefore, this impact would be less than significant with mitigation.

Human Remains

Impact CP-4: Project construction could result in a substantial adverse effect related to the disturbance of human remains. (Less than Significant with Mitigation)

Although no known human burial locations have been identified within the project C-APE, the possibility cannot be entirely discounted. Project construction could result in direct impacts on previously undiscovered human remains during any earthmoving activities. Although earthmoving associated with construction would be a comparatively short-term activity, impacts on human remains would constitute a long-term impact. The impact related to the disturbance of human remains during construction would be potentially significant, but would be reduced to a less-than-significant level with implementation of Mitigation Measure M-CP-4.

Mitigation Measure M-CP-4: Accidental Discovery of Human Remains.

The treatment of any human remains and associated or unassociated funerary objects discovered during soil-disturbing activities shall comply with applicable state laws. Such treatment would include immediate notification of the Alameda County coroner and, in the event of the coroner's determination that the human remains are Native American, notification of the NAHC, which would appoint a Most Likely Descendant (MLD) (PRC Section 5097.98). The archaeological consultant, SFPUC, and MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of any human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5[d]). The agreement would take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. The PRC allows 48 hours to reach agreement on these matters. If the MLD and the other parties could not agree on the reburial method, the SFPUC shall follow Section 5097.98(b) of the PRC, which states that "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance." All archaeological work performed under this mitigation measure shall be subject to review by the ERO or designee.

Implementation of Mitigation Measure M-CP-4 would address impacts on any buried human remains and associated or unassociated funerary objects that are accidentally discovered during project construction activities by requiring the SFPUC to adhere to appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition protocols. Therefore, this impact would be less than significant with mitigation.

5.5.3.5 Impact Analysis for Pumping Variants

Pumping Variant 1

Since Pumping Variant 1 does not include construction of the Alameda Creek Pump Station, wet well, control building for the pump station, transfer pipeline, or retaining wall along the southern boundary of the pump station site adjacent to the access road, construction of Pumping Variant 1 would require less ground disturbance and excavation than that required for the proposed project. As a result, the potential for accidental discovery or disturbance of buried cultural resources to occur, including human remains, during project construction might be less than under the proposed project. Paleontological impacts may be similarly reduced. However, because all of the other proposed facilities and permanent improvements would still be constructed under Pumping Variant 1, the overall impacts related to accidental discovery or disturbance of buried cultural resources would be similar to those of the proposed project. This variant would still require the same construction activities in the vicinity of Alameda Siphons Nos. 1 and 2, which are considered historical resources, and thus would result in the same potential impacts on historical resources as the proposed project. Therefore, implementation of Pumping Variant 1 would not change the analysis, conclusions, or mitigation measures presented in Section 5.5.3.4, above.

Pumping Variant 2

Pumping Variant 2 would construct all of the same facilities and improvements as the proposed project using the same construction methods and equipment. Thus, the potential impacts on historical, archaeological, and paleontological resources and human remains would be the same as those identified for the proposed project. Thus, implementation of Pumping Variant 2 would not change the analysis, conclusions, or mitigation measures presented in Section 5.5.3.4, above.

5.5.3.6 Cumulative Impacts and Mitigation Measures

Impact C-CP: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on historical, archaeological, or paleontological resources, or human remains. (Less than Significant with Mitigation)

The geographic scope for cumulative impacts on cultural resources includes the cultural resources C-APE for the project and the Sunol Valley region. The SABPL project would contribute to cumulative impacts on cultural resources, including historical, archaeological, and paleontological resources, if the SABPL project and other projects listed in Table 5.1-6 were to adversely affect the same cultural resources affected by the project or would cause impacts on other cultural resources in the project vicinity.

Historical Resources

As discussed in Impact CP-1, the SABPL project would have a potentially significant impact on historical resources because Alameda Siphons Nos. 1 and 2 (considered historical resources for the purposes of CEQA compliance) could be damaged during construction. Cumulative SFPUC projects in the project vicinity include the Alameda Siphons Seismic Reliability Upgrade (Alameda Siphons) project, New Irvington Tunnel (NIT) project, San Antonio Pump Station Upgrade project, and Upper Alameda Creek Filter Gallery (Filter Gallery) project. Of these, only the Alameda Siphons project could affect the same historical resources as the proposed project (Alameda Siphons Nos. 1 and 2, which are historic architectural resources).

The Alameda Siphons project includes construction of a new siphon (Alameda Siphon No. 4) between the Alameda East and West Portals as well as seismic reinforcement of Alameda Siphon No. 2 at the Calaveras fault, both of which could cause accidental damage to Alameda Siphons Nos. 1 and 2. Under the Alameda Siphons project, Alameda Siphon No. 2 would be seismically reinforced by installing 300 feet of engineered foundation treatment at the Calaveras fault crossing, and constructing seismic upgrades and improvements to vaults and valve houses at the Alameda East Portal. Construction of the new Alameda Siphon No. 4 also has the potential to cause accidental damage to Alameda Siphons Nos. 1 or 2. Because this construction and the construction activities under the SABPL project could result in damage to these same historical resources, cumulative impacts on historical resources would be potentially significant, and the SABPL project's contribution to this impact would be cumulatively considerable.

However, as discussed in Impact CP-1, the SABPL project's impact on these historical resources would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3)** (see Impact UT-1 in Section 5.12, Utilities and Service Systems, for description), which requires implementation of measures during construction of the SABPL project to protect Alameda Siphons Nos. 1 and 2 from damage. Implementation of this mitigation measure would reduce the impact such that the SABPL project's contribution to cumulative impacts on historical resources would not be cumulatively considerable (less than significant).

Archaeological Resources and Human Remains

As discussed in Impacts CP-2 and CP-4, excavation associated with the SABPL project would have a significant impact related to the potential to encounter previously unrecorded archaeological resources and/or human remains interred outside of a formal cemetery. Cumulative projects in the proposed project vicinity that would also involve excavation include the Alameda Siphons project, NIT project, San Antonio Pump Station Upgrade project, Filter Gallery project, and SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project. These projects could also encounter previously unrecorded archaeological resources or human remains, which would be a potentially significant cumulative impact, and the SABPL project's contribution to this impact would be cumulatively considerable.

However, as discussed in Impacts CP-2 and CP-4, the SABPL project's contribution to cumulative impacts related to the potential to encounter previously unrecorded archaeological resources and human remains would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-CP-2b (Accidental Discovery of Archaeological Resources)** and **M-CP-4 (Accidental Discovery of Human Remains)** (see Impact CP-2, above, for description). These measures require the SFPUC to distribute the San Francisco Planning Department's archaeological resource "ALERT" sheet to the project prime contractor, subcontractors, and/or any utilities firm involved in soil-disturbing activities within the project area. If the ERO determines that an archaeological resource may be present within the project area, the SFPUC is required to retain the services of a qualified archaeological consultant to evaluate the find. With regard to the accidental discovery of human remains, in particular, the Alameda County coroner must be immediately notified, and, in the event the coroner determined that the remains were Native American, the NAHC must be notified. Implementation of these measures would effectively avoid damage to or loss of resources, and little to no residual impact would remain after mitigation. With implementation of these mitigation measures, the project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Although the SABPL project could have a significant impact related to the potential to disturb archaeological site SA-1, the project's impacts on this archaeological resource would be less than significant with implementation of **Mitigation Measure M-CP-2a (Site Protection Measures for Prehistoric Archaeological Site SA-1)** (see Impact CP-2, above, for description), and none of the projects listed in Table 5.1-6 would have an adverse effect on this site. Therefore, there would be no cumulative impact related to the potential to disturb archaeological site SA-1.

Paleontological Resources

As discussed in Impact CP-3, the SABPL project could have a significant impact related to the potential to encounter paleontological resources during excavation within the Pleistocene alluvium and Briones Formation, both of which have a high paleontological potential. Cumulative projects in the SABPL project vicinity that would involve excavation in the same geologic units include the Alameda Siphons project, NIT project, San Antonio Pump Station Upgrade project, Filter Gallery project, and SMP-30 Expansion project. These cumulative projects could also encounter paleontological resources during construction, which would be a potentially significant cumulative impact, and the SABPL project's contribution to this impact would be cumulatively considerable.

However, as discussed in Impact CP-3, the SABPL project's impacts on paleontological resources would be site-specific and limited to the project construction areas, and would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-CP-3 (Paleontological Resources Mitigation Program)** (see Impact CP-3, above, for description). This measure requires the SFPUC to: conduct a preconstruction paleontological assessment based on the final project design; ensure paleontological resources training is provided to construction forepersons and field supervisors regarding the recognition of paleontological resources and proper procedures to be followed in the event that potentially significant resources are unearthed; assess and salvage any fossils discovered by the construction crews; and provide an onsite paleontological monitor if recommended in the preconstruction paleontological assessment. Implementation of this mitigation measure would ensure that any paleontological resources encountered during construction would be avoided or recovered and appropriately managed. Implementation of this measure would effectively avoid damage to or loss of resources, and little to no residual impact would remain after mitigation. Therefore, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are substantially similar to or the same as those of the proposed project (refer to Section 5.5.3.5, Impact Analysis for Pumping Variants), the cumulative impact analysis and associated conclusions provided above apply to both project variants.

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5.6 Transportation and Circulation

This section provides an overview of existing transportation conditions within the proposed San Antonio Backup Pipeline (SABPL) project vicinity, evaluates the potential impacts on traffic, transportation, and circulation that could result from implementing the project, and identifies mitigation measures, as appropriate.

5.6.1 Setting

The proposed SABPL project is located in unincorporated Alameda County. The study area considered for this impact analysis includes the network of regional highways and local roadways that would be used by construction workers and vehicles to access the project area. **Figure 5.6-1** shows regional and local roadways that provide access to the project area.

5.6.1.1 Regional and Local Roadways

Interstate 680 (I-680) provides regional access to the project area. I-680 is a four- to eight-lane freeway that extends between I-280 and U.S. 101 in San Jose and I-80 in Fairfield. I-680 serves as a primary north-south regional route, connecting the Livermore–Amador Valley with Contra Costa County in the north and the Santa Clara Valley in the south. I-680 in the project vicinity is accessed via on- and off-ramps at Calaveras Road and State Route 84 (SR 84) (also Paloma Road) in Alameda County.

Calaveras Road provides the primary access to the project area. Calaveras Road is a two-lane roadway (one lane in each direction) and, in the vicinity of the proposed project, has relatively flat grades and a straight alignment. The posted speed limit on Calaveras Road is 50 miles per hour (mph).

Weekday traffic on I-680 consists primarily of commuter traffic during peak periods (generally between the hours of 7 a.m. and 9 a.m., and 4 p.m. and 6 p.m.), and a mix of residential, commercial, and industrial traffic throughout the day. Recent data published by the California Department of Transportation (Caltrans) for 2009 indicate that the average daily traffic volume on I-680 in the vicinity of the project area is about 142,000 vehicles per day at Calaveras Road/SR 84, with a.m. and p.m. peak-hour volumes of 10,800 vehicles per hour (Caltrans, 2009a). Trucks represent about 8 percent of the total daily traffic volumes (Caltrans, 2009b).

Weekday daily traffic volumes on Calaveras Road between I-680 (north of the project area) and Geary Road (south of the project area) for the year 2006 were between 1,100 and 1,300 vehicles per day, and peak-hour traffic volumes were about 80 vehicles during the a.m. peak hour and 100 vehicles during the p.m. peak hour (LCW Consulting, 2006; LCW Consulting, 2011a). This segment of Calaveras Road serves as a haul route for the existing aggregate sand and gravel quarries in the area. This haul route was utilized by the quarry operations in 2006 and continues today. Due to limited development in the Alameda watershed, traffic conditions along this segment of Calaveras Road are expected to remain substantially similar from an ongoing, existing facilities and operations traffic standpoint. Because the 2006 traffic data represent

SOURCE: ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.6-1
Regional and Local Roadways

conditions before construction was initiated for several SFPUC projects in the Sunol Valley, these traffic volumes are considered an appropriate representation of baseline conditions. Various SFPUC projects have commenced construction in the Sunol Valley since 2006, resulting in a cumulative increase in construction-related traffic; this impact is addressed below in Section 5.6.3.7, Cumulative Impacts and Mitigation Measures.

5.6.1.2 Transit Service

Alameda County Transit (AC Transit) is the principal bus service provider in Alameda County. There is no AC Transit bus service along Calaveras Road.

5.6.1.3 Bicycle and Pedestrian Network

Bikeways are typically classified as Class I, Class II, or Class III facilities. Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists and pedestrians. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles, while Class III bikeways are signed bike routes that allow bicycles to share streets or sidewalks with vehicles or pedestrians. Calaveras Road south of I-680 is not part of the designated Alameda Countywide Bicycle Network (Alameda County CMA, 2006). However, the East Bay Bicycle Coalition has identified Calaveras Road in Alameda County as an on-road route recommended for bicycle travel (East Bay Bicycle Coalition, 2005). Calaveras Road experiences considerable recreational bicycle use on weekends, while bicycle volumes are generally low on weekdays.

There are no sidewalks or designated pedestrian facilities on Calaveras Road. Pedestrian volumes are very low throughout the day, as the predominant mode of travel in the area is by automobile.

5.6.2 Regulatory Framework

5.6.2.1 Federal Regulations

There are no federal regulations pertaining to transportation impacts that are applicable to the proposed project.

5.6.2.2 State and Local Regulations

Transportation analysis in California is guided by policies and standards set at the state level by Caltrans and at the local level by jurisdictional agencies such as the Alameda County Congestion Management Agency (CMA). Local jurisdictions regulate speed limits and other driving standards on local roadways. Caltrans and local jurisdictions generally assess the impacts of long-term (not short-term) traffic conditions. The goal of state and local plans and policies related to transportation is to prepare for future growth and the vehicular, transit, pedestrian, and bicycle travel demand associated with that growth.

The level of service[1] (LOS) designations for roadways in the Alameda County Congestion Management Program (CMP) network vary by roadway segment and are generally LOS E or LOS F. I-680 is part of the Alameda County CMP network. A LOS monitoring study conducted by the Alameda County CMA in 2010 indicates that I-680 operates at LOS E or better, with the exception of the northbound segments of I-680 between Washington Boulevard and Mission Boulevard/State Route 262 (SR 262) located south of the project area, and between Vargas Road and Andrade Road. Calaveras Road is not part of the Alameda County CMP network (Alameda County CMA, 2010).

5.6.3 Impacts and Mitigation Measures

5.6.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to transportation and circulation, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- Conflict with an applicable congestion management program, including but not limited to LOS standards, travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that causes substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses;
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

5.6.3.2 Approach to Analysis

As explained below, the proposed SABPL project would not result in construction and/or operational impacts related to the following significance criteria.

- *Conflict with an Applicable Plan, Ordinance, or Policy Establishing Measures of Effectiveness for the Performance of the Circulation System during Project Operations*. Operations and maintenance activities associated with the SABPL project are expected to be similar to those occurring

[1] Level of service (LOS) is a qualitative description of a facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Level of service ranges from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

under baseline conditions, and would result in no change to traffic generation or transit demand. Thus, project operations would not result in long-term increases in traffic volumes or transit demand such that alternative transportation would be affected, nor would it affect bicycle and pedestrian travel. Therefore, this significance criterion is discussed below under Impact TR-1 only as it applies to project construction activities.

- *Conflict with an Applicable Congestion Management Program during Project Construction*. The LOS standards established by Alameda County are intended to regulate long-term traffic impacts resulting from a project and do not apply to temporary construction projects. Therefore, this significance criterion is not applicable to project construction activities and is only discussed below under Impact TR-4 as it relates to operational impacts.

- *Result in a Change in Air Traffic Patterns*. Due to the nature and scope of the proposed project, implementation of the project does not have the potential to change air traffic patterns. In addition, the project would not involve the installation of structures that could interfere with air space. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.

- *Substantially Increase Hazards due to a Design Feature*. Implementation of the SABPL project would not permanently change the existing or planned transportation network and would not include any design features that would permanently increase the potential for traffic safety hazards. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.

- *Result in Inadequate Emergency Access during Project Operations*. Implementation of the SABPL project would not permanently change the existing or planned transportation network and would not affect emergency access on Calaveras Road. Therefore, this significance criterion is not applicable to the proposed project operations, and is discussed further under Impact TR-2 only as it applies to project construction activities.

- *Conflict with Adopted Policies, Plans, or Programs Regarding Public Transit, Bicycle, or Pedestrian Facilities during Project Operations*. Implementation of the SABPL project would not permanently change the existing or planned alternative transportation network in Alameda County and therefore would not conflict with policies, plans, or programs related to transit, bicycle, or pedestrian travel. Upon completion of the proposed project, operations and maintenance activities are expected to be similar to those occurring under baseline conditions and would not result in long-term increases in traffic safety hazards or transit demand such that alternative transportation would be affected. Therefore, this significance criterion is not applicable to proposed project operations, and is discussed further under Impact TR-3 only as it applies to project construction activities.

While parking deficits are considered to be a social effect rather than an impact on the physical environment, a deficiency in parking has the potential to trigger secondary effects that could constitute significant environmental impacts under CEQA. However, the proposed staging areas would provide sufficient capacity to accommodate the anticipated parking demand for construction worker vehicles, estimated to be a maximum of 89 vehicles per day.

This impact analysis evaluates the potential for short-term impacts on roadways due to construction-related changes in roadway capacities or increases in construction-related traffic, as well as long-term impacts associated with operation of the proposed project. Project impacts are determined by adding the anticipated project-related traffic volumes to the "baseline" roadway volumes presented above in Section 5.6.1.1, Regional and Local Roadways. The San Francisco Planning Department generally considers impacts to be significant when project-related traffic on a roadway segment causes the level of service to deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F. In addition, a project would have a significant effect if it would contribute substantially to traffic volumes on roadway segments already operating at LOS E or LOS F.

Construction of the proposed project is estimated to require a total of 21 months to complete. Spoils disposal would take place for approximately 20 months. Project construction would generally occur on weekdays between 7 a.m. and 7 p.m., and between 5:30 a.m. and 7 p.m. during the summer months; however, as stated in Chapter 3, Project Description, extended construction hours and weekend work might be necessary during connection of the proposed backup pipeline to Alameda Siphon No. 3 (two weeks) and to the San Antonio Pipeline (four weeks).

Calaveras Road is designed to handle a mix of vehicle types (including heavy trucks). This road has been accommodating heavy trucks associated with the existing aggregate operations for many years, and no improvements to Calaveras Road are planned as part of the proposed project. However, increased wear and tear on Calaveras Road from construction-generated vehicles associated with the proposed SABPL project and other cumulative SFPUC projects (e.g., Calaveras Dam Replacement project, Upper Alameda Creek Filter Gallery [Filter Gallery] project, New Irvington Tunnel [NIT] project, and Alameda Siphons Seismic Reliability Upgrade [Alameda Siphons] project) has been addressed through a Memorandum of Agreement (MOA) with Alameda County (SFPUC and Alameda County, 2010). The MOA commits the SFPUC to provide repairs to any affected county roadways, including Calaveras Road, during and/or after the completion of construction activities. Because the MOA ensures that Calaveras Road will remain in a good state of repair, the potential impact associated with damage to Calaveras Road from project construction activity is not further discussed.

5.6.3.3 Summary of Impacts

Table 5.6-1 lists the proposed project's transportation and circulation impacts and significance determinations.

TABLE 5.6-1
SUMMARY OF IMPACTS – TRANSPORTATION AND CIRCULATION

Impacts	Significance Determinations
Impact TR-1: Construction of the proposed project would not substantially 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 travel.	LS
Impact TR-2: Project construction activities would not result in inadequate emergency access.	LS
Impact TR-3: Project construction activities would decrease the safety of public roadways for vehicles, bicyclists, and pedestrians.	LSM
Impact TR-4: Vehicle trips generated during project operations and maintenance activities would not substantially conflict with an applicable congestion management program.	LS

TABLE 5.6-1 (Continued)
SUMMARY OF IMPACTS – TRANSPORTATION AND CIRCULATION

Impacts	Significance Determinations
Impact C-TR: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative traffic increases and safety hazards on local and regional roads.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.6.3.4 Construction Impacts and Mitigation Measures

Impact TR-1: Construction of the proposed project would not substantially 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 travel. (Less than Significant)

The plans, ordinances, and policies of local jurisdictions and county agencies that establish measures of effectiveness for the performance of the circulation system are intended to address potential long-term and permanent project effects on the circulation system (e.g., roadways, sidewalks, and bicycle and transit facilities). Due to the nature of the SABPL project (facility improvements to an existing water supply system), the project would not permanently affect the transportation and circulation system; therefore, this analysis assesses potential temporary impacts on the overall transportation and circulation system during construction activities, including roadways, public transit, bicycle facilities, and pedestrian facilities.

The SABPL project would not conflict with established plans, ordinances, or policies pertaining to the performance of the circulation system because, as described below, most construction activities would occur within the SFPUC right-of-way; the project would not permanently change the circulation system; the project would be limited in duration; and construction activities would not result in a substantial increase in vehicles traveling along local roadways.

Impact on Roadways

Travel Lane Closures. All project construction activities would occur along the west side of Calaveras Road. Construction activities include site clearing, grading, excavation, soil stockpiling, pipeline installation, construction of new structures, backfilling, and revegetating or repaving to preconstruction conditions. Access to the project area during construction would be from Calaveras Road, and the SFPUC would not construct any new access roads. In general, travel lane closures on Calaveras Road are not expected; however, SFPUC has indicated that temporary closure of a single lane for up to 10 minutes, with one-way traffic controls, could be required periodically throughout construction to accommodate large construction vehicles accessing the site. Traffic flow along Calaveras Road would be maintained at all times. Therefore, impacts related to a temporary reduction in roadway capacity would be less than significant.

Construction Traffic. Construction traffic would result in short-term increases in traffic volumes on Calaveras Road and I-680. Adding construction vehicle traffic to baseline roadway volumes without increasing the capacity of the roadway could result in increased congestion and delay for vehicles. The presence of construction truck traffic would temporarily reduce roadway capacities due to the slower travel speeds and larger turning radii of trucks. The impacts of construction traffic would be most noticeable in the immediate vicinity of the project area and less noticeable farther away and on regional transportation facilities.

Construction-related vehicle trips would include construction workers traveling to and from the SABPL project area, haul truck trips associated with materials and equipment deliveries, and haul truck trips associated with the transport of excavated materials. The number of construction-related vehicles traveling to and from the project area would vary on a daily basis depending on the construction phase, planned activity, and materials needs. In particular, the number of truck trips on Calaveras Road associated with the disposal of excess soil and rock materials would vary depending on the selected strategy for managing the excavated materials and the amount that would need to be disposed of offsite. Options for managing excess spoils generated during construction include: (a) temporarily placing the spoils in Pit F6 or at the Surface Mining Permit 30 (SMP-30) aggregate processing facility for subsequent processing, resale, and reuse; (b) permanently placing the spoils in an earthen berm at the North Spoils Site, or in an earthen berm at the former nursery site located within Staging Area C; and (c) hauling the spoils offsite to an appropriate landfill. The total volume of excess spoils generated by project construction activities would be about 118,250 cubic yards, resulting in a total of 11,825 truckloads over a 20-month period. The SFPUC estimates that 25 percent of the excess spoils would be hauled offsite, resulting in approximately seven truckloads (14 truck trips) of spoils requiring offsite disposal in landfills each weekday.

Table 5.6-2 indicates the maximum number of construction truck and construction worker vehicle trips (inbound and outbound) generated by each proposed project component on a daily basis. Based on the anticipated overlap of project components, there would be between 88 and 114 construction truck trips per day, and between 154 and 178 construction worker trips per day. Overall, depending on the phase of construction, the number of vehicle trips generated by short-term project construction on Calaveras Road and I-680 would range from 242 to 292 trips per day (LCW Consulting, 2011b).

Construction-related trips to and from the project work area would be distributed throughout the day. Construction workers would travel to and from the project site based on a work shift that would generally occur on weekdays and Saturdays between 5:30 a.m. and 7 p.m. Trucks delivering equipment and materials to the project area from offsite locations and hauling excavated materials from the project area to offsite locations would generally travel on weekdays between 6 a.m. and 7 p.m. Truck deliveries and hauling to and from the site would not occur on weekends or during nighttime hours.

The impact of construction-related vehicles and haul trucks on Calaveras Road was quantitatively assessed using the operational analysis methodology provided in the *Highway*

TABLE 5.6-2
DAILY CONSTRUCTION VEHICLES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

Construction Activity	Duration	Construction Worker Trips[a]	Construction Truck Trips[b]	Total Daily Trips
Installation of the backup pipeline and water pipeline to town of Sunol	15 months	60	30	90
Construction of the discharge facility at Pit F3-East	6 months	30	10	40
Construction of the cutoff wall	16 months	30	10	40
Installation of the dewatering pipeline and transfer pipeline	3 months	50	50	100
Construction of the Alameda Creek Pump Station	5 months	36	20	56
Construction of the new chemical facility	5 months	20	14	34
Offsite hauling	20 months	4	14	18

NOTES:
[a] Based on maximum number of construction workers. Includes inbound and outbound vehicle trips.
[b] Includes inbound and outbound vehicle trips.

SOURCE: LCW Consulting, 2011b.

Capacity Manual (Transportation Research Board, 2000) and the LOS impact thresholds of the San Francisco Planning Department. As specified in the *Highway Capacity Manual 2000*, Calaveras Road is a Class II two-lane highway. The level of service for two-lane highways is defined in terms of "percent time-spent-following" (PTSF) another vehicle.[2] **Table 5.6-3** presents the LOS designation and the associated PTSF values for each LOS designation.

TABLE 5.6-3
LEVEL OF SERVICE CRITERIA FOR TWO-LANE CLASS II HIGHWAYS

Level of Service	Percent Time-Spent-Following
A	< 40
B	> 40–55
C	> 55–70
D	> 70–85
E	> 85

SOURCE: Transportation Research Board, 2000.

[2] Percent time-spent-following (PTSF) is the average percentage of total travel time on a two-lane highway that vehicles must remain in platoons behind slower moving vehicles because of the inability to pass. The *Highway Capacity Manual 2000* methodology estimates PTSF based on factors such as terrain (e.g., level or rolling), geometric design (e.g., presence of shoulders, proportion of no-passing zones), and traffic conditions (e.g., total traffic volumes, directional distribution, and mix of autos, trucks, and recreational vehicles in the traffic flow).

Table 5.6-4 presents the a.m. and p.m. peak-hour traffic volumes, the PTSF, and the resulting LOS designations for both baseline roadway conditions and with the addition of construction trips. The analysis is based on the largest expected increase in daily trips during construction activities. The analysis assumes that the maximum of 89 construction workers per day would travel to and from the project area during the a.m. and p.m. peak hours. In addition, a maximum of 12 construction truck trips would occur during the peak hours, resulting in a total peak-hour increase of 101 vehicle trips. As shown on Table 5.6-4, the results of the quantitative LOS analysis indicate that the addition of up to 101 construction-generated vehicle trips during both the a.m. and p.m. peak hours would not substantially affect baseline traffic levels on Calaveras Road, and the roadway operating conditions would remain at acceptable levels (i.e., at LOS D or better). Therefore, the impact on Calaveras Road from short-term increases in traffic volumes during construction of the SABPL project would be less than significant.

TABLE 5.6-4
LEVEL OF SERVICE OPERATING CONDITIONS ON CALAVERAS ROAD SOUTH OF I-680

	Baseline Conditions			During Project Construction		
Peak Hour[a]	**Volume**	**PTSF[b]**	**LOS**	**Volume**	**PTSF**	**LOS**
AM Peak	79	34.5	A	180	50.5	B
PM Peak	103	45.3	B	204	55.3	C

[a] On Calaveras Road, the a.m. peak hour is typically between 6 a.m. and 7 a.m., and the p.m. peak hour is between 4 p.m. and 5 p.m.
[b] PTSF – Percent Time-Spent-Following

SOURCE: LCW Consulting, 2011.

The addition of up to 101 vehicles during the a.m. and p.m. peak hours on I-680 would represent a minimal increase in peak-hour traffic volumes (less than 1 percent). Since both directions of I-680 in the vicinity of Calaveras Road currently operate at acceptable levels of service during the a.m. and p.m. peak periods, the addition of up to 101 vehicle trips to I-680 would not substantially affect the peak-hour operating conditions. During the p.m. peak hour, two northbound segments of I-680 (between Washington Boulevard and Mission Boulevard/SR 262, and between Vargas Road and Andrade Road) operate at LOS F conditions. Since the predominant direction of project construction-related vehicle trips during the p.m. peak period would be outbound from the project area (i.e., construction workers leaving the site following the end of the work shift), the workers would travel southbound on I-680 south of Calaveras Road and northbound on I-680 north of Calaveras Road, and not on the northbound segments that operate at LOS F during the p.m. peak period. Therefore, impacts related to short-term traffic increases on I-680 during construction would be less than significant.

Impacts on Public Transit

Since there are no public transit routes on Calaveras Road, project construction activities and vehicles would not affect transit operations. Thus, no impact on public transit would occur.

Impacts on Bicycle Facilities

There are no bicycle facilities on Calaveras Road; bicyclists currently share the travel lanes with vehicles. Throughout the construction period, bicycle travel on Calaveras Road would be maintained. Since bicycle travel in the area would be maintained throughout the construction period, and since the number of construction vehicles generated on an hourly basis would not be substantial (about 101 vehicles per hour during the a.m. and p.m. peak hours when construction workers are commuting to and from the project area, and about 12 vehicles per hour during non-peak hours), project-related impacts on bicycle travel along Calaveras Road would be less than significant. Potential impacts related to bicycle safety are addressed below under Impact TR-3.

Impacts on Pedestrian Travel

There are no pedestrian facilities on Calaveras Road, and pedestrian volumes are very low throughout the day. Therefore, construction traffic would not substantially affect pedestrian travel on Calaveras Road, and construction-related impacts on pedestrian travel along Calaveras Road would be less than significant. Potential impacts related to pedestrian safety are addressed below under Impact TR-3.

Impact TR-2: Project construction activities would not result in inadequate emergency access. (Less than Significant)

Project construction activities would be conducted west of Calaveras Road and not within the travel lanes of Calaveras Road. Construction-related traffic associated with project activities would not be substantial (approximately 242 to 292 trips per day) and would not pose an obstacle to emergency-response vehicles along Calaveras Road. Project activities would not require full street closures of Calaveras Road, and emergency vehicles would have continuous access to all public roadways. In some instances, traffic flow on Calaveras Road could be temporarily interrupted for short periods of time (up to 10 minutes) to accommodate large construction vehicles accessing the site; however, travel lanes would be reopened and construction vehicles would move to the side of the road to accommodate any passing emergency vehicles. Therefore, impacts on emergency access would be less than significant.

During pipeline construction, all access roads leading to project areas would remain open at all times, including the road off of Calaveras Road that provides access to the SMP-30 area, and the San Antonio Pump Station access road, which leads to a private ranch residence (the Garcia residence) located approximately 1,550 feet southwest of the project area. Installers laying a section of pipeline across the access roads would work in an open trench over a period of approximately two to three days. As necessary, contractors would use trench plates to maintain access. Therefore, impacts on access to adjacent roadways would be less than significant.

Impact TR-3: Project construction activities would decrease the safety of public roadways for vehicles, bicyclists, and pedestrians. (Less than Significant with Mitigation)

Construction vehicles traveling to and from the project area would share the roadway with other vehicles as well as with bicyclists and pedestrians. The use of Calaveras Road to access the project area during construction could increase traffic safety hazards due to potential conflicts between construction vehicles (with slower speeds and wider turning radii than autos) and automobiles, bicyclists, and pedestrians.

The greatest increase in the number of proposed project-related construction vehicles using Calaveras Road to access the site would occur on weekdays, when there would be an average of 12 truck trips per hour to and from the site; construction-related vehicle trips would increase to approximately 101 during the a.m. and p.m. peak hours, when construction workers would be traveling to or from the site. Haul trips to transport excavated spoils would occur Monday through Friday, and therefore the number of project construction-related vehicles on Saturdays would be less than on weekdays. Although most construction activities would occur Monday through Saturday, extended construction hours and Sunday work would be necessary during certain phases of construction, including air gap construction and connection with the proposed backup pipeline (four weeks), and connection of the backup pipeline to Alameda Siphon No. 3 (two weeks).

Since project-generated vehicle trips would be greatest on weekdays (when there are few pedestrians and bicyclists on Calaveras Road), the potential for conflicts and increased traffic safety hazards would be limited. Regardless, this potential increase in traffic safety hazards during construction is considered to be a potentially significant impact. However, impacts related to increased safety hazards during construction activities would be reduced to a less-than-significant level with implementation of Mitigation Measure M-TR-3.

Mitigation Measure M-TR-3: Traffic Control Plan.

The SFPUC or its contractor(s) shall prepare and implement a traffic control plan. The plan shall conform to the state's *Manual of Traffic Controls for Construction and Maintenance Work Areas* (Caltrans, 2006), where applicable. Elements of the traffic control plan shall include, but not be limited to, the following:

- Advance warning signs shall be installed on Calaveras Road (to the south and north of the access points) advising motorists, bicyclists, and pedestrians of the construction zone ahead in order to minimize hazards associated with construction activities immediately adjacent to Calaveras Road, including the entry and egress of project-related construction vehicles.

- Pedestrian and bicycle access and circulation shall be maintained during project construction where it is safe to do so.

- A public information program shall be developed and implemented to advise motorists, bicyclists, and nearby property owners of the impending construction activities (e.g., media coverage, direct distribution of flyers to affected properties, email notices, portable message signs, and informational signs).

- All equipment and materials shall be stored within the designated work areas so as to avoid obstructing traffic.
- Hauling of excavated materials shall be limited to weekdays to reduce potential conflicts with recreational bicycling on Calaveras Road on weekends.
- Adequate driving and bicycling conditions on Calaveras Road shall be maintained throughout the construction period.
- The SFPUC and its contractors shall coordinate individual traffic control plans for SFPUC projects in the Sunol Valley.

This measure would require that the SFPUC take actions to minimize traffic safety hazards during construction (i.e., through the installation of signs to warn motorists, bicyclists, and pedestrians of the construction zone; use of flaggers, illuminated signs, temporary stoplights, or flashing yellow lights; or a combination of these methods). Therefore, this impact would be less than significant with mitigation.

5.6.3.5 Operational Impacts and Mitigation Measures

Impact TR-4: Vehicle trips generated during project operations and maintenance activities would not substantially conflict with an applicable congestion management program. (Less than Significant)

The LOS standards established by Alameda County are intended to regulate long-term traffic impacts resulting from a project. As described above in Section 5.6.2.2, Calaveras Road is not part of the Alameda County CMP network, while I-680 is included as a CMP network segment.

After completion of project construction activities, the backup pipeline would require periodic operations review and maintenance, similar to existing conditions, and would not generate a significant number of new vehicle trips. With the proposed project, the number of trips related to supply deliveries would not be expected to change compared to baseline conditions. Overall, any increases in traffic generated by operation and maintenance of the new project components would be minimal and would not result in a noticeable increase in traffic on Calaveras Road or I-680. Therefore, because the proposed project would not result in long-term impacts on roadways used to access the project area, and because Calaveras Road—the primary access road to the project area—is not part of the Alameda County CMP network, potential impacts on the local congestion management program would be less than significant.

5.6.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

The overall construction schedule and duration for Pumping Variant 1 is expected to be same as for the proposed project. Since Pumping Variant 1 does not include construction of the Alameda Creek Pump Station, wet well, control building for the pump station, retaining wall along the southern boundary of the pump station site adjacent to the access road, or transfer pipeline, the total excavation and excess spoils volume estimated for Pumping Variant 1 (108,750 cubic yards) would be less than that of the proposed project (118,250 cubic yards). Assuming 25 percent of the excess spoils would be hauled offsite, implementation of Pumping Variant 1 would result in approximately 2,400 less cubic yards of spoils requiring offsite disposal in landfills compared to the proposed project. However, there would still be approximately seven truckloads (14 truck trips) of spoils requiring offsite disposal in landfills each weekday. By eliminating the facilities identified above, Pumping Variant 1 would result in a slight reduction in construction worker vehicle traffic when compared to the proposed project. However, while Pumping Variant 1 would generate less construction traffic when compared the proposed project, the overall impact conclusions and mitigation measures identified in Section 5.6.3.4, above, would not change due to the limited difference in traffic generation.

Like the proposed project, Pumping Variant 1 would not be expected to increase the number of vehicle trips associated with periodic operations review and maintenance when compared to the baseline condition. Thus, implementation of Pumping Variant 1 would not change the analysis or conclusions presented in Section 5.6.3.5, above.

Pumping Variant 2

Pumping Variant 2 would include construction of all of the same facilities as the proposed project, except that one of the submersible pumps adjacent to the new discharge facility would be a high-pressure pump. Thus, this variant would result in the same construction-related impacts on transportation and circulation as described for the proposed project. In addition, like the proposed project, Pumping Variant 2 would not be expected to increase vehicle trips associated with periodic operations review and maintenance when compared to the baseline condition. Thus, implementation of Pumping Variant 2 would not change the analysis, conclusions, or mitigation measures presented in Sections 5.6.3.4 and 5.6.3.5, above.

5.6.3.7 Cumulative Impacts and Mitigation Measures

Impact C-TR: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative traffic increases and safety hazards on local and regional roads. (Less than Significant with Mitigation)

The geographic scope for potential cumulative impacts related to transportation and circulation encompasses roadways in the Sunol Valley (Calaveras Road between the project area and I-680, the I-680 on- and off-ramps at Calaveras Road, and I-680 in the vicinity of the Calaveras Road crossing). Existing land uses, including the SMP-30 sand and gravel quarry, the existing nursery at the Calaveras Road/I-680 interchange, and recreational park facilities in the southern Sunol Valley, account for current traffic conditions along Calaveras Road. I-680 is a major interstate highway; general growth and development within the region has contributed to traffic on this roadway.

As described above in Section 5.6.3.2, construction of the SABPL project would result in a temporary (approximately 21-month) increase in vehicle trips on Calaveras Road between the project area and I-680, and on I-680 (see Impact TR-1). Construction activities associated with the SABPL project are expected to occur between October 2012 and June 2014. Of the cumulative projects listed in Table 5.1-6, only those that would be accessed via Calaveras Road and that have overlapping construction schedules could contribute to cumulative traffic impacts on this roadway; these projects include the SFPUC Filter Gallery project, the SFPUC NIT project, the SFPUC Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir (SVWTP Expansion) project, the SFPUC Calaveras Dam Replacement project, the SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project, various SFPUC pipeline inspection projects, and possibly the PG&E Gas Pipeline Crossing project (if constructed concurrently). No residential or commercial projects are currently being developed in the immediate project vicinity that would increase traffic. The SFPUC Alameda Siphons project, the SFPUC San Antonio Pump Station Upgrade project, the SFPUC San Antonio Reservoir Hypolimnetic Oxygenation project, the Alameda County Route 84 Safety project, Alameda County I-680 High Occupancy Vehicle Lane project, and the Sunol Bridge Replacement project are either already completed, or would be completed prior to construction of the SABPL project and would not affect cumulative traffic volumes. Certain future cumulative projects (i.e., the Alameda County Route 84 Expressway Widening project and the Niles Canyon Safety Improvement project) would not affect or be affected by traffic on Calaveras Road and for this reason were not included in the cumulative traffic analysis. Therefore, this cumulative analysis only considers the construction-phase traffic associated with the identified cumulative projects with overlapping construction schedules.

As discussed in Impact TR-1, construction of the proposed SABPL project would include a maximum of 101 construction-related vehicle trips during the a.m. and p.m. peak hours. **Table 5.6-5** presents the projected number of vehicle trips on Calaveras Road and I-680 as estimated by CHS Consulting Group for the SABPL project and other future projects in the Sunol Valley that have overlapping construction schedules (CHS Consulting, 2009), as updated by LCW Consulting (2011b) to reflect completed projects and new information on planned projects.

CHS Consulting Group conducted the analysis of cumulative conditions based on: traffic counts on Calaveras Road collected in March 2006 (CHS Consulting, 2009); traffic volume data on I-680 obtained from Caltrans; and output from the Alameda County travel demand forecasting model. In this analysis, future traffic volumes (without the effect of the cumulative construction projects in Sunol Valley) were estimated by adding the prorated difference in volumes from the Alameda County travel-forecasting model between the years 2005 and 2010 to the baseline traffic volumes.

TABLE 5.6-5
VEHICLE TRIP GENERATION FOR THE CUMULATIVE PROJECTS

Cumulative Project [Scheduled Construction Period]	AM and PM Peak-Hour Vehicle Trips[a,b]	
	Calaveras Road	I-680
Filter Gallery [2014 to 2015]	19	19
NIT [2010 to 2014]	120	148
SVWTP Expansion [2010 to 2013]	146	132
Various Pipeline Inspections [ongoing]	10	10
Calaveras Dam Replacement [2011 to 2015]	109	101
San Antonio Backup Pipeline [2012 to 2014]	101	101
SMP-30 Expansion [schedule to be determined]	32	32
PG&E Gas Pipeline Crossing [schedule to be determined]	13	13
TOTAL	**550**	**556**

NOTES:
[a] Assumes all workers arrive and depart during the peak hours.
[b] Spoils hauling and material deliveries are distributed evenly throughout a 10-hour workday.

SOURCE: CHS Consulting, 2009; LCW Consulting, 2011b.

To evaluate the cumulative effect of construction traffic on I-680 and Calaveras Road, the traffic from the SABPL project and other projects with overlapping construction schedules was added to the future traffic volumes estimated by the Alameda County travel demand forecasting model. On the basis of this analysis, the combined cumulative projects would add up to 550 vehicle trips to Calaveras Road and up to 556 vehicle trips to I-680 during the a.m. and p.m. peak hours. The traffic analysis, performed using the *Highway Capacity Manual 2000* methodology (Transportation Research Board, 2000), indicated that both Calaveras Road and I-680 would continue to operate at acceptable levels of service under the future cumulative conditions, and that no significant cumulative traffic impacts on Calaveras Road or I-680 would result (CHS Consulting, 2009 and LCW Consulting, 2011b).

The cumulative traffic analysis above did not identify any cumulatively significant traffic impacts related to LOS. However, due to the possible overlap in cumulative project construction schedules in the Sunol Valley region, cumulative impacts associated with increased traffic and safety hazards for vehicles, bicycles, and pedestrians are considered significant, and the SABPL project's contribution would be cumulatively considerable. As discussed above in Impact TR-3, the project's impact associated with increased traffic and safety hazards would be reduced to less than significant with implementation of **Mitigation Measure M-TR-3 (Traffic Control Plan)** (see Impact TR-3, above, for description), which includes provisions to address potential safety hazards during construction activities for the SABPL project. However, even with implementation of this mitigation measure, the SABPL project's contribution to cumulative traffic safety hazards would remain cumulatively considerable. Implementation of **Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan)** would require the SFPUC to coordinate the project-specific traffic control plans of other SFPUC projects in the Sunol Valley and identify measures to minimize cumulative impacts, thereby limiting the SABPL project's contribution to this cumulative impact. Therefore, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable with mitigation (less than significant).

Mitigation Measure C-M-TR: Combined Sunol Valley Traffic Control Plan.

The SFPUC or its construction contractor(s) shall coordinate and comply with the ongoing Regional Traffic Coordination Plan for the Sunol Valley region; this plan coordinates the project-specific traffic control plans for SFPUC projects developed as part of Mitigation Measure M-TR-3 (Traffic Control Plan) and identifies additional measures to minimize the impacts of construction traffic on Calaveras Road and I-680.

The SFPUC regularly updates the Regional Traffic Coordination Plan for the Sunol Valley based on the most current construction schedules and construction phases of SFPUC projects within the Sunol Valley. The most recent Regional Traffic Coordination Plan for the Sunol Valley region was prepared in November 2011 for the September 2011–December 2011 period (SFPUC, 2011).

After construction activities associated with the SABPL project are completed, these new facilities would require periodic review and maintenance (similar to existing operations) and would not generate a substantial number of new operational trips. In addition, the combined number of vehicle trips associated with operation and maintenance of other cumulative SFPUC projects in the Sunol Valley (i.e., Alameda Siphons, San Antonio Pump Station, and San Antonio Hypolimnetic Oxygenation Facility projects) would be minimal, if any, and would not result in a noticeable increase in traffic on Calaveras Road.

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are substantially similar to or the same as those of the proposed project (refer to Section 5.6.3.6, Impact Analysis for Project Variants), the cumulative impact analysis and related conclusions provided above apply to both project variants.

5.6.4 References

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San Francisco Public Utilities Commission (SFPUC) and Alameda County, Programmatic Memorandum of Agreement between the City and County of San Francisco acting through its Public Utilities Commission and the County of Alameda (Sunol Valley Regional Projects). March 2010.

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Transportation Research Board, National Research Council, *Highway Capacity Manual 2000*. 2000.

5.7 Noise and Vibration

This section evaluates the potential noise and vibration impacts associated with constructing and operating the proposed San Antonio Backup Pipeline (SABPL) project. It describes the existing noise environment, presents relevant noise regulations and standards, identifies sensitive noise receptors that could be affected by the proposed project, and evaluates the potential effects of project construction and operation on these receptors.

5.7.1 Setting

5.7.1.1 Noise Descriptors

Sound is a phenomenon occurring in a medium (such as air or water), and the manner in which sound travels through this medium is influenced by the physical properties of the medium (such as temperature, density, humidity, etc.). The amount of energy in the sound is proportional to the pressure generated in the medium. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over 1 million times within the range of human hearing, a logarithmic scale is used to keep sound pressure measurements within a convenient and manageable range. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness. The noise levels presented in this section are expressed in terms of dBA, unless otherwise indicated. **Table 5.7-1** shows some representative noise sources and their corresponding noise levels in dBA.

Planning for acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. Some general guidelines (U.S. EPA, 1974) are as follows: sleep disturbance may occur at levels above 35 dBA; interference with human speech begins at around 60 dBA; and hearing damage may result from prolonged exposure to noise levels in excess of 85 to 90 dBA.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement. Leq (24) is the steady-state energy level measured over a 24-hour period. Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to "quiet time" noise levels to form a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA "penalty" during the evening hours (7 p.m. to 10 p.m.) and a 10-dBA penalty during the night hours (10 p.m. to 7 a.m.). Another 24-hour noise descriptor, called the day-night

TABLE 5.7-1
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT

Examples of Common, Easily Recognized Sounds	Decibels (dBA)	Subjective Evaluations
Near Jet Engine	140	Deafening
Threshold of Pain	130	
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	Very Loud
Noisy Urban Street	90	
Noisy Factory	85[a]	
School Cafeteria with Untreated Surfaces	80	Loud
Lawnmower	70[b]	
Near Freeway Auto Traffic	60[b]	Moderate
Average Office	50[b]	
Soft Radio Music in Apartment	40	Faint
Average Residence without Stereo Playing	30	
Average Whisper	20	Very Faint
Rustle of Leaves in Wind	10	
Human Breathing	5	
Threshold of Audibility	0	

[a] Continuous exposure above 85 dBA is likely to degrade the hearing of most people.
[b] Range of speech is 50 to 70 dBA.

SOURCE: U.S. Department of Housing and Urban Development, 1985.

noise level (Ldn), is similar to CNEL. While both add a 10-dBA penalty to all nighttime noise events between 10 p.m. and 7 a.m., Ldn does not add the evening 5-dBA penalty. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources. The Lmax is the maximum, instantaneous noise level taken during the measurement period.

5.7.1.2 Vibration Descriptors

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the ground. These energy waves generally dissipate with distance from the vibration source (e.g., pile driving or sheetpile driving). Because energy is lost during the transfer of energy from one particle to another, vibration is less perceptible with distance from the source. As discussed above for noise, vibration attenuates as a function of the distance between the source and receptor. For sources of vibration emanating from a single location (i.e., point sources), vibration attenuates at a rate of approximately 50 percent for each doubling of distance from the source (termed the "inverse square law"). This approach tends to underestimate attenuation and therefore provides a "worst-case" estimate of vibration at the receptor.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used to assess the potential for damage to buildings and structures and is expressed in inches per second (in/sec).

The responses of human receptors and structures to vibration are influenced by a combination of factors, including soil/rock type, distance from the source, duration, and the number of perceived events. Energy transmitted through the ground as vibration can reach levels that cause structural damage; however, humans are very sensitive, and the vibration amplitudes that can be perceived by humans are well below the levels that cause architectural or structural damage. A freight train passing at 100 feet can result in vibrations of 0.1 in/sec PPV, while a strong earthquake can produce vibration in the range of 10 in/sec PPV.

In general, cosmetic or threshold damage to residential buildings can occur at vibrations over 0.5 in/sec PPV. The Federal Transit Administration (FTA) recommends a vibration threshold criterion of 0.2 in/sec for fragile buildings (FTA, 2006). Much lower vibration levels (exceeding 0.012 in/sec PPV) can cause disturbance or annoyance, and this threshold is typically applied to construction activities during the more sensitive nighttime hours. Exceedance of the annoyance threshold at night could result in sleep disturbance, depending on the receptors' proximity to construction activities.

5.7.1.3 Existing Noise Environment

The Sunol Valley is located in unincorporated Alameda County and is mostly undeveloped, with few sources of noise and few noise-sensitive receptors. The primary sources of noise in the project area are local traffic on Interstate 680 (I-680) and Calaveras Road, and quarry operations. I-680 is approximately 1,000 feet northwest of the northern project area boundary. Calaveras Road borders the eastern boundary of the project area. Quarry operations exist within and adjacent to the project area.

The noise environment[1] in the project area can be characterized by noise measurements collected in the project vicinity as part of the noise analysis for other SFPUC projects. Measurement Location No. 1 is located west of Calaveras Road and the San Antonio Pump Station, southwest of the southern project area boundary near the Garcia residence (discussed in Section 5.7.1.4, below). Measurement Location No. 2 is near I-680 at Vargas Road, approximately 2.5 miles west of the project area. Measurement Location No. 2 is intended to characterize noise levels

[1] The current noise environment in the project area is higher than the area's typical noise environment due to temporary noise increases related to ongoing construction of other SFPUC Water System Improvement Program (WSIP) projects in the vicinity. The typical noise environment at sensitive receptors (without temporary construction-related noise increases) is better reflected in noise measurements collected in 2007 (prior to the start of WSIP construction activities and corresponding to the date of the Notice of Preparation for the SABPL project) and is applied in this analysis to depict a more conservative (worst-case) impact analysis.

associated with I-680 at the two private residences on Athenour Way (also discussed in Section 5.7.1.4). **Figure 5.7-1** shows the measurement locations and **Table 5.7-2** presents the measurement results. Because residential uses are the most noise-sensitive uses in the project area, measurement locations were selected to characterize the ambient noise environment at residential receptors located closest to the project-related construction activities (i.e., excavation, facility installation, and backfill).

TABLE 5.7-2
SUMMARY OF NOISE MEASUREMENT RESULTS

	Measurement Location No. 1 Noise Levels West of San Antonio Pump Station[a] (dBA)	Measurement Location No. 2 Noise Levels South of I-680 Freeway[b] (dBA)
Time	Leq Noise Level Range	Leq Noise Level Range
Daytime Leq (7 a.m. – 10 p.m.)	44 – 53	64 – 68
Nighttime Leq (10 p.m. – 7 a.m.)	41 – 49	60 – 68
Ldn	53	70 – 71

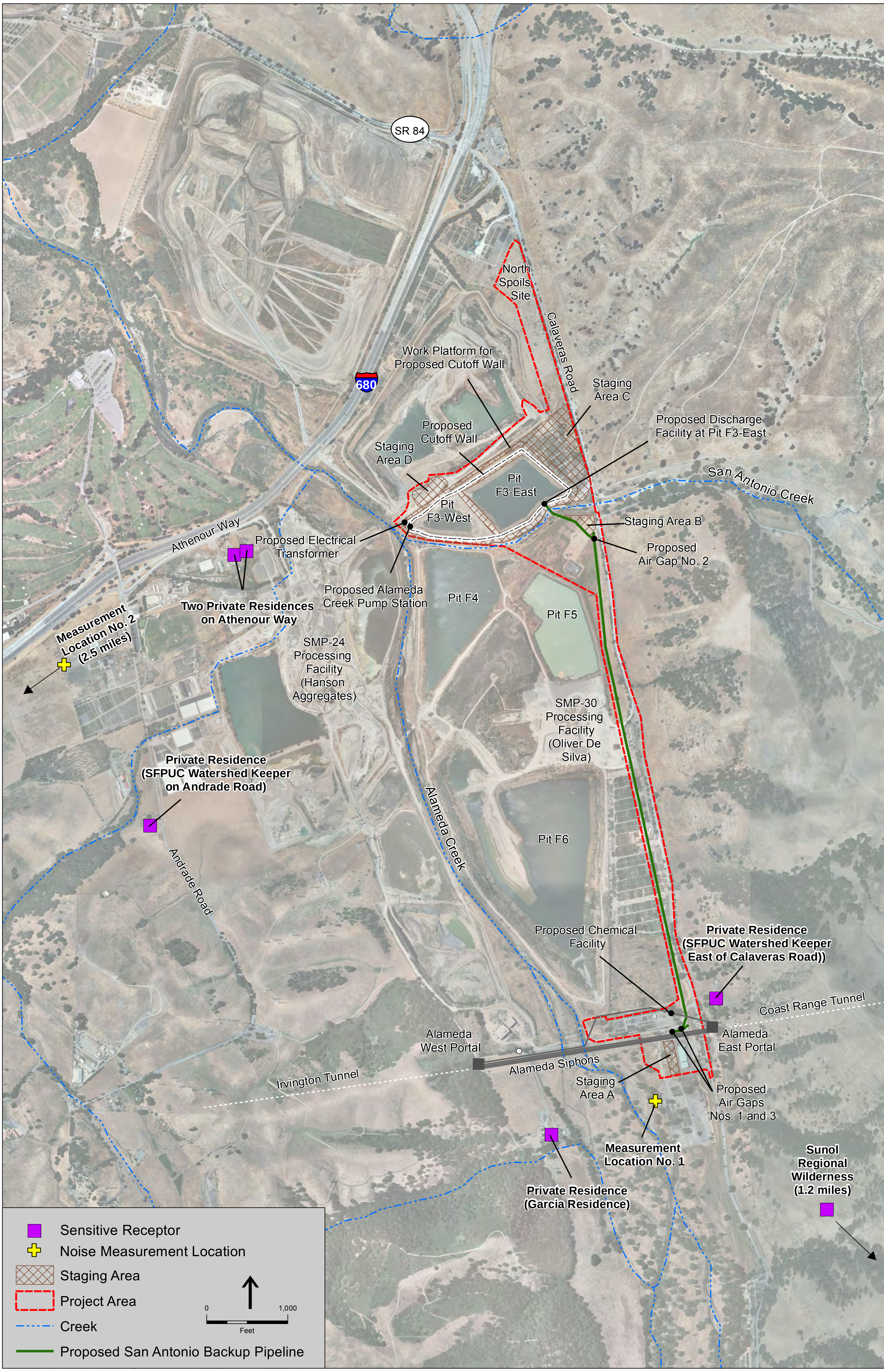
NOTES: Measurement No. 1 taken approximately 1,000 feet west of the Calaveras Road centerline from noon on Thursday, January 18, 2007 to noon on Friday, January 19, 2007, using Quest SoundPro DL Type II digital sound level meters (see Figure 5.7-1). Measurement No. 2 was taken approximately 450 feet southeast of the I-680 freeway centerline at Vargas Road from September 24, 2008 to September 28, 2008.

[a] Continuous exposure above 85 dBA is likely to degrade the hearing of most people.
[b] Range of speech is 50 to 70 dBA.

SOURCE: Orion, 2007 (Measurement No. 1); San Francisco Planning Department, 2009 (Measurement No. 2).

5.7.1.4 Sensitive Receptors

There are four private residences within 0.5 mile of the project area. These sensitive receptors are shown on Figure 5.7-1 and described below relative to maximum daytime and nighttime construction noise sources during SABPL project construction activities. One private ranch residence (Garcia residence) is located approximately 1,300 feet southwest of the project area; 1,550 feet southwest of Staging Area A; and 1,900 feet west of Calaveras Road, Air Gaps Nos. 1 and 3, and the southern portion of the backup pipeline alignment. There is a currently unoccupied SFPUC watershed keeper's residence located near the Alameda East Portal, approximately 225 feet east of the project area and Calaveras Road; 360 feet east of the southern portion of the backup pipeline alignment; and 500 feet east of Air Gaps Nos. 1 and 3. The primary source of existing ambient noise at the Garcia residence and the SFPUC watershed keeper's residence is traffic on Calaveras Road. There are two private residences on Athenour Way, approximately 2,100 feet west of the project area and the proposed Alameda Creek Pump Station, 2,200 feet west of Staging Area D, 4,280 feet west of Air Gap No. 2, and 200 to 300 feet south of the I-680 freeway. There is also an occupied SFPUC watershed keeper's residence on Andrade Road to the south of the Athenour Way residences located approximately 4,700 feet west of the project area and proposed Alameda Creek Pump Station. In addition to freeway noise, the two



SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 5.7-1

Noise Measurement Locations and Sensitive Receptors

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residences on Athenour Way and the SFPUC watershed keeper's residence on Andrade Road are subject to noise from Hanson Aggregates' processing facility. Athenour Way serves as the main access road to this facility. Hanson Aggregates' processing facility includes a gravel/aggregate processing facility, which is open from 6 a.m. to 3:30 p.m., Monday through Saturday, and an asphalt processing facility, which operates on demand for up to 24 hours per day, 7 days per week (Jackson, 2011).

People in residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks, and some outdoor recreation areas are generally more sensitive to noise than people at commercial and industrial establishments. Consequently, the noise standards for these sensitive land uses are more stringent than those for less sensitive uses. In general, residences and schools are among the land uses considered most sensitive to noise. No schools, childcare centers, churches, hospitals, or nursing homes are located in the vicinity of the project area.

Natural areas typically require some degree of quiet for passive recreational uses and are often considered noise-sensitive. While there are a number of regional preserves in the project area, the Sunol Regional Wilderness is the closest to the project area, with the closest trail located approximately 1.2 miles to the southeast.

5.7.2 Regulatory Framework

5.7.2.1 Federal Regulations

The Federal Noise Control Act of 1972 established, by statutory mandate, a national policy "to promote an environment for all Americans free from noise that jeopardizes their public health and welfare." The act provides for a division of powers between the federal government and state and local governments that affords primary responsibility for noise source emission control to the federal government. State and local governments retain rights, authorities, and primary responsibility for controlling the use of noise sources and the levels of noise to be permitted within their jurisdictions (U.S. EPA, 1974). Alameda County and the City of Fremont are the applicable regulatory agencies for noise within the study area.

5.7.2.2 State Regulations

The California Vehicle Code (California Vehicle Code Section 27204) limits the noise generated from all on-road trucks manufactured since 1987 to 80 dBA when measured at 50 feet from the line of travel for any operating condition.

The California Occupational Safety and Health Administration (Cal/OSHA) requires backup warning alarms that activate immediately upon reverse movement on all vehicles that are used to haul dirt and have a haulage capacity of 2.5 cubic yards or more (Title 8, California Code of Regulations). Backup alarms must be audible above the surrounding ambient noise level at a distance of 200 feet.

5.7.2.3 Local Regulations

Alameda County

The Sunol Valley is located within the Alameda watershed, and the project area is in an unincorporated area of Alameda County. The noise policies of the East County Area Plan of the Alameda County General Plan promote the compatibility of land uses with respect to noise generation by legislatively protecting sensitive land uses from noise sources. The East County Area Plan indicates that for a residential land use, a noise environment of less than 65 dBA CNEL would be considered a "little" impact (Alameda County, 2002). The East County Area Plan does not have specific provisions that apply to construction noise.

The Alameda County Noise Ordinance regulates noise sources, such as mechanical equipment and amplified sounds, and prescribes hours of heavy equipment operation and construction activities. In most cases, local noise ordinances are part of local building and zoning ordinances that do not apply to SFPUC projects (pursuant to California Government Code Section 53090 et seq.). However, the time and noise limits in local noise ordinances are taken into consideration in determining whether the project would have a significant noise effect under CEQA.

Table 6.60.040A in Section 6.60.040 of the Alameda County General Code (Title 6, Health and Safety, Chapter 6.60) specifies exterior noise level standards at receiving single- or multiple-family residential, school, hospital, church, and public library uses. **Table 5.7-3** presents these exterior noise level standards, categorized based on the duration of exposure to a given noise level (i.e., the "cumulative number of minutes in any one-hour time period").

TABLE 5.7-3
ALAMEDA COUNTY EXTERIOR NOISE LEVEL STANDARDS FOR SENSITIVE RECEPTORS

Category	Cumulative Number of Minutes in any One-Hour Time Period	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
1	30	50 dBA	45 dBA
2	15	55 dBA	50 dBA
3	5	60 dBA	55 dBA
4	1	65 dBA	60 dBA
5	0	70 dBA	65 dBA

Based on these noise and duration limits, the maximum theoretical noise limit for any one-hour time period equates to 58 dBA (Leq) during the day and evening (7 a.m. to 10 p.m.) and 53 dBA (Leq) at night (10 p.m. to 7 a.m.). This section of the code also specifies that the applicable standard must be adjusted to equal the existing ambient noise level if the measured ambient noise level exceeds the applicable noise level standard. As indicated in Table 5.7-2, ambient noise levels in the vicinity of the Athenour Way residences exceed the ordinance noise limits; therefore, the applicable ordinance noise limits applied in this analysis are the minimum ambient noise levels measured, which were 64 dBA (Leq) during the day and evening and 60 dBA (Leq) during the night. In addition, the above noise level standards must be reduced by 5 dBA for recurring impulsive noises such as pile driving.

Section 6.60.070(E) specifies the following hourly limits for construction: 7 a.m. to 7 p.m. on weekdays, and 8 a.m. to 5 p.m. on Saturdays and Sundays. Construction activities conducted outside of these hours (between 7 p.m. and 7 a.m. on weekdays and 5 p.m. and 8 a.m. on weekends) would be subject to the noise level standards listed in Table 5.7-3.

5.7.3 Impacts and Mitigation Measures

5.7.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to noise and vibration, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in 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;
- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, expose people residing or working in the area to excessive noise levels;
- For a project located in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels; or
- Be substantially affected by existing noise levels.

5.7.3.2 Approach to Analysis

The SABPL project would not result in construction or operational impacts related to three of the significance criteria listed above regarding airports and substantial adverse effects on the project from existing noise levels; therefore, no impact discussion is provided for these topics for the reasons described below. In addition, as described below, there would be no operational impacts related to a fourth significance criterion—groundborne vibration; therefore, the impact discussion for this criterion focuses on the potential effects of project construction only.

- *Result in Generation of Excessive Groundborne Vibration or Groundborne Noise Levels During Project Operations*. With implementation of the SABPL project, routine maintenance and operations of the proposed facilities and improvements would be similar to existing conditions and would not generate excessive groundborne vibration or groundborne noise levels. The closest sensitive receptors to the proposed discharge facility at Pit F3-East are the two private residences at Athenour Way, over 0.5 mile to the west. Given this distance, any groundborne noise generated by infrequent discharges from the backup pipeline would have no impact on these receptors. Thus, the criterion related to groundborne vibration and groundborne noise levels is not applicable to project operations, and is discussed below only as it relates to project construction (see Impact NO-3).

- *Be Located Within 2 Miles of a Public Airport or Within an Airport Land Use Plan Area and Expose People to Excessive Noise Levels*. There are no public airports in the project vicinity, and the project area is not located in an area covered by airport land use plan. The nearest public airport to the project area is the San Jose International Airport, which is approximately 14 miles to the southwest in San Jose. Therefore, the SABPL project would not result in the long-term exposure of workers to excessive airport-related noise levels. The significance criterion related to noise levels within an airport land use plan area is not applicable to the SABPL project, and no further discussion is provided.

- *Be Located Near a Private Airstrip and Expose People to Excessive Noise Levels*. There are no private airstrips in the project vicinity. The nearest private airstrips are the First Interstate Bank Operations Center Heliport and the Washington Hospital Heliport in Fremont, both of which are approximately 6 miles to the west. Therefore, the SABPL project would not result in the long-term exposure of workers to excessive airport-related noise levels. The significance criterion related to noise levels near private airstrips is not applicable to the SABPL project, and no further discussion is provided.

- *Be Substantially Affected by Existing Noise Levels*. Since the SABPL project is not a noise-sensitive land use, the last significance criterion listed above related to whether the project would be substantially affected by existing noise levels is not applicable to the proposed project, and no further discussion is provided.

The noise impact assessment evaluates short-term (temporary) impacts associated with construction of project facilities as well as long-term (permanent) impacts resulting from project operations. For construction noise, the potential for impacts is assessed by considering several factors, including the proximity of construction-related noise sources to sensitive receptors, typical noise levels associated with construction equipment, the potential for construction noise levels to interfere with daytime and nighttime activities, the duration that sensitive receptors would be affected, and whether proposed activities would occur outside the construction time limits prescribed in local ordinances. For operational noise, this impact evaluation determines the potential for impacts by assessing the noise generation potential of project facilities; if the SABPL project would introduce a new source of noise to the area, this evaluation determines the proximity to sensitive receptors and the potential for operational noise to remain within noise ordinance limits at the nearest receptors.

To address the CEQA significance criterion regarding "substantial temporary or periodic noise increases in ambient noise levels" for construction noise, a "substantial" noise increase is defined as an increase in noise to a level that causes interference with land use activities at nearby sensitive receptors during the day and/or night. One indicator that construction noise could interfere with daytime activities would be speech interference, and an indicator that construction noise could interfere with nighttime activities would be sleep interference.

This analysis uses the following criteria to define potential "substantial" noise impacts:

- *Speech Interference*. Speech interference is an indicator of impact on typical daytime and evening activities. A speech interference threshold, in the context of impact duration and time of day, is used to identify substantial increases in noise resulting from temporary construction activities. Noise peaks generated by construction equipment could result in speech interference at nearby private residences if the noise level in the interior of the building exceeds 45 to 60 dBA. A typical building can reduce noise levels by 25 dBA with the windows closed (U.S. EPA, 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 70 dBA (Leq) at receptors would maintain an acceptable interior noise environment of 45 dBA. It should be noted that such noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction process. For this analysis, a significant impact would occur if noise levels remained above the 70-dBA speech interference threshold on consecutive days for longer than two weeks.[2]

  However, for outdoor recreational uses such as hiking in the Sunol Regional Wilderness, noise levels above 60 dBA (Leq) are considered to be significant, since there are no building attenuation benefits and speech interference can thus occur at lower noise levels.

- *Sleep Interference*. Based on available sleep criteria data, an interior nighttime level of 35 dBA is considered acceptable (U.S. EPA, 1974). Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 60 dBA at receptors would maintain an acceptable interior noise environment of 35 dBA. Since a 15-dBA reduction would occur with windows open, an exterior noise level of 50 dBA (Leq) would be required to maintain an acceptable interior noise environment of 35 dBA. Therefore, a 50-dBA threshold is applied in order to allow for open windows during the 21-month construction duration.

This noise impact assessment estimates noise levels associated with proposed project construction and compares daytime construction noise levels at sensitive receptors against the speech interference threshold, and nighttime construction noise levels at sensitive receptors against the sleep interference threshold.

To address the CEQA significance criterion regarding "noise levels in excess of standards established in the local general plan or noise ordinance," this EIR considers the standards in the Alameda County Noise Ordinance. For this analysis, a noise impact could be considered significant if project-related noise levels exceeded the construction hours or noise level standards established in the Alameda County Noise Ordinance, namely: (1) construction activity is limited to 7 a.m. to 7 p.m. on weekdays, and 8 a.m. to 5 p.m. on Saturdays and Sundays; (2) for construction occurring outside these hours, the ordinance noise limits are 58 dBA (Leq) between

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2 Construction would occur during warm weather (summer and fall) when houses without air conditioning typically open windows for cooling. Construction-related noise could exceed the speech interference criterion inside homes if windows were open. Construction noise increases are considered to result in a significant noise impact if windows must remain closed for longer than two consecutive weeks to maintain acceptable interior noise levels.

7 p.m. and 10 p.m., and 53 dBA (Leq) between 10 p.m. and 7 a.m.; and (3) operational noise limits are 58 dBA (Leq) between 7 a.m. and 10 p.m., and 53 dBA (Leq) between 10 p.m. and 7 a.m.

Project-related excavation and construction activities could result in vibration that could disturb nearby residents, and cause cosmetic damage to existing aboveground structures as well as buried facilities such as pipelines. A wide range of thresholds for vibration impacts has been published. For example, the U.S. Bureau of Mines specifies a threshold cracking criterion of 2.0 in/sec PPV for high frequencies (Wilson Ihrig & Associates, 2005), while the FTA recommends a vibration threshold criterion of 0.2 in/sec for damage to fragile buildings (FTA, 2006). (No fragile buildings exist in the project vicinity.) This assessment evaluates whether project-related construction activities would result in "excessive groundborne vibration" based on the following thresholds:

- *Cosmetic Damage to Aboveground Structures (0.4 - 0.5 in/sec PPV).*[3] To assess the potential for construction-related vibration to cause cosmetic damage to nearby structures, this analysis applies a 0.4 in/sec PPV threshold for continuous vibration (caused by vibratory pile drivers and large vibratory rollers/compactors) and 0.5 in/sec PPV threshold for impact pile driving.

- *Nighttime Annoyance Threshold (0.012 in/sec PPV).*[4] Much lower vibration levels (exceeding 0.012 in/sec PPV) can cause disturbance or annoyance to residences; this threshold is applied to construction activities during the more sensitive nighttime hours (10 p.m. to 7 a.m.). Exceedance of this annoyance threshold at night could result in sleep disturbance, depending on the receptors' proximity to construction activities.

- *Damage Threshold for Buried Facilities (4.0 in/sec PPV).*[5] To assess potential vibration impacts on buried facilities, this analysis applies a 4.0 in/sec PPV damage threshold for buried facilities such as pipelines.

The impact analysis presented below estimates vibration levels at nearby structures and sensitive receptors based on the vibration source and setback distance. The estimated vibration levels are then compared to the thresholds described above to determine the potential for significant impacts to occur.

5.7.3.3 Summary of Impacts

Table 5.7-4 lists the SABPL project's noise and vibration impacts and significance determinations.

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[3] These thresholds are consistent with those applied to the adjacent SFPUC New Irvington Tunnel (NIT) project (Wilson Ihrig & Associates, 2008).

[4] This threshold is consistent with those applied to the adjacent SFPUC NIT project (Wilson Ihrig & Associates, 2008).

[5] Vibration under the ground surface is lower than that measured at the ground surface. A threshold of 4.0 in/sec PPV is commonly used for underground optical-fiber cables. Underground or restrained concrete structures can withstand vibration of 10.0 in/sec PPV before the appearance of threshold cracks. Thus, underground utilities are less sensitive than surface structures (Wilson Ihrig & Associates, 2009). The 4.0 in/sec PPV threshold is consistent with those recommended by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

TABLE 5.7-4
SUMMARY OF IMPACTS – NOISE AND VIBRATION

Impacts	Significance Determinations
Impact NO-1: Construction activities would result in substantial temporary increases in ambient noise levels that could interfere with nearby land uses.	LSM
Impact NO-2: Construction activities would expose people to noise levels in excess of standards established by the Alameda County Noise Ordinance.	LSM
Impact NO-3: Construction activities would not result in excessive groundborne vibration.	LS
Impact NO-4: Project operations would not result in a substantial permanent increase in ambient noise levels in the project vicinity or significant impacts related to the exposure of people to noise levels in excess of standards established by the Alameda County Noise Ordinance.	LS
Impact C-NO: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative noise impacts.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.7.3.4 Construction Impacts and Mitigation Measures

Impact NO-1: Construction activities would result in substantial temporary increases in ambient noise levels that could interfere with nearby land uses. (Less than Significant with Mitigation)

Project-related construction activities would result in temporary noise increases at sensitive receptors located adjacent to or near the project area. Construction noise levels would vary at any given receptor depending on the construction activity, equipment type, duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor.

For construction noise, a "substantial" noise increase is defined as short-term interference with activities during the day and night. One indicator that construction noise could interfere with daytime activities would be speech interference, and an indicator that construction noise could interfere with nighttime activities would be sleep interference. Since there are different thresholds for determining the significance of noise impacts during the day and night, noise impacts associated with project construction are separated into two categories: (1) daytime and evening (7 a.m. to 10 p.m.), when the 70-dBA speech interference threshold is applied; and (2) nighttime (10 p.m. to 7 a.m.), when the 50-dBA sleep interference threshold is applied. Project construction would generally occur Monday through Saturday from 7 a.m. to 7 p.m.; however, as stated in Chapter 3, Section 3.6.11, extended construction hours and Sunday work would be necessary during certain phases of construction: during construction of the three air gaps and when connecting these air gaps to the proposed backup pipeline (four weeks), and when connecting the backup pipeline to the existing Alameda Siphon No. 3 (two weeks).

Construction Equipment Noise

The types of construction equipment that would be used for the proposed project are listed in **Table 3-3** of Chapter 3. These equipment types typically generate maximum noise levels ranging from about 74 to 91 dBA at a distance of 50 feet from the source. The rate of attenuation (i.e., reduction) is about 6 dBA for every doubling of distance from a point source. **Table 5.7-5** indicates noise levels at 50 feet from the noise source for typical construction equipment, and provides estimates of daytime construction-related noise levels at the closest sensitive receptors. **Table 5.7-6** identifies nighttime construction-related noise levels at the closest residential receptors based on the limited construction activities that would occur during periods of extended construction hours. As indicated in Chapter 3, Section 3.6.11, extended construction hours would be necessary for a total of 6 weeks during the 21 months of project construction.

In order to estimate project-related construction noise levels at receptor locations, the noise levels were grouped by receptor location, and the minimum distances between sensitive receptors and facility locations (identified in the left column) were determined. These levels reflect the highest noise levels that would occur at the closest residential and recreational receptors (representing the maximum impact), but such levels would only occur when equipment is being operated at the north and south ends of the project area. There are no sensitive receptors that could be affected by project-related construction noise in the central part of the project area.

Pipeline installation would be performed using open-trench construction methods, which would involve initial clearing of the work area (which could include removing vegetation and debris), grading or pavement cutting, excavation of the trench, installation of the pipe, backfilling of the trench, and restoration of the ground surface. Installation of the backup pipeline and water pipeline to the town of Sunol along Calaveras Road would occur over approximately 15 months. Demolition of the two quarry buildings located east of Pit F3-East would involve demolition, grading, and restoration of the ground surface. Construction of the proposed discharge facility at Pit F3-East, the Alameda Creek Pump Station and wet well, the cutoff wall around Pits F3-East and F3-West, transfer pipeline, dewatering pipeline, and dewatering facilities in the northern part of the project area would involve grading, excavation, installation of pumps and other facilities, and restoration of the ground surface, and would take place over approximately 16 months. Construction of the new chemical facility in the southern part of the project area near the San Antonio Pump Station would occur over about 5 months. Spoils hauling related to the temporary placement of spoils in the Surface Mining Permit 30 (SMP-30) area, permanent placement of spoils in earthen berms at the North Spoils Site and former nursery site within Staging Area C, and disposal of spoils at nearby landfills would occur for a total of 20 months.

As indicated in Table 5.7-5, noise resulting from general daytime construction activities and equipment would not exceed the 70-dBA speech interference threshold at the closest residential receptors (two residences on Athenour Way,[6] the Garcia residence, and the SFPUC watershed keeper's residence east of Calaveras Road), nor would it exceed the 60-dBA speech interference

6 Construction noise levels at the new SFPUC watershed residence on Andrade Road would also not exceed 70-dBA speech interference threshold since it is located even farther from the project area (4,700 feet) than the Athenour Way residences.

TABLE 5.7-5
ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS (DBA) AT THE CLOSEST SENSITIVE RECEPTORS

Receptor Location Relative to Noise Source	Maximum Noise Source	Reference Hourly Leq in dBA at 50 Feet	Minimum Distance Between Closest Receptor and Source	Distance and/or Topographic Adjustment	Adjusted Leq	Exterior Speech Interference Criterion Applied to Impact NO-1	Minimum Daytime Ambient Noise Level	Daytime Noise Ordinance Limit Applied to Impact NO-2	With Mitigation Measure M-NO-1	Mitigated Leq
Noise Levels at the Closest Private Residences on Athenour Way (Minimum Distances From Where Identified Equipment Would Operate)										
Two residences on Athenour Way relative to the proposed facilities at Pits F3-East and F3-West, including proposed Alameda Creek Pump Station and wet well, cutoff wall, transfer pipeline, and discharge facility at Pit F3-East	Loader/ Backhoe/ Dozer	80	2,100	-33	47	70	64	64	Not Required	NA
	Grader/ Excavator/ Concrete Pumper Truck	85	2,100	-33	52	70	64	64	Not Required	NA
	Truck (Flatbed, Boom, Tank, Dump, Haul, Water, Delivery)	80	2,100	-33	47	70	64	64	Not Required	NA
	Compactor	82	2,100	-33	49	70	64	64	Not Required	NA
	Crane	83	2,100	-33	50	70	64	64	Not Required	NA
	Drill Rig	88	2,000	-33	55	70	64	64	Not Required	NA
	Paver	89	2,100	-36	53	70	64	64	Not Required	NA
	Rollers	74	2,100	-36	38	70	64	64	Not Required	NA
	Pipe Cutting/ Welding	78	2,100	-33	44	70	64	64	Not Required	NA
	Pump	76	2,100	-33	43	70	64	64	Not Required	NA
	Generator	78	2,100	-33	45	70	64	64	Not Required	NA
	Compressor	81	2,100	-33	48	70	64	64	Not Required	NA
	Sheetpile Driver	93	2,100	-36	57	70	64	64	Not Required	NA
	Slurry Mixing Plant	76	2,100	-36	40	70	64	64	Not Required	NA
Two residences on Athenour Way relative to Staging Area D	Loader/ Backhoe/ Dozer	80	2,200	-34	46	70	64	64	Not Required	NA
	Grader/ Excavator	85	2,200	-34	51	70	64	64	Not Required	NA
	Truck	80	2,200	-34	46	70	64	64	Not Required	NA
Noise Levels at the Closest Private Residence (Garcia Residence) West of Calaveras Road (Minimum Distances From Where Identified Equipment Would Operate)										
Garcia residence relative to southern SABPL alignment, Air Gaps No. 1 and No. 3, new chemical facility, chemical injection station, sampling station, and flow meter vault	Loader/ Backhoe/ Dozer	80	1,900	-33	47	70	44	58	Not Required	NA
	Grader/ Excavator/ Concrete Pumper Truck	85	1,900	-33	52	70	44	58	Not Required	NA
	Truck	80	1,900	-33	47	70	44	58	Not Required	NA
	Compactor	82	1,900	-33	49	70	44	58	Not Required	NA
	Crane	83	1,900	-33	50	70	44	58	Not Required	NA
	Drill Rig	88	1,900	-33	55	70	44	58	Not Required	NA
	Paver	89	1,900	-33	56	70	44	58	Not Required	NA
	Rollers	74	1,900	-33	41	70	44	58	Not Required	NA
	Pipe Cutting/ Welding	78	1,900	-33	45	70	44	58	Not Required	NA
	Generator	78	1,900	-33	45	70	44	58	Not Required	NA
	Compressor	81	1,900	-33	48	70	44	58	Not Required	NA
Garcia residence relative to Staging Area A	Loader/ Backhoe/ Dozer	80	1,550	-30	50	70	44	58	Not Required	NA
	Grader/ Excavator	85	1,550	-30	55	70	44	58	Not Required	NA
	Truck	80	1,550	-30	50	70	44	58	Not Required	NA

NOTES: NA = Not Applicable. LIGHT GREY cells indicate significance threshold applied to Impact NO-1, and DARK GREY cells indicate significance threshold applied to Impact NO-2. Construction noise would not exceed the 70-dBA speech interference criterion (Impact NO-1) at identified receptor.

TABLE 5.7-5 (Continued)
ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS (DBA) AT THE CLOSEST SENSITIVE RECEPTORS

Receptor Location Relative to Noise Source	Maximum Noise Source	Reference Hourly Leq in dBA at 50 Feet	Minimum Distance Between Closest Receptor and Source	Distance and/or Topographic Adjustment	Adjusted Leq	Exterior Speech Interference Criterion Applied to Impact NO-1	Minimum Daytime Ambient Noise Level	Daytime Noise Ordinance Limit Applied to Impact NO-2	With Mitigation Measure M-NO-1	Mitigated Leq
Noise Levels at the Closest Residence (Watershed Keeper's Residence) East of Calaveras Road (Minimum Distances From Where Identified Equipment Would Operate)										
SFPUC watershed keeper's residence relative to southern SABPL alignment	Loader/ Backhoe/ Dozer	80	360	-22	58	70	44	58	Not Required	NA
	Grader/ Excavator	85	360	-22	**63**	70	44	58	-10	53
	Truck (Flatbed, Haul, Delivery, Tank)	80	360	-22	58	70	44	58	Not Required	NA
	Compactor	82	360	-22	**60**	70	44	58	-10	50
	Crane	83	360	-22	**61**	70	44	58	-8	53
	Drill Rig	88	360	-22	**66**	70	44	58	-13	53
	Paver	89	360	-22	**67**	70	44	58	-9	58
	Rollers	74	360	-22	52	70	44	58	Not Required	NA
	Pipe Cutting/ Welding	78	360	-22	56	70	44	58	Not Required	NA
	Generator	78	360	-22	56	70	44	58	Not Required	NA
	Compressor	81	360	-22	**59**	70	44	58	-6	53
SFPUC watershed keeper's residence relative to Air Gaps No. 1 and No. 3, new chemical facility, chemical injection station, sampling station, and flow meter vault	Loader/ Backhoe/ Dozer	80	500	-25	55	70	44	58	Not Required	NA
	Grader/ Excavator/ Concrete Pumper Truck	85	500	-25	**60**	70	44	58	-10	50
	Truck (Flatbed, Haul, Delivery, Tank)	80	500	-25	55	70	44	58	Not Required	NA
	Compactor	82	500	-25	57	70	44	58	Not Required	NA
	Crane	83	500	-25	58	70	44	58	Not Required	NA
	Drill Rig	88	500	-25	**63**	70	44	58	-13	50
	Paver	89	500	-25	**64**	70	44	58	-9	55
	Rollers	74	500	-25	49	70	44	58	Not Required	NA
	Pipe Cutting/ Welding	78	500	-25	53	70	44	58	Not Required	NA
	Generator	78	500	-25	53	70	44	58	Not Required	NA
	Compressor	81	500	-25	56	70	44	58	Not Required	NA
Noise Levels at the Closest Trail in Sunol Regional Wilderness (Minimum Distance From Where Identified Equipment Would Operate)										
Closest Trail in the Sunol Wilderness Preserve relative to the proposed SABPL alignment	Loader/ Backhoe/ Dozer	80	6,500	-53	27	60	44	58	Not Required	NA
	Grader/ Excavator	85	6,500	-53	32	60	44	58	Not Required	NA
	Truck (Flatbed, Haul, Delivery, Tank)	85	6,500	-53	32	60	44	58	Not Required	NA
	Compactor	82	6,500	-53	29	60	44	58	Not Required	NA
	Crane	83	6,500	-53	30	60	44	58	Not Required	NA
	Drill Rig	88	6,500	-53	35	60	44	58	Not Required	NA
	Paver	89	6,500	-53	36	60	44	58	Not Required	NA
	Rollers	74	6,500	-53	21	60	44	58	Not Required	NA
	Pipe Cutting/ Welding	78	6,500	-53	25	70	44	58	Not Required	NA
	Generator	78	6,500	-53	25	60	44	58	Not Required	NA
	Compressor	81	6,500	-53	28	60	44	58	Not Required	NA

NOTES: NA = Not Applicable. LIGHT GREY cells indicate significance threshold applied to Impact NO-1, and DARK GREY cells indicate significance threshold applied to Impact NO-2. Construction noise would not exceed the 70-dBA speech interference criterion (Impact NO-1) at identified receptors, but where **bolded**, these noise levels would exceed the 58-dBA ordinance noise limit, which is applied to construction occurring beyond the the ordinance time limit in Impact NO-2.

SOURCES FOR REFERENCE NOISE LEVELS: U.S. EPA, 1971; FTA, 2006.

TABLE 5.7-6
ESTIMATED NIGHTTIME CONSTRUCTION NOISE LEVELS (DBA) AT THE CLOSEST SENSITIVE RECEPTORS

Receptor Location Relative to Noise Source	Maximum Noise Source	Reference Hourly Leq in dBA at 50 Feet	Minimum Distance Between Closest Receptor and Source	Distance and/or Topographic Adjustment	Adjusted Leq	Exterior Sleep Interference Criterion Applied to Impact NO-1	Minimum Nighttime Ambient Noise Level	Nighttime Noise Ordinance Limit (10 p.m. to 7 a.m.) Applied to Impact NO-2	With Mitigation Measure M-NO-1	Mitigated Leq
Noise Levels at the Closest Private Residences (Minimum Distances to these Residences Where Identified Equipment Would Operate)										
Garcia residence relative to the proposed SABPL connection to Alameda Siphon No. 3 and Air Gaps No. 1 and No. 3	Pipe Cutting/ Welding	78	1,900	-33	45	50	41	53	Not Required	NA
	Pump	76	1,900	-33	43	50	41	53	Not Required	NA
	Generator	78	1,900	-33	45	50	41	53	Not Required	NA
	Compressor	81	1,900	-33	48	50	41	53	Not Required	NA
SFPUC Watershed Keeper's Residence relative to proposed SABPL connection to Alameda Siphon No. 3 and Air Gaps No. 1 and No. 3	Pipe Cutting/ Welding	78	500	-25	**53**	50	41	53	-3	50
	Generator	78	500	-25	**53**	50	41	53	-3	50
	Compressor	81	500	-25	**56**	50	41	53	-6	50
Two residences on Athenour Way relative to Air Gap No. 2	Pipe Cutting/ Welding	78	4,280	-44	34	50	41	53	Not Required	NA
	Generator	78	4,280	-44	34	50	41	53	Not Required	NA
	Compressor	81	4,280	-44	37	50	41	53	Not Required	NA

NOTES: NA = Not Applicable. LIGHT GREY cells indicate significance threshold applied to Impact NO-1, and DARK GREY cells indicate significance threshold applied to Impact NO-2. Noise levels from all identified sources would exceed the 50-dBA sleep interference threshold (Impact NO-1) at the SFPUC watershed keeper's residence, while only compressor noise would exceed the 53-dBA nighttime noise ordinance limit (Impact NO-2).

threshold at the closest recreational trail in the Sunol Regional Wilderness (located 1.2 miles to the southeast). Therefore, construction-related noise occurring during the daytime hours (7 a.m. to 10 p.m.) would result in a less-than-significant noise impact at the closest sensitive receptors. However, in addition to noise associated with operation of construction equipment, nearby residential receptors would also be subject to noise from backup alarms used on construction vehicles. Backup alarms for haul trucks must be audible above the surrounding ambient noise level at a distance of 200 feet.[7] The characteristics of the alarm tone mean that backup alarms are often designed to be 10 to 15 dBA higher than the worst-case construction/industrial noise environment. Therefore, backup alarms are typically designed to emit a sound as loud as 85 to 115 dBA (L_{max}).[8]

As indicated above in Table 5.7-5, daytime construction activities would create sound levels of 52 to 67 dBA at 360 feet (the distance between the SFPUC watershed keeper's residence east of Calaveras Road and the southern terminus of the backup pipeline); 50 to 56 dBA at 1,550 feet (the distance between the Garcia residence and Staging Area A); and 38 to 57 dBA at 2,100 feet (the distance between the two residences on Athenour Way and the Alameda Creek Pump Station, wet well, and cutoff wall). Such noise levels could periodically exceed the minimum daytime ambient noise levels of 44 to 64 dBA (L_{max}) at the Garcia residence and SFPUC watershed keeper's residence east of Calaveras Road and could therefore be occasionally noticeable at these residential receptors. Construction noise levels could be lower due to topographic obstructions and would only occur when construction equipment was being operated at these minimum distances from the receptors; in addition, the noise levels would decrease with distance as pipeline construction proceeded away from each receptor. While construction noise would be noticeable, the 70-dBA speech interference threshold would not be exceeded. Therefore, noise impacts resulting from noise-generating construction activity are considered less than significant when they occur during the daytime and evening hours (7 a.m. to 10 p.m.).

Extended construction hours during air gap construction and connection with the backup pipeline, and during connection of the backup pipeline to Alameda Siphon No. 3, would result in nighttime construction noise for a combined total of six weeks. Backup alarms would not be used during evening and nighttime hours (see Impact NO-2 below for details). However, as indicated in Table 5.7-6, project-related construction activities could exceed the 50-dBA sleep interference threshold at the SFPUC watershed keeper's residence east of Calaveras Road due to the use of heavy construction equipment, resulting in a significant impact (see bolded noise levels in Table 5.7-6). With implementation of Mitigation Measure M-NO-1, construction-related nighttime noise levels would be reduced to a less-than-significant level at this residence (see noise levels with controls listed in Table 5.7-6).

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7 The Cal/OSHA requires backup warning alarms that activate immediately upon reverse movement on all vehicles with a hauling capacity of 2.5 cubic yards or more that are used to haul dirt (Title 8, California Code of Regulations, Section 1592).

8 Such noise levels are necessary because alarms must be audible over ambient noise levels, and the construction noise environment at 50 feet behind any piece of moving machinery could be as high as 70 to 90 dBA.

Mitigation Measure M-NO-1: Administrative and Source Controls.

The SFPUC shall include in construction contract specifications the requirement that the construction contractor conform to the sleep interference threshold of 50 dBA (Leq) between 10 p.m. and 7 a.m. when operating equipment within 1,000 feet of the SFPUC watershed keeper's residence east of Calaveras Road (if it is occupied at the time of construction). Measures to maintain noise levels at or below this performance standard shall include implementation of best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, acoustically attenuating shields or shrouds, and enclosures around stationary equipment such compressors or generators) for all equipment used at night.

The name and phone number of a designated project liaison shall be provided to the inhabitant(s) of the SFPUC watershed keeper's residence in the event that noise disturbance occurs. This liaison shall take steps to resolve any complaints received, including modifying construction practices as necessary to address the noise complaint.

Mitigation Measure M-NO-1 would reduce the potential for nighttime noise impacts at sensitive receptors by requiring the contractor to use noise control techniques, which would help ensure that noise emitted from construction equipment is below the sleep interference threshold, and by providing a project liaison to resolve any complaints. Therefore, this impact would be less than significant with mitigation.

Impacts related to temporary increases in ambient daytime and nighttime noise levels at the Garcia residence and at the two residences on Athenour Way would be less than significant, and no mitigation is necessary.

Noise from Construction Traffic

Construction-related haul and delivery trucks and worker vehicles would use Calaveras Road for site access. The associated traffic increases would contribute incrementally to traffic noise along this roadway.

Truck noise levels depend on vehicle speed, load, terrain, as well as other factors. The effects of construction-related truck traffic would depend on the level of background noise already occurring at a particular sensitive receptor. In quiet noise environments such as residential neighborhoods protected by structural or topographic sound barriers (Leq averaging 50 dBA), one truck per hour would be noticeable, even though such a low volume would not measurably increase noise levels. In slightly noisier environments, such as freeway interchanges, where sensitive receptors are not protected by structural or topographic sound barriers (Leq averaging 60 dBA), the threshold level is higher, and 10 trucks per hour would be required to noticeably increase the noise exposure. In moderately noisy environments (Leq averaging 70 dBA), a noise increase would be perceptible with the addition of 100 trucks per hour (Caltrans, 1998).

In quiet environments or during quieter times of the day, truck noise is mainly a single-event disturbance; although the hourly average noise level associated with short, single events is not very high, individual noise peaks of 80 to 85 dBA at 50 feet are common during a truck passage.

However, in noisy environments or during less noise-sensitive hours, truck noise is perceived as part of the total noise environment rather than as an individual disturbance. Construction-related truck volumes associated with the SABPL project would vary from day to day, with the highest volumes generally occurring during the excavation and backfilling stages of pipeline construction. When haul truck noise is considered on an hourly basis rather than as a single noise event, noise levels generated by peak hourly construction and worker vehicle traffic are estimated to reach hourly noise levels of up to 53 dBA (Leq) at 50 feet from the roadway centerline.

When such noise levels are added to existing traffic noise levels along Calaveras Road (estimated at 58 dBA Leq at 50 feet from the roadway centerline based on existing traffic volumes), project-related traffic increases would result in a 3-dBA noise increase. In general, noise increases of 3 dBA are barely perceptible to most people (Caltrans, 1998). Estimated traffic noise levels would not exceed the 70-dBA speech interference criterion during the daytime or evening hours (7 a.m. to 10 p.m.) at 50 feet from Calaveras Road, and would be even lower at the closest residential receptors to the east and southwest of the road (the SFPUC watershed keeper's residence and Garcia residence, which are located approximately 225 and 1,900 feet from Calaveras Road, respectively). Project-related haul trucks would not operate along Calaveras Road during the nighttime or evening hours (7 p.m. to 7 a.m.). Therefore, noise impacts associated with construction trucks and worker vehicles would be less than significant, and no mitigation measures are required.

Impact NO-2: Construction activities would expose people to noise levels in excess of standards established by the Alameda County Noise Ordinance. (Less than Significant with Mitigation)

Project construction would generally occur during daytime hours (7 a.m. to 7 p.m.), Monday through Saturday, for approximately 21 months. Extended construction hours and Sunday work would be necessary during certain phases of construction, including during construction of the air gaps and the connections between the air gaps and the backup pipeline (four weeks), and during connection of the backup pipeline to Alameda Siphon No. 3 (two weeks). When compared to the Alameda County Noise Ordinance time limits (7 a.m. to 7 p.m. on weekdays and 8 a.m. to 5 p.m. on Saturdays and Sundays), the majority of construction activities would be consistent with ordinance time limits on weekdays; however, construction would extend beyond the time limits for Saturday work and also for a total of six weeks during construction of the three air gaps, the connections between the air gaps and the backup pipeline, and the connection between the backup pipeline and Alameda Siphon No. 3.

For construction activities extending beyond the ordinance time limits on Saturdays or during the six weeks of extended construction, the Alameda County Noise Ordinance specifies exterior noise standards. The ordinance's equivalent Leq noise limit is calculated to be 58 dBA for any equipment operating between 7 p.m. and 10 p.m., and 53 dBA between 10 p.m. and 7 a.m. Estimated construction noise levels that would exceed the 58-dBA and 53-dBA (Leq) ordinance noise limits are shown in bold in Tables 5.7-5 and 5.7-6, above. As indicated in the tables, ordinance Leq noise limits could be exceeded at the SFPUC watershed keeper's residence east of Calaveras Road, but would not be exceeded at the Garcia residence or the two residences on Athenour Way.[9] Due to the possibility that certain types of construction equipment could operate beyond ordinance time limits at these minimum distances to the SFPUC watershed keeper's residence, the impact is considered significant, but could be reduced to a less-than-significant level with implementation of Mitigation Measure M-NO-2, described below.

In addition, if it is necessary to use equipment with backup alarms beyond the ordinance time limits, Lmax noise levels from backup alarms could exceed the ordinance noise limits (the limit would depend on the duration, as indicated in Table 5.7-3, during any given hour). During these hours (7 a.m. to 8 a.m., and 5 p.m. to 7 p.m. on Saturdays), Lmax noise levels from backup alarms (53 to 73 dBA at 360 feet from the SFPUC watershed keeper's residence, 40 to 60 dBA at 1,550 feet from the Garcia residence, and 38 to 58 dBA at 2,100 feet from the two residences on Athenour Way) could periodically exceed the ordinance noise limits (at the upper end of the range of possible noise levels generated by backup alarms), which would be a significant impact. As discussed above in Section 5.7.2.1, Cal/OSHA requires backup warning alarms on all vehicles with a hauling capacity of 2.5 cubic yards or more that are used to haul dirt. However, as discussed in Section 3.6.11 in Chapter 3, Project Description, haul trips to transport excavated spoils to landfill facilities would be limited to weekdays between 7 a.m. and 7 p.m. Thus, backup beepers from haul trucks would not be used outside of the ordinance time limits. For all other construction vehicles, implementation of Mitigation Measure M-NO-2 would ensure that noise from backup alarms meets ordinance noise limits at these four receptors, thus reducing the impact to a less-than-significant level.

Mitigation Measure M-NO-2: Noise Control Plan.

The SFPUC shall include in construction contract specifications the requirement that the construction contractor prepare a noise control plan. The contract specifications shall stipulate that before the start of mobilization or construction, the contractor must submit to the SFPUC for review and approval a noise control plan prepared by a qualified noise consultant. For work performed beyond local ordinance time limits (e.g., construction of air gaps and connections to the backup pipeline, and connection of the backup pipeline to Alameda Siphon No. 3), the noise control plan shall also ensure that noise levels do not exceed the following noise performance standards:

Time Period	Maximum Noise Level
Weekdays 7 p.m. to 10 p.m.	One-hour Leq of 58 dBA at nearest residence Lmax of 65 dBA at project boundary
Saturdays 7 a.m. to 8 a.m. and 5 p.m. to 7 p.m.	One-hour Leq of 58 dBA at nearest residence Lmax of 65 dBA at project boundary

[9] Construction noise levels at the SFPUC watershed keeper's residence on Andrade Road would also not exceed ordinance Leq noise limits since it is located even farther from the project area (4,700 feet) than the Athenour Way residences.

Time Period	Maximum Noise Level
All days 10 p.m. to 7 a.m.	One-hour Leq of 50 dBA[a] at nearest residence Lmax of 65 dBA at project boundary

[a] Rather than the one-hour Leq of 53 dBA from the Alameda County Construction Ordinance, the more restrictive sleep criterion limit of 50 dBA is applicable during these hours.

To achieve the above Leq performance standards, the contractor shall incorporate the noise and source controls listed under Mitigation Measure M-NO-1 (Administrative and Source Controls), as necessary.

To achieve the above Lmax standards, the contractor may use administrative controls instead of audible backup alarms, subject to safety priorities and consistent with state and federal worker safety laws. Such administrative controls shall provide backup warning on all vehicles that operate in areas where backward movement would constitute a hazard to employees working in the area on foot, and where the operator's vision is obstructed to the rear of the vehicle (earthmoving equipment) (California Code of Regulations, Title 8, Section 1592). Administrative controls may include designing traffic patterns in the project area to minimize the need for backward movement, or requiring a spotter or flagger in clear view of the operator to direct the backing operation or requiring the operator to dismount and circle the vehicle immediately prior to starting a backup operation.

Alternatively, the SFPUC shall consult with Cal/OSHA to determine whether additional noise reductions may be achieved through Cal/OSHA-approved alternatives to backup alarms without compromising site safety. If Cal/OSHA indicates that such alternatives are a viable option and the SFPUC, in consultation with the contractor, determines that site safety would not be compromised, then the contractor shall apply for a variance from Cal/OSHA and use such alternatives consistent with Cal/OSHA requirements. Such alternatives could include, but are limited to:

- "Smart" alarms that have an audible range of 77 to 97 (dBA but limit the warning signal to 5 dBA over ambient noise levels)
- Radar presence-sensing alarms, which identify objects in the reversing path of a truck
- Use of "bbs-tek" broadband backup alarm systems, which use a broadband sound instead of a more noticeable single-frequency sound
- Use of strobe lights instead of audible alarms (which are particularly effective at night)

The administrative source controls and alternatives identified above that are approved by Cal/OSHA instead of backup alarms shall be included in the noise control plan. If none of these alternatives to backup alarms can be implemented, the use of backup alarms shall be avoided during the evening and nighttime hours to achieve the Lmax performance standard (e.g., by routing trucks and equipment to eliminate the need to back up, or by eliminating truck and heavy equipment use at night).

Mitigation Measure M-NO-2 would address the issue of backup beepers by requiring implementation of a noise control plan outlining noise control techniques and administrative controls to be used in the project area. Implementation of the noise control plan would ensure that noise generated from construction activities occurring beyond the Alameda County Noise Ordinance time limits is reduced to below the ordinance noise limit. Therefore, this impact would be less than significant with mitigation.

Impact NO-3: Construction activities would not result in excessive groundborne vibration. (Less than Significant)

Construction of the proposed project, particularly sheetpile driving, could cause vibration levels that could disturb local residents. Cosmetic damage to fragile buildings and structures is not expected since there are no fragile buildings in the project vicinity. As described above in Section 5.7.3.2, this analysis applies significance thresholds related to cosmetic damage of 0.4 in/sec PPV for continuous vibration and 0.5 in/sec for pile driving. A significance threshold of 0.012 in/sec PPV is applied to nighttime construction activities for vibration-related annoyance at nearby residences.

Vibration from Sheetpile Driving

Sheetpile driving would be used to shore excavations for the proposed wet well beneath the Alameda Creek Pump Station and for the new discharge facility at Pit F3-East if the contractor chooses to use this construction method. Sheetpile driving would generate the highest levels of vibration of all construction methods under consideration. Vibratory sheetpile driving could generate vibration as high as 0.734 in/sec PPV at 25 feet, while impact sheetpile installation could generate up to 1.518 in/sec PPV at 25 feet. The closest buildings to the proposed wet well and discharge facility are the two Athenour Way residences, located approximately 2,100 feet from the wet well. At this distance, vibration levels from vibratory sheetpile driving would be 0.009 in/sec PPV, well below the 0.4 in/sec PPV threshold for continuous vibration. Impact sheetpile driving at this distance would generate vibration levels of 0.18 in/sec PPV, well below the 0.5 in/sec PPV threshold for impact or transient vibration. Since neither the 0.4 in/sec PPV nor the 0.5 in/sec PPV threshold would be exceeded, vibration impacts from sheetpile driving would be less than significant at the closest sensitive receptors. Sheeptile driving would not occur during nighttime hours (10 p.m. to 7 a.m.); therefore, the nighttime vibration threshold would not apply.

While the closest buildings would not be significantly affected by vibration from sheetpile driving activities associated with the proposed wet well and discharge facility at Pit F3-East, there are several buried pipelines in the project area vicinity, including the South Bay Aqueduct, that could potentially be affected by vibration from these activities. The closest buried pipelines are located at least 25 feet or more from the Alameda Creek Pump Station and wet well, and 450 feet or more from the new discharge facility at Pit F3-East. Operation of a vibratory roller/compactor would generate vibration levels of 0.21 in/sec PPV at 25 feet, while vibratory and impact sheetpile drivers would generate vibration levels of 0.734 and 1.518 in/sec PPV, respectively, at 25 feet. When compared to the 4.0 in/sec PPV damage threshold for buried pipelines, vibration levels would not exceed this threshold at the closest buried pipelines. In addition, since the potential for liquefaction in the project area is low (URS Corporation, 2009), no damage to buried pipelines related to vibration-induced liquefaction effects are expected to occur. Therefore, construction-related vibration effects on existing buried pipelines would be less than significant.

Vibration from Other Construction Activities

Vibration levels generated by large bulldozers and loaded trucks are estimated at approximately 0.019 to 0.023 in/sec PPV at 100 feet and 0.053 in/sec PPV at 100 feet from vibratory compactors. These vibration levels would decrease by half for every doubling of distance (Wilson Ihrig & Associates, 2008). The residential receptors that would be closest to vibratory construction equipment during SABPL project construction are the SFPUC watershed keeper's residence east of Calaveras Road (360 feet east of the southern backup pipeline alignment), and the Garcia residence (1,900 feet from Air Gaps Nos. 1 and 3 and the southern backup pipeline alignment). Vibration levels generated by most project activities (including operation of vibratory compactors) would be approximately 0.015 in/sec PPV or less at 360 feet, and 0.003 in/sec PPV or less at 1,900 feet, which would not exceed the 0.4 in/sec PPV damage threshold for continuous vibration, thus resulting in a less-than-significant impact. In addition, heavy equipment such as bulldozers, loaded trucks, or vibratory compactors would not operate during the more sensitive nighttime hours (10 p.m. to 7 a.m.). Therefore, the nighttime vibration threshold would not apply.

5.7.3.5 Operational Impacts and Mitigation Measures

Impact NO-4: Project operations would not result in a substantial increase in ambient noise levels in the project vicinity or significant impacts related to the exposure of people to noise levels in excess of standards established by the Alameda County Noise Ordinance. (Less than Significant)

The SABPL project proposes facilities that could generate noise during project operation. The primary sources of operational noise would be pumps at Pits F3-East and F3-West, including three 274-horsepower pumps at the Alameda Creek Pump Station and two submersible pumps adjacent to the proposed discharge facility at Pit F3-East. The SABPL project would also construct an electrical transformer adjacent to the Alameda Creek Pump Station. All of the proposed facilities would be connected to overhead and underground powerlines; however, during a power outage an emergency generator would be used to power the new chemical facility.

The closest sensitive receptors to the proposed Alameda Creek Pump Station and the new discharge facility at Pit F3-East are the two residences on Athenour Way, which are located approximately 2,100 feet to the west of the proposed Alameda Creek Pump Station and 3,600 feet west of the proposed discharge facility at Pit F3-East. At 2,100 feet, the three proposed

274-horsepower pumps and electrical transformer at the pump station site (estimated to generate noise levels of approximately 72 to 73 dBA at 50 feet) would generate noise levels of approximately 40 dBA at these receptors—well below the minimum existing 64 dBA (Leq) ambient daytime noise level and 60 dBA (Leq) nighttime noise level near these residences (see Table 5.7-2), and below the Alameda County daytime (64 dBA) and nighttime (60 dBA) exterior noise level standards (as noted in Section 5.7.2.3, above, the ordinance noise limits at these areas equate to the existing ambient noise levels). The two submersible pumps would be located underground and would not generate noise levels at the surface; therefore, the SABPL project's operational noise impact on the two residences on Athenour Way would be less than significant.

Smaller pumps would be located at the new chemical facility, flow meter vault, chemical injection station, and sampling station. These smaller pumps would be below ground and within facility enclosures (e.g., the chemical building, concrete vaults, and concrete manhole risers). Because the buildings and enclosures housing these pumps would provide noise attenuation, and due to the large setback distances from the closest residential receptors (Garcia residence at 1,900 feet and SFPUC watershed keeper's residence at 360 feet), noise generated by these smaller pumps would remain below the ordinance nighttime noise limit of 53 dBA (Leq) and the daytime noise limits of 58 dBA (Leq).

Operation of the standby generator at the fluoride facility for the new chemical facility could generate noise levels as high as 49 dBA (Leq) at the Garcia residence and 60 dBA (Leq) at the SFPUC watershed keeper's residence east of Calaveras Road. Such noise levels would be generated during testing, which would typically occur once per week during daytime hours for a period of 45 to 60 minutes. The minimum daytime ambient noise level of 44 dBA would be exceeded at both the SFPUC watershed keeper's residence and the Garcia residence, which indicates the generator noise could be audible at these two residences. However, given the short duration of testing (one hour per week) and the short-term, temporary nature of generator use during testing or power outages, this exceedance is considered to be less than significant.

5.7.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Pumping Variant 1 does not propose construction of the Alameda Creek Pump Station, wet well, control building for the pump station, electrical transformer, or retaining wall along the southern boundary of the pump station site adjacent to the access road; therefore, no construction noise related to these facilities would occur, and construction noise could be slightly lower than that generated by the proposed project during certain phases of construction. However, because all other facilities and permanent improvements would still be constructed under Pumping Variant 1, the overall construction-related noise and vibration impacts would be similar to those of the proposed project, and this variant would not change the conclusions or mitigation measures identified in Section 5.7.3.4, above. The one-step pumping proposed under Pumping Variant 1 (e.g., discharged water would be pumped directly from quarry Pit F3-East to San Antonio Reservoir or the Sunol Valley Water Treatment Plant) would result in less operational noise than under the proposed project because noise generated by the pumps at the Alameda Creek Pump Station (three 274-horsepower pumps) would be eliminated (since the Alameda Creek Pump Station would not be constructed). However, operational noise was determined to be less than significant under the proposed project. Thus, construction and operation of Pumping Variant 1 would not change the conclusions or mitigation measures presented in Sections 5.7.3.4 and 5.7.3.5, above.

Pumping Variant 2

Pumping Variant 2 would involve construction of all of the same facilities as those identified for the proposed project and would result in the same construction-related noise impacts as the proposed project. Although it would provide more operational flexibility (i.e., one-step pumping vs. two-step pumping) when compared to the proposed project, Pumping Variant 2 would result in the same operational impacts as the proposed project. Thus, construction and operation of Pumping Variant 2 would not change the conclusions or mitigation measures presented in Sections 5.7.3.4 and 5.7.3.5, above.

5.7.3.7 Cumulative Impacts and Mitigation Measures

Impact C-NO: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative noise impacts. (Less than Significant with Mitigation)

For cumulative construction-related noise and vibration impacts, the geographic scope encompasses the sensitive residential receptors in the vicinity of the project area. These sensitive receptors are: the currently unoccupied SFPUC watershed keeper's residence, located 225 feet east of Calaveras Road and the project area; the Garcia residence, located approximately 1,300 feet southwest of the project area; the two private residences on Athenour Way, located approximately 2,100 feet west of the project area; and the Sunol Regional Wilderness, with the closest trail located approximately 1.2 miles southeast of the project area. Noise impacts associated with the SABPL project would result from construction-related equipment and hauling activities, as well as from operational activities associated with the Alameda Creek Pump Station at the northwestern project boundary.

Construction-Related Daytime Noise Increases in the Project Vicinity

As discussed in Impact NO-1, project-related daytime construction-related noise levels would not exceed the 70-dBA speech interference threshold at the nearest sensitive receptors. However, construction activities associated with the SFPUC NIT project and SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project could overlap with those of the SABPL project near its southern boundary, and construction activities associated with the SFPUC Upper Alameda Creek Filter Gallery (Filter Gallery) project and SMP-30 Expansion project could overlap with those of the SABPL project near its northern boundary (see Table 5.1-6). These cumulative projects overlap geographically with the SABPL project area, and together, these projects have the potential to generate cumulative daytime noise levels that exceed the 70-dBA speech interference threshold at the two residential receptors located in the southern project vicinity (SFPUC watershed keeper's residence and Garcia residence), and at the two residences on Athenour Way in the northern project vicinity. Since the closest trail in the Sunol Regional Wilderness is over 1 mile away from the SABPL, NIT, Filter Gallery, and SMP-30 Expansion projects, cumulative noise impacts on this trail would be less than significant.

However, in the southern portion of the SABPL project area, the SABPL project's estimated daytime construction noise levels would be up to 56 dBA (Leq) at the Garcia residence and up to 67 dBA at the SFPUC watershed keeper's residence. When added to the estimated NIT project's daytime Leq noise levels of 66 dBA at the Garcia residence and 58 dBA at the SFPUC watershed keeper's residence (San Francisco Planning Department, 2009), the combined Leq noise levels would be 66 dBA at the Garcia residence and 68 dBA at the SFPUC watershed keeper's residence. Because these combined noise levels would not exceed the daytime 70-dBA speech interference threshold, cumulative impacts related to temporary increases in daytime ambient noise levels in the southern project area would be less than significant.

Similarly, the daytime construction noise levels at the two residential receptors on Athenour Way near the northern project area (2,100 feet or more from the SABPL project area and 1,500 feet or more from the Filter Gallery project) would be up to 57 dBA (Leq) from the SABPL project and up to 65 dBA (Leq) from the Filter Gallery project in the northern portion of the project area. If construction of these two projects were to occur at the same time, the combined noise level would be up to 66 dBA (Leq). This noise level would also not exceed the daytime 70-dBA speech interference threshold at the residential receptors on Athenour Way. Therefore, the cumulative noise impact on the closest sensitive receptors from daytime construction in the northern project area would be less than significant.

Preparation of the EIR for the SMP-30 Expansion project is currently underway. No information from that EIR's noise impact evaluation is currently available. The potential for site preparation activities for the SMP-30 Expansion project facilities to overlap with construction of the NIT, SABPL, and Filter Gallery projects is currently unknown. Initial site preparation activities for the SMP-30 Expansion project include relocating existing utility lines along Calaveras Road. The SMP-30 project also involves the construction of cutoff walls along the east bank of Alameda Creek and south bank of San Antonio Creek. If these activities were to coincide with construction of the SABPL, NIT, and Filter Gallery projects, combined noise levels at the closest sensitive receptors could reach or slightly exceed the 70-dBA speech interference threshold, a potentially significant cumulative noise impact. However, given the characteristics of the SABPL project's construction noise levels described above, which were determined to be less than significant, the SABPL project's contribution to this cumulative impact is considered less than cumulatively considerable (less than significant).

Construction-Related Nighttime Noise Increases in the Project Vicinity

As discussed in Impact NO-1, construction of the proposed project facilities in the southern project area would occur beyond the ordinance time limits of 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 5 p.m. on Saturdays and Sundays during construction of the three air gaps, the connections between the air gaps and the backup pipeline, and the connection between the backup pipeline and Alameda Siphon No. 3, for a combined total of six weeks of extended construction hours. The SABPL project's maximum nighttime Leq noise level would be 48 dBA at the Garcia residence and 56 dBA at the SFPUC watershed keeper's residence. When combined with the NIT project's estimated nighttime noise levels of 49 dBA (Leq) at the Garcia residence and 50 dBA (Leq) at the SFPUC watershed keeper's residence (San Francisco Planning Department, 2009), cumulative nighttime noise levels could exceed the 50-dBA sleep interference threshold by 2 dBA at the Garcia residence and 7 dBA at the SFPUC watershed keeper's residence, a significant cumulative impact. The SABPL project's contribution of 48 dBA (Leq) at the Garcia residence and 56 dBA (Leq) at the SFPUC watershed keeper's residence is considered cumulatively considerable.

However, cumulative noise increases could also occur at the Garcia Residence and the SFPUC watershed keeper's residence on the east side of Calaveras Road as a result of on-site nighttime construction activities required for the SABPL project (described above) combined with cumulative truck traffic along Calaveras Road associated with the construction of other SFPUC projects in the Sunol Valley. The Environmental Impact Report (EIR) for the SFPUC Calaveras Dam Replacement project estimated cumulative nighttime traffic-related noise increases along Calaveras Road to be 52 dBA (Leq) at the Garcia residence and 50 dBA (Leq) at the SFPUC watershed keeper's residence located on the east side of Calaveras Road (San Francisco Planning Department, 2011). When combined with the nighttime construction noise generated by the SABPL project during the six weeks of extended construction hours, nighttime noise levels could reach 55 dBA (Leq) at the Garcia residence (a 3-dBA increase) and 58 dBA (Leq) at the SFPUC watershed keeper's residence (a 1-dBA increase). Therefore, a temporary but significant cumulative noise impact would result, and the SABPL project's contribution to cumulative nighttime noise impacts would be cumulatively considerable.

As described in Impact NO-1, the SABPL project's impact related to nighttime noise increases at sensitive receptors would be reduced to a less than significant level with implementation of **Mitigation Measure M-NO-1 (Administrative and Source Controls)** (see Impact NO-1, above, for description), which requires the contractor to implement noise control techniques during construction. With implementation of this mitigation measure, cumulative noise levels could still exceed the sleep interference threshold at the Garcia Residence or the SFPUC watershed keeper's residence, and the SABPL project's contribution to cumulative nighttime noise increases would remain cumulatively considerable. However, the SABPL project's contribution to this cumulative impact would be reduced to less-than-significant with implementation of Mitigation Measure M-C-NO, described below.

Mitigation Measure M-C-NO: Coordination of Nighttime Construction and Truck Traffic.

The SFPUC shall coordinate the nighttime construction activities of the SABPL project with the nighttime construction activities and haul traffic of other SFPUC projects in the Sunol Valley, including the NIT project, Filter Gallery project, and Calaveras Dam Replacement project, to ensure that maximum nighttime noise levels do not cumulatively exceed the 50-dBA sleep interference criterion or the noise performance standards of the Alameda County Noise Ordinance at the Garcia residence or SFPUC watershed keeper's residence (when occupied). Alternatively, to mitigate impacts on the watershed keeper's residence, the SFPUC can elect to temporarily relocate its inhabitants (restrictions on maximum nighttime noise levels above would still apply at the Garcia residence).

Mitigation Measure M-C-NO would address cumulative nighttime construction noise by requiring the SFPUC to coordinate nighttime construction activities associated with other SFPUC projects in the Sunol Valley such that the maximum nighttime construction noise levels do not cumulatively exceed the 50-dBA sleep interference criterion at the Garcia residence or the SFPUC watershed keeper's residence. Therefore, the cumulative impact would be less than significant with mitigation.

The two residential receptors on Athenour Way and the SFPUC watershed keeper's residence on Andrade Road are too far from the southern portion of the project area where nighttime cumulative noise increases would occur; therefore, a cumulative impact would not occur at these receptors.

Daytime Noise Disturbance Along Construction Routes

During construction activities associated with the SABPL project, construction vehicles would use Calaveras Road between the proposed work areas and I-680. Haul trucks associated with SABPL project construction would not operate along Calaveras Road during the nighttime hours (7 p.m. to 7 a.m.). As discussed above under Impact NO-1, traffic increases from SABPL project construction would result in an estimated 3-dBA noise increase at 50 feet from the centerline of Calaveras Road, and the noise increase would be even less at the SFPUC's watershed keeper's residence and the Garcia residence.

Although this daytime project-related noise increase would be less than significant, the project's construction-related vehicle noise on Calaveras Road could contribute to increased traffic noise associated with other cumulative projects in the Sunol Valley that are constructed concurrently, including the NIT project, Filter Gallery project, SFPUC Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir project (SVWTP Expansion) project, Calaveras Dam Replacement project, and various SFPUC pipeline inspection projects. The cumulative traffic analysis presented in Section 5.6, Transportation and Circulation, indicates that as many as 550 vehicles per hour (peak hour) could travel along Calaveras Road under the worst-case scenario. Based on this peak hourly volume, the noise levels from cumulative traffic on Calaveras Road would be less than 70 dBA (L_{eq}) during the daytime at both the Garcia residence (located approximately 1,900 feet west of Calaveras Road) and the SFPUC watershed keeper's residence (located approximately 225 feet east of Calaveras Road). Therefore, the cumulative noise impact from daytime traffic increases along Calaveras Road would be less than significant.

Other cumulative projects under construction in the Sunol Valley could result in a significant cumulative noise impact from nighttime traffic on Calaveras Road. However, since all haul trips associated with construction of the SABPL project would be limited to weekdays between 7 a.m. and 7 p.m., the SABPL project would not generate truck traffic on Calaveras Road during the nighttime hours, and haul traffic from the SABPL project would not contribute to this cumulative impact.

Noise from SABPL project-related construction traffic in combination with cumulative project traffic is not expected to significantly alter existing noise levels on I-680. The ambient noise levels along this roadway are already high, and the small amount of additional traffic from the cumulative projects would not substantially raise existing freeway noise levels. Therefore, cumulative impacts related to noise increases on I-680 would be less than significant.

Exposure of People to Noise Levels in Excess of Standards Established by the Alameda County Noise Ordinance

As discussed above under Impact NO-2, during certain phases of construction, the SABPL project would include construction outside of the Alameda County Noise Ordinance time limits on Saturdays (between 5p.m. and 7p.m.) for a combined total of six weeks). The SABPL project's maximum nighttime Leq noise level would be 48 dBA at the Garcia residence and 56 dBA at the SFPUC watershed keeper's residence. When combined with the NIT project's estimated nighttime noise levels of 49 dBA (Leq) at the Garcia residence and 50 dBA (Leq) at the SFPUC watershed keeper's residence (San Francisco Planning Department, 2009), cumulative nighttime noise levels could be 52 dBA at the Garcia residence and 57 dBA at the SFPUC watershed keeper's residence. These noise levels would be less than the maximum noise levels allowed by the Alameda County Noise Ordinance (58 dBA for any equipment operating between 7 a.m. and 10 p.m.), but would exceed the 50 dBA nighttime noise limit between 10 p.m. and 7 a.m. at the SFPUC watershed keeper's residence. Therefore, cumulative impacts related to exposure of people to noise levels in excess of standards established by the Alameda County Noise Ordinance would be significant, and the SABPL project's contribution would be cumulatively considerable.

As described in Impact NO-2, the SABPL project's impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-NO-2 (Noise Control Plan)** (see Impact NO-2, above, for description), which would require the construction contractors to prepare a noise control plan for construction activities performed beyond the local ordinance time limits. However, even with implementation of this mitigation measure, cumulative noise levels could still exceed the 50 dBA sleep interference criterion between 10 p.m. and 7 a.m. at the SFPUC watershed keeper's residence, and the SABPL project's contribution to nighttime noise increases would remain cumulatively considerable. Implementation of **Mitigation Measure M-C-NO (Coordination of Nighttime Construction and Truck Traffic)** (described above) would require the SFPUC to coordinate the SABPL project's nighttime construction activities with construction truck traffic related to construction of other SFPUC projects that use Calaveras Road to ensure that maximum nighttime construction noise levels do not cumulatively exceed the 50-dBA noise limit at the SFPUC watershed keeper's residence. Therefore, the cumulative impact would not be significant with mitigation.

Construction-Related Vibration

As discussed in Impact NO-3, operation of continuous vibration sources (including vibratory compactors) in the southern SABPL project area would generate vibration levels of approximately 0.015 in/sec PPV or less at the SFPUC watershed keeper's residence on the east side of Calaveras Road, and 0.003 in/sec PPV or less at the Garcia residence (see Impact NO-3, above, for description). These levels would not exceed the applicable 0.4 in/sec PPV continuous vibration threshold at either residence. The NIT EIR estimates vibration levels of up to 0.038 in/sec PPV at the Garcia residence from impact pile driving activities associated with NIT project construction at the Alameda West Portal. Vibration levels at the SFPUC watershed keeper's residence would be lower since it is located farther from this portal than the Garcia residence. Together, the vibration levels generated from these two projects would remain well below the 0.4 in/sec PPV continuous vibration threshold and 0.5 in/sec PPV transient vibration threshold at either residence. Thus, the cumulative impact in the southern project area would be less than significant.

There would also be a potential for cumulative vibration impacts in the northern SABPL project area if construction of SABPL project facilities occurred simultaneously with sheetpile driving associated with the Filter Gallery project. Impact sheetpile driving for construction of the proposed wet well beneath the Alameda Creek Pump Station would generate vibration levels of up to 0.018 in/sec PPV at the two Athenour Way residences. If these sheetpile driving activities coincided with sheetpile-driving activities for the Filter Gallery project related to construction within the streambed of Alameda Creek, cumulative vibration levels of up to 0.048 in/sec PPV could result at the two residences. The cumulative vibration levels would not exceed the 0.4 in/sec PPV continuous vibration threshold or 0.5 in/sec PPV threshold for pile driving; as such, the potential for cumulative vibration impacts is less than significant.

Operational Noise

As discussed in Impact NO-4, the SABPL project would generate noise from a standby generator for the new chemical facility near the project's southern boundary, resulting in noise levels of 49 dBA Leq at the Garcia residence and 60 dBA at the SFPUC watershed keeper's residence. The NIT project's ventilation fan and backup generator in this area would result in noise levels of 42 dBA at the Garcia residence and 44 to 59 dBA Leq at the SFPUC watershed keeper's residence. Cumulative noise levels at these receptors would be 49 dBA and 60 dBA, respectively. Noise levels at the Garcia residence would remain below the daytime noise ordinance limit of 58 dBA. Although the noise level at the SFPUC watershed keeper's residence could periodically exceed the noise ordinance limit by 2 dBA, the standby generator proposed by the SABPL project would only be operated about one hour per week for testing and the NIT project's ventilation fans would only be operated during routine inspections and maintenance activities. While the simultaneous operation of these facilities would increase the maximum operational noise levels estimated at the SFPUC watershed keeper's residence, the potential for simultaneous operation would be low. Given these minimal increases in noise levels and the limited potential for simultaneous operation, cumulative increases in operational noise would be less than significant.

As stated above, preparation of the EIR for the SMP-30 Expansion project is currently underway, but no information from that EIR's noise impact evaluation is currently available. Operational noise increases from the SMP-30 Expansion project could also contribute to the cumulative operational noise levels at the Garcia residence and SFPUC watershed keeper's residence located east of Calaveras Road. Such increases would, in turn, increase the potential for the noise ordinance limit to be exceeded, a potentially significant cumulative impact. However, given the characteristics of the SABPL project's operational noise levels, which were determined to be less than significant, the SABPL project's contribution to this cumulative impact is considered less than cumulatively considerable (less than significant).

As discussed in Impact NO-4, in the northern portion of the project area, the SABPL project would also generate noise from three 274-horsepower pumps at the Alameda Creek Pump Station and two submersible pumps located at the new discharge facility at Pit F3-East. A fourth 274-horsepower pump would be installed at the Alameda Creek Pump Station for operation of the Filter Gallery project, for a total of three active and one standby. Since the pumps at the Alameda Creek Pump Station could only be operated for one project at any given time, the project-specific noise levels described in Impact NO-4 also represent cumulative noise levels with implementation of the Filter Gallery project (i.e., a less-than-significant noise impact). Therefore, no cumulative impacts related to operational noise increases would occur from pumping operations associated with these projects.

Cumulative Impacts of Pumping Variants

Since Pumping Variant 1 would eliminate construction noise associated with the Alameda Creek Pump Station, wet well, transfer pipeline, electrical transformer, and retaining wall, and would reduce noise from haul truck traffic along Calaveras Road due to the reduction in excess spoils that are associated with these facilities, Pumping Variant 1's contribution to cumulative construction noise levels would be slightly less than the proposed project. However, overall, implementation of Pumping Variant 1 would result in similar construction-related noise impacts as those of the proposed project. Since Pumping Variant 2 would construct all of the same facilities and permanent improvements as the proposed project, the project's contribution to cumulative construction noise levels under Pumping Variant 2 would be the same as the proposed project. The conclusions provided above regarding cumulative construction noise and vibration, including the implementation of **Mitigation Measure M-C-NO (Coordination of Nighttime Construction and Truck Traffic)** (described above), are applicable to both project variants.

Under Pumping Variant 1, the project's contribution to cumulative operational noise would also be less than under the proposed project because noise associated with operation of the four 274-horsepower pumps at the Alameda Creek Pump Station would not occur under this pumping variant. Even with operation of the Alameda Creek Pump Station under the proposed project and Pumping Variant 2, cumulative operational noise levels would continue to be well below the minimum existing ambient nighttime noise levels at the two residences on Athenour Way. Therefore, the cumulative impact significance determinations identified above apply to both project variants.

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5.8 Air Quality

This section addresses the air quality impacts that could result from implementation of the proposed San Antonio Backup Pipeline (SABPL) project, including increases in criteria air pollutants. The principal air emissions generated by the proposed project would be short term in nature and associated with the construction of project facilities. Impacts specific to greenhouse gas (GHG) emissions and climate change are evaluated in Section 5.9, Greenhouse Gas Emissions.

5.8.1 Setting

The project area is located in unincorporated Alameda County in the Sunol Valley. The project area is within the San Francisco Bay Area Air Basin (SFBAAB), which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, as well as the southern portion of Sonoma County and the southwest portion of Solano County. Ambient concentrations of air pollutants in the project area are a product of the quantity of pollutants emitted by local sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect air quality and pollutant transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight.

5.8.1.1 Meteorology

On an annual basis, temperatures in the Sunol Valley average 60 degrees Fahrenheit, with summer highs in the upper 70s and winter lows in the low 40s. August and September are the warmest months, and December and January are the coldest. January and February are the wettest months, with an average of 3.2 inches of rain each month; July and August average 0.1 inch of rain per month or less. Although the project area averages 20 inches of rainfall annually, precipitation varies markedly from year to year (WRCC, 2009). Thus, the rainfall total in one month of a heavy-precipitation year may exceed that of an entire annual total during a drought.

Winds are an important element in characterizing the air quality setting of any project. Wind controls both the microscale dispersion of any locally generated air emissions and their regional trajectory. Winds during warmer months are typically out of the west and northwest, averaging nearly 10 miles per hour. During the day, localized emissions are carried in a southeastward direction toward the Sunol Regional Wilderness. At night, emissions are less readily ventilated and travel in more random directions. During the day, there is usually little potential for large-scale stagnation. However, winds at night are often less than 2 to 3 miles per hour. Local radiation temperature inversions during the night (when the ground is cooler than the air) can combine with these light winds to create localized air stagnation near major air pollution emission sources (e.g., freeways). The low development density in the vicinity of the proposed SABPL project helps to minimize the potential for adverse health effects associated with nocturnal inversions.

5.8.1.2 Ambient Air Quality

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of six criteria air pollutants: ozone, carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Existing and probable future air quality in the project area can best be inferred from examining ambient air quality measurements taken by the BAAQMD at its former Fremont–Chapel Way monitoring station (this monitoring station was closed on October 31, 2010) over the past several years. **Table 5.8-1** presents a seven-year summary of monitoring data (2004–2010) from the Fremont-Chapel Way monitoring station and compares measured maximum pollutant concentrations against the most stringent applicable ambient air quality standards (both state and federal standards are described below in Section 5.8.2). SO_2 is not included in the table because this pollutant was not monitored at the Fremont–Chapel Way monitoring station.

TABLE 5.8-1
FREMONT–CHAPEL WAY AMBIENT AIR QUALITY MONITORING SUMMARY (2004–2010)

Pollutant	Most Stringent Applicable Standard	Number of Days Standards were Exceeded and Maximum Concentrations Measured						
		2004	2005	2006	2007	2008	2009	2010
Ozone								
Maximum 1-hour concentration (ppm)[b]		0.090	0.105	0.102	0.079	0.112	0.099	0.120
Days 1-hour standard exceeded	>0.09 ppm[a]	0	1	4	0	1	4	1
Maximum 8-hour concentration (ppm)[a]		0.071	0.079	0.074	0.068	0.079	0.075	0.081
Days 8-hour standard exceeded	>0.07 ppm[a]	1	1	3	0	3	2	1
Days 8-hour standard exceeded	>0.075 ppm[b]	0	1	0	0	1	0	1
Carbon Monoxide (CO)								
Maximum 8-hour concentration (ppm)		1.66	1.96	1.81	1.57	1.43	1.20	0.55
Maximum 1-hour concentration (ppm)		3.0	3.2	2.9	2.5	1.9	2.0	1.6
Days 1-hour standards exceeded	> 20 ppm[a]	0	0	0	0	0	0	–
Days 8-hour standards exceeded	>9 ppm[a,b]	0	0	0	0	0	0	0
Nitrogen Dioxide (NO_2)								
Maximum 1-hour concentration (ppm)		0.060	0.069	0.063	0.058	0.062	0.051	0.053
Days 1-hour standard exceeded	>0.18 ppm[a]	0	0	0	0	0	0	0
Suspended Particulates (PM_{10})								
Maximum 24-hour concentration (μg/m^3)		48.9	54.1	56.6	60.6	38.7	–	–
Days 24-hour standard exceeded[c]	>50 μg/m^3 [a]	0	1	1	1	0	0	–
Days 24-hour standard exceeded[c]	> 150 μg/m^3 [b]	0	0	0	0	0	0	–
Suspended Fine Particulates ($PM_{2.5}$)								
Maximum 24-hour concentration (μg/m^3)		39.9	33.4	43.9	51.2	28.6	39.3	26.3
Days 24-hour standard exceeded	>35 μg/m^3 [d]	2	0	2	2	0	1	0
Annual Average (μg/m^3)		9.4	9.0	10.3	8.7	9.4	9.3	–
Annual standard exceeded?	>12 μg/m^3 [a]	No	No	No	No	No	No	–

NOTES: "–" indicates that data are not available; ppm = parts per million; μg/m^3 = micrograms per cubic meter.
[a] State standard, not to be exceeded.
[b] Federal standard, not to be exceeded.
[c] Because PM_{10} is only sampled every sixth day, the actual number of days over the standard can be estimated to be six times the number shown.
[d] Federal standard, reduced from 65 μg/m^3 to 35 μg/m^3 in 2006.

SOURCE: CARB, 2011; BAAQMD, 2009.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxide (NO_X). The main sources of NO_X and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. Automobiles are the single largest source of ozone precursors in the Bay Area. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process, resulting in the regional dispersion of ozone. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema (BAAQMD, 2011a). Table 5.8-1 shows that, according to published data, the more stringent applicable standards have been very infrequently exceeded during the past seven years.

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, dizziness, fatigue, unconsciousness, and even death (BAAQMD, 2011a). Table 5.8-1 shows that no exceedances of CO standards were recorded at the Fremont–Chapel Way monitoring station between 2004 and 2010. Maximum 8-hour CO levels average less than 25 percent of the allowable 8-hour standard.

Suspended and Inhalable Particulate Matter

Particulate matter is a class of air pollutants that consists of solid and liquid airborne particles in an extremely small size range. Particulate matter is measured in two size ranges: PM_{10} for particles less than 10 microns in diameter, and $PM_{2.5}$ for particles less than 2.5 microns in diameter. Motor vehicles generate about half of all Bay Area particulates, through tailpipe emissions as well as brake pad and tire wear. Another large source of fine particulates is wood burning in fireplaces and stoves. Fine particulates small enough to be inhaled into the deepest parts of the human lung can cause adverse health effects. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health (BAAQMD, 2011a).

Diesel exhaust is an important concern in the Bay Area and throughout California. The California Air Resources Board (CARB) identified diesel engine particulate matter (DPM) as a toxic air contaminant (TAC), and DPM has also been identified as a human carcinogen. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the diesel soot particles, which are very small and can penetrate deeply into the lungs. Several medical research studies have linked near-road pollution exposure to a variety of adverse health outcomes impacting children and adults, including significant allergic response and elevated production of specific antibodies (BAAQMD, 2011a).

Table 5.8-1 shows that exceedances of the state PM_{10} standard occur relatively infrequently in southern Alameda County (Fremont–Chapel Way monitoring station). The state 24-hour PM_{10} standard was exceeded not more than once per year between 2004 and 2009. The less stringent federal 24-hour PM_{10} standard was not exceeded during this period.

In 2006, the U.S. Environmental Protection Agency (U.S. EPA) revised the standard for $PM_{2.5}$, which represents the fine fraction of particulate matter. California's annual average standard went into effect in 2003. Table 5.8-1 presents the $PM_{2.5}$ data from the Fremont–Chapel Way monitoring station for 2004 through 2010. The federal 24-hour $PM_{2.5}$ standard was not exceeded until the standard was reduced in 2006 from 65 to 35 $\mu g/m^3$. Based on the monitoring results, the more stringent standard would have been exceeded twice in 2004, was exceeded twice in 2006 and twice in 2007, and once in 2009. Because $PM_{2.5}$ is usually monitored every third day, it is estimated that the federal 24-hour standard has been exceeded approximately four times in each of the past five years based on published data.

Other Criteria Air Pollutants

The standards for NO_2, SO_2, and lead are being met in the SFBAAB, and pollutant trends suggest that the air basin will continue to meet these standards for the foreseeable future.

5.8.1.3 Toxic Air Contaminants

TACs are a defined set of airborne air pollutants that may pose a present or potential hazard to human health. A wide range of sources, from industrial plants to motor vehicles, emit TACs. Like $PM_{2.5}$, TACs can be emitted directly and can also be formed in the atmosphere through reactions with different pollutants. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute effects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches. DPM, a component of $PM_{2.5}$, accounts for over 80 percent of the inhalation cancer risk from TACs in the Bay Area and is one of the TACs of greatest concern. There are two categories of the most common sources of TACs: stationary sources such as back up diesel generators, dry cleaners, and gasoline stations; and on-road mobile sources from cars and trucks on high traffic volume roadways and off-road mobile sources such as construction equipment, ships, and trains.

In addition to monitoring criteria air pollutants, both the BAAQMD and the CARB operate TAC monitoring networks in the San Francisco Bay Area. These stations measure 10 to 15 TACs, depending on the specific station. The TACs selected for monitoring are those that have traditionally been found in the highest concentrations in ambient air, and therefore tend to produce the most significant risk. There are no ambient TAC monitoring stations in the Sunol Valley area. The closest station is the Livermore–793 Rincon Avenue monitoring station, located approximately 9 miles northeast of the SABPL project area. Average 2008 TAC concentrations in the Sunol Valley were within the range measured at other TAC monitoring stations within the SFBAAB (BAAQMD, 2008).

In the Bay Area, there are a number of areas where the exposure of sensitive populations to TACs is relatively high. These areas are identified by the BAAQMD as Impacted Communities. The Sunol Valley is not located within any Impacted Community boundaries.

Permitted Stationary Sources and Mobile Sources in the Project Vicinity

Stationary emission sources permitted by the BAAQMD and major roadway sources (>10,000 ADT) located within 1,000 feet of the project area are listed in **Table 5.8-2** and shown in **Figure 5.8-1**. No major non-permitted sources (e.g., train yards, distribution facilities, and high volume fueling stations) are located within 1,000 feet of the project area. Calaveras Road in the vicinity of the SFPUC watershed keeper's residence carries less than 10,000 vehicles per day (LCW Consulting, 2006, 2011).

TABLE 5.8-2
EXISTING PERMITTED STATIONARY AND MOBILE EMISSIONS SOURCES IN THE PROJECT VICINITY

Site	Facility Name and Emissions Source	Street Address	City	Excess Cancer Risk (cases in a million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ (μ/m^3)
15592	SPFUC (Source: 100-kilowatt emergency generator)	5555 Calaveras Road	Sunol	20.93	0.007	–	0.038
16195	CEMEX Construction Materials Pacific (Source: crushers, screens, conveyors, feed hopper, stockpiles, haul roads, non-retail gasoline dispensing facility)	6527 Calaveras Road	Sunol	0.02	0	–	119
Interstate 680 at a distance of 10 feet to the east			Sunol	131.784	0.118	0.073	0.815
Combined Cancer Risk and Hazards[a]				**152.734**	**0.125**	**0.073**	**119.853**

NOTE:
[a] This would be the risk level if the closest sensitive receptor were exposed for the next 70 years at the point of maximum risk for all three sources.

SOURCE: BAAQMD, 2011b, 2011c, 2011d, 2011f.

The CEMEX Construction Materials Pacific facility (Site 16195) is located on land owned by the City and County of San Francisco (CCSF) that is currently leased to Oliver De Silva, Inc. and operated under Surface Mining Permit 30 (SMP-30). The SMP-30 facility is a sand and gravel processing plant that includes 13 identified sources of particulate emissions. Emission sources include four rock crushers, six vibratory screens, a feed hopper, conveyors, stockpiles, and haul roads. The facility also contains a non-retail gasoline dispensing facility that generates very small amounts of volatile organic compounds (VOCs). BAAQMD staff have reported that the screening level $PM_{2.5}$ concentration at the fenceline of Site 16195 is 119 μg/m^3 (BAAQMD, 2011f). However, these emissions are almost entirely attributable to fugitive dust. The BAAQMD's health risk thresholds apply to exhaust emissions, but not fugitive dust. Furthermore, although the SMP-30 facility may include onsite sources of other TACs associated with the gasoline dispensing facility, this facility is more than 3,000 feet from the SFPUC watershed keeper's residence. Given this distance, coupled with the small amounts of VOCs emitted by the gas dispensing operations and the fact that the majority of emissions are from fugitive dust and not exhaust, this facility is not considered a source of cumulative risk or hazards for nearby sensitive receptors. No additional discussion regarding emissions from this facility is provided, however a qualitative discussion of related emissions from mining activities at Pit F6, an active quarry pit associated with this facility, is included below in the analysis of construction-related health risks (see Section 5.8.3.7, Cumulative Impacts and Mitigation Measures).

5.8.1.4 Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive than the general population to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. People engaged in strenuous work or exercise are also more sensitive to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses or parks are also considered sensitive due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.

No schools, childcare centers, churches, hospitals, or nursing homes are located in the vicinity of the proposed project. Figure 5.8-1 shows the project area and identifies sensitive receptors within 0.5 mile of the project area. There is a currently unoccupied SFPUC watershed keeper's residence approximately 225 feet east of the project area and Calaveras Road, just north of the Alameda East Portal, and an occupied SFPUC watershed keeper's residence approximately 4,700 feet west of the project area on Andrade Road. A private ranch residence (Garcia residence) is located approximately 1,300 feet southwest of the project area. There are two private residences on Athenour Way west of the project's northern boundary, approximately 2,100 feet west of Pit F3-West and 200 to 300 feet south of Interstate 680 (I-680). The Sunol Golf Course is located 0.5 mile to the northwest and the closest recreational trail is the Maguire Peaks Trail in the Sunol Regional Wilderness, approximately 1.2 miles southeast of the project area. Other distant sensitive receptors include residential uses in Sunol (approximately 1 mile northwest of the project area) and along Vallecitos Road (more than 1 mile north of the project area).

5.8.2 Regulatory Framework

5.8.2.1 Federal and State Regulations

The Clean Air Act Amendments of 1970 established national ambient air quality standards, and individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological problems in California, there is considerable diversity between the state and national ambient air quality standards, as

SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 5.8-1
Existing Emissions Sources and Sensitive Receptors

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shown in **Table 5.8-3**. California ambient standards tend to be at least as protective as national ambient standards, and are often more stringent.

The ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, the elderly, people weak from other illness or disease, or people engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above the ambient air quality standards before adverse health effects are observed.

Federal Clean Air Act

The 1977 Clean Air Act (last amended in 1990; United States Code, Title 42, Section 7401 et seq.) requires that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants will be controlled to achieve all standards within the deadlines specified in the Clean Air Act.

In 1982, the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and the BAAQMD jointly prepared the *Bay Area Air Quality Plan* for the SFBAAB. The plan predicted attainment of the federal clean air standards within the air basin by 1987; however, federal clean air standards were not attained throughout the entire air basin until 1991. The *Bay Area Air Quality Plan* was incorporated into California's State Implementation Plan (SIP), a plan required under the federal Clean Air Act. A SIP must contain control strategies that demonstrate attainment of national ambient air quality standards by specific Clean Air Act deadlines.

The SFBAAB's current attainment status with respect to federal standards is summarized in Table 5.8-3. In general, the Bay Area experiences low concentrations of most pollutants when compared to federal standards, except for ozone and particulate matter (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically. The SFBAAB's attainment status for ozone has changed several times over the past decade, first from "nonattainment" to "attainment" in 1995, then back to "unclassified nonattainment" in 1998 for the 1-hour federal ozone standard. In June 2004, the Bay Area was designated as "marginal nonattainment" for the 8-hour ozone standard. In 2008, the U.S. EPA lowered the 8-hour ozone standard from 0.08 part per million (ppm) to 0.075 ppm. As a designated "marginal" nonattainment area for the federal 8-hour ozone standard, preparation of a SIP is currently not required. However, in January 2011, the U.S. EPA proposed to revise the federal ozone standard downward from 0.060 ppm to 0.070 ppm, and is expected to issue final designations based on this new standard in 2011. Although this change is small, it could result in the removal of the "marginal" qualifier to the nonattainment designation. If this occurs, preparation of a SIP may be required for the federal 8-hour ozone standard.

TABLE 5.8-3
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS AND SFBAAB ATTAINMENT STATUS

Pollutant	Averaging Time	State Standards[a] Concentration	State Standards[a] Attainment Status	Federal Standards[b] Concentration[c]	Federal Standards[b] Attainment Status
Ozone	1 hour	0.09 ppm (180 μg/m³)	N	N/A	–
	8 hour	0.07 ppm (137 μg/m³)	N	0.075 ppm	N[d]
Carbon Monoxide	1 hour	20 ppm (23 mg/m³)	A	35 ppm (40 mg/m³)	A
	8 hour	9 ppm (10 mg/m³)	A	9 ppm (10 mg/m³)	A
Nitrogen Dioxide	1 hour	0.18 ppm (339 μg/m³)	A	0.10 ppm (See footnote e)	U
	Annual arithmetic mean	0.030 ppm (57 μg/m³)	N/A	0.053 ppm (100 μg/m³)	A
Sulfur Dioxide (see footnote f)	1 hour	0.25 ppm (655 μg/m³)	A	0.075 ppm (196 μg/m³)	A
	24 hour	0.04 ppm (105 μg/m³)	A	0.14 ppm (365 μg/m³)	A
	Annual arithmetic mean	N/A	–	0.03 ppm (80 μg/m³)	A
Particulate Matter (PM_{10})	24 hour	50 μg/m³	N	150 μg/m³	U
	Annual arithmetic mean	20 μg/m³	N	N/A	–
Fine Particulate Matter ($PM_{2.5}$)	24 hour	N/A	–	35 μg/m³ (See footnote g)	N
	Annual arithmetic mean	12 μg/m³	N[g]	15 μg/m³	A
Sulfates	24 hour	25 μg/m³	A	N/A	–
Lead[h]	30 day average	1.5 μg/m³	–	N/A	A
	Calendar quarter	N/A	–	1.5 μg/m³	A
	Rolling 3 month average[i]	N/A	–	0.15 μg/m³	See footnote i
Hydrogen Sulfide	1 hour	0.03 ppm (0.15 μg/m³)	U	N/A	–
Vinyl Chloride[h]	24 hour	0.01 ppm (26 μg/m³)	–	N/A	–

NOTES: A = attainment; N = nonattainment; U = unclassified; N/A = not applicable or no applicable standard; ppm = parts per million; μg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; – = not indicated or no information available.

[a] State ambient air quality standards (California). The state standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and suspended particulate matter (PM_{10}) are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that the CARB determines would occur less than once per year on the average.

TABLE 5.8-3 (Continued)
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS AND SFBAAB ATTAINMENT STATUS

[b] National ambient air quality standards. National standards shown are the "primary standards" designed to protect public health. National standards, other than for ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the three-year average of the fourth highest daily concentration is 0.075 ppm (775 ppb) or less. The 24-hour PM_{10} standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than 150 μg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the three-year average of 98th percentile is less than 35 μg/m^3.

[c] National air quality standards are set by U.S. EPA at levels determined to be protective of public health with an adequate margin of safety.

[d] In early January 2010, the U.S. EPA proposed a stricter air quality standard for ground level ozone. The new ozone proposal would set the primary smog standard at a level between 0.060 and 0.070 ppm measured over an 8-hour period. The U.S. EPA expects to finalize the newly proposed national 8-hour ozone standard in 2011.

[e] To attain this standard, the three-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

[f] On June 2, 2010, the U.S. EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO_2 national standards must continue to be used, however, until one year following U.S. EPA initial designations of the new 1-hour SO_2 national standard. The U.S. EPA expects to designate areas by June 2012.

[g] The U.S. EPA designated the SFBAAB as nonattainment of the $PM_{2.5}$ standard on October 8, 2009. The effective date of the designation is December 14, 2009 and the BAAQMD has three years to develop a plan—called a State Implementation Plan (SIP)—that demonstrates the SFBAAB will achieve the revised standard by December 14, 2014. The SIP for the new $PM_{2.5}$ standard must be submitted to the U.S. EPA by December 14, 2012.

[h] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure below which there are no adverse health effects determined.

[i] National lead standard, rolling three-month average: final rule signed October 15, 2008. Final designations expected in October 2011.

SOURCE: BAAQMD, 2011e.

California Clean Air Act

In 1988, California passed the California Clean Air Act (California Health and Safety Code Section 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment, but based on the state ambient air quality standards rather than the federal standards. The attainment status of the SFBAAB with respect to state standards is summarized in Table 5.8-3. As shown in the table, the Bay Area experiences low concentrations of most pollutants when compared to state standards, except for ozone, PM_{10}, and $PM_{2.5}$, for which standards are exceeded periodically. The California Clean Air Act requires that air districts in which state air quality standards are exceeded must prepare a plan that documents reasonable progress towards attainment. A three-year update is required. In the Bay Area, this planning process is incorporated into the Clean Air Plan (CAP) and the BAAQMD adopted the CAP in 2010 (see discussion below under the heading Bay Area Air Quality Management Basin).

California Air Resources Board

The CARB is the state agency responsible for regulating air quality. Its responsibilities include establishing state ambient air quality standards, emissions standards, and regulations for mobile emissions sources (e.g., autos, trucks), in addition to overseeing the efforts of countywide and multi-county air pollution control districts, which have primary responsibility over stationary sources. The emission standards most relevant to the proposed project are those related to on- and off-road heavy-duty diesel engines. The CARB also regulates vehicle fuels with the intent of reducing emissions; it has set emission reduction performance requirements for gasoline (California reformulated gasoline) and limited the sulfur and aromatic content of diesel fuel to make it burn cleaner. The CARB also sets the standards used to pass or fail vehicles in smog-check and heavy-duty truck inspection programs.

In 2005, the CARB approved the Airborne Toxic Control Measure (ATCM) to Limit Diesel-Fueled Commercial Motor Vehicle Idling to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles, which altered five sections of Title 13 of the California Code of Regulations (CCR). The relevant changes with respect to the proposed project are in Section 2485. Pertinent requirements of the measure include:

(c) The driver of any vehicle subject to this section:

- (1) shall not idle the vehicle's primary diesel engine for greater than five minutes at any location, except as noted below; and
- (2) shall not operate a diesel-fueled auxiliary power system to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than five minutes at any location when within 100 feet of a restricted area, except as noted below.

"Restricted area" means any real property zoned for individual or multifamily housing that has one or more such units. There are 12 exceptions to this requirement (e.g., emergency situations, military, adverse weather conditions, etc.), including when a vehicle's power takeoff is being used to run pumps, blowers, or other equipment; when a vehicle is stuck in traffic, stopped at a light, or under direction of a police officer; when a vehicle is queuing beyond 100 feet from any restricted area; and when an engine is being tested, serviced, or repaired.

5.8.2.2 Local Regulations

Bay Area Air Quality Management District

The BAAQMD is the regional agency responsible for air quality regulation within the SFBAAB, regulating air quality through planning and review activities. The BAAQMD has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits, impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. The BAAQMD regulates new or expanding stationary sources of toxic air contaminants.

In September 2010, the BAAQMD adopted the *Bay Area 2010 Clean Air Plan* (BAAQMD, 2010b), which updates the *Bay Area 2005 Ozone Strategy* and complies with state air quality planning requirements as codified in the California Health and Safety Code. While steady progress in reducing ozone levels in the SFBAAB has been achieved, the region is designated non-attainment for both the 1- and 8-hour state ozone standards. In addition, emissions of ozone precursors in the SFBAAB contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the CAP to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins. The 2010 CAP addressed four categories of pollutants: ozone and ozone precursors (ROG and NO_X); particulate matter (primarily $PM_{2.5}$), air toxics, and GHGs. The CAP contains 55 control strategies that can be grouped into the following categories:

- 18 stationary source measures
- 10 mobile source measures
- 17 transportation control measures
- 6 land use and local impact measures
- 4 energy and climate measures

In response to SB 636, the BAAQMD completed the *Particulate Matter Implementation Schedule* in November 2005. The implementation schedule evaluates the applicability of the 103 particulate matter (PM) control measures on CARB's list and discusses how applicable measures are implemented by the BAAQMD. The BAAQMD implements a number of regulations and programs to reduce PM emissions, such as controlling dust from earthmoving and construction/ demolition operations, limiting emissions from various combustion sources such as cement kilns and furnaces, and reducing PM emissions from composting and chipping activities. In addition to limiting stationary sources, the BAAQMD implements a variety mobile source incentive programs to encourage fleet operators and the public to purchase low-emission vehicles, re-power old polluting heavy duty diesel engines, and install after market emissions control devices to reduce particulates and NO_X emissions.

In June 2010, the BAAQMD adopted new CEQA significance thresholds and updated their CEQA Guidelines. These newly-adopted thresholds include quantitative CEQA significance thresholds for emissions of criteria pollutants, ozone precursors, and TACs during project construction and operations (BAAQMD, 2011a).

5.8.3 Impacts and Mitigation Measures

5.8.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to air quality, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

5.8.3.2 Approach to Analysis

This air quality impact analysis considers construction and operational impacts associated with the proposed project. The SABPL project would construct several new facilities and improvements to provide reliable conveyance capacity and increased flexibility for managing planned and emergency discharges of water from the Hetch Hetchy system. Construction equipment, trucks, worker vehicles, and ground-disturbing activities associated with the SABPL project would generate emissions of criteria air pollutants and precursors.

The *San Antonio Backup Pipeline Project Air Quality Technical Report (CS-954A)* (SABPL Air Quality Technical Report) (Orion, 2011) was prepared to evaluate air quality impacts associated with construction and operation of the SABPL project. This technical report is consistent with San Francisco Planning Department, Environmental Planning Division's (formerly the Major Environmental Analysis Division) requirements for air quality assessments and the *BAAQMD CEQA Guidelines*. The SABPL Air Quality Technical Report is provided in **Appendix K** of this EIR.

With implementation of the SABPL project, the backup pipeline would be used only on rare occasions for discharges of quality-impaired Hetch Hetchy water during emergency operations and planned maintenance activities. The new chemical facility would replace the existing chemical facility, but the frequency of use would remain essentially unchanged. Operation of the proposed facilities and improvements would generate criteria pollutants and precursors related to one backup generator powered by liquid propane gas (LPG) at the SFPUC Sunol Valley Chloramination Facility to provide power to the new chemical facility in the event of a power outage. Vehicle trips associated with facility maintenance and periodic inspections would be similar to the existing condition and are not expected to result in an increase in criteria pollutant and precursor emissions.

Construction-related and operational emissions are evaluated in accordance with the *BAAQMD CEQA Guidelines* for assessing and mitigating air quality impacts (BAAQMD, 2011a). The *BAAQMD CEQA Guidelines* require quantification of construction-related exhaust emissions and specify the daily criteria pollutant emissions significance thresholds. Thus, this air quality analysis estimates daily criteria pollutant emissions associated with project construction and compares them to BAAQMD significance thresholds.

Consistent with the *BAAQMD CEQA Guidelines*, this analysis assumes potential health risk and hazard impacts could occur at sensitive receptors located within 1,000 feet from emission sources. Thus, human health risks and hazards associated with project construction and operations are calculated at the one sensitive receptor within the 1,000-foot zone of influence: the SFPUC watershed keeper's residence located approximately 225 feet east of the project area and Calaveras Road, just north of the Alameda East Portal (see Figure 5.8-1). Although the residence is currently unoccupied, this air quality analysis conservatively assumes that the residence would be occupied during project-related construction activities and operations. This analysis evaluates risk and hazard impacts on this sensitive receptor due to the SABPL project's construction-related TAC emissions. Cumulative risk and hazard impacts associated with the SABPL project's construction-related emissions in combination with emissions from other cumulative projects in the Sunol Valley region are also evaluated.

The *BAAQMD CEQA Guidelines* also provide significance thresholds for criteria pollutant and precursor emissions associated with project operations. This air quality analysis estimates the direct[1] and indirect[2] criteria pollutant and TAC emissions associated with project operations and compares them to the BAAQMD significance thresholds. The significance of the SABPL project's criteria pollutant and TAC contributions to cumulative operational emissions in the SFBAAB are also evaluated.

5.8.3.3 Summary of Impacts

Table 5.8-4 summarizes the SABPL project's air quality impacts and significance determinations.

TABLE 5.8-4
SUMMARY OF IMPACTS – AIR QUALITY

Impacts	Significance Determinations
Impact AQ-1: Emissions generated during project construction activities would violate air quality standards and would contribute substantially to an existing air quality violation.	SUM
Impact AQ-2: Project construction would not expose sensitive receptors to substantial pollutant concentrations.	LS
Impact AQ-3: Project construction activities would not create objectionable odors affecting a substantial number of people.	LS
Impact AQ-4: Project operations would not violate air quality standards or contribute substantially to an existing air quality violation.	LS
Impact AQ-5: Project operations would not expose sensitive receptors to substantial pollutant concentrations.	LS
Impact AQ-6: Project operations would not create objectionable odors affecting a substantial number of people.	NI
Impact AQ-7: Implementation of the proposed project would not conflict with or obstruct implementation of the 2010 Clean Air Plan.	LS
Impact C-AQ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative air quality impacts associated with criteria pollutant emissions and health risks.	SUM

NI = No Impact
LS = Less than Significant impact, no mitigation required
SUM = Significant and Unavoidable impact with implementation of feasible Mitigation

1 Direct emissions are those emissions that are generated directly from project-related construction equipment (including construction trucks) or project facilities.
2 Indirect emissions are offsite emissions associated with electricity generation.

5.8.3.4 Construction Impacts and Mitigation Measures

Impact AQ-1: Emissions generated during project construction activities would violate air quality standards and would contribute substantially to an existing air quality violation. (Significant and Unavoidable even with implementation of feasible Mitigation)

Criteria pollutants would be emitted during construction of all project components. As previously discussed, construction is planned to occur over approximately 21 months, from October 2012 through June 2014. Project construction would generate fugitive dust (including PM_{10} and $PM_{2.5}$) during various construction activities, including excavation, grading, demolition, and vehicle travel on both paved and unpaved surfaces. Other criteria pollutants would also be generated from the exhaust emissions of construction equipment and vehicles. Without controls, emissions of these criteria pollutants could adversely affect the SFBAAB's attainment status relative to state and federal air quality standards.

The *BAAQMD CEQA Guidelines* require quantification of construction-related emissions (equipment exhaust). The BAAQMD's daily criteria pollutant emissions significance thresholds for construction activities are presented in **Table 5.8-5**. For all proposed projects, the BAAQMD recommends implementation of all Basic Construction Measures (these measures are included as Mitigation Measure M-AQ-1a, below). If the daily criteria pollutant thresholds of significance for construction activities are exceeded prior to implementing this mitigation, additional construction mitigation measures are recommended.

TABLE 5.8-5
BAAQMD DAILY CRITERIA POLLUTANT EMISSIONS SIGNIFICANCE THRESHOLDS FOR CONSTRUCTION ACTIVITIES

Pollutant	Significance Thresholds for Average Daily Emissions
ROG	54 pounds per day (lbs/day)
NO_X	54 lbs/day
PM_{10} (exhaust)	82 lbs/day
$PM_{2.5}$ (exhaust)	54 lbs/day
PM_{10}/$PM_{2.5}$ (fugitive)	Best Management Practices

Emissions from the SABPL project's construction equipment and vehicles would be generated from multiple sources, including heavy mobile equipment and delivery/haul trucks, worker vehicles, and semi-stationary sources such as air compressors and generators. Construction-related criteria pollutant emissions were calculated for the SABPL project as a function of construction activity, construction duration, average haul truck mileage, and worker trips (auto/light-truck mileage). The CARB's computer model URBEMIS2007 was used to calculate construction activity emissions based on the equipment list and workforce estimates presented in Table 3-3 in Chapter 3, Project Description, but adjusted to reflect average daily conditions for average daily construction assumptions (see Appendix K). **Table 5.8-6** summarizes the SABPL project's estimated average daily construction emissions for the years 2012, 2013, and 2014. The highest average daily quantity of pollutants would be emitted in 2013, the year when most project construction activities would occur. The estimated daily average construction emissions for 2012 and 2014 would be lower than for 2013 because less construction would occur during these years. The model results indicate that the BAAQMD CEQA significance thresholds for emissions of criteria pollutants generated during construction would not be exceeded in 2012. Based on the large anticipated heavy-equipment fleet and the worst-case assumption that daily construction activities could involve overlapping construction activities for up to four project elements in 2013 and three elements in 2014, the model results indicate average daily NO_x emissions would substantially exceed the BAAQMD CEQA significance thresholds in 2013 and 2014, a significant impact. Implementation of the mitigation measures identified below would reduce this impact, but not to a less-than-significant level.

TABLE 5.8-6
AVERAGE DAILY EMISSIONS OF CRITERIA POLLUTANTS DURING CONSTRUCTION

Construction Phase	ROG	NO_x	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Average Daily Emissions[a] (All Construction Phases) in 2012 (lbs/day)				
- Unmitigated[b]	6.0	52.2	2.6	2.4
- Mitigated[c]	6.0	36.4	2.0	1.8
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Thresholds Without Mitigation?	No	No	No	No
Exceeds Thresholds With Mitigation?	No	No	No	No
Average Daily Emissions[a] (All Construction Phases) in 2013 (lbs/day)				
- Unmitigated[b]	18.9	168.7	8.2	7.3
- Mitigated[c]	18.9	114.2	6.0	5.3
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Thresholds Without Mitigation?	No	Yes	No	No
Exceeds Thresholds With Mitigation?	No	Yes	No	No
Average Daily Emissions[a] (All Construction Phases) in 2014 (lbs/day)				
- Unmitigated[b]	13.2	112.4	5.6	6.8
- Mitigated[c]	13.2	77.5	4.1	4.8
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Thresholds Without Mitigation?	No	Yes	No	No
Exceeds Thresholds With Mitigation?	No	Yes	No	No

NOTES:
[a] Average daily emissions include construction equipment emissions as well as emissions from both on-road and on-site truck activities associated with excess spoils management and disposal The air quality analysis provided in Appendix K is based on an earlier (and lower) estimate of excess spoils volumes. As a result, the haul truck-related emissions presented in Appendix K are lower than those included in the average daily emissions estimates above.
[b] "Unmitigated" conditions reflect emissions that would occur prior to implementation of any mitigation measures.
[c] "Mitigated" conditions reflect emissions that would occur after implementation of Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_x Reduction).

SOURCE: URBEMIS2007, 2011.

Mitigation Measure M-AQ-1a: BAAQMD Basic Construction Measures.

The SFPUC shall post one or more publicly visible signs with the telephone number and person to contact at the SFPUC with complaints related to excessive dust or vehicle idling. This person shall respond to complaints and, if necessary, take corrective action within 48 hours. The telephone number and person to contact at the BAAQMD's Compliance and Enforcement Division shall also be provided on the sign(s) in the event that the complainant also wishes to contact the applicable air district.

In addition, to limit dust, criteria pollutants, and precursor emissions associated with project construction, the following BAAQMD-recommended Basic Construction Measures shall be included in all construction contract specifications for the proposed project:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- Vehicle speeds on unpaved areas shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times for construction equipment (including vehicles) shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to two minutes. Clear signage of this requirement shall be provided for construction workers at all access points to construction areas.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

Mitigation Measure M-AQ-1b: BAAQMD Additional Construction Measures for NO_X Reduction.

To reduce NO_X emissions during construction, the following provisions shall be included in all construction contractor specifications for the **proposed** project:

- To reduce NOX during construction, 40 percent of the total horsepower-hours from diesel-powered off-road equipment with engines greater than 50 horsepower shall be from equipment that satisfies United States Environmental Protection Agency (U.S. EPA) Tier 3 NOX emission standards. The SFPUC shall demonstrate this to the San Francisco Planning Department by presenting an inventory of all equipment with engines over 50 horsepower that will be used and an estimate of the number of hours each piece of equipment will operate to calculate the total number of horsepower-hours for project construction (equipment horsepower multiplied by the hours of operation). The inventory shall also identify which equipment meets Tier 3 NOX emissions and demonstrate that they constitute 40 percent of the total horsepower-hours. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-market products, and/or other options as they become available.

- All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NOX and DPM, including all generators meeting Tier 4 standards.
- All contractors shall use equipment that meets the CARB's most recent certification standard for off-road heavy-duty diesel engines for a given model year engine.

These measures would reduce the project's NO_X emissions by requiring construction contractors to implement best management practices to limit dust, criteria pollutants, and precursor emissions associated with project construction, and requiring the preparation of an NO_X reduction plan that identifies the construction equipment and Best Available Control Technology that would be used during construction to reduce emissions of NO_X and DPM. However, even with implementation of the above mitigation measures, the peak daily construction emissions would still exceed the BAAQMD thresholds (see Table 5.8-6, above). Therefore, the SABPL project's impacts related to criteria pollutant emissions during construction are considered significant and unavoidable.

Impact AQ-2: Project construction would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

The SABPL project would construct several new facilities and improvements to provide reliable conveyance capacity and increased flexibility for managing planned and emergency discharges of quality-impaired water from the Hetch Hetchy system. Combustion emissions from construction equipment and vehicles (i.e., heavy equipment and delivery/haul trucks, worker commute vehicles, air compressors, and generators) would be generated during project construction and could expose sensitive receptors to DPM and other TACs. Offsite DPM and other TAC emissions include those generated by construction worker commute vehicles and by diesel haul/delivery trucks used during construction, particularly trucks used to transport excavated materials from the project area and construction materials to the project area. TAC emissions from construction worker commute trips would be minor compared to the emissions generated by construction equipment and haul/delivery trucks. In addition to these offsite emissions, diesel-powered construction equipment would release DPM onsite along the internal construction site access routes. Combustion and exhaust contain a number of different TACs that are associated with various health risk factors (SCAQMD, 2010). DPM exhaust emissions from off-road heavy equipment and from on-road haul/delivery trucks operating within the project area during project construction were calculated using currently accepted calculation protocols and are described in detail in the SABPL Air Quality Technical Report (see Appendix K).

The only sensitive receptor within 1,000 feet of the proposed construction access routes is the SFPUC watershed keeper's residence, which is located 225 feet east of Calaveras Road near Alameda East Portal. This sensitive receptor is also 300 feet or more from the access road leading to the new chemical facility site, Staging Area A, and the southern terminus of the backup pipeline. Although this residence is currently unoccupied, the analysis presented below conservatively assumes that the residence would be occupied during project construction.

A screening-level individual cancer analysis was conducted using the U.S. EPA SCREEN3 computer model to determine the maximum inhalation cancer risk from project-related construction activities at the closest sensitive receptor (the SFPUC watershed keeper's residence east of Calaveras Road) (U.S. EPA SCREEN3, 2011). Construction activities relative to the closest sensitive receptor were allocated to three primary source areas:

- *Pits F3-East and F3-West Vicinity*. Includes construction of the new discharge facility at Pit F3-East, cutoff wall around Pits F3-East and F3-West, Alameda Creek Pump Station, transfer pipeline, and dewatering facilities, as well as use of Staging Area D.
- *Calaveras Road Vicinity*. Includes installation of the backup pipeline and the 12-inch-diameter water pipeline to the town of Sunol, use of Staging Areas B and C, and the permanent placement of excess spoils in earthen berms at the North Spoils Site and at the former nursery site located within Staging Area C.
- *San Antonio Pump Station Vicinity*. Includes construction of the new chemical facility and use of Staging Area A.

Emissions within each source area were assumed to be uniformly distributed by off-road equipment and truck mobility. The incremental contribution from each source area was summed to calculate a peak one-hour DPM exposure. The annual DPM exposure was estimated using the conservative assumption that the annual average equals one-tenth of the peak hour. Estimated incremental emissions contributions from each source area are presented in **Table 5.8-7**. As indicated in this table, the SABPL project's construction-related DPM emissions and associated health risks at the closest sensitive receptor (the SFPUC watershed keeper's residence) would not exceed the BAAQMD's cancer and chronic non-cancer risk thresholds. Therefore, the impact at the closest sensitive receptor (as well as at more distant sensitive receptors) related to DPM exposure would be less than significant.

Acute exposure health risk derives from the total organic compounds (TOCs) contained in the organic fraction of diesel exhaust. One-hour TOC exposures at the nearest sensitive receptor (SFPUC watershed keeper's residence) were calculated from the ratio of TOC to $PM_{2.5}$ in the BAAQMD emission inventory for off-road heavy equipment. **Table 5.8-8** lists the specific organic gases that constitute TOC exposure and the corresponding acute reference exposure levels (RELs). Acrolein and formaldehyde would create very small acute inhalation health risks, and the contribution from all other TOCs would be negligible. As indicated in the table, the SABPL project's impact at the SFPUC watershed keeper's residence (and at more distant sensitive receptors) related to TOC exposure during project construction would not exceed the BAAQMD's acute non-cancer risk threshold and therefore would be less than significant.

TABLE 5.8-7
CONSTRUCTION-RELATED CANCER RISK AND CHRONIC NON-CANCER HEALTH RISK AT SFPUC WATERSHED KEEPER'S RESIDENCE EAST OF CALAVERAS ROAD

Source Area	Estimated Peak-Hour Emission Contribution
Pits F3-East and F3-West Vicinity	0.03614 μg/m^3
Calaveras Road Vicinity	0.06317 μg/m^3
San Antonio Pump Station Vicinity	0.10660 μg/m^3
Parameter	**$PM_{2.5}$ Exposure, Cancer Risk, and Non-cancer Chronic Hazard Index from Project Construction Activities**
1-Hour $PM_{2.5}$	0.20591 μg/m^3
Annual Average $PM_{2.5}$	0.02059 μg/m^3
BAAQMD Annual Average $PM_{2.5}$ Significance Threshold	0.3 μg/m^3
Exceeds Threshold?	No
ASF-Weighted Concentration (Annual x 10)	0.20591 μg/m^3
70-year Weighted Average (Annual Weighted x 1.75 / 70)	0.00051475 μg/m^3
Infant Cancer Risk[a] (ASF = 10)	1.54×10^{-6}
Youth Cancer Risk[a] (ASF = 3)	0.46×10^{-6}
Adult Cancer Risk[a] (ASF = 1)	0.15×10^{-6}
BAAQMD Cancer Risk Significance Threshold	Excess Cancer Risk >10×10^{-6}
Exceeds Threshold?	No
Chronic Non-cancer Hazard Index (0.02059 (Annual) / 5)	0.004
BAAQMD Chronic Non-cancer Significance Threshold	Hazard Index > 1
Exceeds Threshold?	No
Acute Non-cancer Hazard Index	0.0233
BAAQMD Acute Non-cancer Significance Threshold	Hazard Index > 1
Exceeds Threshold?	No

NOTES:
$PM_{2.5}$ represents combustion $PM_{2.5}$ from DPM and does not include fugitive dust.
μg/m^3 = microgram per cubic meter; ASF = age-sensitivity factor.
[a] When age-sensitivity factors are included, the cancer risk would vary depending on whether there are infants, youths, or only adults at the SFPUC watershed keeper's residence.

SOURCE: U.S. EPA SCREEN3, 2011.

TABLE 5.8-8
CONSTRUCTION-RELATED SPECIATED ACUTE NON-CANCER HEALTH RISK AT SFPUC WATERSHED KEEPER'S RESIDENCE EAST OF CALAVERAS ROAD

Organic Gas	TOC Fraction[a]	Concentration (μg/m³)	Acute REL (μg/m³)	Hazard Index
Acetaldehyde	0.2457	0.3911	470	0.00084
Acrolein	0.0106	0.0169	2.5	0.00678
Benzene	0.0584	0.0929	1,300	0.00007
1,3 Butadiene	0.0682	0.1085	–	–
Ethylbenzene	0.0034	0.0054	–	–
Formaldehyde	0.541	0.8619	55	0.01568
Hexane	0.0084	0.0135	–	–
Naphthalene	0.0062	0.0098	–	–
PAHs (no Naph)	0.0114	0.0181	–	–
Toluene	0.0331	0.0527	37,000	<0.00002
Xylene	0.0331	0.0212	22,000	<0.00002
Total				0.02336
BAAQMD Acute Non-cancer CEQA Significance Threshold				Hazard Index > 1

NOTES: "–" = chronic REL only; acute REL does not apply. PAHs = polycyclic aromatic hydrocarbons.
[a] Assuming conservatively that all TOCs are toxic air contaminants (acute or chronic).

SOURCE: SCAQMD, 2010.

Impact AQ-3: Project construction activities would not create objectionable odors affecting a substantial number of people. (Less than Significant)

SABPL project construction would not involve any activities that could cause water to stagnate, creating a potential odor. Combustion emissions from the use of diesel fuel in construction equipment, as well as tar or asphalt used for access road improvements, could generate localized objectionable odors. Construction equipment used during installation of the backup pipeline and water pipeline to the town of Sunol adjacent to the southbound lane of Calaveras Road would generate diesel exhaust emissions and could result in objectionable odors for bicyclists traveling along Calaveras Road. Project construction would increase vehicle and truck traffic along Calaveras Road, which would also generate odors associated with diesel emissions. As discussed in Section 3.6.11 in Chapter 3, Project Description, truck deliveries and hauling to and from the project area would be limited to weekdays; therefore, odors from construction truck traffic would not affect bicyclists traveling on Calaveras Road on Saturdays or Sundays, which are generally the days with the greatest bicycle use. In addition, the proposed project would be subject to Title 13 of the California Code of Regulations, Section 2485, which limits idling of diesel-fueled commercial motor vehicles and related odors.

Although odors from diesel exhaust could be perceivable to bicyclists traveling on Calaveras Road during certain phases of construction, these effects would be limited in duration as cyclists pass the project area, and would be less noticeable on weekends when cycling along Calaveras Road is most popular. Therefore, any objectionable odors generated by project construction activities would not have a significant effect on bicyclists traveling along Calaveras Road. Due to the distance between the closest residences and the project area (the SFPUC watershed keeper's residence is 225 feet to the east and the Garcia residence is 1,300 feet to the southwest), odor problems at the nearest residences are not expected. This impact is considered less than significant.

Although this impact is already less than significant and no mitigation is necessary, the Section 2485 requirements have been incorporated, with more stringent BAAQMD idling-time limitations, into Mitigation Measure M-AQ-1a (BAAQMD Basic Construction Measures) (see Impact AQ-1, above, for description), which would further limit diesel odors generated by construction vehicles. Even if odors were temporarily perceivable by bicyclists traveling along Calaveras Road or, although highly unlikely, at the two closest residences, a substantial number of people would not be affected. Therefore, the project's construction impacts related to objectionable odors would be less than significant.

5.8.3.5 Operational Impacts and Mitigation Measures

Impact AQ-4: Project operations would not violate air quality standards or contribute substantially to an existing air quality violation. (Less than Significant)

Once the proposed facilities and improvements are completed, the SFPUC would continue to use the existing San Antonio Pipeline to move water into and out of San Antonio Reservoir; discharges from the reservoir to San Antonio Creek would occur solely through the existing outlet structure and discharge facility at the base of Turner Dam. Like the existing condition, the SFPUC would continue to use the existing San Antonio Pump Station to pump quality-impaired Hetch Hetchy water to San Antonio Reservoir (when flows are less than 160 mgd) and to pump water from the reservoir to the Sunol Valley Water Treatment Plant (SVWTP).

With the proposed project, planned and emergency discharges from the Hetch Hetchy system that are currently routed to San Antonio Creek would be routed to Pit F3-East via the backup pipeline. The SFPUC would utilize the new discharge facility at Pit F3-East, the dewatering facilities at Pits F3-East and F3-West, and the Alameda Creek Pump Station to convey water that is discharged to Pit F3-East to San Antonio Reservoir. Operation of these facilities would not create a new source of indirect air emissions as a result of increased electricity usage, because the primary source of electrical energy for the proposed facilities would be hydroelectric power. Operation of the new chemical facility to dechlorinate and pH-adjust the water prior to discharge would also rely on hydroelectric power. As a result, there would be no regional increase in combustion-related criteria air pollutants due to increased electricity use associated with project operations. However, the 150-kilowatt (kW), LPG-powered, portable emergency generator used to power the new chemical facility during power outages would be a new direct source of emissions and would require a permit to operate from the BAAQMD.

SFPUC system operators use fluoride (in the form of hydrofluorosilicic acid) to fluoridate Hetch Hetchy supplies and local water supplies from the Alameda watershed prior to delivery to customers, and to pH-adjust treated Hetch Hetchy water in the existing San Antonio Pipeline prior to discharging it to San Antonio Creek or San Antonio Reservoir. The fluoride is stored at the existing fluoride facility located at the south end of the Sunol Valley Chloramination Facility. As part of the proposed project, new underground chemical feed lines would be constructed between the existing fluoride facility and the new chemical facility. The calcium thiosulfate would be stored in an 8,000-gallon chemical storage tank with secondary containment to prevent a release of the chemical into the environment. At the new chemical facility, the fluoride would be mixed with calcium thiosulfate and conveyed via new underground chemical feed lines to the proposed chemical injection vault along the southern backup pipeline alignment. Hydrogen fluoride (which is the same as hydrofluorosilicic acid, except that hydrofluorosilicic acid is in liquid form) is a toxic air contaminant. Calcium thiosulfate is not a listed air contaminant. Like the existing chemical feed lines, the new chemical feed lines would be constructed underground and would not increase the potential exposure of workers or nearby residents to health risks associated with fluoride.

The *BAAQMD CEQA Guidelines* provide significance thresholds for criteria pollutant and precursor emissions associated with project operations. These represent the levels at which a project's individual emissions of criteria air pollutants would substantially contribute to the SFBAAB's existing air quality violations. If daily average or annual operational emissions would exceed any applicable thresholds of significance shown in **Table 5.8-9**, the proposed project would result in a significant impact.

TABLE 5.8-9
BAAQMD SIGNIFICANCE THRESHOLDS FOR EMISSIONS OF CRITERIA AIR POLLUTANTS AND PRECURSORS GENERATED DURING PROJECT OPERATIONS

Pollutant/Precursor	Daily Average Emissions (lbs per day)	Maximum Annual Emissions (tons per year)
ROG	54	10
NO_X	54	10
PM_{10}	82	15
$PM_{2.5}$	54	10

Operational emissions associated with the emergency generator were estimated based on the conservative assumption that the generator would be operated at full power (150 kW) for one hour each week during routine testing and maintenance of the generator. These emissions are presented in **Table 5.8-10** (generator model assumptions are described in detail in Appendix K). As indicated in Table 5.8-10, criteria pollutant emissions from weekly operation of the generator would not exceed the BAAQMD's significance thresholds, resulting in a less-than-significant impact. Since the proposed 150-kW LPG-powered generator would replace an existing 100-kW diesel-powered generator, net increases in criteria pollutants associated with generator operations would be even less than indicated in the table.

TABLE 5.8-10
PROJECT OPERATIONAL CRITERIA POLLUTANT EMISSIONS

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Emission Factor (grams per kilowatt-hour)	0.10	0.12	0.08	0.08
	Average Daily Emissions (lbs/day)			
LPG-Powered (150-kW) Emergency Generator (one hour per week)[a]	0.033	0.040	0.026	0.026
BAAQMD CEQA Significance Thresholds	54	54	82	54
	Average Annual Emissions (tons/year)			
LPG-Powered (150-kW) Emergency Generator (52 hours per year)	0.0009	0.0010	0.0007	0.0007
BAAQMD CEQA Significance Thresholds	10	10	15	10

NOTES: LPG = liquid propane gas; kW = kilowatt.

[a] Average daily emissions = one-hour test emissions per week, divided by seven days per week.

SOURCES: SCAQMD, 2008 for LPG generator emissions factors; URBEMIS2007, 2011.

The proposed facilities and improvements would require periodic operations review and maintenance, similar to existing conditions, and would not generate a significant number of new vehicle trips. The number of trips related to supply deliveries with the project would be the same or similar when compared to existing conditions. Thus, impacts related to criteria pollutant emissions from vehicle trips during project operations would be less than significant.

Except for the emissions associated with weekly testing and maintenance of the LPG-powered emergency generator and the infrequent use of this generator during power outages, project operations would not cause an increase in criteria pollutant emissions. There would be no regional increase in combustion-related criteria air pollutants associated with increased electricity use during operation of the new chemical facility, Alameda Creek Pump Station, and dewatering facilities, because the primary source of electrical energy for these facilities would be hydroelectric power. The proposed backup pipeline, new chemical facility, discharge facility at Pit F3-East, and the Alameda Creek Pump Station would require periodic operations review and maintenance, similar to existing conditions, and would not generate a significant number of new vehicle trips. With the proposed project, the number of trips related to supply deliveries would be the same as or similar to the number of trips under existing conditions. Therefore, air pollutant emissions associated with project operations would the same as or similar to those under existing conditions. Overall, this impact is considered less than significant.

Impact AQ-5: Project operations would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

The only source of TAC emissions associated with project operations would be the LPG-powered emergency generator (150-kW portable generator), to be located at the Sunol Valley Chloramination Facility for use by the new chemical facility during power outages. Exhaust emissions from LPG-powered generators include very small amounts of a variety of TACs. The principal LPG-combustion TACs are formaldehyde, ammonia, and benzene, which are associated with acute non-cancer health risks. The BAAQMD has developed TAC emissions-based trigger levels for stationary sources. These trigger levels have been applied in this analysis as significance thresholds for operation of the proposed emergency generator, since the BAAQMD has not adopted specific CEQA significance thresholds for portable generators.

The South Coast Air Quality Management District (SCAQMD, 2010) has published TAC emission factors for LPG combustion in emergency generators, including a list of 22 TACs that may be released from a four-stroke, rich-burn, LPG-powered emergency generator.[3] Of these 22 compounds, the BAAQMD has adopted trigger levels for 20 of them, and if preliminary calculations indicated these trigger levels would be exceeded, a more detailed impact analysis would be required. **Table 5.8-11** lists the hourly and annual emission levels of those TACs based on the conservative assumption that the generator would be operated at full power (150 kW) for one hour each week for routine testing and maintenance, and compares the emissions to the applicable trigger levels. As indicated in the table, no acute or chronic trigger levels would be exceeded by generator exhaust. Therefore, health risk impacts associated with weekly testing and maintenance of the proposed generator would be less than significant.

Impact AQ-6: Project operations would not create objectionable odors affecting a substantial number of people. (No Impact)

Operation of the proposed Alameda Creek Pump Station, dewatering facilities, and chemical facility would not create nuisance odor problems, because these facilities would run on electrical power (no direct emissions) and the chemical feed lines would be underground (closed systems). In addition, operation of the LPG-powered emergency generator would not create nuisance odors because there are no odors associated with the combustion of natural gas. With the proposed project, quality-impaired Hetch Hetchy water would be discharged to quarry Pit F3-East infrequently during planned and emergency operations. Hetch Hetchy water is typically characterized by low biological content (and consequent anaerobic activity), making odor

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[3] SCAQMD emissions data are used in this analysis because the BAAQMD has not published TAC emission factors for LPG-powered generators. LPG combustion emissions data are typically not aggregated by air district because emissions are equipment-specific and do not vary geographically. The basic source of emission factors, including those published by the SCAQMD, is the U.S. EPA's AP-42, Compilation of Emission Factors, which are applied nationally.

TABLE 5.8-11
EMERGENCY GENERATOR OPERATIONAL TAC EMISSIONS

TAC	Emissions Factor (lbs/ 1,000 gallons)	Hourly Emissions (lbs)	BAAQMD Acute Trigger Level (lbs/hour)	Annual Emissions (lbs)	BAAQMD Chronic Trigger Level (lbs/year)
Acetaldehyde	0.252	0.006	1	0.296	3.8
Acrolein	0.238	0.005	0.0055	0.280	14
Ammonia	0.300	0.007	7.1	0.352	7,700
Benzene	0.143	0.003	2.9	0.168	3.8
Carbon Tetrachloride	0.0016	<0.001	4.2	0.002	2.5
Chloroform	0.00124	<0.001	0.33	0.001	2
Ethylbenzene	0.00224	<0.001	–	0.003	43
Ethylene Dibromide	0.00193	<0.001	–	0.002	1.5
Ethylene Dichloride	0.00102	<0.001	–	0.001	5.3
Formaldehyde	1.86	0.042	0.12	2.186	18
Methanol	0.277	0.006	62	0.326	150,000
Methylene Chloride	0.00373	<0.001	31	0.004	110
Naphthalene	0.00879	<0.001	–	0.103	3.2
Styrene	0.00108	<0.001	46	0.001	35,000
1,1,2,2-Tetrachloroethane	0.00229	<0.001	–	0.003	1.9
Toluene	0.0505	0.001	52	0.059	12,000
1,1,2-Trichloroethane	0.00138	<0.001	–	0.002	6.6
Vinyl Chloride	0.00065	<0.001	400	0.001	1.4
Xylene	0.0176	<0.001	49	0.021	27,000

NOTE: The BAAQMD's Regulation 2, Rule 5, *New Source Review of Toxic Air Contaminants*, and BAAQMD's *CEQA Guidelines and Significance Thresholds* specify that a cancer risk greater than 10 in a million or an acute/chronic hazard index greater than 1 constitutes a significant impact.

SOURCES: SCAQMD, 2010; BAAQMD, 2010a.

problems unlikely. Even when characterized by excessive turbidity and high pH due to high sediment loads in pipelines or failure of disinfection facilities upstream of the Sunol Valley, the Hetch Hetchy water discharged to the quarry pits would be of similar quality or even or superior to the water currently in the quarry pits. Furthermore, the closest residences to Pits F3-East and F3-West are 2,100 feet to the west on Athenour Way, so even if project operations did result in noticeable odors, the odors would not be perceptible from these residences. For these reasons, there would be no impact related to objectionable odors during project operations.

Impact AQ-7: Implementation of the proposed project would not conflict with or obstruct implementation of the 2010 Clean Air Plan. (Less than Significant)

The most recently adopted air quality plan for the SFBAAB is the BAAQMD's *2010 Clean Air Plan* (CAP), which is a comprehensive plan aimed at improving Bay Area air quality and protecting public health. The CAP defines a control strategy for implementation by the BAAQMD to reduce emissions and decrease ambient concentrations of harmful pollutants (ground-level ozone and its key precursors, ROG and NO_X), as well as to safeguard public health by reducing exposure to the air pollutants that pose the greatest health risks (particulate matter, primarily $PM_{2.5}$ and precursors to secondary $PM_{2.5}$).

As indicated above in Section 5.8.2.2, the CAP contains 55 control measures under the following categories: stationary-source measures, mobile-source measures, transportation control measures, land use and local impact measures, and energy and climate measures. The temporary air quality impacts associated with project construction would not hinder the long-term air quality planning goals of the 2010 CAP due to the short-term nature of the construction emissions. In addition, implementation of Best Available Control Technology to reduce NO_X and DPM emissions during project construction activities, in accordance with Mitigation Measure M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction) (see Impact AQ-1, above, for description), would be consistent with the control measures and strategies identified in the CAP.

Except for the emissions associated with maintenance of the LPG-powered emergency generator and the infrequent use of this generator during power outages, proposed project operations would not result in increased air pollutant emissions. Operation of the proposed LPG-powered emergency generator would generate $PM_{2.5}$ and TAC emissions that are well below the BAAQMD's CEQA significance thresholds (see Impacts AQ-4 and AQ-5). Further, the proposed 150-kW LPG-powered generator would replace an existing 100-kW diesel-powered generator, resulting in a lower net increase in criteria pollutants and DPM health risks than what is estimated for the LPG-powered emergency generator alone. Given the limited emissions associated with project operations (i.e., well below BAAQMD's CEQA thresholds), the proposed project's operational emissions would be consistent with the CAP (the most recently adopted regional air quality plan). Thus, the project would not conflict with or obstruct implementation of the applicable air quality plan, and this impact is considered less than significant.

5.8.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Since Pumping Variant 1 would not construct the Alameda Creek Pump Station, wet well, control building for the pump station, electrical transformer, or retaining wall along the access road at the southern boundary of the Alameda Creek Pump Station, there would be no construction emissions related to these improvements. As a result, construction-related emissions would be slightly lower than those of the proposed project during certain phases of construction. Although the Alameda Creek Pump Station would not be constructed, average daily NO_X emissions associated with construction of all other proposed facilities and improvements would still exceed the BAAQMD CEQA significance threshold. Under Pumping Variant 1, average daily emissions of NO_X in 2013 from the combination of overlapping construction phases would be 166.1 lbs/day. With implementation of Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction) (see Impact AQ-1, above, for descriptions), NO_X emissions would be reduced to 111.7 lbs/day, which would still exceed the BAAQMD CEQA significance threshold of 54 lbs/day. The health risk impacts associated with DPM emissions from operation of construction equipment near the SFPUC watershed keeper's residence east of Calaveras Road (the closest sensitive receptor to the project area) that were identified under Impact AQ-2 for the proposed project would still occur under Pumping Variant 1 and would be less than significant. The potential also exists for construction-related nuisance odors from diesel emissions under Pumping Variant 1 along Calaveras Road and in the vicinity of the same two identified sensitive receptors in the southern project area (SFPUC watershed keeper's residence and Garcia residence), and, as with the proposed project, the impact would be less than significant. Therefore, this variant would not change the conclusions or mitigation measures identified above in Section 5.8.3.4, above.

As part of project operations under Pumping Variant 1, the SFPUC would use a one-step pumping process to dewater Pit F3-East and pump the discharged water directly to San Antonio Reservoir or the SVWTP. Although energy requirements for this pumping variant would be lower than those of the proposed project (see Impact ME-4 in Section 5.18, Mineral and Energy Resources), implementation of this pumping variant would not reduce emissions of regional combustion-related criteria air pollutants related to energy generation because both the proposed project and Pumping Variant 1 would rely on hydroelectric power as the primary source of power. As with the proposed project, the only new source of operational emissions under Pumping Variant 1 would be the LPG-powered emergency generator for the new chemical facility. Weekly testing and maintenance of this generator under Pumping Variant 1 would be the same as for the proposed project and would result in the same less-than-significant operational criteria pollutant emissions impacts identified for the proposed project under Impact AQ-4, above. Operational health risks at the SFPUC watershed keeper's residence, the closest sensitive receptor, that were identified under Impact AQ-5 would be the same under Pumping Variant 1. Like the proposed project, there would be no impact related to operational nuisance odors due to the distance between the closest residences and Pits F3-East and F3-West.

Thus, construction and operation of Pumping Variant 1 would not change the conclusions or mitigation measures presented in Sections 5.8.3.4 and 5.8.3.5.

Pumping Variant 2

Pumping Variant 2 would construct all of the same facilities identified for the proposed project and would result in the same construction-related criteria pollutant emissions, health risks and hazards, and odor impacts as the proposed project. Like the proposed project, Pumping Variant 2 would not cause emissions of regional combustion-related criteria air pollutants related to energy generation because the facilities would use hydroelectric power. As with the proposed project, the only new source of operational emissions under Pumping Variant 2 would be the LPG-powered emergency generator for the new chemical facility. Weekly testing and maintenance of this generator under Pumping Variant 2 would be the same as described for the proposed project and would result in the same less-than-significant impacts associated with operational emissions of criteria pollutants and human health risks and hazards. As identified for the proposed project, there would be no impact related to nuisance odors from operations due to the distance between residences and Pits F3-East and F3-West. Thus, construction and operation of Pumping Variant 2 would not change the analysis, conclusions, or mitigation measures presented in Sections 5.8.3.4 and 5.8.3.5.

5.8.3.7 Cumulative Impacts and Mitigation Measures

Impact C-AQ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative air quality impacts associated with criteria pollutant emissions and health risks. (Significant and Unavoidable even with implementation of feasible Mitigation)

Construction-Related Criteria Pollutant Emissions

To address cumulative impacts on regional air quality, the BAAQMD has established thresholds of significance for construction-related criteria pollutants and precursor emissions. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality violations. If average daily or annual emissions exceed these thresholds, the SABPL project would result in a cumulatively significant impact. As indicated in Table 5.8-6 above, construction-related criteria pollutant and precursor emissions associated with the SABPL project would exceed the BAAQMD significance threshold for NO_X, and the SABPL project's contribution to this cumulative impact would be cumulatively considerable. Implementation of **Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures)** and **M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction)** (see Impact AQ-1, above, for descriptions) would reduce NO_X emissions by requiring construction contractors to implement best management practices to limit dust, criteria pollutants, and precursor emissions associated with project construction, and to use Best Available Control Technology to reduce emissions of NO_X and DPM. However, although these measures would reduce the SABPL project's construction-related emissions, the emissions would not be reduced to a less-than-significant level. Therefore, even with mitigation, the SABPL project's contribution to cumulative air quality impacts related to criteria pollutants and precursor emissions during construction would remain cumulatively considerable (significant and unavoidable).

Construction-Related Health Risks

To address cumulative impacts on local air quality conditions due to TAC emissions during project construction, the BAAQMD recommends assessing impacts within 1,000 feet of the proposed project, taking into account both project-specific and cumulative sources (i.e., the proposed project plus existing and foreseeable future projects). The BAAQMD has established the following cumulative thresholds of significance that should be applied at the SABPL project's maximally exposed individual (MEI) (the SFPUC watershed keeper's residence east of Calaveras Road): 100 excess cancer cases in a million; a hazard index of 1 for chronic and acute non-cancer risk; and 0.8 μg/m^3 of $PM_{2.5}$ (annual average) from all local sources.

As discussed above under Impact AQ-2, the SABPL project would result in an increase in $PM_{2.5}$ emissions from haul and delivery trucks during construction. While the project-related excess cancer risk, chronic non-cancer hazard index, and average daily $PM_{2.5}$ emissions at the MEI—the SFPUC watershed keeper's residence on the east side of Calaveras Road—would not exceed the BAAQMD CEQA significance thresholds (see Table 5.8-7 and Table 5.8-10), it is possible that significant cumulative increases in $PM_{2.5}$ emissions could occur due to simultaneous construction of other projects in the vicinity in addition to any existing identified risk sources within the project vicinity (listed in Table 5.8-2). Cumulative risk and hazard impacts at the MEI from cumulative construction projects in the Sunol Valley are shown in **Table 5.8-12**.

**TABLE 5.8-12
CUMULATIVE CONSTRUCTION ACTIVITY RISK AND HAZARD AT
MAXIMALLY EXPOSED INDIVIDUAL (SFPUC WATERSHED KEEPER'S RESIDENCE)**

Risk and Source	Estimated Risk and Hazard (cases in a million)	BAAQMD Threshold (cases in a million)
Excess Cancer Risk		
Existing SFPUC Generator (100 kW)	1.67	
I-680 Traffic at a Distance of 8,300 Feet to the North	6.4	
SABPL Project Construction (ASF = 10)	1.54	
Other SFPUC Construction Projects	90.5	
Cumulative or Combined Cancer Risk	100.11	100
Chronic Hazard Index		
Existing SFPUC Generator (100 kW)	0.0056	
I-680 Traffic at a Distance of 8,300 Feet to the North	0.0046	
SABPL Project Construction	0.004	
Other SFPUC Construction Projects	0.11	
Cumulative Chronic Hazard Risk	0.1242	10
$PM_{2.5}$ Increment (μg/m^3)		
Existing SFPUC Generator (100 kW)	0.0030	
I-680 Traffic at a Distance of 8,300 Feet to the North	0.041	
SABPL Project Construction	0.0206	
Cumulative	0.0646	0.8 μg/m^3

NOTES: μg/m^3 = microgram per cubic meter; ASF = age-sensitivity factor; kW = kilowatts.
Derivations of risks are described in text above.

Potentially concurrent construction projects include the SFPUC Calaveras Dam Replacement project (construction is anticipated to begin in late 2011), the SFPUC New Irvington Tunnel (NIT) project (currently under construction), and the SFPUC Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir (SVWTP Expansion) project (currently under construction). The estimated project-specific excess cancer risks and chronic non-cancer hazard index for these three approved cumulative projects are presented below.

- Based on the analysis conducted for the Calaveras Dam Replacement project (San Francisco Planning Department, 2011) and current BAAQMD guidance, the excess cancer risk would be 52 in a million for an infant and the chronic non-cancer hazard index would be 0.06 at the SFPUC watershed keeper's residence on the east side of Calaveras Road, the closest sensitive receptor to project-related construction vehicle and truck traffic.

- Based on the analysis conducted for the NIT project (San Francisco Planning Department, 2009a) and current BAAQMD guidance, the excess cancer risk would be 36 in a million for an infant and the chronic non-cancer hazard index would be 0.05 at the MEI (not specified) due to project-related construction vehicle and truck traffic.

- Based on the analysis conducted for the SVWTP Expansion project (San Francisco Planning Department, 2009b) and current BAAQMD guidance, the excess cancer risk would be 2.5 in a million for an infant at the SFPUC watershed keeper's residence on the east side of Calaveras Road due to project-related construction vehicle and truck traffic.

In addition, it is possible that construction of the proposed SFPUC Alameda Creek Filter Gallery (Filter Gallery) project and site preparation activities for the SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project could also overlap with construction of the SABPL project. Environmental reviews for both the Filter Gallery project and the SMP-30 Expansion project are currently underway. Due to the limited information that is currently available for the Filter Gallery project and the SMP-30 Expansion project, risk and hazards associated with these projects cannot be quantified at this time. The Filter Gallery project is located more than 1,000 feet from the SFPUC watershed keeper's residence and would not contribute to cumulative construction risk and hazard impacts at this residence. The slurry cutoff walls along the east bank of Alameda Creek and south bank of San Antonio Creek that are proposed as part of the SMP-30 Expansion project are also more than 1,000 feet from the SFPUC watershed keeper's residence. However, potential utility relocations along Calaveras Road under the SMP-30 Expansion project could be located within 1,000 feet of the SFPUC residence and contribute to cumulative construction-related risk and hazards impacts.

The stationary and mobile emissions sources within 1,000 feet of the project area that are included in this analysis of cumulative construction emissions are the SFPUC's existing 100-kW emergency generator and traffic on the I-680 freeway. The BAAQMD has developed risk estimates for each source, but these estimates reflect the health risks at the point of maximum impact. For the SABPL project, a distance adjustment factor was applied to estimate risks at the MEI (the SFPUC watershed keeper's residence east of Calaveras Road) based on distance from the emissions sources. The distance-adjusted risk values for these sources are summarized in Table 5.8-12, above, along with the risks associated with the SABPL project and other SFPUC projects that could be under construction concurrently.

As indicated in Table 5.8-12, the combined risks would exceed the BAAQMD's CEQA cumulative significance thresholds of 100 excess cancer cases in a million. However, the hazard index of 1 for chronic and acute non-cancer risk and 0.8 $\mu g/m^3$ of $PM_{2.5}$ emissions (annual average) thresholds would not be exceeded. Because the baseline concentration of $PM_{2.5}$ emissions at Site 16195 (see Table 5.8-2) is due almost exclusively to fugitive dust, no measurable cumulative $PM_{2.5}$ impact is expected to occur from SABPL project construction and ongoing mining operations at Site 16195. However, when emissions from various sources of mobile emissions associated with ongoing mining activities at Pit F6 combined with emissions from construction of potential utility relocations under the proposed SMP-30 Expansion project are considered, both sources would further contribute to the exceedance of the threshold for excess cumulative cancer cases.

Therefore, during construction, the cumulative health risk impacts related to excess cancer would be significant. No quantitative threshold is available to gauge the significance of the SABPL project's contribution to this cumulative health risk impact. However, the majority of the cumulative health risk would result from construction of related SFPUC projects; therefore, the cumulative impact is considered significant. Further, no feasible mitigation measures have been identified to reduce this impact. Therefore, the impact is considered significant and unavoidable.

Operational Criteria Pollutant Emissions

The BAAQMD's thresholds of significance for operational criteria pollutants and precursor emissions represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality violations. If average daily or annual emissions were to exceed these thresholds, the project would result in a cumulatively significant impact. As discussed in Impact AQ-4, and indicated in Table 5.8-10 above, operational criteria pollutant and precursor emissions associated with the proposed project would not exceed the BAAQMD's CEQA significance thresholds. Therefore, the SABPL project's contribution to cumulative air quality impacts related to emissions of ozone, PM_{10}, and $PM_{2.5}$ would not be cumulatively considerable (less than significant).

Operational Health Risks

The SABPL project would result in an increase in emissions of TOCs and particulate matter when the LPG-powered emergency generator for the new chemical facility is operated. The effects of these emissions at the closest sensitive receptor—the SFPUC watershed keeper's residence on the east side of Calaveras Road—are described under Impact AQ-5, above. Cumulative increases in TAC emissions could occur from operation of the proposed LPG-powered generator in combination with other emissions from sources located within 1,000 feet of the SABPL project and this sensitive receptor.

The only other proposed or approved SFPUC project facilities within 1,000 feet of the SABPL project is the Filter Gallery project, which could also utilize the Alameda Creek Pump Station and associated improvements along with the SABPL project. Despite the potential for facilities to be shared between the two projects, the SFPUC has not made a decision regarding the primary source of power for the Filter Gallery project. Power for the Filter Gallery project would either be from: (a) the Hetch Hetchy Water & Power (HHWP) Calaveras Substation at Calaveras Road, just south of San Antonio Creek, or (b) the Pacific Gas and Electric Company (PG&E) Sunol Substation at Calaveras Road, just south of I-680. If the SFPUC decides to connect to the HHWP Calaveras Substation, which draws from hydroelectric power, no increase in combustion-related criteria air pollutants is expected to result from Filter Gallery project operations. If the SFPUC decides to connect to the PG&E Sunol Substation for power supplies, Filter Gallery project operations could result in an increase in combustion-related criteria air pollutants. Regardless, because PG&E power is drawn from a regional grid, it is not possible to ascribe the electrical energy consumption emissions to any particular air basin (or to accurately quantify them, because the grid draws from a variety of resources such as coal, natural gas, wood/agricultural waste, etc.—each of which has a different emission level per megawatt). Thus, if the SFPUC elects to use PG&E power for the Filter Gallery project, there would be an incremental but unquantifiable health risk due to electrical energy consumption. No backup power supplies or generators are proposed under the Filter Gallery project.

The proposed SMP-30 Expansion project is also located within 1,000 feet of the SABPL project and would also have the potential to contribute to cumulative increases in operational health risks.

When operational emissions associated with the SABPL project are considered with other existing permitted stationary sources and mobile sources within 1,000 feet of the project (see Table 5.8-2), the cumulative operational emissions at the MEI would be well below the BAAQMD cumulative significance thresholds of 100 excess cancer cases in a million, and a hazard index of 1 for chronic and acute non-cancer risk, as shown in **Table 5.8-13**, below. Operation of the proposed project's LPG-powered emergency generator would result in very small amounts of LPG-combustion TACs. Emissions from SABPL project facilities and other cumulative sources shown in Table 5.8-13 would not exceed the BAAQMD risk thresholds; therefore, cumulative operational health risk and hazard impacts at the MEI would not be significant. While the SMP-30 Expansion project's health risk evaluation is currently underway, the BAAQMD's Permit to Operate under Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminants) for this project could allow up to the maximum cancer risk of 10 in one million and non-cancer risk of Hazard Index 1.0 for chronic and acute non-cancer risks. If the maximum risks from the SMP-30 Expansion project were added to the cumulative risks listed in Table 5.8-13 (for purposes of this analysis), the cumulative risk and hazards thresholds would still not be exceeded and therefore, would remain less than significant.

Cumulative Impacts of Pumping Variants

Pumping Variant 1 and Pumping Variant 2 would result in the same or a similar contribution to construction-related air quality impacts as the proposed project, with one exception: construction of Pumping Variant 1 would result in lower NO_X emissions, but these emissions would still exceed the BAAQMD significance threshold for NO_X, even with implementation of Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction) (see Impact AQ-1, above, for descriptions). Therefore,

TABLE 5.8-13
RISK AND HAZARDS FROM CUMULATIVE SOURCES AT THE SABPL PROJECT'S MAXIMALLY EXPOSED INDIVIDUAL (SFPUC WATERSHED KEEPER'S RESIDENCE)

Site	Facility Name and Emissions Source	Street Address	City	Excess Cancer Risk (cases in a million)	Chronic Hazard Index	$PM_{2.5}$ (μ/m^3)
–	SFPUC (Source: Proposed 150-kW LPG-Powered Emergency Generator)	5555 Calaveras Road	Sunol	0.32	<0.01	0.00062
15592	SFPUC (Source: Existing 100-kW Diesel-Powered Emergency Generator)	5555 Calaveras Road	Sunol	0.84	0.0028	0.00152
I-680 at a Distance of 8,300 Feet to the North			Sunol	6.4	0.0046	0.0041
Combined Risks from Permitted and Major Roadway Sources				7.56	0.0074	0.006
BAAQMD Cumulative Significance Thresholds				100	10	0.8

SOURCES: BAAQMD, 2011a, 2011b, 2011c, 2011d, 2011f.

as would occur with the proposed project and Pumping Variant 2, construction-related NO_X emissions under Pumping Variant 1 would constitute a significant and unavoidable impact. Since the only source of operational emissions under the proposed project would also be the only source for Pumping Variants 1 and 2, the contribution to operational emissions would be the same as under the variants and the proposed project. Therefore, the cumulative impact analysis and related conclusions provided above apply to both project variants.

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5.9 Greenhouse Gas Emissions

This section addresses greenhouse gas (GHG) emissions that could result from implementation of the proposed San Antonio Backup Pipeline (SABPL) project. Construction-related and operational GHG emissions are evaluated quantitatively and then compared to significance thresholds adopted by the Bay Area Air Quality Management District (BAAQMD). GHGs and their contribution to climate change are a global issue, and this analysis qualitatively assesses the SABPL project's consistency with local and statewide GHG reduction policies.

5.9.1 Setting

5.9.1.1 GHGs and Climate Change

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse. The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O).[1]

While the presence of the primary GHGs in the atmosphere are naturally occurring, CO_2, CH_4, and N_2O are mainly the result of human activities, which have accelerated the emission rate of these compounds into the earth's atmosphere. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are generated during certain industrial processes. GHGs are typically reported in "carbon-dioxide-equivalent" measures (CO_2e).[2]

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to climate change. Potential climate change impacts in California may include, but are not limited to, a decrease in snowpack; sea level rise; and a greater number of extreme heat days per year, high ozone days, large forest fires, and drought years. Secondary effects are likely to include a global rise in sea level, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity (California Climate Change Portal, 2011).

5.9.1.2 GHG Emissions Summary

The California Air Resources Board (CARB) estimated that in 2008 California produced about 478 million metric tons of CO_2e (MMT CO_2e). The CARB found transportation to be the source of 37 percent of the state's total GHG emissions, followed by electricity generation (both in-state and

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[1] Ozone that is not directly emitted but formed from other gases in the troposphere (the lowest level of the earth's atmosphere) also contributes to the retention of heat.

[2] Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon-dioxide-equivalents," which represent a weighted average based on the heat absorption (or "climate change") potential of each gas. This allows the total GHG emissions resulting from a project or activity to be expressed as a single number that represents the total carbon footprint resulting from that project or activity.

out-of-state) (24 percent) and industrial sources (19 percent). Commercial and residential fuel use (primarily for heating) accounted for 9 percent of the state's total GHG emissions (CARB, 2010b).

In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) and the industrial and commercial sectors are the two largest sources of GHG emissions, each accounting for approximately 36 percent of the Bay Area's 95.8 MMT CO_2e emitted in 2007. Electricity generation accounted for approximately 16 percent of the Bay Area's GHG emissions, followed by residential fuel usage at 7 percent, off-road equipment at 3 percent, and agriculture at 1 percent (BAAQMD, 2010a).

5.9.2 Regulatory Framework

5.9.2.1 Federal Regulations

There are no federal regulations or requirements pertaining to GHG emissions that apply to the SABPL project.

5.9.2.2 State Regulations

Global Warming Solutions Act (Assembly Bill 32)

In 2006, the California legislature passed the Global Warming Solutions Act, or Assembly Bill 32 (AB 32) (California Health and Safety Code Division 25.5, Sections 38500 et seq.). AB 32 requires the CARB to design and implement emission limits, regulations, and other feasible and cost-effective measures to ensure that statewide GHG emissions will be reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions).

California Climate Change Scoping Plan

In December 2008, pursuant to AB 32, the CARB adopted the *California Climate Change Scoping Plan*, which outlines measures to attain the 2020 GHG reduction limits. To meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels, or about 15 percent from today's levels (CARB, 2010a). The Scoping Plan estimates a reduction of 174 MMT CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors (see **Table 5.9-1** below). The CARB has identified an implementation timeline for the GHG reduction strategies in the Scoping Plan (CARB, 2010b). Some of these measures may require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. Additionally, some emission reduction strategies may require environmental review under state regulations (CEQA) or federal regulations (the National Environmental Policy Act, or NEPA). In March 2011, the San Francisco Superior Court issued a final ruling that effectively blocked the CARB from implementing the GHG-reducing actions outlined in the Scoping Plan until the CARB complies with CEQA. The CARB is currently in the process of reconsidering the environmental impact of the Scoping Plan and examining alternatives to the Scoping Plan's cap-and-trade policy.

TABLE 5.9-1
CALIFORNIA CLIMATE CHANGE SCOPING PLAN –
ESTIMATED GHG REDUCTIONS

Sector	Estimated GHG Reduction by 2020 (MMT CO_2e)
Transportation Sector	62.3
Electricity and Natural Gas	49.7
Industry	1.4
Landfill Methane Control Measure (Discrete Early Action)	1
Forestry	5
High Climate-Change-Potential GHGs	20.2
Additional Reductions Needed to Achieve the GHG Cap	34.4
Total Reductions Counted Towards 2020 Target	**174**
Other Recommended Measures	
Government Operations	1–2
Agriculture – Methane Capture at Large Dairies	1
Water	4.8
Green Buildings	26
High Recycling / Zero Waste Commercial Recycling Composting Anaerobic Digestion Extended Producer Responsibility Environmentally Preferable Purchasing	9
Total Reductions Counted Towards 2020 Target	**42.8 – 43.8**

SOURCE: CARB, 2010b.

AB 32 also anticipates that local government actions will result in reduced GHG emissions. The CARB has identified a GHG reduction target of 15 percent from current levels for local governments, noting that successful plan implementation relies on the authority of local governments to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.

5.9.2.3 Local Regulations

Bay Area Air Quality Management District CEQA Guidelines

The BAAQMD is the primary agency responsible for air quality regulation in the San Francisco Bay Area Air Basin. The Bay Area Air Basin comprises Alameda, San Francisco, Santa Clara, Contra Costa, Marin, Napa, and San Mateo Counties, the southern half of Sonoma County, and the southwestern portion of Solano County. As part of its role in air quality regulation, BAAQMD prepares guidelines and procedures to assist lead agencies in evaluating a project's potential air quality impacts during the CEQA environmental review process. In June 2010, the BAAQMD adopted revised CEQA thresholds of significance for air quality impacts as well as new thresholds of significance for operational GHG impacts, which were not previously included in the BAAQMD CEQA Guidelines. The BAAQMD has not defined quantitative GHG thresholds for construction activities. OPR's amendments to the CEQA Guidelines as well as BAAQMD's *CEQA Air Quality Guidelines* and thresholds of significance have been incorporated into the analysis in Section 5.9.3.

San Francisco Greenhouse Gas Reduction Ordinance

In May 2008, the City and County of San Francisco (CCSF) adopted an ordinance amending the San Francisco Environment Code to establish GHG emissions targets and departmental action plans; to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets; and to make environmental findings. The Greenhouse Gas Reduction Ordinance establishes the following GHG emissions reduction limits and the target dates by which to achieve them:

- Reduce GHG emissions by 25 percent below 1990 levels by 2017.
- Reduce GHG emissions by 40 percent below 1990 levels by 2025.
- Reduce GHG emissions by 80 percent below 1990 levels by 2050.

The ordinance also directs CCSF departments to prepare climate action plans that assess GHG emissions associated with their activities and with the activities they regulate, and to report the results of those assessments to the San Francisco Department of the Environment.

SFPUC Climate Action Plan

In 2009, pursuant to San Francisco's Greenhouse Gas Reduction Ordinance, the SFPUC presented a departmental climate action plan focused on energy efficiency and renewable energy programs that help to reduce GHG emissions. The total energy savings potential for all SFPUC facilities is estimated to be 11.8 million kilowatt-hours (kWh) of electricity. A number of SFPUC energy-efficiency and renewable energy generation projects have already been implemented, and many more are in the planning, design, or construction phases (San Francisco Planning Department, 2010).

The SFPUC manages and implements energy-efficiency projects in municipal buildings and facilities and provides energy-efficiency services such as energy audits and design and construction management. Energy-efficiency technologies are commonly applied to lighting; heating, ventilation, and air conditioning (HVAC); facility pumps and motors; and electrical controls. As of 2007, the SFPUC estimated that the energy-efficiency improvement projects had resulted in a reduction in CO_2 emissions of approximately 11,000 metric tons (MT) per year (San Francisco Planning Department, 2010).

The SFPUC currently operates over 2 megawatts (MW) of solar electric photovoltaic projects throughout San Francisco that collectively generate over 2 million kWh of clean renewable electricity annually. A large-scale solar electric photovoltaic project planned for Sunset Reservoir is expected to produce an additional 5 MW of solar energy. Other potential opportunities for large-scale solar projects are being considered for the SFPUC Tesla Portal facility in San Joaquin County as well as for SFPUC water supply facilities in the Sunol Valley. In addition, the SFPUC has installed wind-monitoring equipment at sites in and around the Bay Area and the Sierra Nevada mountains to evaluate the potential for wind power development (San Francisco Planning Department, 2010). SFPUC projects that reduce electrical energy consumption and/or generate renewable energy help to reduce GHG emissions associated with SFPUC facility operations.

San Francisco's Electricity Resource Plan

The *2011 Updated Electricity Resource Plan* presents the City-wide plan to help San Francisco achieve its goal of generating all of its energy needs from renewable and zero-GHG electric energy sources by 2030 (SFPUC, 2011a). See Section 5.18.2.3 in Section 5.18, Energy and Mineral Resources, for additional information regarding this plan.

5.9.3 Impacts and Mitigation Measures

5.9.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to GHG emissions, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs.

5.9.3.2 Approach to Analysis

The analysis of GHG emissions considers construction-related and operational impacts associated with the proposed project. Pursuant to Section 15064.4 of the CEQA Guidelines, the significance of the SABPL project's GHG emissions has been determined based on the BAAQMD's adopted thresholds of significance, and on whether the SABPL project's emissions would exceed levels outlined in any applicable GHG reduction plans, policies, or regulations.

The BAAQMD thresholds of significance include a threshold for operational GHG emissions but none for construction-related GHG emissions (BAAQMD, 2010b). The BAAQMD recommends the significance of GHG construction-related emission impacts be determined in relation to meeting AB 32 GHG reduction targets. The BAAQMD further recommends, and encourages lead agencies to incorporate, best management practices (BMPs) to reduce GHG emissions during construction, as feasible and applicable (BAAQMD, 2011). BMPs could include, but are not limited to: ensuring that at least 15 percent of the construction fleet is comprised of alternatively fueled (e.g., biodiesel, electric) vehicles/equipment; using at least 10 percent local building materials; and recycling or reusing at least 50 percent of construction waste or demolition materials.

The impact analysis in this section estimates the annual GHGs that would be emitted during project construction activities, and then compares these estimates to total annual GHG emissions in the Bay Area and in the state (there are no applicable construction-related thresholds). The impact analysis also compares the total GHG emissions that would be generated during project construction (averaged over the lifespan of the project) to BAAQMD operational significance thresholds. The BAAQMD's operational GHG thresholds of significance that apply to the SABPL project are 10,000 MT of CO_2e per year for stationary sources, or 1,100 MT of CO_2e per year for mobile sources.

5.9.3.3 Summary of Impacts

TABLE 5.9-2
SUMMARY OF IMPACTS – GREENHOUSE GAS EMISSIONS

Impacts	Significance Determinations
Impact GG-1: Project construction would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	LS
Impact GG-2: Project operations would generate GHG emissions, but not at levels that would have a significant impact on the environment.	LS
Impact GG-3: Project operations would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	LS
Impact C-GG: The proposed project would not result in a cumulatively considerable contribution to cumulative GHG emissions.	LS

LS = Less than Significant impact, no mitigation required

5.9.3.4 Construction Impacts and Mitigation Measures

Impact GG-1: Project construction would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Less than Significant)

Project construction activities are estimated to occur over approximately 21 months (between October 2012 and June 2014), and the resulting exhaust emissions from off-road equipment, on-road trucking, and construction worker commute traffic during this period are expected to contribute minimally to long-term regional increases in GHGs. **Table 5.9-3** presents the SABPL project's estimated annual construction-related emissions for 2012, 2013, and 2014. As indicated in the table, construction activities associated with the SABPL project would generate up to an estimated 2,565 MT of CO_2e in the peak year (2013). Emissions associated with project construction would represent approximately 5.7×10^{-6} (0.0006) percent of total annual GHG emissions for the state,[3] and approximately 2.8×10^{-5} (0.0028) percent of total annual GHG

[3] CARB (2010b) reported statewide GHG emissions in 2008 at approximately 478 MMT CO_2e.

TABLE 5.9-3
ESTIMATED ANNUAL GHG EMISSIONS DURING CONSTRUCTION

	Estimated Annual Emissions (MT per year)	
	CO_2	CO_2e
2012		
Backup Pipeline and Water Pipeline to Sunol	92	93
Maximum GHG Emissions in 2012	92	93
2013		
Backup Pipeline and Water Pipeline to Sunol	1,109	1,119
Discharge Facility at Pit F3-East	321	324
Cutoff Wall	478	482
Transfer Pipeline and Dewatering Pipeline	249	251
Alameda Creek Pump Station	116	117
New Chemical Facility	407	411
Maximum GHG Emissions in 2013	2,680	2,704
2014		
Backup Pipeline and Water Pipeline to Sunol	185	187
Discharge Facility at Pit F3-East	321	324
Cutoff Wall	159	160
Maximum GHG Emissions in 2014	665	671
Applicable BAAQMD CEQA Significance Thresholds	None	

NOTE: When CO_2 and non-CO_2 GHG emissions are considered together, they are referenced as CO_2e, which add approximately 0.9 percent to CO_2 emissions from diesel equipment exhaust (CCAR, 2009).

SOURCE: URBEMIS2007, 2011.

emissions for the entire Bay Area.[4] The contribution of GHG emissions from the project would be extremely small in terms of both the statewide and Bay Area annual GHG emissions. During the entire 21-month construction period, an estimated 3,468 MT of CO_2e emissions would be generated (BAAQMD, 2010b). When averaged over a conservative 30-year lifespan for the SABPL project, the average annual GHG emissions associated with all project construction activities would equate to approximately 1156 MT of CO_2e emissions per year.

Neither the state nor the BAAQMD has adopted a methodology or quantitative threshold—such as those that exist for criteria pollutants—that can be applied to a construction project to evaluate the significance of an individual project's construction-related contribution to GHG emissions. Although the BAAQMD's CEQA Guidelines do not specify thresholds of significance for construction-related GHG emissions, they do encourage incorporation of BMPs to reduce GHG

[4] BAAQMD (2010a) reported regional Bay Area GHG emissions in 2007 at approximately 95.8 MMT CO_2e (88.7 MMT CO_2e were emitted within the San Francisco Bay Area Air Basin and 7.1 MMT CO_2e were indirect emissions from imported electricity).

emissions during construction, as applicable, such as ensuring that at least 15 percent of the construction fleet is comprised of alternatively fueled (e.g., biodiesel, electric) construction vehicles/equipment; using at least 10 percent local building materials; and recycling or reusing at least 50 percent of construction waste or demolition materials.

As indicated in Section 3.6.7.2 of Chapter 3, Project Description, the SFPUC has established construction-related GHG reduction actions that would be included in all construction specifications for the SABPL project; these GHG reduction actions would be implemented as part of the proposed project and would reduce the GHG emissions associated with project construction by requiring construction contractors to maintain adequate tire pressure in all construction vehicles and minimize the idling time for construction equipment (including vehicles).

Furthermore, consistent with the BAAQMD-recommended BMPs for reducing GHG emissions during construction, it is expected that the majority of debris and excavated materials produced during project construction activities would be diverted from landfills. Most construction debris would consist of spoils, rock, and other excavated materials. As described under Impact UT-3 in Section 5.12, Utilities and Service Systems, because soils in the project area are generally considered to be of good quality, the SFPUC estimates that 25 percent of the excess spoils generated during construction would be hauled to a landfill, and the remaining 75 percent of the excess spoils would be permanently placed in an earthen berm at the North Spoils Site or in an earthen berm at the former nursery site located within Staging Area C, and/or temporarily placed in Pit F6 or the SMP-30 aggregate processing facility for subsequent sale and reuse. Therefore, an estimated 75 percent of excess construction spoils would be diverted from landfills, thereby minimizing GHG emissions associated with construction haul trucks and solid waste disposal.[5]

A relatively small amount of GHGs would be generated during project construction activities in comparison to statewide and Bay Area GHG emissions. Further, GHG emissions would be temporary in nature, would be limited to the approximately 21-month construction period, and would not continue after completion of project construction. The SFPUC would also require construction contractors to implement GHG reduction actions, and the majority of construction waste would be diverted from landfills. For these reasons, project construction would not conflict with state AB 32 goals and CCSF Greenhouse Gas Reduction Ordinance goals related to the reduction of GHG emissions. Therefore, this impact would be less than significant.

Although no mitigation is necessary, implementation of Mitigation Measure M-AQ-1a (BAAQMD Basic Construction Measures) (see Impact AQ-1 in Section 5.8, Air Quality, for description), which includes idling restrictions specified in Title 13 of the California Code of Regulations, Section 2485, would limit criteria pollutant emissions and, in turn, reduce construction-related GHG emissions.

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5 Decomposition of organic waste in municipal solid waste landfills produces CH_4, CO_2, and N_2O (BAAQMD, 2010a). The estimated emissions presented in Table 5.9-3 already reflect reductions in GHG emissions from such diversions of excess construction spoils, since this analysis assumes 25 percent of excess spoils would be off-hauled to landfills and 75 percent would remain in the vicinity.

5.9.3.5 Operational Impacts and Mitigation Measures

Impact GG-2: Project operations would generate GHG emissions, but not at levels that would result in a significant impact on the environment. (Less than Significant)

SFPUC operations requiring the diversion of quality-impaired Hetch Hetchy water out of the regional water system would use the San Antonio Pump Station to pump flows of up to 160 million gallons per day (the capacity of the San Antonio Pump Station) to either San Antonio Reservoir or the Sunol Valley Water Treatment Plant (SVWTP). Because this is the case under both existing conditions and with-project conditions, GHG emissions associated with this scenario would not change with project implementation.

However, the diversion of Hetch Hetchy flows greater than 160 million gallons per day would increase electrical power consumption under the proposed project. Under the existing condition, these higher flows are discharged by gravity to San Antonio Creek. Since water that is discharged to San Antonio Creek cannot be recovered, the only electrical power consumption associated with the existing creek discharges is the power needed to operate the existing chemical facility that dechlorinates and pH-adjusts the Hetch Hetchy water.

With implementation of the proposed project, the higher flows would be discharged to Pit F3-East by gravity via the proposed backup pipeline. Discharged water in the quarry pit at or above 190 feet mean sea level (msl) would then be recovered by SFPUC facility operators using a two-step pumping process that would convey the water to San Antonio Reservoir or the SVWTP. The existing annual energy consumption associated with discharges to San Antonio Creek at the base of Turner Dam is approximately 40,924 kWh. Operation of the pumps needed to recover the water discharged to Pit F3-East would increase operational energy consumption by an estimated 235,038 kWh per year, for a total energy consumption of 275,962 kWh per year (SFPUC, 2011b). However, since the primary source of electrical energy for both of these facilities, existing and proposed, is hydroelectric power from the Hetch Hetchy Water & Power (HHWP) Calaveras Substation, fossil fuels would not be used and GHG emissions would not increase due to the project's increased electricity demand. Similarly, the new chemical facility and electrical control building would utilize hydroelectric power. In addition, consistent with state and local policies related to energy efficiency, the SFPUC has designed the proposed SABPL project facilities (chemical facility and electrical control building) in accordance with the 2008 Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in the California Code of Regulations, Title 24, Part 6, as appropriate (see Impact ME-4 in Section 5.18, Mineral and Energy Resources, for additional discussion). Thus, no impact related to GHG emissions would result from the increase in electrical power consumption during project operations.

The existing chemical facility would be decommissioned once the new chemical facility is brought online. A diesel fuel-powered portable emergency generator (100 kilowatts) at the Sunol Valley Chloramination Facility currently provides backup power for the existing chemical facility during power outages. As part of the proposed project, this generator would be replaced by a liquid propane gas-powered backup generator (150 kilowatts). The new generator would be

50 percent larger than the existing generator, but liquid propane gas would generate approximately 14 percent less CO_2e than diesel. Based on an assumed one-hour test per week, direct operational GHG emissions from the 100-kilowatt diesel generator are currently 3.9 MT of CO_2e per year,[6] while the 150-kilowatt propane generator would emit 7.1 MT of CO_2e per year.[7] Therefore, project implementation would result in a net increase of 3.2 MT of CO_2e per year. When compared to the BAAQMD significance threshold of 10,000 MT of CO_2e per year for stationary sources, the impact related to the calculated increase in operational GHG emissions from generator testing and maintenance would be less than significant.

The SABPL project would require periodic operations review and maintenance activities, but the number of vehicle trips would be similar to those required under existing conditions. The number of trips related to supply deliveries with the proposed project is not expected to change when compared to existing conditions. Therefore, the project's operational GHG emissions associated with worker vehicle trips would be less than significant.

Impact GG-3: Project operations would not conflict with any plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Less than Significant)

As indicated under Impact GG-2, above, the SABPL project's long-term operational GHG emissions would not exceed the adopted BAAQMD GHG significance thresholds. Given that operational GHG emissions would be less than significant and energy efficiency measures would be implemented, the proposed project would not conflict with the state's AB 32 goal and associated Scoping Plan estimates of reducing GHG emissions to 1990 levels by 2020, or the CCSF Greenhouse Gas Reduction Ordinance's and associated SFPUC Climate Action Plan's goal of reducing GHG emissions by 25 percent below 1990 levels by 2017 and up to 80 percent below 1990 levels by 2050. The proposed project would also not conflict with San Francisco Electricity Resource Plan's goal of generating all of its energy needs from renewable and zero-GHG electric energy sources by 2030. The impact would therefore be less than significant.

5.9.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1 and Pumping Variant 2

Both Pumping Variant 1 and Pumping Variant 2 would involve the construction and operation of new pumping facilities to recover Hetch Hetchy water that is discharged to Pit F3-East, as well as a liquid propane gas-powered backup generator for the new chemical facility. Although the Alameda Creek Pump Station would not be constructed under Pumping Variant 1, this variant

6 This estimate is based on 7.4 gallons per hour (100 kilowatts under maximum load), 385 gallons per year of diesel combustion, and 10.2 kilograms (kg) of CO_2e per gallon (CCAR, 2009).

7 This estimate is based on 22.7 gallons per hour (150 kilowatts under maximum load), 1,180 gallons per year of propane combustion, and 6 kg of CO_2e per gallon (CCAR, 2009).

would still result in an increase in hydroelectric power consumption due to the high-pressure submersible pumps that would be installed and operated. The total annual energy consumption for Pumping Variant 1 would be approximately 238,233 kWh, which is 37,729 kWh per year less than under the proposed project (SFPUC, 2011b), but would not result in decreased operational GHG emissions compared to the proposed project, because the power source would be hydroelectric power from the HHWP Calaveras Substation. Similarly, the total annual energy consumption for Pumping Variant 2, estimated at 257,098 kWh (SFPUC, 2011b), would not change the operational GHG emissions compared to the proposed project, because the power source would be hydroelectric power from the HHWP Calaveras Substation. Thus, construction and operation of either Pumping Variant 1 or 2 would not change the analysis or conclusions presented in Sections 5.9.3.4 and 5.9.3.5, above.

5.9.3.7 Cumulative Impacts and Mitigation Measures

Impact C-GG: The proposed project would not result in a cumulatively considerable contribution to GHG emissions. (Less than Significant)

Because GHG emissions affect global climate change, the evaluation of GHG emissions is inherently a cumulative impact issue. Since it is not feasible to evaluate GHG emissions impacts based on the sum of all past, present, and reasonably foreseeable future projects on a global scale, the geographic scope for cumulative GHG emission impacts is the San Francisco Bay Area Air Basin as well as the state as a whole.

GHG Emissions during Project Construction

As discussed above under Impact GG-1, the BAAQMD has not established a threshold of significance for construction-related GHG emissions. It is estimated that construction activities associated with the SABPL project would generate up to 2,495 MT of CO_2e in the peak year (2013). Total GHG emissions from construction activity calculated over a minimum 30-year expected lifespan of the project would be approximately 107 MT of CO_2e per year. Peak-year construction emissions of 2,565 MT of CO_2e would represent approximately 5.3×10^{-6} (0.0005) percent of total annual GHG emissions for the state,[8] and approximately 2.7×10^{-5} (0.0027) percent of total annual GHG emissions for the entire Bay Area.[9] Thus, while the cumulative impact of regional and statewide GHG emissions is potentially significant, the contribution of GHG emissions from the project would be extremely small in terms of both the statewide and Bay Area annual GHG emissions. In addition, construction-related GHG emissions would be temporary in nature and limited to the approximately 21-month construction period. Therefore, the SABPL project's contribution to GHG emissions during construction would not be cumulatively considerable (less than significant).

[8] CARB (2010b) reported State-wide GHG emissions in 2008 at approximately 478 MMT CO_2e.

[9] BAAQMD (2010a) reported regional Bay Area GHGs emissions in 2007 at approximately 95.8 MMT CO_2e (88.7 MMT CO_2e were emitted within the San Francisco Bay Area Air District and 7.1 MMT CO_2e were indirect emissions from imported electricity).

Although no mitigation is necessary, the SFPUC would implement GHG reduction actions and would divert the majority of construction-related wastes from landfills. Further, implementation of Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction), which are prescribed to reduce NO_X emissions during construction (see Impact AQ-1 in Section 5.8, Air Quality), would also serve to reduce GHG emissions during construction.

GHG Emissions during Project Operations

Given the global nature of the climate change issue, cumulative GHG emissions are considered a significant impact. At the project level, the BAAQMD CEQA Guidelines established 10,000 MT of CO_2e per year as the individual project operational threshold. Because the BAAQMD's threshold of significance for operational GHG emissions represents the level that would not substantially conflict with the goal of reducing statewide GHG emissions—which in turn are aimed at stabilizing global climate change (BAAQMD, 2011)—GHG emissions below this threshold are not considered cumulatively considerable.

As discussed above under Impact GG-2, net increases in direct operational GHG emissions resulting from testing and maintenance of the larger, 150-kilowatt liquid propane gas-powered backup generator would be 3.2 MT of CO_2e per year. The increased use of hydroelectric power during project operations would not result in an increase in GHG emissions. Because the SABPL project's operational GHG emissions would be less than the BAAQMD's threshold of 10,000 MT of CO_2e, the SABPL project's contribution to cumulative GHG emissions and associated climate change impacts would not be cumulatively considerable (less than significant).

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are substantially similar to or the same as those of the proposed project (refer to Section 5.9.3.6, Impacts of Pumping Variants), the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.9.4 References

Bay Area Air Quality Management District (BAAQMD), *Source Inventory of Bay Area Greenhouse Gas Emissions*. February 2010a.

Bay Area Air Quality Management District (BAAQMD), Adopted Air Quality CEQA Thresholds of Significance. June 2, 2010b.

Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act Air Quality Guidelines*. Updated May 2011.

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San Francisco Planning Department, *City and County of San Francisco Strategies to Address Greenhouse Gas Emissions in San Francisco*. November 2010.

San Francisco Public Utilities Commission (SFPUC), *San Francisco's 2011 Updated Electricity Resource Plan, Achieving San Francisco's Vision for Greenhouse Gas Free Electricity*. March 2011a.

San Francisco Public Utilities Commission (SFPUC), CUW 374.03 San Antonio Backup Pipeline Project – Annual Energy Consumption Estimates and Electric Load and Pumping Costs for SABPL Discharged Water from Pond F3-East to Wet Well. August 2011b.

URBEMIS2007, Computer Model Output for SABPL Project – Construction Exhaust Emissions. August 2011. (Provided in Appendix B of the *SFPUC San Antonio Backup Pipeline Project Air Quality Technical Report* [Orion, 2011], which is provided in Appendix K of this EIR.)

5.10 Wind and Shadow

This section analyzes the potential for the proposed San Antonio Backup Pipeline (SABPL) project to adversely affect existing wind and shadow patterns.

5.10.1 Setting

The proposed project is located in the Sunol Valley in unincorporated Alameda County, south of the Interstate 680 and State Route 84 junction within Alameda watershed lands. The lands are owned by the City and County of San Francisco (CCSF) and managed by the SFPUC. The Alameda watershed encompasses 56 square miles (36,000 acres) of largely undeveloped, rolling grassland and scattered oak woodlands. As discussed in Section 5.11, Recreation, public access to the Alameda watershed is limited, and there are no public facilities within or immediately adjacent to the project area.

Land uses in the project vicinity consist of various water supply facilities, gravel mining operations, cattle grazing and open space, and four private residences: the SFPUC watershed keeper's residence, approximately 225 feet east of the project area and Calaveras Road near the Alameda East Portal; the Garcia residence, approximately 1,300 feet southwest of the project area; and two private residences on Athenour Way, approximately 2,100 feet west of the project area. Existing aboveground structures in the project vicinity include the San Antonio Pump Station, the existing chemical facility at the San Antonio Pump Station, the Sunol Valley Chloramination Facility, an existing fluoride facility, and several auxiliary buildings associated with SFPUC water system operations (see Figure 3-3 in Chapter 3, Project Description). With the exception of the approximately 40-foot-high Sunol Valley Chloramination Facility at the southern end of the project area, existing aboveground structures in the project vicinity are generally small, widely spaced, single-story buildings surrounded by gravel access roads and grassland. Due to the heights of these aboveground structures, wind and shadow patterns in the project area are largely unaffected by development.

5.10.2 Regulatory Framework

There are no federal, state, or local regulations governing wind or shadow that apply to the SABPL project. Although CCSF regulations govern wind and shadow effects within the boundaries of San Francisco, these local regulations do not apply to the SABPL project because the project is not located in San Francisco. Nevertheless, an overview of CCSF wind and shadow regulations is provided for informational purposes.

5.10.2.1 Wind

The San Francisco Planning Code establishes wind comfort and wind hazard criteria for use in evaluating new development in four areas of the city: the C-3 Downtown Commercial Districts (Section 148); the Van Ness Avenue Special Use District (Section 243[c][9]); the Folsom–Main Residential/Commercial Special Use District (Section 249.1); and the Downtown Residential

District (Section 825). As the proposed project would not be located in any of these areas, the wind comfort and wind hazard criteria established in the Planning Code do not apply to the project.

5.10.2.2 Shadow

San Francisco General Plan

The Recreation and Open Space Element of the San Francisco General Plan (CCSF, 1996) includes the following policy related to potential solar access or shading impacts:

> *Policy 2.3*: Solar access to public open space should be protected.

The policy promotes solar access and avoidance of shade to maintain the usability of public open spaces. It states that the requirements of Planning Code Section 295 apply to the review of projects that could shade San Francisco Recreation and Park Department property. Policy 2.3 further states that:

> A number of other open spaces designated in this Element or elsewhere in the General Plan are under the jurisdiction of other public agencies, or are privately owned and therefore not protected by the Planning Code amendments. These spaces should be given other forms of protection to assure they are not shaded during the hours of their most intensive use. Any new shading should be remedied to the extent feasible by expanding opportunities for public assembly and recreation in indoor and outdoor settings.

The proposed project is not located on San Francisco Recreation and Park Department property, and none of the project components would affect areas accessible to the public. Therefore, these policies do not apply to the proposed project.

San Francisco Planning Code

Planning Code Section 295, adopted in 1984 pursuant to voter approval of Proposition K (also known as the Sunlight Ordinance), prohibits the issuance of building permits for structures over 40 feet in height that would cast shade or shadow on property under the jurisdiction of, or designated to be acquired by, the Recreation and Park Commission. The statute applies to the time of day beginning one hour after sunrise and ending one hour before sunset at any time of year, unless the Planning Commission determines that the shade or shadow would have an insignificant adverse impact on the use of such property.

The project area is located in the Alameda watershed, outside of San Francisco, and there are no parks or open spaces within the project area or vicinity that are under the jurisdiction of the San Francisco Recreation and Park Department. Therefore, the SABPL project would not be subject to review under Planning Code Section 295.

5.10.3 Impacts and Mitigation Measures

5.10.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to wind and shadow, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Alter wind in a manner that substantially affects public areas; or
- Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.

Due to the nature of the proposed project, there would be no impacts related to these significance criteria for the reasons described below:

- *Alter Wind in a Manner that Substantially Affects Public Areas*. The proposed project involves the construction of: four new single-story facilities and buildings (the new chemical facility near the southern backup pipeline alignment, the electrical control building for the discharge facility at Pit F3-East, and the Alameda Creek Pump Station and adjacent control building on the west side of Pit F3-West); an approximately 10-foot-tall electrical transformer adjacent to the Alameda Creek Pump Station; multiple manhole risers and vaults along the backup pipeline alignment extending 2 to 3 feet above grade; and vertical piping at cross-connections extending 8 to 10 feet above the ground surface. These structures are similar in size and height to other SFPUC buildings in the area and would not alter wind patterns in the project vicinity, including wind patterns along Calaveras Road, which is a popular route for recreational bicyclists. Therefore, the criterion related to altering wind in a manner that would substantially affect publicly accessible areas is not applicable to the proposed project and is not discussed further.
- *Create New Shadow in a Manner that Substantially Affects Outdoor Recreation Facilities or Other Public Areas*. The SABPL project does not propose any features that would substantially affect shadow patterns. The tallest structures to be constructed under the proposed project are the new chemical facility at the south end of the backup pipeline alignment, the electrical control building at Pit F3-East, and the Alameda Creek Pump Station and control building on the west side of Pit F3-West. These single-story buildings would not be high enough to create substantial new shadows that could affect outdoor recreational facilities or other public areas. Therefore, the criterion related to creating new shadow that would substantially affect outdoor recreational facilities or other public areas is not applicable to the proposed project and is not discussed further.

5.10.3.2 Construction and Operational Impacts and Mitigation Measures

As described above, implementation of the proposed project would not result in impacts related to wind and shadow. Therefore, no mitigation measures related to this resource topic are necessary.

5.10.3.3 Impact Analysis for Pumping Variants

Pumping Variant 1 and Pumping Variant 2

As with the proposed project, implementation of Pumping Variant 1 or Pumping Variant 2 would not include construction of any structures or features that would alter wind and shadow patterns. Thus, the effects of the pumping variants on wind and shadow would be the same as those under the proposed project and would not change the analysis or conclusions presented in Section 5.10.3.2, above.

5.10.3.4 Cumulative Impacts and Mitigation Measures

Implementation of the proposed project would not result in cumulative impacts related to wind and shadow because the project would not cause any project-specific impacts related to this resource topic.

Cumulative Impacts of Pumping Variants

As with the proposed project, implementation of either Pumping Variant 1 or Pumping Variant 2 would not result in impacts related to wind and shadow. Thus, the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.10.4 References

City and County of San Francisco (CCSF), San Francisco General Plan, Recreation and Open Space Element. 1996.

5.11 Recreation

This section evaluates the potential impacts on recreational resources associated with implementation of the proposed San Antonio Backup Pipeline (SABPL) project. This analysis addresses publicly accessible recreational resources in the vicinity of the SABPL project, including local roadways used for bicycling and designated recreational trails used for hiking, jogging, bicycling, and equestrian use.

5.11.1 Setting

The proposed project would be located on land owned by the City and County of San Francisco (CCSF) and managed by the SFPUC within the Sunol Valley in unincorporated Alameda County. The project area extends roughly two miles from the San Antonio Pump Station, which is located near the Alameda Siphons at the southern end of the project area, to the North Spoils Site, which is located along the west side of Calaveras Road, just south of the Interstate 680 (I-680) and State Route 84 (SR 84) junction. Public access is limited on CCSF-owned lands, and there are no public recreational facilities within or immediately adjacent to the project area. However, the Sunol Water Temple, the Sunol Valley Golf Club, and several East Bay Regional Park District (EBRPD) recreational facilities are located in the project vicinity and are accessed via Calaveras Road and other nearby roadways. In addition, Calaveras Road is a popular bicycle route. These recreational resources are described below.

5.11.1.1 Recreational Parks and Trails

The EBRPD operates three public parks and open space areas within five miles of the project area: the Sunol Regional Wilderness, Ohlone Regional Wilderness, and Mission Peak Regional Preserve. The Sunol Regional Wilderness is a 6,859-acre park located approximately one mile southeast from the southernmost portion of the project area; it has a visitor's center as well as facilities for camping, picnicking, hiking, backpacking, and horseback riding (EBRPD, 2009). Calaveras Road is the main vehicle access route to the Sunol Regional Wilderness from the north. The Ohlone Regional Wilderness is located east of and adjacent to the Sunol Regional Wilderness. Portions of the Sunol-Ohlone Regional Wilderness are on CCSF-owned Alameda watershed lands. The Mission Peak Regional Preserve, also managed by the EBRPD, is approximately 2.6 miles southwest of the SABPL project area. This park provides opportunities for hiking, bicycling, and horseback riding (EBRPD, 2010).

The closest recreational trail to the project area is the Maguire Peaks Trail, located approximately 1.2 miles southeast of the project area in the Sunol Regional Wilderness (see **Figure 5.3-1** in Section 5.3, Aesthetics).

5.11.1.2 Popular Bicycle Routes

Calaveras Road is a popular route for recreational cyclists and has been used as a route for the professional AMGEN Tour of California bicycle race. Several local cycling groups, such as the Bay

Area Velo Girls and Valley Spokesmen Bicycling Touring Club, use Calaveras Road for regularly scheduled rides (Bay Area Velo Girls, 2010; Valley Spokesmen Bicycling Touring Club, 2010).

5.11.1.3 Sunol Valley Golf Club

The Sunol Valley Golf Club is located southwest of the I-680 and SR 84 junction and offers two 18-hole courses, a pro-shop, and banquet facilities (Sunol Valley Golf Club, 2009). The Sunol Valley Golf Club is approximately 0.75 mile west of the project area.

5.11.1.4 Sunol Water Temple

The Sunol Water Temple (managed by the SFPUC) is located west of the I-680 and SR 84 junction, approximately 0.75 mile west of the North Spoils Site. In 1976, the American Society of Civil Engineers designated the Sunol Water Temple a California Historical Engineering Landmark; the temple is open to the public Monday through Friday (SFPUC, 2010).

5.11.2 Regulatory Framework

There are no federal, state, or local regulations or requirements pertaining to recreational resources or facilities that are directly applicable to the proposed SABPL project.

5.11.3 Impacts and Mitigation Measures

5.11.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to recreation, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- 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;
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment; or
- Physically degrade existing recreational resources.

5.11.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the following significance criteria; therefore, no impact discussion is provided for these topics for the reasons described below:

- *Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities*. The proposed project does not propose to construct new homes or businesses and would not increase the number of residents in the project area. Thus, implementation of the proposed project would not increase the use of recreational parks or other recreational facilities in the area. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.

- *Include Recreational Facilities or Require the Construction or Expansion of Recreational Facilities*. The SABPL project does not propose to construct recreational facilities and would not result in the need for new or expanded recreational facilities. Thus, the significance criterion related to the construction or expansion of recreational facilities is not applicable to the proposed project and is not discussed further.

To evaluate the SABPL project's potential to physically degrade recreational resources, this analysis considers whether the SABPL project would:

- Remove or damage existing recreational resources directly;
- Cause physical environmental effects (such as air quality, noise, traffic, or aesthetic effects) that would indirectly deteriorate the quality of the recreational experience; or
- Disrupt access to existing recreational facilities (which could divide a recreational user from some of the established recreational amenities).

The evaluation of impacts on recreational resources focuses on the potential for construction activities to directly or indirectly degrade existing recreational resources and uses in the project vicinity. To determine the potential for construction activities to cause direct effects on recreation, the proposed construction areas were compared to the locations of identified recreational resources and facilities. Potential indirect effects were identified through the same means, as well as through a review of the impact findings presented in other pertinent sections of this EIR (e.g., Sections 5.3, Aesthetics; 5.6, Transportation and Circulation; 5.7, Noise and Vibration; and 5.8, Air Quality). The impact analysis addresses the potential for project construction activities to result in indirect impacts on recreational uses by causing: (1) deterioration in the recreational experience at nearby hiking trails (due to views of construction sites and activities), or (2) disruption of bicycling along Calaveras Road (due to construction-related noise and dust, and increased traffic safety hazards). Local planning documents and maps, including topographic maps, local street maps, and electronic maps available via the Internet were reviewed to identify the recreational resources in the project vicinity.

During future project operations, the SABPL project would not affect established recreational resources or uses because nearly all of the facilities associated with the project would be constructed underground and would operate in a manner that could not affect access to, or use of, any recreational resources.

5.11.3.3 Summary of Impacts

Table 5.11-1 lists the proposed project's recreation impacts and significance determinations.

TABLE 5.11-1
SUMMARY OF IMPACTS – RECREATION

Impacts	Significance Determinations
Impact RE-1: The proposed project could temporarily degrade existing recreational uses during construction.	LSM
Impact RE-2: The proposed project would not degrade existing recreational uses during project operations.	NI
Impact C-RE: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on recreational resources and uses.	LSM

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

5.11.3.4 Construction Impacts and Mitigation Measures

Impact RE-1: The proposed project could temporarily degrade existing recreational uses during construction. (Less than Significant with Mitigation)

Temporary, direct impacts on established recreational facilities and resources could result if construction activities overlapped geographically with existing recreational facilities or trails. Construction activities could also cause temporary, indirect impacts on recreational resources as a result of visual disruption, impeded access to recreational facilities or trails, construction-related noise, or dust/exhaust emissions at or in proximity to recreational resources.

Construction activities associated with the proposed project would not directly affect recreational facilities because there are no recreational facilities within the project area. In addition, there are no designated recreational trails or facilities in the immediate vicinity of the project area that could be adversely affected by construction-related noise and dust/exhaust emissions. Views of project construction activities from nearby recreational trails (if available) would be distant, largely obstructed by topography and vegetation, and set against a backdrop of existing gravel mining activities (see Figure 5.3-4 in Section 5.3, Aesthetics). Thus, project construction activities would not adversely affect the recreational experience at designated recreational facilities, including nearby hiking trails, the Sunol Water Temple, and the Sunol Valley Golf Club.

Calaveras Road, a popular bicycle route, forms the eastern boundary of the project area and provides the primary access to the project vicinity. The backup pipeline and 12-inch-diameter water pipeline to the town of Sunol would be installed adjacent to the southbound lane of Calaveras Road. Construction equipment used during pipeline installation would generate noise and dust/exhaust emissions that could adversely affect the recreational experience of bicyclists traveling along Calaveras Road. In addition, project construction would increase vehicle and truck traffic along Calaveras Road, which would generate noise and diesel emissions and increase traffic safety risks compared to existing conditions. This increased traffic safety risk is due to the increased potential for conflicts between construction vehicles—which have slower speeds and wider turning radii than automobiles—and non-construction-related automobiles and bicyclists (see Impact TR-3, in Section 5.6, Transportation and Circulation). Construction traffic could also result in temporary delays of up to 10 minutes when large construction vehicles turn west into the quarry access roads from Calaveras Road due to the wide turning radii of construction vehicles (see Impact TR-1, in Section 5.6, Transportation and Circulation); this could impede access to the nearby EBRPD parks and trails, the Sunol Water Temple, and the Sunol Valley Golf Course, which are accessed via Calaveras Road and other nearby roadways.

Construction-related air quality, and traffic safety effects along Calaveras Road would combine to increase the overall impacts on the recreational experience of bicyclists, although these impacts would be limited in duration as the cyclists pass the project area. Project impacts on recreational bicycling along Calaveras Road could be significant. However, these impacts could be reduced to a less-than-significant level through implementation of the mitigation measures identified below.

Mitigation Measure M-TR-3: Traffic Control Plan.

(See Impact TR-3 in Section 5.6, Traffic and Circulation, for description.)

Mitigation Measure M-AQ-1a: BAAQMD Basic Construction Measures.

(See Impact AQ-1 in Section 5.8, Air Quality, for description.)

Mitigation Measure M-AQ-1b: BAAQMD Additional Construction Measures for NO_X Reduction.

(See Impact AQ-1 in Section 5.8, Air Quality, for description.)

Collectively, implementation of these mitigation measures would address secondary impacts related to recreational bicycling along Calaveras Road during project construction. Mitigation Measure M-TR-3 would address traffic safety issues by requiring roadside safety protocols and traffic control measures to minimize conflicts with bicycles and to maintain safe traffic flow along Calaveras Road; this measure would also ensure access to recreational areas along Calaveras Road is maintained throughout construction. Mitigation Measures M-AQ-1a and M-AQ-1b would address the effects of construction-related air emissions for recreational bicyclists traveling along Calaveras Road by requiring construction practices that limit fugitive dust and exhaust emissions. Although construction-related noise would incrementally contribute to secondary impacts on recreational bicycling, the level of construction noise would not be substantial enough such that mitigation is needed to reduce the overall impact to recreation during project construction. Therefore, this impact would be less than significant with mitigation.

5.11.3.5 Operational Impacts and Mitigation Measures

Impact RE-2: The proposed project would not degrade existing recreational uses during project operations. (No Impact)

Future project operations would not result in increased noise or air emissions at or immediately adjacent to recreational facilities or resources. The proposed facilities would be operated and monitored primarily through Supervisory Control and Data Acquisition (SCADA)[1] and would not be manned by SFPUC staff; therefore, daily vehicle trips would be similar to existing conditions and would not increase as a result of project operations. SFPUC staff would periodically visit the facilities in pickup trucks to conduct routine maintenance, but the number of vehicle trips would be similar to the number occurring under existing conditions and would not result in additional traffic congestion or increased traffic hazards. As noted above in Section 5.11.3.2, operation of the proposed project would not affect established recreational resources or uses because the majority of the proposed project facilities and improvements would be underground, and none of the facilities would affect access to, or use of, any recreational resources. Thus, no impact on recreational resources or facilities would occur as a result of project operations, and no mitigation is required.

5.11.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Pumping Variant 1 would not include the Alameda Creek Pump Station, wet well, control building for the pump station, retaining wall along the southern boundary of the pump station site adjacent to the access road, or the transfer pipeline; as a result, the total excavation under Pumping Variant 1 would be slightly less than that of the proposed project, thereby reducing fugitive dust and the volume of excess construction spoils. Since fewer facilities would be constructed compared to the proposed project, this pumping variant would also result in approximately one less truckload of spoil requiring offsite disposal each day and a slight reduction in construction worker traffic. This decreased traffic coupled with the construction of fewer facilities could also slightly lower construction-related noise. However, the overall impact conclusions and mitigation measures identified in Section 5.11.3.4, above, would not change. Because Pumping Variant 1 would have the same construction schedule as the proposed project and would involve most of the same construction activities and equipment, Pumping Variant 1 would result in similar construction impacts as described above for the proposed project.

As with the proposed project, future project operations under Pumping Variant 1 would not affect recreational resources or established recreational uses because none of the facilities would affect access to, or use of, any recreational resources. Thus, implementation of this pumping variant would not change the analysis and conclusions presented in Section 5.11.3.5, above.

[1] SCADA systems allow for remote monitoring and operation of facilities.

Pumping Variant 2

Overall, Pumping Variant 2 would construct all of the same facilities, involve all of the same construction activities and equipment, and have the same construction schedule as the proposed project. Thus, Pumping Variant 2 would have the same construction-related effects on recreational resources and recreational uses as described for the proposed project. In addition, as with the proposed project, future project operations under Pumping Variant 2 would not affect recreational resources or established recreational uses because none of the facilities would affect access to, or use of, any recreational resources. Thus, implementation of Pumping Variant 2 would not change the analysis, conclusions, or mitigation measures presented in Sections 5.11.3.4 and 5.11.3.5, above.

5.11.3.7 Cumulative Impacts and Mitigation Measures

Impact C-RE: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on recreational resources and uses. (Less than Significant with Mitigation)

The geographic scope for cumulative impacts on recreational resources consists of the project area and immediate vicinity, and the projects that could contribute to construction-related traffic on Calaveras Road.

As discussed above under Impact RE-1, construction of the SABPL project would generate construction-related noise, fugitive dust, diesel emissions, and traffic, which could have a significant impact on recreational bicycling along Calaveras Road. Increased traffic could also cause traffic delays and disrupt vehicular access to the nearby EBRPD parks and trails, the Sunol Water Temple, and the Sunol Valley Golf Course. Of the cumulative projects listed in Table 5.1-6, the New Irvington Tunnel project, Upper Alameda Creek Filter Gallery project, Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir project, Calaveras Dam Replacement project, and SMP-30 Quarry Expansion and Cutoff Wall project, as well as routine pipeline inspections, could also generate construction-related noise, fugitive dust, diesel emissions, and traffic along Calaveras Road that could affect recreational uses of Calaveras Road and access to nearby recreational facilities, a potentially significant cumulative impact. The SABPL project's contribution to this cumulative impact would be cumulatively considerable.

As described in Impact RE-1, the SABPL project's impact related to recreational uses would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-TR-3 (Traffic Control Plan)** (see Impact TR-3 in Section 5.6, Transportation and Circulation, for description), **M-AQ-1a (BAAQMD Basic Construction Measures)**, and **M-AQ-1b (BAAQMD Additional Construction Measures for NO_x Reduction)** (see Impact AQ-1 in Section 5.8, Air Quality, for descriptions). However, even with implementation of these measures, the SABPL project's contribution to cumulative impacts on recreational uses would be cumulatively considerable due to the project's contribution to cumulative traffic safety hazards. Implementation of **Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan)**, described in Section 5.6, Traffic and Circulation, would address cumulative recreational impacts associated with increased traffic hazards by requiring the SFPUC to coordinate the project-specific traffic control plans of SFPUC construction projects in the Sunol Valley and identify measures to minimize cumulative traffic-related impacts. Therefore, with implementation of mitigation, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are substantially similar to those of the proposed project, the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.11.4 References

Bay Area Velo Girls. Available online at: http://www.velogirls.com/resources/routes.php. Accessed December 22, 2010.

East Bay Regional Park District (EBRPD), Sunol Regional Wilderness. Available online at: www.ebparks.org/parks/sunol.htm. Accessed December 22, 2010.

San Francisco Public Utilities Commission (SFPUC), Natural Resources, Alameda Watershed, Sunol Water Temple. Available online at: http://www.sfwater.org/mto_main.cfm/MC_ID/20/MSC_ID/188/MTO_ID/350. Accessed December 22, 2010.

Sunol Valley Golf Club, Our Golf Courses. Available online at: http://www.sunolvalley.com/sections/ourgolfcourses/index.cfm. Accessed December 22, 2010.

Valley Spokesmen Bicycle Touring Club. Available online at: http://www.valleyspokesmen.org/routeSheetsValidateAndRecord.php. Accessed December 22, 2010.

5.12 Utilities and Service Systems

This section provides an assessment of potential impacts on utilities and service systems that could occur with implementation of the proposed San Antonio Backup Pipeline (SABPL) project. The utilities and service systems discussed in this section include natural gas, petroleum, electricity, telecommunications, stormwater drainage, water supply pipelines, wastewater collection, and solid waste disposal. Mitigation measures to reduce potential impacts are provided, as appropriate.

5.12.1 Setting

The proposed project is located in unincorporated Alameda County in the Sunol Valley. Utility lines and infrastructure within the project vicinity, as well as solid waste disposal facilities within the greater San Francisco Bay Area that could be used to dispose of construction-related wastes, are described below.

5.12.1.1 Utilities

Natural Gas

Natural gas in the Sunol Valley is served through a network of regional gas pipelines owned by Pacific Gas and Electric Company (PG&E). An existing PG&E 36-inch-diameter high-pressure natural gas pipeline crosses the proposed backup pipeline alignment at pipeline station 67+25, and a PG&E 22-inch-diameter natural gas pipeline is oriented east-west between quarry Pit F2 and Pits F3-East and F3-West, parallel to the California Department of Water Resources (DWR) South Bay Aqueduct. These pipelines are considered high-priority utility lines.[1] The backup pipeline would be routed under the 36-inch-diameter pipeline. The work platform for the cutoff wall is expected to be within 50 feet of the 22-inch-diameter pipeline.

Petroleum

An 8-inch-diameter underground crude oil pipeline owned and operated by the Chevron Pipeline Company (Chevron), located parallel to and east of Calaveras Road, is considered a high-priority utility line. This pipeline is located outside of the project area.

Electricity

PG&E and SFPUC Hetch Hetchy Water & Power (HHWP) provide electrical power to the Sunol Valley and own several overhead electrical transmission and distribution lines in the project

[1] For the purpose of this analysis, this EIR uses the California Department of Transportation (Caltrans) policies, as stated in its *Project Development Procedures Manual*, to identify "high-priority" utilities that would pose a risk to workers and the public in the event of an accident during construction, and which therefore warrant special consideration. Pursuant to the policy, high-priority utilities include pipelines carrying petroleum products; oxygen; chlorine; toxic or flammable gases; natural gas in pipelines greater than 6 inches nominal pipe diameter or with normal operating pressures greater than 60 pounds per square inch gauge; and underground electricity supply lines, conductors, or cables with a potential to ground more than 300 volts that do not have effectively grounded sheaths (Caltrans, 1999).

vicinity. PG&E has overhead powerlines near the proposed chemical facility: a 60-kilovolt (kV) powerline parallels the east side of Calaveras Road, and a 12-kV powerline parallels the Alameda Siphons. HHWP transmits hydroelectric power through three 130-kV overhead tower lines that traverse the project area between pipeline stations 65+00 and 68+00. Another HHWP overhead powerline parallels the western side of Calaveras Road. The HHWP Calaveras Substation is located south of San Antonio Creek and west of Calaveras Road, near Staging Area B (see Figures 3-4 and 3-6 in Chapter 3, Project Description).

Telecommunications

The Sunol Valley is served by multiple telecommunications companies, including GTE Mobilnet, Nextel of California, Pacific Bell Mobile Services and Sprint Spectrum, and AT&T. Some of the telecommunications lines in the project area share poles with overhead powerlines along Calaveras Road.

Stormwater Drainage

Within the Sunol Valley, stormwater is collected and conveyed through a system of culverts, open channels, and natural drainages that discharge into local watercourses, including Alameda and San Antonio Creeks. Stormwater drainage facilities along Calaveras Road are maintained by the Alameda County Department of Public Works, which is also responsible for flood protection in the county (Alameda County, 2002).

San Antonio and Alameda Creeks are the primary drainages in the project vicinity. Several culverts and storm drains along Calaveras Road convey runoff from the hilly areas east of Calaveras Road; the water runs beneath Calaveras Road towards Alameda Creek. Additional discussion of stormwater drainage, including impacts and mitigation measures, is provided in Section 5.16, Hydrology and Water Quality.

Water Supply

The SFPUC provides potable water service to users in the Sunol Valley, including SFPUC facilities in the project vicinity; the town of Sunol; and some local businesses and residents in unincorporated Sunol Valley. The proposed improvements would require construction and excavation activities in close proximity to several existing SFPUC water supply pipelines. These pipelines include the San Antonio Pipeline, the Alameda Siphons, the 36-inch-diameter water pipeline to the town of Sunol, the 36-inch-diameter Sunol Pump Station Pipeline, and the Alameda East Portal Overflow Pipeline. A 12-inch-diameter General Electric (GE) water pipeline and the South Bay Aqueduct, a component of the DWR's State Water Project, also traverse the project area.

The 60-inch-diameter San Antonio Pipeline runs parallel to the proposed backup pipeline alignment at a distance of about 12 feet between pipeline stations 0+00 and 56+00; the proposed backup pipeline would not cross the San Antonio Pipeline. The Alameda Siphons Nos. 1, 2, and 3 are located at the southern end of the backup pipeline alignment near pipeline station 0+00 and the proposed chemical facility (see Figure 3-3 in Chapter 3, Project Description). The proposed backup pipeline would emerge from the ground at Air Gap No. 3, which would span 40 to 80 feet and pass over Alameda Siphon No. 2 before transitioning back underground and connecting to Alameda Siphon No. 3. The 36-inch-diameter potable water pipeline to the town of Sunol generally parallels the proposed backup pipeline alignment for most of its length and crosses the backup pipeline alignment at pipeline stations 48+50 and 56+25; the backup pipeline would be routed beneath the 36-inch-diameter water pipeline to the town of Sunol where these two pipelines cross. The Alameda East Portal Overflow Pipeline, which has been extended to the southern tip of quarry Pit F6 as part of the Alameda Siphons Seismic Reliability Upgrade project, is located between pipeline stations 2+00 and 3+50. The proposed backup pipeline alignment would cross under the Alameda East Portal Overflow Pipeline at pipeline station 2+00. A 12-inch-diameter GE water pipeline and GE pump station are located near pipeline station 0+00 to the east of the proposed backup pipeline alignment and north of the Alameda Siphons. The proposed backup pipeline alignment does not cross the GE water pipeline.

The DWR's South Bay Aqueduct is an 84-inch-diameter pipeline that conveys water from the California State Water Project to portions of Alameda and Santa Clara Counties. The South Bay Aqueduct traverses east-west through the project area on the north side of quarry Pits F3-East and F3-West. As described in Chapter 3, Project Description, an abandoned inter-tie pipeline from a former connection between the South Bay Aqueduct and the SFPUC regional water system runs east-west along the northern edge of Pit F3-West. Construction of the proposed cutoff wall around the perimeter of Pits F3-East and F3-West could require work within DWR's right-of-way for the South Bay Aqueduct. In addition, the SFPUC proposes to remove the segment of the abandoned inter-tie pipeline located beneath Staging Area D during project construction.

Wastewater

The Sunol Valley is not served by local sewer systems, and there are no nearby sewer treatment facilities. Residents and businesses use either onsite septic systems (and associated leachfields) or portable chemical toilets that are periodically replaced and hauled offsite for treatment. Wastewater generated at the SFPUC facilities in the Sunol Valley is collected in holding tanks and is periodically pumped from the holding tanks into a truck and transported to the Dublin San Ramon Services District's wastewater facility in Dublin for treatment (San Francisco Planning Department, 2008).

5.12.1.2 Solid Waste Disposal

Solid waste disposal facilities located in Alameda and Santa Clara Counties would be utilized to dispose of project-related construction waste. There are eight active landfills in Alameda and Santa Clara Counties: the Altamont Landfill and Resource Recovery Center, Vasco Road Sanitary Landfill, City of Palo Alto Refuse Disposal Site, Guadalupe Sanitary Landfill, Kirby Canyon Recycling and Disposal Facility, Newby Island Landfill, Zanker Material Processing Facility, and Zanker Road Resource Recovery Operations Landfill. **Table 5.12-1** lists the active landfills in Alameda and Santa Clara Counties, including their characteristics and capacity information. The total remaining capacity of these landfills is approximately 105,759,332 cubic yards (CIWMB, 2009).

TABLE 5.12-1
ACTIVE LANDFILLS IN ALAMEDA AND SANTA CLARA COUNTIES

Jurisdiction	Total Estimated Permitted Capacity[a] (cubic yards)	Total Estimated Capacity Used[b] (cubic yards)	Percent Used[b]	Estimated Remaining Capacity[a] (cubic yards)	Remaining Capacity Date[c]	Percent Remaining Capacity[b]	Closure Date[a]	Waste Types Accepted/Permitted
Alameda County								
Altamont Landfill and Resource Recovery	62,000,000	16,280,000	26%	45,720,000	As of 08/22/05	74%	1/1/2029	Ash, construction/demolition, contaminated soil, green materials, industrial, mixed municipal, other designated waste, tires, shreds
Vasco Road Sanitary Landfill	31,942,205	22,071,501	69%	9,870,704	As of 06/19/07	31%	1/1/2015	Contaminated soil, industrial, mixed municipal, other designated waste, green materials, construction/ demolition
Santa Clara County								
City of Palo Alto Refuse Disposal Site	7,758,854	6,969,672	90%	789,182	As of 05/01/05	10%	12/30/2011	Construction/demolition, industrial, mixed municipal
Guadalupe Sanitary Landfill	28,600,000	14,000,000	49%	14,600,000	As of 06/11/01	51%	unknown	Construction/demolition, green materials, industrial, mixed municipal
Kirby Canyon Recycling and Disposal Facility	36,400,000	20,871,507	57%	15,528,493	As of 06/11/01	43%	12/31/2022	Construction/demolition, industrial, tires, green materials, mixed municipal
Newby Island Landfill	50,800,000	32,525,047	64%	18,274,953	As of 9/30/06	36%	6/1/2025	Construction/demolition, contaminated soil, green materials, industrial, mixed municipal, sludge (biosolids), tires
Zanker Material Processing Facility	540,100	41,100	8%	499,000	As of 04/01/04	92%	12/31/2018	Construction/demolition, other designated waste
Zanker Road Resource Recovery Operations Landfill	1,300,000	823,000	63%	477,000	As of 08/16/05	37%	01/01/2029	Construction/demolition, green materials, industrial, tires

a Capacity information from Solid Waste Information System (SWIS) Facility/Site Listings (CIWMB, 2009; CalRecycle, 2010).
b Calculated using California Integrated Waste Management Board data (CIWMB, 2009).
c Remaining capacity date from SWIS Facility/Site Listings.

5.12.2 Regulatory Framework

5.12.2.1 Federal Regulations

No federal regulations related to utilities and service systems are applicable to the proposed project.

5.12.2.2 State Regulations

California Public Utilities Commission

The California Constitution vests the California Public Utilities Commission (CPUC) with the sole authority to regulate privately owned and investor-owned public utilities, such as PG&E. This exclusive power extends to all aspects of utility regulation, including facility location, design, construction, maintenance, and operation. CPUC provisions require regulated utilities to work closely with local governments and give due consideration to their concerns. The CPUC does not regulate publicly owned utilities such as the SFPUC.

California Integrated Waste Management Act of 1989

The California Integrated Waste Management Board (CIWMB) was created to oversee, manage, and track waste generated in California. In January 2010, the CIWMB changed its name to the Department of Resources, Recycling, and Recovery (CalRecycle). The authority and responsibilities of the CIWMB (now CalRecycle) were shaped by Assembly Bill (AB) 939 and Senate Bill 1322, which were signed into law as the California Integrated Waste Management Act of 1989 (Public Resources Code [PRC], Division 30). The California Integrated Waste Management Act, as modified by subsequent legislation, required all California cities and counties to implement programs to reduce, recycle, and compost at least 50 percent of wastes by the year 2000 (PRC Section 41780). A jurisdiction's diversion rate is the percentage of total waste that it diverts from disposal through reduction, reuse, and recycling programs. The state determines compliance with this mandate to divert 50 percent of generated waste (which includes both disposed and diverted waste) through a complex formula. This formula requires cities and counties to conduct empirical studies to establish a "base-year" waste generation rate against which future diversion is measured. The actual determination of the diversion rate in subsequent years is arrived at through deduction instead of direct measurement. Rather than counting the amount of material recycled and composted, the city or county tracks the amount of material disposed of at landfills and then subtracts that amount from the base-year amount; the difference is assumed to be diverted (PRC Section 41780.2).

Utility Notification Requirements

Title 8, Section 1541 of the California Code of Regulations requires excavators to determine the approximate locations of subsurface installations such as sewer, telephone, fuel, electricity, and water lines (or any other subsurface installations that may reasonably be encountered during excavation work) prior to opening an excavation.

California law (Government Code Section 4216 et seq.) requires owners and operators of underground utilities to become members of and participate in a regional notification center, such as Underground Service Alert–Northern California (USA North). USA North receives reports of planned excavations from public and private excavators, and transmits the information to all participating members that may have underground facilities at the location of an excavation. USA members mark or stake their facilities, provide information, or give clearance to dig (USA North, 2010).

5.12.2.3 Local Regulations

Alameda County Source Reduction and Recycling Initiative

Alameda County Measure D (the Alameda County Source Reduction and Recycling Initiative Charter Amendment) required that the County prepare a source reduction and recycling plan to assist it in reaching a 75 percent diversion goal by 2010, which exceeds the 50 percent diversion goal for individual jurisdictions mandated by AB 939. The plan identifies specific programs, objectives, and strategies for meeting the goal. One major program area covered by the plan is Green Building, which focuses on construction and demolition debris recovery of unpainted wood, concrete, asphalt, and cardboard. The other four major program areas are Organics, Business and Public Agencies, Schools, and Public Education. The Alameda County Source Reduction and Recycling Board, created by Measure D, implements this plan.

Alameda County Integrated Waste Management Plan

Additionally, the Alameda County Waste Management Authority adopted the *Alameda County Integrated Waste Management Plan*, which identifies waste diversion plans and programs. The plan promotes interjurisdictional cooperation to achieve the goal of 75 percent diversion by 2010. This goal includes diverting construction and demolition waste, and the Waste Management Authority encourages member cities to mandate construction and demolition debris recycling. A model ordinance requires 100 percent diversion of all Portland cement concrete and asphalt concrete, and an average of at least 50 percent diversion of all other construction and demolition debris.

5.12.3 Impacts and Mitigation Measures

5.12.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to utilities and service systems, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements;
- Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Be out of compliance with federal, state, and local statutes and regulations related to solid waste.

Due to the nature of the proposed project, this EIR applies the following additional criterion (in addition to those described above), and considers that the project would have a significant effect on utilities and service systems if it were to:

- Disrupt operation or require relocation of regional or local utilities.

5.12.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no construction or operational impacts related to five of the above-listed significance criteria; therefore, no impact discussion is provided for these topics for the reasons described below.

1) Exceed Wastewater Treatment Requirements,
2) Result in the Construction or Expansion of Wastewater Treatment Facilities, or
3) Result in a Determination by the Wastewater Treatment Provider That There is Insufficient Capacity to Serve the Project.

The SABPL project would not generate wastewater. Therefore, the project would not exceed the wastewater treatment requirements of the Regional Water Quality Control Board, result in the construction or expansion of wastewater facilities, or exceed wastewater treatment capacity. Thus, the significance criteria related to wastewater treatment and capacity are not applicable to construction or operation of the proposed project and are not discussed further.

4) Have Insufficient Water Supply Available to Serve the Project. The proposed project would not require additional water supply or require new or expanded water supply resources or entitlements. Thus, the significance criterion related to sufficient water supply is not applicable to construction or operation of the proposed project and is not discussed further.

5) Require or Result in the Construction or Expansion of Stormwater Drainage Facilities. The project does not propose to construct or expand stormwater drainage facilities. As discussed under Impact HY-7 in Section 5.16, Hydrology and Water Quality, project implementation would not substantially increase the rate or amount of stormwater runoff. Thus, project implementation would not cause an exceedance of existing stormwater drainage capacity that would necessitate the construction or expansion of infrastructure. Thus, the significance criterion related to the construction or expansion of stormwater drainage facilities is not applicable to the proposed project and is not discussed further. For additional discussion of the proposed project's effects on stormwater drainage facilities, see Section 5.16, Hydrology and Water Quality.

In addition, as described below, there would be no operational impacts related to two additional significance criteria; therefore, the impact discussions for these topics focus on project construction.

1) Be Served by a Landfill with Insufficient Permitted Capacity to Accommodate the Project's Solid Waste Disposal Needs Associated During Operations, and
2) Be Out of Compliance with Statutes and Regulations Related to Solid Waste During Operations.

Upon completion of project construction, the proposed project would not generate solid waste requiring disposal. Thus, the significance criteria related to solid waste and landfill capacity are not applicable to project operations, and are discussed below only as they relate to project construction (see Impacts UT-3 and UT-4).

The analysis of project effects related to utilities and service systems addresses temporary construction-related impacts as well as impacts during project operations. However, as indicated in Sections 5.12.3.4 and 5.12.3.5, below, potential impacts on utilities and utility services would occur primarily during project construction; project operations would not result in substantial long-term impacts on utilities and service systems. During construction, short-term temporary disruption of service could occur if existing utilities were accidentally damaged during utility relocation or other project-related construction activities.

This analysis also identifies potential impacts related to landfill capacity resulting from the disposal of construction waste as well as the ability of local jurisdictions to comply with federal, state, and local landfill statutes. The largest potential source of solid waste would be excavated soil and rock material. While much of the soil would be reused onsite as backfill, an estimated 118,250 cubic yards of excess spoils would be generated during construction activities. Excess spoils would be: (a) permanently placed in an earthen berm at the North Spoils Site or in an earthen berm at the former nursery site located just east of Pit F3-East; (b) temporarily placed in Pit F6 or at the Surface Mining Permit 30 (SMP-30) aggregate processing facility and subsequently resold by the quarry operator for reuse; and/or (c) hauled away to an appropriate landfill facility. Thus, the analysis evaluates the potential effects of landfill disposal with respect to the available capacity of local landfills and local jurisdictions' ability to comply with solid waste diversion rates.

5.12.3.3 Summary of Impacts

Table 5.12-2 lists the proposed project's utility and service system impacts and significance determinations.

TABLE 5.12-2
SUMMARY OF IMPACTS – UTILITIES AND SERVICE SYSTEMS

Impacts	Significance Determinations
Impact UT-1: Project construction could result in a substantial adverse effect related to disruption of utility operations or accidental damage to existing utilities.	LSM
Impact UT-2: Project construction could result in a substantial adverse effect related to the relocation of regional or local utilities.	LSM
Impact UT-3: Project construction would not result in a substantial adverse effect related to landfill capacity.	LS
Impact UT-4: Project construction would not result in a substantial adverse effect related to compliance with federal, state, and local statutes and regulations pertaining to solid waste.	LS
Impact UT-5: Project operations would not have a substantial adverse effect related to the disruption or relocation of existing utilities or utility services.	LS
Impact C-UT: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts related to disruption or relocation of utilities.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.12.3.4 Construction Impacts and Mitigation Measures

Impact UT-1: Project construction could result in a substantial adverse effect related to disruption of utility operations or accidental damage to existing utilities. (Less than Significant with Mitigation)

Excavation activities and installation of the proposed pipelines and cutoff wall could result in accidental damage to existing regional or local utility lines or disruption of utility services. Installation of the backup pipeline would require excavation of an approximately 7,000-foot-long, 12- to 15-foot-wide, and up to 20-foot-deep trench. The 12-inch-diameter water pipeline to the town of Sunol would be installed parallel to and west of the backup pipeline and would require excavation of an approximately 5,700-foot-long, 3-foot-wide trench. The transfer pipeline would require excavation of an approximately 1,250-foot-long, 6-foot-wide, and 8-foot-deep trench; the trench for the dewatering pipeline would be 1,400 feet long, 4 feet wide, and 6 feet deep. The proposed cutoff wall would require excavation of an approximately 5,000-foot-long and 80-foot-deep trench along the perimeter of Pits F3-East and F3-West and would require construction within DWR's right-of-way for the South Bay Aqueduct.

The use of boom trucks and/or cranes to stage and lay pipeline segments, install the pumps at the Alameda Creek Pump Station, and construct the new overhead powerlines could result in accidental damage to existing overhead utility lines. In addition, overhead utility poles and underground utility lines along Calaveras Road could be susceptible to accidental damage from the movement of large construction equipment and vehicles throughout the project area.

As discussed in Section 5.12.1, above, a number of underground utility lines cross the project area, including a natural gas pipeline, electrical powerlines, and several water supply pipelines. The 8-inch-diameter Chevron crude oil pipeline and the 12-inch-diameter GE water pipeline would not be at risk of damage because project construction would not require excavation or trenching in the immediate vicinity of these pipelines. As indicated in the engineering design drawings associated with the proposed project (SFPUC, 2011; URS, 2010c), existing utilities in the project area with the potential to conflict with the proposed project include:

- San Antonio Pipeline
- 36-inch-diameter PG&E high-pressure gas pipeline
- 22-inch-diameter PG&E high-pressure gas pipeline
- Overhead electrical distribution and transmission lines and associated utility poles
- Alameda Siphons Nos. 1 through 3
- South Bay Aqueduct
- Sunol Pump Station Pipeline
- Alameda East Portal Overflow Pipeline

Accidental rupture of or damage to these utility lines during project construction could temporarily disrupt utility services and, in the case of high-priority utilities like the two PG&E high-pressure gas pipelines, could result in significant safety hazards for construction workers. For the above reasons, impacts on existing utilities and utility services during project construction are considered significant. However, these impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures M-UT-1a through M-UT-1h.

Mitigation Measure M-UT-1a: Confirm Utility Line Information.

The SFPUC or its contractors shall locate overhead and underground utility lines that may be encountered during excavation work prior to opening an excavation. Information regarding the size, color, and location of existing utilities shall be confirmed before excavation activities commence. These utilities shall be highlighted on all construction drawings.

Mitigation Measure M-UT-1b: Safeguard Employees from Potential Accidents Related to Underground Utilities.

While any excavation is open, the SFPUC or its contractors shall protect, support, or remove underground utilities as necessary to safeguard employees. As part of contractor specifications, the contractor(s) shall be required to provide updates on planned excavations for the upcoming week, and to specify when construction will occur near a high-priority utility—specifically the 36-inch-diameter and 22-inch-diameter PG&E gas pipelines as well as any other high-priority utility lines that are identified. At the beginning of each week when this work will take place, SFPUC construction managers shall attend tailgate meetings with contractor staff, as required by the California Occupational Safety and Health Administration, to record all protective and avoidance measures regarding such excavations.

Mitigation Measure M-UT-1c: Notify Local Fire Departments.

In the event that construction activities result in damage to high-priority utility lines, including leaks or suspected leaks, the SFPUC or its contractors shall immediately notify local fire departments to protect worker and public safety.

Mitigation Measure M-UT-1d: Emergency Response Plan.

Prior to commencing construction activities, the SFPUC shall develop an emergency response plan that outlines procedures to follow in the event of a leak or explosion. The emergency response plan shall identify the names and phone numbers of PG&E staff who would be available 24 hours per day in the event of damage or rupture of the high-pressure PG&E natural gas pipelines. The plan shall also detail emergency response protocols including notification, inspection, and evacuation procedures; any equipment and vendors necessary to respond to an emergency, such as an alarm system; and routine inspection guidelines.

Mitigation Measure M-UT-1e: Ensure Prompt Reconnection of Utilities.

The SFPUC or its contractors shall promptly notify utility providers to reconnect any disconnected utility lines as soon as it is safe to do so.

Mitigation Measure M-UT-1f: Coordinate Final Construction Plans with Affected Utilities.

The SFPUC or its contractors shall coordinate final construction plans and specifications with affected utilities.

Mitigation Measure M-UT-1g: Avoidance of Utilities Constructed or Modified by Other SFPUC Projects.

The final construction drawings for the SABPL project shall reflect any changes in utility locations as well as the locations of any new utilities installed during construction of other SFPUC projects in the Sunol Valley whose disturbance areas overlap with the SABPL project area. These overlapping projects include the Alameda Siphons Seismic Reliability Upgrade, Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir, San Antonio Pump Station Upgrade, and New Irvington Tunnel projects.

Mitigation Measure M-UT-1h: Measures to Protect Alameda Siphons Nos. 1, 2, and 3.

SFPUC engineers and the construction contractor’s engineers shall evaluate the structural integrity of Alameda Siphons Nos. 1, 2, and 3 in the vicinity of the proposed connection with the backup pipeline and identify the specific design and construction techniques to be implemented during connection of the backup pipeline to Alameda Siphon No. 3 to prevent damage to Alameda Siphons Nos. 1, 2, and 3. Particular attention shall be paid to Alameda Siphons Nos. 1 and 2, which are historical resources. The SFPUC shall incorporate protective measures into the construction contract specifications if applicable to prevent damage to

Alameda Siphons Nos. 1, 2, and 3. Potential measures include shoring excavated areas around the siphons, using low-impact tunneling equipment, prohibiting unnecessary equipment movement over or near the siphons, and/or securing or enclosing the siphons to prevent movement or damage during connection with the proposed backup pipeline.

Implementation of Mitigation Measures M-UT-1a through M-UT-1h would address impacts related to the potential disruption of utility operations or accidental damage to existing utilities by requiring that SFPUC engineers and/or the construction contractor: confirm the location of existing utilities and mark the confirmed locations accurately on the final construction drawings; work with utility service providers to minimize the risk of damage to existing utility lines and ensure prompt reconnection of service in the event of a service disruption; clearly outline the procedures to follow in the event of a leak or explosion; take special precautions when working near high-priority utility lines; immediately notify local fire departments of any damage to high-priority utility lines; and take protective measures to avoid damage to Alameda Siphons Nos. 1, 2, and 3 during project construction. Therefore, this impact would be less than significant with mitigation.

Impact UT-2: Project construction could result in a substantial adverse effect related to the relocation of regional or local utilities. (Less than Significant with Mitigation)

The proposed alignments for the backup pipeline and the 12-inch-diameter water pipeline to the town of Sunol would cross beneath or above existing utilities at several locations. The SABPL project does not propose to relocate utilities, but it is possible that relocation would be necessary once the locations and characteristics of conflicting utilities are confirmed. In addition, the utility poles along the backup pipeline alignment and within the limits of the pipeline trench might need to be relocated if they have not already been moved as part of another SFPUC project prior to construction of the SABPL project. Consequently, installation of the backup pipeline could require temporary or permanent relocation of utility lines that are owned and operated by other utility companies. For the above reasons, impacts related to utility relocation are considered significant. However, with implementation of the mitigation measures described below, this impact would be reduced to a less-than-significant level.

Mitigation Measure M-UT-1a: Confirm Utility Line Information.

(See description under Impact UT-1, above.)

Mitigation Measure M-UT-1f: Coordinate Final Construction Plans with Affected Utilities.

(See description under Impact UT-1, above.)

Mitigation Measure M-UT-1g: Avoidance of Utilities Constructed or Modified by Other SFPUC Projects.

(See description under Impact UT-1, above.)

Adverse effects related to the relocation of regional or local utilities would be addressed through implementation of Mitigation Measures M-UT-1a, M-UT-1f, and M-UT-1g by requiring that the SFPUC or its contractors coordinate final construction plans and specifications with affected utilities and ensuring that these final plans and specifications include the most current information regarding existing utilities in the project area.

Impact UT-3: Project construction would not result in a substantial adverse effect related to landfill capacity. (Less than Significant)

Most construction debris would consist of spoils, rock, and other excavated materials. As described in Section 3.6.9 in Chapter 3, Project Description, an estimated 118,250 cubic yards of excess spoils and excavated materials would be generated during construction of the proposed project. Depending on the quality of the excavated material, excavated spoils could be: (a) temporarily placed in the bottom of Pit F6 or at the SMP-30 aggregate processing facility for subsequent resale and reuse; (b) permanently placed in an earthen berm at the North Spoils Site or in an earthen berm at the former nursery site located east of Pit F3-East; and/or (c) hauled offsite to an appropriate landfill facility for disposal.

Landfills and disposal facilities in Alameda and Santa Clara Counties that accept construction and demolition waste are shown in Table 5.12-1. Although construction waste could be disposed of at landfills in either of these counties, it is probable that materials generated during construction activities would be hauled to the Altamont Landfill or Vasco Road Sanitary Landfill in Alameda County, given the proximity of these facilities to the project area and their ability to accept contaminated soil.

The quantities of excavated material that would be disposed of at landfills cannot be specifically calculated at this time. However, because soils in the project area are generally considered to be of good quality, the SFPUC estimates that 25 percent of the excess spoils would be hauled to a landfill, and the remaining 75 percent of the excess spoils would be permanently placed in an earthen berm at the North Spoils Site or in an earthen at the former nursery site located east of Pit F3-East, and/or sold for subsequent reuse (e.g., temporarily placed in Pit F6 or the SMP-30 aggregate processing facility during project construction). Based on this assumption, approximately 29,560 cubic yards of excess spoils would be disposed of at nearby landfills. This quantity represents approximately 0.06 percent and 0.3 percent of the estimated remaining landfill capacity at the Altamont and the Vasco Road Sanitary Landfills, respectively, and a much smaller percentage of the total remaining landfill capacity in Alameda and Santa Clara Counties.

Because adequate landfill capacity exists to accept the project's construction waste, impacts related to exceeding permitted landfill capacity would be less than significant.

Impact UT-4: Project construction would not result in a substantial adverse effect related to compliance with federal, state, and local statutes and regulations pertaining to solid waste. (Less than Significant)

Both Alameda and Santa Clara Counties are in compliance with the State of California's 50 percent annual waste diversion goal. As of 2006, unincorporated Alameda County diverted 69 percent of its waste, and unincorporated Santa Clara County diverted 58 percent (CalRecycle, 2011a, 2011b). As described above, four management strategies for excess spoils are proposed: (a) temporary placement in the bottom of Pit F6 or at the SMP-30 aggregate processing facility for subsequent resale and reuse; (b) permanent placement in an earthen berm at the North Spoils Site; (c) permanent placement in an earthen berm at the former nursery site to the east of Pit F3-East; and/or (d) offsite disposal at an appropriate landfill facility. Although the quantities of excavated material to be disposed of at landfills cannot be specifically calculated at this time, the SFPUC estimates that 75 percent of the excess spoils would be diverted from landfills by permanently placing the spoils in earthen berms at the North Spoils Site or former nursery site, or temporarily placing the spoils in Pit F6 or the SMP-30 aggregate processing facility for subsequent resale and reuse. Because the anticipated 75 percent diversion rate for excess spoils generated during SABPL project construction is consistent with Alameda County's 75 percent diversion goal and exceeds the State's 50 percent diversion goal, impacts related to compliance with federal, state, and local solid waste statutes are considered less than significant.

5.12.3.5 Operational Impacts and Mitigation Measures

Impact UT-5: Project operations would not have a substantial adverse effect related to the disruption or relocation of existing utilities or utility services. (Less than Significant)

A discharge from the proposed project would raise water elevations in Pit F3-East above existing levels. As a result, seepage forces could cause erosion or destabilization of the embankment between quarry Pits F3-East and F3-West and Pit F2, potentially jeopardizing the integrity of the South Bay Aqueduct. The potential for high seepage forces to cause internal erosion of the embankment, and the potential for seepage to affect the stability of the embankment were evaluated by URS for the proposed project (URS, 2010a). The results of the analysis indicated that the stability of the embankment could be adversely affected if the water level in Pit F3-East were to reach 253 feet mean sea level (msl) and remain there for an extended period of time (i.e., if the start of dewatering were delayed one or two weeks). However, the proposed project includes a water level sensor in Pit F3-East that would automatically notify operators when water levels in Pits F3-East and F3-West are at or above 195 feet msl. As part of Hanson Aggregates' ongoing water management operations (as described in Chapter 3, Section 3.7, Operations and Maintenance), Hanson Aggregates would manage Pit F3-East to maintain water levels at or below 195 feet msl to ensure sufficient "freeboard"[2] is available to accommodate discharges from the

[2] In this context, freeboard is the vertical distance between the water line and the top of the pit.

backup pipeline. Following a discharge from the backup pipeline, SFPUC facility operators would pump the discharged water out of Pits F3-East and F3-West to San Antonio Reservoir or the Sunol Valley Water Treatment Plant within 30 days or less until water levels are restored to 195 feet msl (URS, 2010b). The proposed project operations would limit the potential for water levels to reach 253 feet msl and would serve to prevent water from remaining at these levels for an extended period of time. In addition, installation of the cutoff wall around Pits F3-East and F3-West would prevent seepage into the embankment. Therefore, potential impacts related to damage to the South Bay Aqueduct during project operations would be less than significant. No other utilities within the project area have the potential to be affected during project operations.

5.12.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Because Pumping Variant 1 does not include construction of the Alameda Creek Pump Station, wet well, control building for the pump station, retaining wall along the southern boundary of the pump station site adjacent to the access road, or the transfer pipeline, excess spoils and the overall soil and surface disturbance associated with Pumping Variant 1 would be slightly less than under the proposed project (108,750 vs. 118,250 cubic yards). As a result, the less-than-significant impacts identified above in Section 5.12.3.4 related to landfill capacity and compliance with statutes and regulations pertaining to solid waste would be lower under Pumping Variant 1. However, because all other facilities and improvements under the proposed project would still be constructed, overall impacts on utilities and utility services would be similar to those of the proposed project, and this variant would not change the conclusions or mitigation measures identified in Sections 5.12.3.4 and 5.12.3.5, above.

Pumping Variant 2

Pumping Variant 2 would construct all facilities and improvements described for the proposed project (except that one of the low-pressure submersible pumps at the new discharge facility would be replaced with a high-pressure submersible pump) and would generate the same volume of excess spoils as the proposed project. Thus, construction and operation of Pumping Variant 2 would not change the analysis or conclusions presented in Sections 5.19.3.4 and 5.19.3.5, or the mitigation measures identified to address potential impacts on utilities and utility services.

5.12.3.7 Cumulative Impacts and Mitigation Measures

Impact C-UT: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts related to disruption or relocation of utilities. (Less than Significant with Mitigation)

The geographic scope for potential cumulative utilities and service systems impacts consists of the project area, immediate vicinity, and the service areas of regional service/utility providers. For landfill capacity, the geographic scope includes the service areas of Alameda and Santa Clara Counties, where disposal of construction-related waste could occur. For compliance with solid waste statutes and regulations, the geographic area encompasses Alameda County.

Damage to or Disruption of Existing Utilities and Relocation of Utilities

As described in Impacts UT-1 and UT-2, the SABPL project could have a significant impact related to the potential to damage existing utilities, disrupt utility services where utility lines would be crossed during construction, or require relocation of some utilities. Several of the projects listed in Table 5.1-6 could also result in damage to existing utilities, disruption of utility services, or relocation of utilities. In particular, the Alameda Siphons Seismic Reliability Upgrade project (Alameda Siphons project) installed new connections between the existing Alameda Siphons and the pipeline that delivers water to the town of Sunol, and constructed a GE pipeline to deliver water to a GE facility to the north. The Alameda Siphons project also extended the Alameda East Portal Overflow Pipeline to SMP-30 Pit F6, and a portion of the existing overflow pipeline was abandoned in place. If the abandoned pipeline segment were encountered during installation of the proposed backup pipeline, it would be demolished at the crossing. The Alameda Siphons project also relocated some overhead utilities to underground locations in the southern portion of the SABPL project area and installed Alameda Siphon No. 4 above the existing San Antonio Pipeline and below the Chevron Pipeline. Additionally, other SFPUC projects within the geographic scope of the SABPL project could cause service disruptions for the same set of customers within a short timeframe as a result of the concurrent implementation of SFPUC projects in the Sunol Valley area. Therefore, cumulative impacts related to disruption of utility operations or accidental damage to existing utilities and relocation of regional or local utilities would be significant and the SABPL project's contribution to this cumulative impact could be cumulatively considerable.

However, as discussed in Impacts UT-1 and UT-2 the SABPL project's impacts related to damaging existing utilities, disrupting utility services, and relocating utilities would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-UT-1a (Confirm Utility Line Information); M-UT-1b (Safeguard Employees from Potential Accidents Related to Underground Utilities); M-UT-1c (Notify Local Fire Departments); M-UT-1d (Emergency Response Plan); M-UT-1e (Ensure Prompt Reconnection of Utilities); M-UT-1f (Coordinate Final Construction Plans with Affected Utilities); M-UT-1g (Avoidance of Utilities Constructed or Modified by Other SFPUC Projects); and M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3)** (see Impact UT-1, above, for descriptions). Implementation of these mitigation measures would ensure that existing utilities are accurately located and protected during construction, and that emergency response procedures are in place to minimize potential damage during construction. With implementation of these mitigation measures, the project's contribution to cumulative impacts related to damage or disruption of existing utilities and relocation of utilities would not be cumulatively considerable (less than significant).

Landfill Capacity

As discussed in Impact UT-3, the proposed project would generate an estimated 118,250 cubic yards of excess spoils. Most of the cumulative projects listed in Table 5.1-6 would also generate construction-related waste. If all of these wastes were disposed of in offsite disposal facilities, there could be a significant cumulative impact on landfill capacity. However, as discussed in Impact UT-3, approximately 75 percent of the spoils produced under the proposed project would be permanently placed at the North Spoils site or former nursery site located just east of Pit F3-East and/or sold for subsequent reuse. The 25 percent of the spoils that would be disposed of offsite (approximately 29,600 cubic yards) represents a very small fraction of the total remaining landfill capacity in Alameda and Santa Clara Counties. Therefore, the project's contribution to cumulative demand on landfill capacity would not be cumulatively considerable (less than significant).

Compliance with Solid Waste Statutes and Regulations

The proposed project and all of the projects listed in Table 5.1-6 would generate wastes that require offsite disposal. However, the proposed project would divert approximately 75 percent of the excess spoils from offsite disposal facilities (in excess of the state-mandated goal of 50 percent), and each of the cumulative projects would be required to implement source reduction, recycling, and composting measures—as mandated by AB 939 and implemented by the Alameda County waste management ordinance—to divert wastes from landfills. Therefore, the potential cumulative impact related to compliance with solid waste statutes and regulations would be less than significant.

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are substantially similar to or the same as those of the proposed project (refer to Section 5.12.3.6, Impact Analysis for Pumping Variants), the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.12.4 References

Alameda County, *East County Area Plan, A Portion of the Alameda County General Plan, Volume I: Goals, Policies, and Programs*. May 2002.

California Department of Transportation (Caltrans), *Caltrans Project Development Procedures Manual – Appendix LL.* 1999.

California Department of Resources Recycling and Recovery (CalRecycle). Available online at: http://www.calrecycle.ca.gov/profiles/. Accessed November 16, 2010.

California Department of Resources Recycling and Recovery (CalRecycle), Jurisdiction Profile for Alameda County (Unincorporated). Available online at: http://www.calrecycle.ca.gov/Profiles/Juris/JurProfile2.asp?RG=U&JURID=5&JUR=Alameda%2Dunincorporated. Accessed November 14, 2011a.

California Department of Resources Recycling and Recovery (CalRecycle), Jurisdiction Profile for Santa Clara County (Unincorporated). Available online at: http://www.calrecycle.ca.gov/Profiles/Juris/JurProfile2.asp?RG=U&JURID=467&JUR=Santa+Clara%2Dunincorporated. Accessed November 14, 2011b.

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San Francisco Planning Department, *Initial Study/Mitigated Negative Declaration, SFPUC Alameda Siphons Seismic Reliability Upgrade Project*, San Francisco Planning Department File No. 2006.0776E. May 2008.

URS Corporation, Memorandum from Philip Meymand and Chi-Chin Tsai to Vivian Chow, SFPUC, *Final Seepage Analysis for SABPL Pond F3-East.* March 31, 2010a.

URS Corporation, Memorandum from Philip Meymand and Chi-Chin Tsai to Vivian Chow, SFPUC, *Project Description for SABPL Pond F3-East Cutoff Wall*. March 5, 2010b.

URS Corporation, *Final Conceptual Engineering Report for the Upper Alameda Creek Filter Gallery Project*. June 30, 2010c.

Underground Service Alert–Northern California (USA North), "Dig Safely" Brochure. Available online at: http://www.usanorth.org/USAColorBrochure.pdf. Accessed November 16, 2010.

5.13 Public Services

This section describes the existing conditions and regulatory setting for public services in the Sunol Valley and analyzes potential impacts on public services that could result from the proposed San Antonio Backup Pipeline (SABPL) project. Public services addressed in this section include law enforcement services and fire protection services. Since the SABPL project does not propose to construct new homes or businesses in the area such that an increase in the local population would occur, the project would not affect schools or libraries; therefore, these public services are not addressed in this section. Potential impacts on parks and recreational facilities are analyzed in Section 5.11, Recreation.

5.13.1 Setting

The proposed project is located entirely within SFPUC Alameda watershed lands in the Sunol Valley, an unincorporated area of Alameda County. Existing land uses in the immediate project vicinity include gravel mining operations, commercial nurseries, grazing, regional open space, and SFPUC water supply facilities. There are two private residences in the immediate project vicinity: an SFPUC watershed keeper's residence near the Alameda East Portal, approximately 225 feet east of the project area and Calaveras Road; and a private ranch residence (Garcia residence), approximately 1,300 feet southwest of the project area. The nearest community to the project area is the town of Sunol, located approximately 1 mile to the northwest.

5.13.1.1 Law Enforcement Services

The Alameda County Sheriff's Office provides law enforcement services to unincorporated areas of Alameda County, including the project area. The closest sheriff's station is at 39439 Paseo Padre Parkway in Fremont, approximately 6 miles west of the project area. The City of Fremont Police Department also provides law enforcement services by responding to emergencies in the project area. The closest police station is at 2000 Stevenson Boulevard in Fremont, approximately 5.5 miles west of the project area (Mulder, 2010). However, considering that responders are on mobile patrol, most responses do not originate from a specific office.

The SFPUC maintains three cottages in the Alameda watershed where SFPUC Natural Resources Division staff reside: the watershed keeper's residence in the vicinity of the Alameda East Portal (described above), a home located approximately one mile west of the project area on Andrade Road, and another cottage near Calaveras Dam. These staff members enforce federal, state, county, and watershed policies, rules, and regulations to minimize dumping, poaching, trespassing, and other illegal activities in the Alameda watershed, including the project area, during daylight hours and also at night when circumstances warrant. Natural Resources Division personnel contact the Alameda County Sheriff's Office when needed to address criminal violations in the Alameda watershed.

5.13.1.2 Fire Protection Services

The California Department of Forestry and Fire Protection (CAL FIRE) provides fire protection services for the SFPUC Alameda watershed, including the project area. Services provided by CAL FIRE include emergency response, hazardous materials spill response, medical aid, and wildland fire suppression and training. CAL FIRE has designated portions of the Alameda watershed as State Responsibility Areas and Local Responsibility Areas. State Responsibility Areas are defined in California Public Resources Code Sections 4125–4127 as lands for which the state has financial responsibility with respect to preventing and suppressing fires. Local Responsibility Areas are defined as areas for which local agencies have the financial responsibility to prevent and suppress fires (CAL FIRE, 2007). However, in many instances, local fire departments contract with CAL FIRE to provide services. The project area is designated as a Local Responsibility Area (CAL FIRE, 2008) within the service area of the Alameda County Fire Department. In the event of a vegetation fire at the project site, the Alameda County Fire Department would also dispatch CAL FIRE to respond (ACFD, 2010).

The CAL FIRE station nearest to the project area is Fire Station 14, which is at 11345 Pleasanton Sunol Road, just north of Interstate 680 in Sunol's Santa Clara Unit, approximately one mile northwest of the project site. In the event of a fire emergency in the project area, CAL FIRE would be dispatched as the first-response team.

5.13.2 Regulatory Framework

5.13.2.1 Federal Regulations

There are no federal regulations governing public services that pertain to the SABPL project.

5.13.2.2 State Regulations

There are no state regulations governing public services that pertain to the SABPL project.

5.13.2.3 Local Regulations

SFPUC Alameda Watershed Management Plan

The *Alameda Watershed Management Plan* (Alameda WMP) provides a policy framework for the SFPUC to make management decisions about the activities, practices, and procedures that are appropriate on SFPUC lands in the Alameda watershed. With respect to public services, the Alameda WMP outlines requirements related to fire protection services, including procedures that contractors must adhere to during construction activities. Section 5.17, Hazards and Hazardous Materials, presents the pertinent Alameda WMP policies related to fire prevention within the Alameda watershed.

5.13.3 Impacts and Mitigation Measures

5.13.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to public services, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, police protection, schools, parks, or other services.

Due to the nature of the proposed project, there would be no impacts related to the above criterion for the reasons described below:

- *Result in Substantial Adverse Physical Impacts Associated with the Provision of, or the Need for, New or Physically Altered Governmental Facilities*. During the proposed 20- to 24-month construction period, up to 89 construction workers would be employed at the project site, depending on the phase of construction and the construction activities taking place (see Chapter 3, Section 3.6.10, Construction Equipment and Workforce). It is expected that construction workers could come from any part of the Bay Area. While it is possible that some workers might temporarily relocate from other areas, the proposed project would not result in a substantial increase in the local population. Potential incidents requiring law enforcement, fire protection, or emergency services could occur during construction; however, any temporary increase in incidents would not exceed the capacity of local law enforcement, fire protection, and emergency facilities such that new or expanded facilities would be required, because any temporary increase in the local population during project construction would be negligible and could be accommodated by existing service providers. Construction of the proposed project would not result in impacts related to the need for new or physically altered governmental facilities in order to maintain existing levels of public services, and no construction-related public service impacts would occur.

  The proposed project would not result in a permanent increase in the local population. Operation and post-construction maintenance activities would be similar to existing maintenance activities and would not result in substantial increases in the demand for public services, including fire protection, police protection, libraries, schools, hospitals, or other services. Therefore, operational impacts related to public services are not applicable.

  Because there would be no construction or operational impacts, the criterion related to the need for new or modified governmental facilities is not applicable to the project and is not discussed further.

5.13.3.2 Construction and Operational Impacts and Mitigation Measures

As described above, implementation of the proposed project would not result in impacts related to public services. Therefore, no mitigation measures related to this resource topic are necessary.

5.13.3.3 Impact Analysis for Pumping Variants

Pumping Variant 1 and Pumping Variant 2

The construction schedule, duration, crew sizes, and activities associated with implementation of Pumping Variants 1 and 2 would be the same as or very similar the proposed project. Therefore, as with the proposed project, construction of either pumping variant would not result in impacts related to new or physically altered governmental facilities, and no construction-related public service impacts would occur.

In addition, as with the proposed project, operation and post-construction maintenance activities associated with Pumping Variants 1 and 2 would be similar to existing maintenance activities and would not increase the demand for public services. Thus, the effects of either pumping variant on public services would be the same as those under the proposed project, and would not change the analysis or conclusions presented in Section 5.13.3.2, above.

5.13.3.4 Cumulative Impacts and Mitigation Measures

Implementation of the proposed project would not result in any cumulative impacts related to public services because the project would not result in any project-specific impacts related to this topic.

Cumulative Impacts of Pumping Variants

As with the proposed project, implementation of either Pumping Variant 1 or Pumping Variant 2 would not result in construction-related or operational impacts (refer to Section 5.13.3.3, Impact Analysis for Pumping Variants). Thus, the cumulative impact conclusion provided above applies to both project variants.

5.13.4 References

Alameda County Fire Department (ACFD), Dispatcher No. 568, personal communication with Kirstin Conti, Project Associate, Environmental Science Associates. October 13, 2010.

California Department of Forestry and Fire Protection (CAL FIRE), Fire and Resource Assessment Program: Alameda County Fire Hazard Severity Zones in State Responsibility Area [Map]. November 7, 2007.

California Department of Forestry and Fire Protection (CAL FIRE), Fire and Resource Assessment Program: Alameda County Very High Fire Hazard Severity Zones in Local Responsibility Area [Map]. September 3, 2008.

Mulder, Judy, External Affairs Representative, Alameda County Sheriff's Office, personal communication with Kirstin Conti, Project Associate, Environmental Science Associates. October 4, 2010.

5.14 Biological Resources

This section describes the biological resources present in the vicinity of the proposed San Antonio Backup Pipeline (SABPL) project and evaluates the project's impacts on sensitive biological resources, including wetlands and aquatic species, fisheries, sensitive habitats, special-status plant and animal species, and protected trees.

5.14.1 Setting

5.14.1.1 Definitions

Project area refers to the area that would experience project-related temporary or permanent surface disturbance, tree removal, or other alterations of habitat within the biological resources study area. (See Section 5.14.1.3, below, for a discussion of the extent to which the SABPL project area overlaps with other SFPUC projects in the Sunol Valley.)

Study area refers to a larger area within which biological resources could be subject to indirect effects (e.g., disturbance to wildlife from construction-related noise).

Special-status biological resources include special-status plants and animals,[1] sensitive natural communities, wetlands, and other waters of the United States and of the state, as defined by the U.S. Army Corps of Engineers (Corps), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Services (NMFS), the California Department of Fish and Game (CDFG), and the California Regional Water Quality Control Board (RWQCB). (See Section 5.14.1.3 for a discussion of special-status biological resources, including special-status plant and animal species, in the project area).

Sensitive natural community is a natural community that receives regulatory recognition from municipal, county, state, and/or federal entities, such as the CDFG in its California Natural Diversity Database (CNDDB), because the community is unique in its constituents, restricted in distribution, supported by distinctive soil conditions, and/or considered locally rare. (See Section 5.14.1.3 for a discussion of sensitive natural communities in the project area).

Special-status plant and animal species are defined as:

- Species listed under the Federal Endangered Species Act (FESA), Marine Mammal Protection Act, California Endangered Species Act (CESA), California Fish and Game Code, or Native Plant Protection Act as endangered, threatened, or depleted; species that are candidates or proposed for listing; or species that are designated as rare or fully protected.

[1] Several species known to occur within the general project area are accorded "special status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species."

- Locally rare species defined in the CEQA Guidelines, which may include species that are designated as sensitive, declining, rare, or locally endemic, or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watch lists. This includes species on Lists 1B and 2 of the California Native Plant Society (CNPS, 2009).

5.14.1.2 Information Sources and Survey Methodology

Literature Review

The EIR consultant team reviewed the following information related to the project area and the plant and wildlife species that may occur there:

- USFWS lists of federal endangered, threatened, proposed, and candidate species that occur in the La Costa Valley and Niles 7.5-minute U.S. Geological Survey (USGS) 7.5 minute topographic quadrangles, (USFWS, 2011)
- CNDDB records for the La Costa Valley and Niles 7.5 minute quadrangles (CNDDB, 2011)
- CNPS Electronic Inventory of Rare and Endangered Plants of California search for La Costa Valley and Niles quadrangles (CNPS, 2011)
- Final listing determinations for 10 Distinct Population Segments of West Coast steelhead (NMFS, 2006)
- SFPUC New Irvington Tunnel Project Final EIR (San Francisco Planning Department, 2009a)
- SFPUC Alameda Siphons Seismic Reliability Upgrade Project Initial Study/Mitigated Negative Declaration (San Francisco Planning Department, 2008)
- SFPUC Sunol/Niles Dam Removal Project Final EIR (San Francisco Planning Department, 2006)
- SFPUC Sunol Valley Water Treatment Plant (SVWTP) Expansion and Treated Water Reservoir Project Final EIR (San Francisco Planning Department, 2009b)
- SFPUC Calaveras Dam Replacement Project Final EIR (San Francisco Planning Department, 2011)
- Botanical Survey Report, San Antonio Backup Pipeline (May and Associates, 2008)
- Terrestrial Habitat Assessment for the San Antonio Backup Pipeline Project (ESA, 2010a)
- Preliminary Delineation of Waters of the United States for the San Antonio Backup Pipeline Project (ESA, 2009)
- Tree Survey Report for the San Antonio Backup Pipeline Project (EMPSi, 2009)
- Focused Special-Status Plant Surveys for the San Antonio Backup Pipeline Project (ESA+Orion, 2010)

Field Surveys

Vegetation and Special-Status Plants

The descriptions of natural communities and special-status biological resources presented in this section are based on reviews of project-specific information and visits to the project area by ESA+Orion and others. May and Associates carried out special-status plant surveys in April, May, June, and July 2008 (May and Associates, 2008). ESA+Orion biologists conducted focused rare plant surveys in accordance with CNPS botanical survey guidelines (CNPS, 2001) on March 11 and 17, April 21, and May 4, 2009 and November 17, 2010 (ESA+Orion, 2010). The November 17, 2010 survey verified current site conditions in light of recent disturbances and modifications to the project area resulting from construction activities for the New Irvington Tunnel (NIT) project and the Alameda Siphons Seismic Reliability Upgrade (Alameda Siphons) project. Environmental Management and Planning Solutions, Inc. conducted a tree survey of the proposed backup pipeline alignment and other limited portions of the project area (EMPSi, 2009). Habitat mapping documented in the following reports was also reviewed: *Final Environmental Impact Report for the San Francisco Public Utilities Commission New Irvington Tunnel Project* (San Francisco Planning Department, 2009a), the *Initial Study/Mitigated Negative Declaration for the San Francisco Public Utilities Commission Alameda Siphons Seismic Reliability Upgrade Project* (San Francisco Planning Department, 2008), and the *Final Environmental Impact Report for the SVWTP Expansion and Treated Water Reservoir Project* (San Francisco Planning Department, 2009b).

Wildlife

Field surveys to assess habitat conditions for wildlife species were carried out on April 21 and May 4, 2009 and November 17, 2010 (ESA, 2010). On April 21, 2009, a reconnaissance survey was conducted to map habitats and identify species present in the project area, as well as to identify habitat elements that could support special-status wildlife species that were not directly observed. On May 4, 2009, a focused survey for burrowing owl (*Athene cunicularia*) was performed consistent with the guidelines for a Phase II assessment outlined in the April 1993 *Burrowing Owl Consortium Survey Protocol and Mitigation Guidelines.* Two ESA biologists conducted this survey by walking multiple transects in the study area for a distance of approximately 1 mile, within and east of the project area and along the grassland slopes east of Calaveras Road. The biologists walked these transects while scanning for burrowing owls, ground squirrels (*Spermophilus beecheyi*), and burrow complexes. Vegetation types and wildlife habitats in the project area were characterized through field observations and review of prior biological resource reports. The November 17, 2010 survey verified current site conditions in light of recent disturbances and modifications to the project area resulting from construction activities for the NIT project and the Alameda Siphons project.

Waters and Wetlands

ESA biologists delineated waters and wetlands of the United States on March 16–18, April 13, April 21, and May 4, 2009 (ESA, 2010b). The delineation was carried out using the routine onsite determination methods described in the 1987 Corps wetland delineation manual (Environmental Laboratory, 1987) and in the *Regional Supplement to the Corps of Engineers Wetland Delineation*

Manual: Arid West Region (Corps, 2008). The wetland delineation determined the location and extent of all wetlands and waters, including but not limited to those potentially under the jurisdiction of the Corps, the San Francisco Bay RWQCB, and the CDFG. The delineation was verified by the Corps on July 8, 2011.

5.14.1.3 Existing Site Conditions

Three SFPUC Water System Improvement Program (WSIP) facility improvement projects in the Sunol Valley partially overlap with the SABPL project area. The Alameda Siphons project overlaps with the SABPL project area in the vicinity of the Alameda Siphons, and this area has been cleared as a result of ongoing construction activities associated with of the Alameda Siphons project. The NIT project overlaps with both the SABPL project and Alameda Siphons project in the vicinity of the Alameda Siphons, but the NIT project, which is larger, also includes improvements that extend from the Alameda West Portal to the Irvington Portal in Fremont. The NIT project overlaps with the SABPL project area for approximately 0.8 mile along Calaveras Road north of the Alameda Siphons, and like the SABPL project and other SFPUC projects in the Sunol Valley, includes the permanent placement of spoils in an earthen berm at the North Spoils Site at the northern tip of the SABPL project area. The North Spoils Site was cleared during construction activities associated with the NIT and Alameda Siphons projects, and wildlife exclusion fencing was installed. A third SFPUC project—the proposed Upper Alameda Creek Filter Gallery project (Filter Gallery project)—is currently undergoing environmental review. The proposed Filter Gallery project would overlap with the northernmost 0.6 mile of the SABPL project area, including quarry Pits F3-East and F3-West, the North Spoils Site, the San Antonio Creek crossing, and the grasslands between San Antonio Creek and the Hetch Hetchy Water & Power (HHWP) Calaveras Substation. In addition, both the SABPL project and the Filter Gallery project would also place excess spoils in an earthen berm at the former nursery site located within Staging Area C, just east of Pit F3-East.

Habitats

Six habitat types have been identified within the project area (ESA, 2010a). **Table 5.14-1** presents a crosswalk between the mapped habitats and the corresponding CNDDB terminology and classification codes (CDFG, 2003) and California Wildlife Habitat Relationships[2] (ESA, 2010a; CDFG, 2003) classifications for habitats within the project area. Because the project area is primarily long and narrow, there is a relatively high potential for indirect impacts on wildlife that use nearby areas. As a result, the terrestrial habitat assessment also included habitats within the line-of-sight of the project area and those that might be subject to construction-related noise increases; this larger area subject to potential project effects has been identified as the biological resources study area (see **Appendix G**). Habitat types occurring within the project area are briefly described below. **Figure 5.14-1** shows the distribution of these habitats in the proposed project area (see Appendix G for descriptions and maps of the habitat types occurring near the project area). **Appendix D** and **Appendix E** present lists of wildlife and plant species, respectively, observed in the project area.

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2 The California Wildlife Habitat Relationships is an information and classification system containing life history, geographic range, habitat relationships, and management information on the amphibians, reptiles, birds, and mammals known to occur in the state.

**TABLE 5.14-1
HABITATS AND NATURAL COMMUNITIES IN THE
SAN ANTONIO BACKUP PIPELINE PROJECT AREA**

Habitat Type	Natural Community Recognized by California Natural Diversity Database	California Wildlife Habitat Relationships Type	Areas Where Present
Developed/ Ruderal	Developed	Developed	**Proposed Project Area:** Backup pipeline alignment; proposed chemical facility; Staging Areas C and D; quarry Pit F6; North Spoils Site; proposed discharge facility at quarry Pit F3-East; slopes of quarry Pits F3-East and F3-West; proposed cutoff wall; proposed Alameda Creek Pump Station; proposed transfer pipeline; proposed dewatering facilities.
Non-native Grassland	Non-native Grassland	Annual Grassland	**Proposed Project Area:** Backup pipeline alignment; Staging Areas A and B.
Riparian	Mule Fat Scrub	Valley Foothill Riparian	**Proposed Project Area:** Backup pipeline alignment; proposed alignment for the water pipeline to the town of Sunol; proposed overhead powerline alignment.
Ephemeral/ Intermittent Stream	–	Riverine	**Proposed Project Area**: San Antonio Creek crossing and unnamed tributary to Alameda Creek crossing Calaveras Road and emptying into Pit F6.
Freshwater Marsh/Seasonal Wetland	Cattail Wetland (*Typha* spp.) Alliance	Fresh Emergent Wetland Wet Meadow	**Proposed Project Area:** Staging Area A.
Lacustrine	–	Lacustrine	**Proposed Project Area:** Quarry Pits F3-East and F3-West.

SOURCES: ESA, 2010b; CDFG, 2003; Mayer and Laudenslayer, 1988.

Previous grading, excavation, commercial development, and the construction of infrastructure have disturbed the majority of the project area, including non-native grassland. Recently disturbed areas still support very limited plant cover, most of it weedy. Other areas contain established annual grasslands dominated by non-native species.

Upland Communities

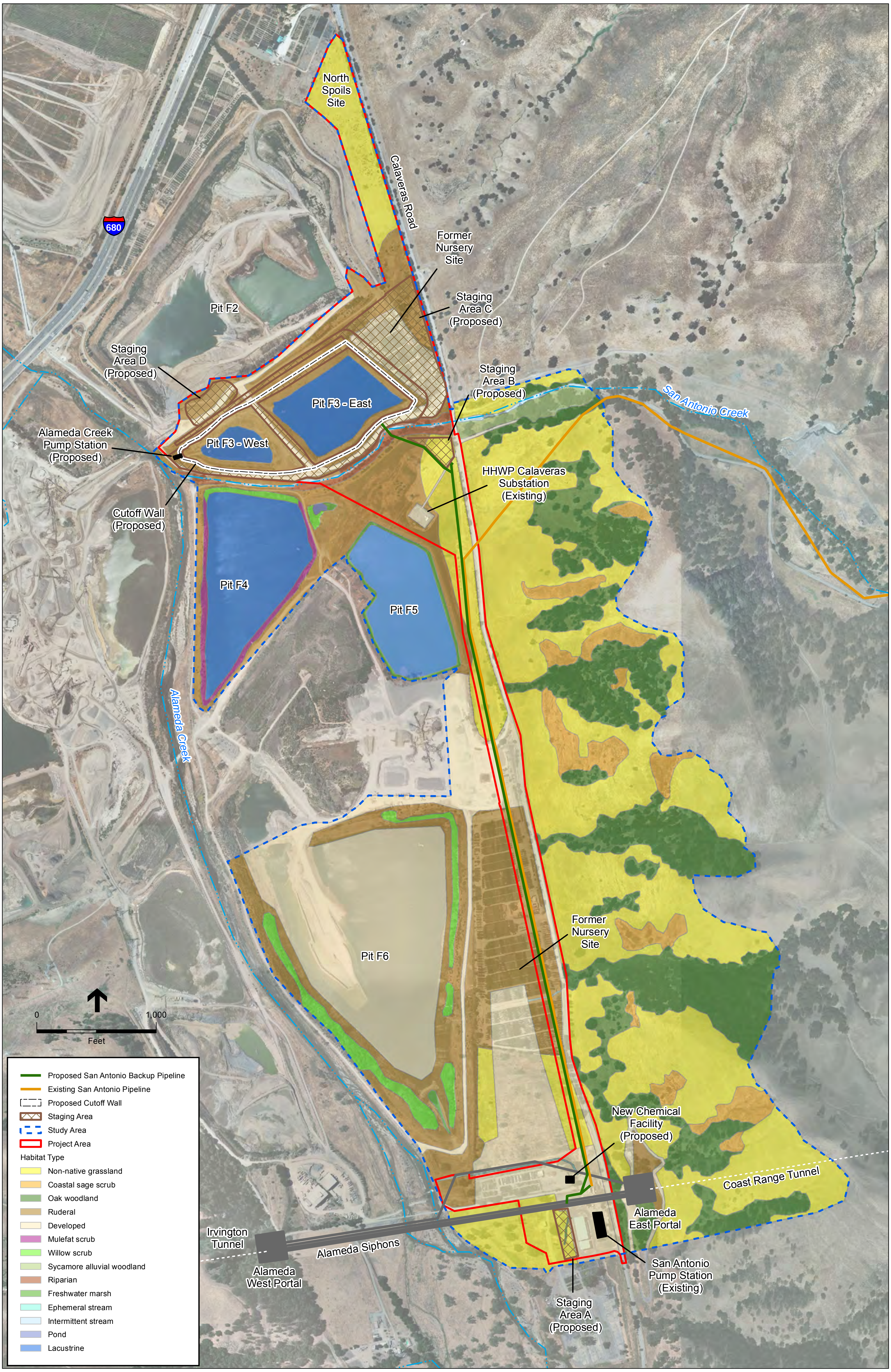
Developed/Ruderal. "Developed" refers to land that is actively in use—for instance, roads, parking areas, residences, landscaped areas, and commercial facilities—where naturally occurring vegetation is not allowed to grow. Developed areas constitute much of the project area and include quarry operations, SFPUC facilities, roads, and areas recently cleared for construction of the NIT and Alameda Siphons projects. Some developed areas may support planted or maintained vegetation such as eucalyptus (*Eucalyptus* spp.), oleander (*Nerium oleander*), Monterey pine (*Pinus radiata*), and lawn. "Ruderal" refers to areas that have been previously cleared or developed, are not in active use, and have developed little vegetation (or that contain developed vegetation that is mostly weedy, non-grass species). The vegetation in many ruderal areas is sparse and does not resemble any identified natural community (such as non-native grassland). In some areas, shrubs such as coyote brush *(Baccharis pilularis*) have become established and contribute a significant amount of cover. In some ruderal and developed areas in the Sunol Valley, large mature native trees have been preserved, providing significant wildlife habitat.

Extensive portions of the project area contain ruderal habitat, such as the slopes of the quarry pits and abandoned or vacated nurseries along Calaveras Road. Typical plant species found in ruderal habitats within the project area include yellow star thistle (*Centaurea solstitialis*), purple star thistle (*Centaurea calcitrapa*), bull thistle (*Cirsium vulgare*), Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum marianum*), stinkwort (*Dittrichia graveolens*), fennel (*Foeniculum vulgare*), and shortpod mustard (*Hirschfeldia incana*). Some quarry walls were mapped as non-native grassland (ESA, 2010a), but these have been reclassified as ruderal because of their high proportion of weeds and woody species such as coyote brush. The California Invasive Plant Council considers a number of species found in ruderal areas to be highly invasive weeds (Cal-IPC, 2006). Yellow star thistle and fennel are ranked as highly invasive, while purple star thistle, Italian thistle, bull thistle, and shortpod mustard are ranked as moderately invasive. Stinkwort is given a "red alert" ranking because it spreads extremely rapidly. Virtually unknown in the Alameda watershed 10 years ago, stinkwort has now become dominant in many highly disturbed sites.

The amount of developed/ruderal habitat in the project area has increased considerably since issuance of the Notice of Preparation in late 2007, and the conversion of land to this habitat type was especially intense in 2010 following construction of the NIT and Alameda Siphons projects. Developed/ruderal habitat is now the most extensive type in the project area. These two projects required site clearance, and hence conversion to developed habitat, at the North Spoils Site, in the vicinity of the proposed chemical facility, near Air Gap No. 1, and in most of the southern portion of the backup pipeline alignment. In these areas, vegetation was removed, all burrows were collapsed, and the sites were graded; however, mature trees[3] such as valley oak (*Quercus lobata*), California sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*), and planted cork oak (*Quercus suber*) were retained where possible in accordance with the mitigation requirements for the NIT and Alameda Siphons projects. As a result, these areas provide more wildlife habitat value than is typical of developed/ruderal habitat types.

In general, developed and ruderal areas have marginal value for wildlife because of high levels of human disturbance and activity and limited vegetation development. Resident wildlife species in developed and ruderal areas tend to be those tolerant of human disturbance, such as raccoon (*Procyon lotor*), western scrub jay (*Aphelocoma californica*), house finch (*Carpodacus mexicanus*), and opossum (*Didelphis virginiana*). Because the project area is situated near extensive areas of natural

[3] "Mature tree" refers to trees greater than 6 inches in diameter at breast height (dbh), or 10 inches aggregate dbh for multi-trunked trees.



SOURCE: ESA + Orion, 2011; Date of aerial photo is 2006

SFPUC San Antonio Backup Pipeline Project

Figure 5.14-1
Habitat Types in the SABPL Biological Resources Study Area

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vegetation, developed and ruderal habitats may be used as movement corridors by species such as wild pig (*Sus scrofa*) and mule deer (*Odocoileus hemionus*). California ground squirrels (*Spermophilus beecheyi*), while not abundant in any portion of the project area, were observed to have burrows in relatively friable soil along roadside fencelines. Developed portions of the project area may support nesting birds such as tree swallow (*Tachycineta bicolor*), rough-winged swallow (*Stelgidopteryx serripennis*), and mourning dove (*Zenaida macroura*), among others.

Non-native Grassland. Non-native grassland consists of a dense to sparse cover of non-native annual grasses, and is found on a wide variety of soils and slopes. This habitat covers undeveloped areas along Calaveras Road south of San Antonio Creek and limited areas near the Alameda Siphons and San Antonio Pump Station. Dominant species vary within the project area, but the most common annual grasses are ripgut brome (*Bromus diandrus*), soft brome (*B. hordeaceus*), wild oats (*Avena fatua, A. barbata*), and Italian ryegrass (*Lolium multiflorum*). Common non-native herbaceous species include stork's bill (*Erodium* spp.) and smooth catsear (*Hypochaeris glabra*). In less disturbed situations, non-native grassland also supports a variety of native grasses and forbs. Typical native herb species in such locations include California poppy (*Eschscholzia californica*), sky lupine (*Lupinus nanus*), and owl's clover (*Castilleja exserta* ssp. *exserta, Orthocarpus* spp., and *Triphysaria* spp.).

In the project area, most of the areas that support non-native grassland are located on soils with a history of past grading and disturbance. Species richness is generally low but tends to reflect past habitats. Some of the areas mapped as non-native grassland near the Alameda Siphons support widely spaced, mature trees such as California sycamore and valley oak, indicating the past presence of riparian woodlands and former floodplain conditions. Along Calaveras Road, in the areas mapped as non-native grassland, there are some small coast live oaks and other trees such as cork oaks, which may have been planted. Sparse to moderately dense areas of coyote brush (*Baccharis pilularis*) are also present in some non-native grassland.

Non-native grassland in the project area supports low densities of small and medium-sized mammals such as mice, California vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), California ground squirrel, cottontail (*Sylvilagus auduboni*), and black-tailed jackrabbit (*Lepus californicus*). Common and typical predators include western rattlesnake (*Crotalus viridis helleri*), Pacific gopher snake (*Pituophis catenifer catenifer*), and California kingsnake (*Lampropeltis getula californiae*). Non-native grassland also provides nesting habitat for short-eared owl (*Asio flammeus*), foraging habitat for raptors, and denning and foraging habitat for American badger (*Taxidea taxus*). The presence of occasional large mature trees along the northernmost and southernmost portions of the backup pipeline alignment adds to the value of this habitat for wildlife.

Riparian and Aquatic Communities

This discussion of the characteristics and distribution of riparian and aquatic communities is largely based on the wetland delineation performed by ESA (2009), which is incorporated as **Appendix H**. **Figure 5.14-2** summarizes jurisdictional waters within and adjacent to the project area.

Riparian. As shown in Figure 5.14-1, riparian habitat is found west of Calaveras Road in the active channel of San Antonio Creek, where the dominant vegetation is widely spaced mule fat (*Baccharis salicifolius*) shrubs with a sandy and scarcely vegetated channel bottom. Scattered coast live oak, valley oak, buckeye, and sycamore are present within and on the banks of the creek, and non-native grasses dominate the understory.

Typically, riparian habitat supports a large variety of wildlife species—including nesting birds such as Wilson's warbler (*Wilsonia pusilla*), Swainson's thrush (*Catharus ustulatus*), and spotted towhee (*Pipilo maculatus*), as well as many species of bats. Within the project area, the structure and extent of riparian habitat is so limited along San Antonio Creek that this habitat is not expected to support species other than those found in non-native grassland.

Freshwater Marsh. Freshwater marsh is a general term for habitat that contains surface water or saturated soil for long periods of time. In the project area, the distribution of this habitat is largely dictated by hydrology-altering human activities. A small area of freshwater marsh has formed as a result of discharges from the San Antonio Pump Station, located south of the Alameda Siphons and west of the Sunol Valley Chloramination Facility and Calaveras Road. This is in approximately the same location as Staging Area A. The discharges have collected within a channel excavated in uplands and have formed a wetland. Freshwater marsh habitat within the project area is small and somewhat disturbed, so the diversity of wildlife it supports is rather limited; bullfrogs (*Bufo catesbiana*), Pacific chorus frogs (*Pseudacris regilla*), and western toad (*Bufo boreas*) tadpoles have been observed using this habitat in the project area (ESA, 2010a).

Intermittent Stream/Ephemeral Stream. An intermittent stream is a watercourse that flows for brief to extended periods during the rainy season, but does not consistently flow year-round. Intermittent streams are fed by rainfall as well as groundwater. An ephemeral stream is a briefly flowing watercourse that flows only after storms, as it receives no groundwater input. Substantial intermittent streams often support characteristic riparian habitats, such as mule fat scrub and sycamore alluvial woodland, that depend on coarse alluvium and, typically, shallow depth to groundwater. Ephemeral streams do not generally support distinctive riparian or freshwater marsh/seasonal wetland. Within the project area, San Antonio Creek is an intermittent stream. One ephemeral stream—an unnamed tributary that formerly emptied into Alameda Creek—begins in the hills east of Calaveras Road, is conveyed under Calaveras Road in a culvert, and then empties into an unvegetated rip-rapped channel within the project area. The channel ultimately empties into quarry Pit F6, and thus provides little or no habitat for wildlife that depend on water or wetland habitats. West of the San Antonio Backup Pipeline project area this channel is currently culverted.

Lacustrine. Lacustrine describes open water habitats. In the project area, such habitats are found in the quarry pits. The pits have limited habitat value due to their use as part of aggregate mining operations; the sides of the pits are very steep and the water levels are managed such that wetland and riparian vegetation development is very limited.

SOURCE: ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.14-2

Jurisdictional Waters Within the Project Area

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Riverine Resources

Alameda Creek. Alameda Creek flows from its headwaters at Oak Ridge to South San Francisco Bay. The creek has historically been divided into three distinct reaches: upper Alameda Creek and its tributaries, including San Antonio Creek; Niles Canyon reach and tributaries such as Arroyo de la Laguna; and lower Alameda Creek, which is primarily a concrete-lined flood control channel.

Channel substrates in Alameda Creek range from silt and sand with small cobbles to gravel and larger boulders. The lower reach of the creek is characterized by extensive urban development and has been channelized (rip-rapped) for floodwater conveyance. Portions of Alameda Creek are shaded by mixed riparian forest at the margins of the creek. This vegetation is extensive in the Niles Canyon reach, where it occupies the first terrace from the edge of the creek (i.e., ordinary high water) to approximately 6 to 8 feet above ordinary high water (San Francisco Planning Department, 2006).

Flows in the main stems of Alameda Creek and its tributaries are highly variable, with high flows during the winter and spring and low flows or no flows during the summer and fall. In the past, portions of Alameda Creek, particularly the Niles Canyon, Sunol Valley, and lower reaches, have had low and intermittent streamflows during the summer of dry years. There have been similar intermittent streamflow conditions in the tributaries, with the greatest frequency of intermittent flows occurring in the lower-elevation alluvial sections during dry years. The seasonal hydrology of Alameda Creek and its tributaries has changed over the past several decades due to construction of upstream storage reservoirs; and flow augmentation from managed releases from the State Water Project's South Bay Aqueduct for groundwater recharge; and deliveries to the Alameda County Water District.

In addition, major alterations to Alameda Creek and its tributaries—including the channelization of the lower 12 miles of Alameda Creek for flood control; the construction of San Antonio, Calaveras, and Del Valle Reservoirs for water supply; and the construction of a concrete drop structure to stabilize the channel around the Bay Area Rapid Transit (BART) weir in Fremont—have made spawning habitat within the watershed inaccessible for some returning anadromous[4] fishes such as steelhead (*Oncorhynchus mykiss*) (Gunther et al., 2000).

The reach of Alameda Creek in the vicinity of the proposed SABPL project, through the Sunol Valley (both upstream and downstream of the confluence with San Antonio Creek), is characterized by a broad low-gradient channel with some braided reaches (Center for Ecosystem Management and Restoration, 2002). Alameda Creek is typically a perennial stream in the upper parts of the watershed; however, in the Sunol Valley and other alluvial flats, a high rate of infiltration coupled with a low-gradient stream channel typically results in a dry streambed during the summer months. In the lower reaches of the Sunol Valley, including the vicinity of the proposed SABPL project, Alameda Creek is bordered by numerous gravel quarries.

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4 Anadromous fish hatch (rear) in freshwater, migrate to the ocean (saltwater) to grow and mature, and migrate back to freshwater to spawn and reproduce.

Thirteen native fish species have been collected in non-tidal portions of Alameda Creek during the past century (Gunther et al., 2000). Many of the species observed in the creek are those typical of streams in the region, including steelhead/rainbow trout, California roach (*Hesperoleucus symmetricus*), Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*, previously known as Sacramento squawfish), Pacific lamprey (*Lampetra tridentata*), and prickly sculpin (*Cottus asper*). In recent years, small numbers of adult Chinook salmon (*Oncorhynchus tshawytscha*) have been recovered in the Alameda Creek Flood Control Channel, as well as other San Francisco Bay streams not previously known to support salmon runs. It is generally believed that hatchery production has resulted in salmon straying to streams that have not traditionally supported them (Gunther et al., 2000).

In addition to native fishes, the Alameda Creek watershed now supports populations of introduced fish species, including bluegill (*Lepomis machrochirus*) and largemouth bass (*Micropterus salmoides*). These introduced species have increased in abundance and distribution throughout the watershed in the past decades (Gunther et al., 2000).

San Antonio Creek. San Antonio Creek is an intermittent drainage that originates approximately 9 miles east of Alameda Creek and flows westward into San Antonio Reservoir. At the base of Turner Dam, the original creek channel of San Antonio Creek continues westward, joining Alameda Creek in the lower reaches of the Sunol Valley in the vicinity of active gravel quarries and upstream of Arroyo de la Laguna. The SFPUC currently uses the existing discharge facility at San Antonio Creek at the base of Turner Dam to release quality-impaired water from the Hetch Hetchy system via the San Antonio Pipeline, and to perform emergency and maintenance releases from the reservoir. Such events are infrequent; however, relatively large volumes of water may be released during these episodes. For much of the year, San Antonio Creek downstream of Turner Dam only receives flow from two drain pipes that each continually drain seepage from Turner Dam at a rate of approximately 20 gallons per minute (CDM, 2007). Perennial flows in the creek resulting from dam seepage extend from Turner Dam to just downstream of the USGS stream gage weir located approximately 0.5 mile east of the Calaveras Road crossing. Downstream of the weir, including through the project area, San Antonio Creek is typically dry for much of the year.

At the location where the proposed backup pipeline crosses San Antonio Creek, the stream channel and banks of the creek are heavily vegetated with non-native annual grasses and ruderal vegetation. The northern bank is nearly vertical and approximately 12 feet high, while the southern bank is relatively gentle and shallow, is less than 4 feet high, and has an approximate 2:1 slope.

Sensitive Natural Communities

The CDFG has identified natural communities within California (as distinct from the organisms they support) as rare and/or sensitive, and these species are tracked in the CNDDB. Each natural community in the database is assigned a ranking that indicates its rarity, current known acreage, known threats, and sensitivity to perturbation. Sensitive natural communities are of special significance because their present rate of loss indicates that acreage reductions or habitat degradation could threaten the viability of dependent plant and wildlife species, and possibly hinder the long-term sustainability of the community or species that rely on it. The loss of sensitive natural communities can also diminish valued ecosystem functions, such as the roles of marshes in water filtration or of riparian woodlands in riverbank stabilization. None of the habitats mapped within the project area are listed by the CNDDB as sensitive natural communities.

This EIR considers the following to be sensitive natural communities: seasonal wetlands and wetland tributaries, perennial seeps, freshwater marsh, other waters of the United States (e.g., intermittent streams and open water), and riparian areas (e.g., mule fat scrub). Almost all types of wetlands are highly biologically active, and almost all have experienced significant declines in California. The freshwater marsh within the project area is not considered Corps jurisdictional. As described below in Sections 5.14.2.1 and 5.14.2.2, various federal and state laws and regulations protect wetlands. A formal wetland delineation and permits from the relevant regulatory agencies, including the Corps, RWQCB, and CDFG, are required when a project would result in impacts on wetlands, federal and/or state jurisdictional waters, or riparian habitat. ESA prepared a formal wetland delineation of potentially jurisdictional features in the SABPL project area, was verified by the Corps on July 8, 2011(see **Appendix H**).

Special-Status Species

A number of species known to occur in the Alameda watershed are protected under state and federal endangered species laws, or have been designated by the CDFG as species of special concern. In addition, Section 15380(b) of the CEQA Guidelines provides a definition of rare, endangered, or threatened species that are not included in any listing.[5] Species recognized under these terms are collectively referred to as "special-status species." For this EIR, special-status species include:

- Plant and wildlife species listed as rare, threatened, or endangered under either FESA or CESA
- Plants listed as List 1A, 1B, or 2 by the CNPS
- Species that are candidates for listing under either federal or state law
- Species designated by the CDFG as species of special concern
- Species protected by the federal Migratory Bird Treaty Act (Title 16, United States Code [USC], Sections 703–711)
- Candidate species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines

ESA+Orion created comprehensive lists of the special-status plant and animal species that have been documented to occur or have the potential to occur in suitable habitat within the project area; these lists indicate whether there is a low, moderate, or high potential for species occurrence

5 For example, vascular plants listed by the CNPS as rare or endangered or as List 1 or 2 are considered subject to Section 15380(b).

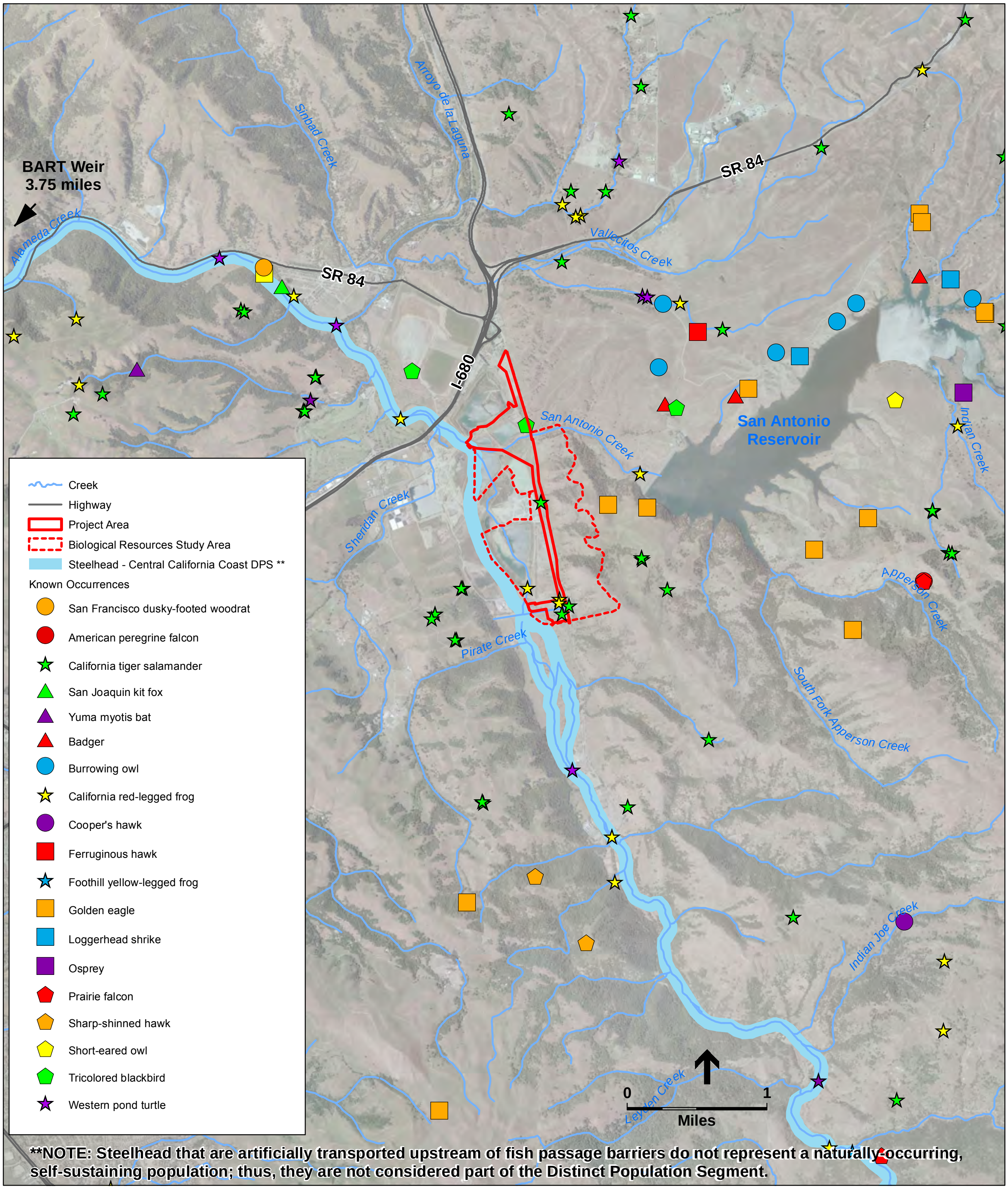
based on previous special-status species record locations and current site conditions. ESA+Orion obtained data on species occurrence from the CNDDB (CNDDB, 2009), the CNPS Electronic Inventory (CNPS, 2009), and the USFWS (USFWS, 2009a). These comprehensive lists of species with the potential to occur in the project vicinity are included in **Appendix F**. Further information on local species occurrence was obtained from the SFPUC (2008) and other biological literature pertaining to the region, including EIRs for nearby SFPUC projects (San Francisco Planning Department, 2008, 2009a, 2009b). **Figures 5.14-3** and **5.14-4** depict special-status wildlife and plant species records, respectively, for the project area. **Tables 5.14-2** and **5.14-3** present the name, status, habitat, distribution, and potential for occurrence of special-status wildlife and plant species that may be present in the project area or that could be affected indirectly during project construction, based on analyses carried out by May and Associates (2008), ESA+Orion (2010), and ESA (2009, 2010a). Federally and state-listed wildlife species and those with a moderate or high potential to occur in the project area are described below. Species with a low potential to occur in the project area are identified in Tables 5.14-2 and 5.14-3 and Appendices D, E, G, and J. As noted in the habitat assessment (ESA, 2010a), the following species were considered to have low potential to occur in the project area due to lack of suitable habitat: Bay checkerspot butterfly (*Euphydryas editha bayensis*), callippe silverspot butterfly (*Speyeria callippe callippe*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), San Joaquin kit fox (*Vulpes macrotis mutica*), foothill yellow-legged frog (*Rana boylii*), western pond turtle (*Actinemys marmorata*), coast horned lizard (*Phrynosoma coronatum*), burrowing owl (*Athene cunicularia*), northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), pallid bat (*Antrozous pallidus*), tule elk (*Cervus elaphus nannodes)*, hoary bat (*Lasiurus cinereus*), Yuma myotis (*Myotis yumanensis*), Townsend's big-eared bat (*Plecotus townsendii*), American badger (*Taxidea taxus*), and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*).

Special-Status Wildlife

Federally and State-Listed Species

California tiger salamander (*Ambystoma californiense*) is state and federally listed as threatened. Final designation of critical habitat for the species was published on August 23, 2005 (Title 70, Code of Federal Regulations [CFR], Sections 49380–49458); the nearest critical habitat unit to the project area lies between Arroyo Hondo and Calaveras Reservoir, approximately six miles south of the project site.

California tiger salamander (CTS) is principally an upland species found in grasslands and open valley-foothill hardwood habitats in Central and Northern California. These salamanders require underground refuges—usually ground squirrel or other small mammal burrows such as those of valley pocket gophers (*Thomomys bottae*)—where they spend the majority of their annual cycle. Between December and February, when seasonal ponds begin to fill, adult CTS engage in mass migrations to aquatic sites during a few rainy nights (Barry and Shaffer, 1994). Suitable conditions for breeding do not occur every year, but reproductive output is high when conditions are suitable. Refuge sites have been documented at distances of 1 mile or more (Orloff, 2007) from breeding ponds.

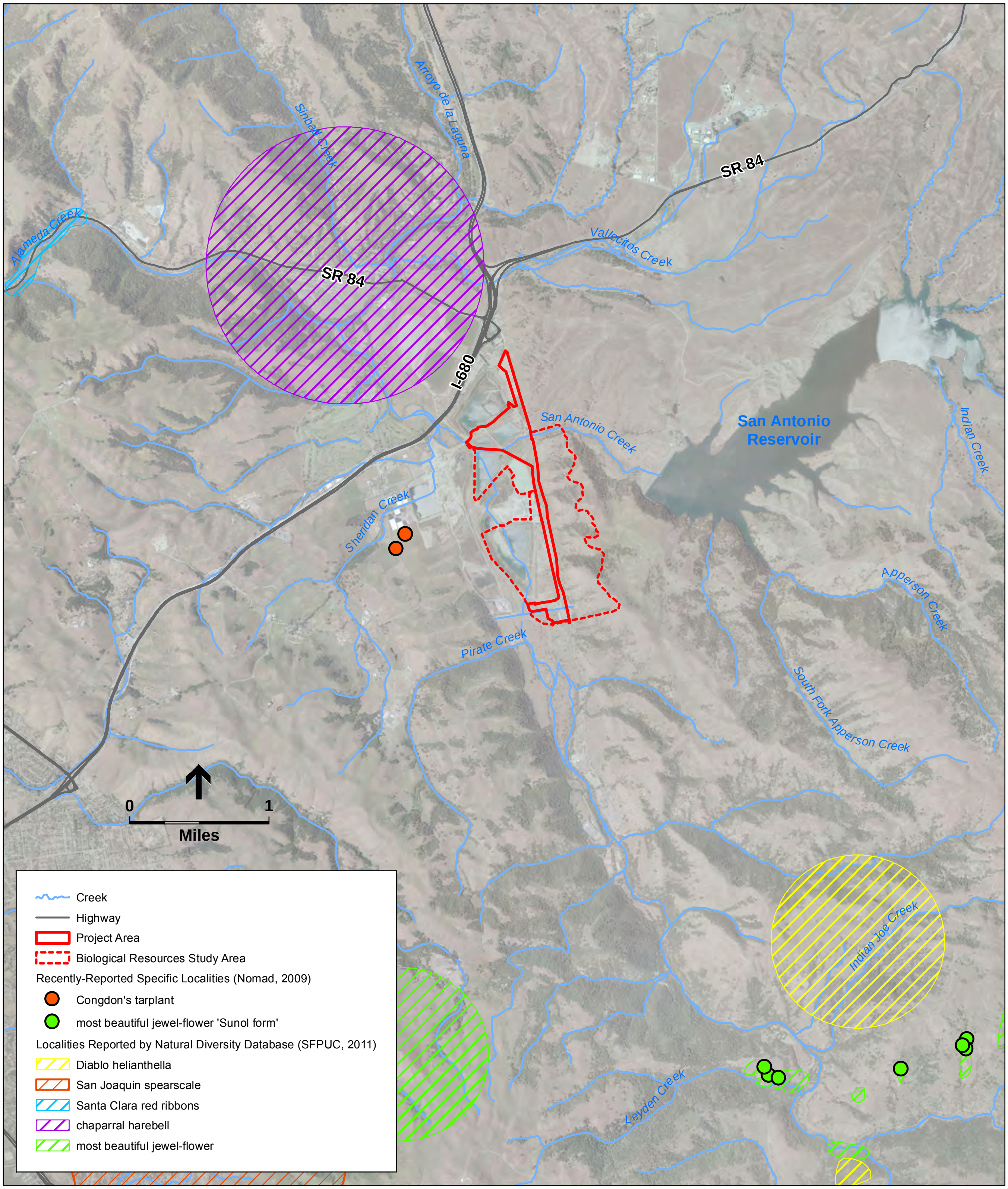


SOURCE: CNDDB, 2010; SFPUC, 2008; SFPUC, 2010; ESRI, 2010

SFPUC San Antonio Backup Pipeline Project

Figure 5.14-3

Special Status Wildlife in the Project Vicinity



SOURCE: Nomad, 2009; SFPUC, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.14-4

Special Status Plant Species in the Project Vicinity

TABLE 5.14-2
FOCUSED LIST OF SPECIAL-STATUS WILDLIFE CONSIDERED
FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Project area**
FEDERAL OR STATE-LISTED SPECIES OR PROPOSED FOR LISTING			
Invertebrates			
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/–	Serpentine bunchgrass and valley needlegrass grassland. Larval food plants are *Plantago erecta*, *Castilleja densiflora* and *C. exserta.* Adult food plants are *Lomatiu*m spp., *Lasthenia californica* and *Layia platyglossa.*	**Low potential**. There are no records of occurrence in the immediate vicinity of the project, and suitable habitat is not present within the project area.
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/–	Grasslands with larval food plant *Viola pedunculata* and nearby adult nectar sources.	**Low potential**. There are records of a butterfly with intermediate characteristics between this and another subspecies in the Alameda watershed (Entomological Consulting Services, 2004; 2005). However, suitable habitat is not present within the project area.
Fishes			
Central California Coast Distinct Population Segment (DPS) steelhead *Onchorhynchus mykiss*	FT/–	Perennial streams with connection to the San Francisco Bay or the Pacific Ocean.	**Not present**. Known to occur in Alameda Creek below BART weir. Potential for occurrence in upper Alameda Creek currently restricted by downstream barriers. The SFPUC and several other public agencies and private and non-profit organizations are undertaking efforts to restore the historic steelhead run in Alameda Creek.
Amphibians			
California tiger salamander *Ambystoma californiense*	FT/CT	Wintering sites occur in grasslands occupied by burrowing mammals; breeds in ponds, vernal pools, and slow-moving or receding streams.	**High potential.** Seven breeding locations are known within 1 mile, and tiger salamanders have been recently sighted near and within the project area. The project area is a potential movement corridor, and small mammal burrows offer estivation and foraging opportunities. However, no breeding habitat is available within the project area.
California red-legged frog *Rana draytonii*	FT/CSC	Breeds in stock ponds, pools, and slow-moving streams.	**High potential.** This species is known to occur in Alameda Creek and San Antonio Creek at the base of Turner Dam, and, based on observations, within and adjacent to the project area. Seasonal wetlands and quarry pits in the project area provide aquatic refugia but not breeding habitat. Grasslands, small mammal burrows, and rock and debris piles offer summer habitat.
Reptiles			
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/CT	Coastal scrub, grassland, and open oak woodland. Prefers rocky openings for basking, foraging.	**Low to moderate potential.** Low quality foraging and dispersal habitat is present in project area grasslands and nearby scrub, especially on the slopes east of Calaveras Road.

TABLE 5.14-2 (Continued)
FOCUSED LIST OF SPECIAL-STATUS WILDLIFE CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Project area**
FEDERAL OR STATE-LISTED SPECIES OR PROPOSED FOR LISTING (cont.)			
Birds			
American peregrine falcon (nesting) *Falco peregrinus anatum*	–/CE	Nests on cliffs, tall buildings, high bridges, and specially designed towers.	**Low potential.** Suitable nesting habitat is absent from the project area. Nesting is unlikely on interior quarry pit slopes or utility towers.
Bald eagle *Haliaeetus leucocephalus*	–/CE	Nests in mountainous habitats near reservoirs, lakes, and rivers, usually in coniferous trees, close to permanent water.	**Low potential.** Although unlikely, large trees in the project area could provide potential nesting habitat. Nesting is documented from Calaveras Reservoir.
Mammals			
San Joaquin kit fox *Vulpes macrotis mutica*	FE/CT	Arid grasslands and open scrubland.	**Low potential.** Suitable habitat is present for foraging and dispersal, but there are few local occurrences. The nearest is approximately 3 miles to the northwest (CNDDB, 2009).
FEDERAL OR STATE FULLY PROTECTED/SPECIES OF SPECIAL CONCERN			
Amphibians			
Foothill yellow-legged frog *Rana boylii*	–/CSC	A year-round resident of cobble-lined streams; breeds in spring months after high water subsides.	**Absent.** Suitable habitat is absent from the project area. This species is limited to perennial, high-gradient drainages.
Reptiles			
Western pond turtle *Actinemys marmorata*	–/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands.	**Low potential.** This species is known from Alameda Creek and San Antonio Creek. Quarry pits provide low-quality habitat for the western pond turtle.
Coast horned lizard *Phrynosoma coronatum*	–/CSC	Sandy areas and river washes, as well as riparian woodland clearings, chaparral, and alkali flats.	**Low potential.** This species is not reported in the project area, although it may be present in the sandy washes of Alameda Creek channel or in rock and debris piles near the quarry pits.
Birds			
Tricolored blackbird *Agelaius tricolor*	–/CSC	A colonial nester; nests in dense freshwater emergent vegetation.	**High potential.** Breeding is known from the Sunol Valley, and large flocks were observed foraging over the project area. Potential breeding habitat exists in freshwater marshes and ruderal vegetation in or near the project area.
Golden eagle *Aquila chrysaetos*	–/CDFG fully protected	Nests in open areas on cliffs and in large trees.	**Moderate potential.** Open areas with large sycamore, cottonwood, and oak trees in the southern project area and along San Antonio Creek east of Calaveras Road could provide nesting habitat. There are known nesting sites on slopes above the base of Turner Dam.
Short-eared owl *Asio flammeus*	–/CSC	Nests in grasslands, usually on the ground.	**Moderate potential.** Grasslands in the project area could provide nesting habitat for the short-eared owl. There are known nesting sites along the southeastern San Antonio Reservoir.

TABLE 5.14-2 (Continued)
FOCUSED LIST OF SPECIAL-STATUS WILDLIFE CONSIDERED
FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Project area**
FEDERAL OR STATE FULLY PROTECTED/SPECIES OF SPECIAL CONCERN (cont.)			
Birds (cont.)			
Burrowing owl *Athene cunicularia*	–/CSC	Nests and forages in low-growing grasslands that support burrowing mammals.	**Low potential.** Grasslands in the project area and a 500-foot buffer are only marginally suitable, supporting few small mammal burrows and fewer burrow complexes. A few holes were observed in rock and debris piles. No owls or owl signs were observed during Phase II protocol-level breeding season surveys.
Northern harrier *Circus cyaneus*	–/CSC	Nests in coastal freshwater and saltwater marshes; nests and forages in grasslands.	**Low potential.** Nesting sites are potentially present in quarry ponds supporting freshwater emergent marshes.
White-tailed kite (nesting) *Elanus leucurus*	–/CDFG fully protected	Nests near wet meadows and open grasslands in dense oak, willow, or other large tree stands.	**Moderate potential.** Potential nesting habitat is present along riparian corridors, and in oak woodlands to the east of Calaveras Road and at the southern end of the project area.
Horned lark *Eremophila alpestris*	–/CSC	Year-long resident in California. Nests on the ground, in grasslands.	**Moderate potential.** Nesting is documented on the north slopes of San Antonio Reservoir. Suitable habitat is present in the project area in grasslands and along access roads.
Cooper's hawk *Accipiter cooperii*	–/CSC	Nests in woodlands, and forages in open habitats and forest edges.	**Moderate potential.** This species is observed nearby in suitable habitat, and may be present along San Antonio Creek in open oak woodland.
Sharp-shinned hawk *Accipiter striatus*	–/CSC	Nests and forages in woodlands.	**Low potential.** Well-developed woodland habitat is not present in the project area.
Loggerhead shrike *Lanius ludovicianus*	–/CSC	Scrub, open woodlands, and grasslands.	**High potential.** Shrike nesting sites may occur in grasslands, shrubs, and trees throughout the project area.
Mammals			
Pallid bat *Antrozous pallidus*	–/CSC	Day roosts are mainly in caves, crevices, and mines; also found in buildings and under bark. Forages in open lowland areas.	**Low to moderate potential.** Potential roosting habitat is available in large-diameter oaks and cottonwoods and under bridges.
Tule elk *Cervus elaphus nannodes*	–/Local protection	The San Antonio elk herd is a resident herd from the hills surrounding San Antonio Reservoir.	**Low potential.** Tule elk are present on the slopes east of Calaveras Road; however, limited habitat is present within the project area and elk are not expected to occur there.
Hoary bat *Lasiurus cinereus*	–/CSC	Roosts in dense foliage of large trees.	**Low to moderate potential.** Roosting habitat is available in large dense oak trees.
Yuma myotis *Myotis yumanensis*	–/CSC	Roosts in caves, old buildings, and under bark. Forms maternity colony in the spring.	**Low to moderate potential.** Roosting habitat is available in large-diameter oaks and cottonwoods and under bridges.
San Francisco dusky-footed woodrat *Neotoma fuscipes*	–/CSC	Occurs in forests with established understory. Constructs nests from woody debris.	**Low potential.** Forests are absent from the project area. Riparian corridors generally lack forest understory, and the habitat size is too small to support the species.

TABLE 5.14-2 (Continued)
FOCUSED LIST OF SPECIAL-STATUS WILDLIFE CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	Listing Status USFWS/ CDFG	General Habitat Requirements	Potential for Species Occurrence Within the Project area
FEDERAL OR STATE FULLY PROTECTED/SPECIES OF SPECIAL CONCERN (cont.)			
Mammals(cont.)			
Townsend's big-eared bat *Plecotus townsendii*	–/CSC	Roosts in caves, mines, buildings, or other human-made structures. Forages in open lowland areas.	**Low to moderate potential.** Roosting habitat is available in large-diameter oaks and cottonwoods and under bridges.
American badger *Taxidea taxus*	–/CSC	Grasslands, savannas, deserts, timberline mountain meadows.	**Low potential.** Limited denning habitat may be present in vicinity grasslands; foraging habitat is limited by the lack of small mammal activity in the project area.

STATUS CODES:

FEDERAL (U.S. Fish and Wildlife Service)
FE = Listed as Endangered (in danger of extinction) by the federal government.
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the federal government.

STATE (California Department of Fish and Game)
CE = Listed as Endangered by the State of California.
CT = Listed as Threatened by the State of California.
CSC = California Species of Special Concern.

SOURCES: CNDDB, 2009; USFWS, 2009a; San Francisco Planning Department, 2008, San Francisco Planning Department, 2009a; San Francisco Planning Department, 2009b; ESA, 2010a.

CTS breeding habitat is present in at least seven stock ponds in surrounding foothills on both sides of the Sunol Valley at distances within 1 mile from the project area (CNDDB, 2009). A CTS road mortality was recorded 1.4 miles south on Calaveras Road (CNDDB, 2009), and a live individual was observed in 2009 in a sump at the Sunol Valley Chloramination Facility at the southern end of the project area (SFPUC, 2009a). More recently, two CTS were found in the Sunol Valley in the vicinity of the Alameda Siphons and NIT projects in early 2011 (SFPUC, 2011a). In the SABPL project area, the small number of mammal burrows and adjacent construction activity at overlapping project sites limit refuge and foraging opportunities for CTS. This species may occur in the project area, mainly utilizing the grassland habitat for dispersal.

California red-legged frog (*Rana draytonii*) is federally listed as a threatened species and is a California species of special concern. Critical habitat was proposed for this species on September 16, 2008 (73 CFR 53492–53680); a portion of this habitat is located about 1 mile southeast of the project area.

California red-legged frogs (CRLF) can be found in relatively permanent waters including ponds, streams, springs, marshes, and lakes. CRLF generally prefer dense shoreline vegetation (such as cattails) that provides good cover for breeding. Moist woodlands, forest clearings, and grasslands also offer suitable habitat for this species in the nonbreeding season. CRLF breed from January to May. Eggs are attached to vegetation in shallow water and are deposited in irregular clusters.

TABLE 5.14-3
FOCUSED LIST OF SPECIAL-STATUS PLANTS CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Project Area**
FEDERAL AND STATE-LISTED SPECIES OR PROPOSED FOR LISTING			
Tiburon Indian paintbrush *Castilleja affinis* ssp. *neglecta*	FE/CT/1B.2	Valley and foothill grassland, on serpentinite.	**Low potential.** Suitable serpentine habitat is not present in the project area; this species was not found during protocol-level surveys.
White-flowered pentachaeta *Pentachaeta bellidiflora*	FE/CE/1B.1	Valley and foothill grassland, often on serpentinite.	**Low potential.** Suitable serpentine habitat is not present in the project area; this species was not found during protocol-level surveys.
OTHER PLANT SPECIES OF CONCERN			
Bent-flowered fiddleneck *Amsinckia lunaris*	--/–/1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland; often on north-facing or sheltered slopes.	**Low potential.** Suitable woodland and grassland habitat is not present in the project area; this species was not found during protocol-level surveys.
San Joaquin spearscale *Atriplex joaquiniana*	–/–/1B.2	Alkaline soils in chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools.	**Low potential.** Suitable alkaline soils not present in project area**.**
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	--/–/1B.2	Chaparral, cismontane woodland, valley and foothill grassland; sometimes found on serpentinite or metamorphic substrate.	**Low potential.** Suitable serpentinite or metamorphic substrate is not present in the project area; this species was not found during protocol-level surveys.
Round-leaved filaree *California macrophylla*	–/–/1B.1	Cismontane woodland, valley and foothill grassland; clay soils with residual moisture.	**Low potential.** Suitable clay soil habitat is not present in the project area; this species was not found during protocol-level surveys.
Chaparral harebell *Campanula exigua*	–/–/1B.2	Rocky places in chaparral, usually on serpentinite substrate.	**Low potential.** Suitable rocky serpentinite substrate not present in project area.
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	–/–/1B.2	Alkaline, low-lying places in valley and foothill grassland, generally on fine-textured soils.	**Low potential.** Suitable fine-textured alkaline substrate not found in project area.
Franciscan thistle *Cirsium andrewsii*	–/–/1B.2	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub; mesic sites, sometimes on serpentinite.	**Low potential.** Suitable habitat is not present in the project area; this species was not found during protocol-level surveys.
South Bay clarkia *Clarkia concinna ssp. automixa*	–/–/4.3	Chaparral and cismontane woodland.	**Low potential.** Suitable habitat is not present in the project area; this species was not found during protocol-level surveys.
Western leatherwood *Dirca occidentalis*	–/–/1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous, riparian scrub, riparian woodland; mesic sites.	**Low potential.** Suitable woodland habitat is not present in the project area; this species was not found during protocol-level surveys.
Stinkbells *Fritillaria agrestis*	SLC/–/4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland; clay, sometimes on serpentinite.	**Low potential.** Suitable habitat is not present in the project area; this species was not found during protocol-level surveys.

TABLE 5.14-3 (Continued)
FOCUSED LIST OF SPECIAL-STATUS PLANTS CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project area
OTHER PLANT SPECIES OF CONCERN (cont.)			
Fritillaria liliacea *Fragrant fritillary*	–/–/1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland; often on serpentinite, and usually on clay soils.	**Low potential.** Suitable substrate and habitat is not present in the project area; this species was not found during protocol-level surveys.
Diablo helianthella *Helianthella castanea*	SC/–/1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill woodland; often openings in scrub or forest.	**Low potential.** Suitable woodland habitat is not present in the project area; this species was not found during protocol-level surveys.
Loma Prieta hoita *Hoita strobilina*	/1B.1	Chaparral, cismontane woodland, riparian woodland; usually serpentinite, mesic sites.	**Low potential.** Suitable habitat and serpentinite substrate is not present in the project area; this species was not found during protocol-level surveys.
Robust monardella *Monardella villosa* ssp. *globosa*	–/–/1B.2	Openings in chaparral, cismontane woodland, and coastal scrub; often more abundant following fire.	**Low potential.** Suitable habitat is not present in the project area; this species was not found during protocol-level surveys.
Gairdner's yampah *Perideridia gairdneri ssp. gairdneri*	–/–/4.2	Broadleaved upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools; mesic sites.	**Low potential.** Suitable mesic habitat is not present in the project area; this species was not found during protocol-level surveys.
Maple-leaved checkerbloom *Sidalcea malachroides*	–/–/4.2	Broadleaved upland forest, coastal prairie, coastal scrub, North Coast coniferous forest; within zone of coastal influence; often in disturbed areas.	**Low potential.** Suitable coastally influenced habitat is not present in the project area; this species was not found during protocol-level surveys.
Most beautiful jewel-flower *Streptanthus albidus* ssp. *peramoenus*	–/–/1B.2	Chaparral, cismontane woodland, valley and foothill grassland, on serpentinite substrate.	**Low potential.** Suitable serpentinite substrate not present in project area.

STATUS CODES:

FEDERAL (U.S. Fish and Wildlife Service)
FE = Listed as Endangered (in danger of extinction) by the federal government.
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the federal government.
FC = Candidate to become a *proposed* species.

STATE (California Department of Fish and Game)
CE = Listed as Endangered by the State of California.
CT = Listed as Threatened by the State of California.
CSC = California Species of Special Concern.

STATE (California Native Plant Society)
List 1A: Plants presumed extinct.
List 1B: Plants rare, threatened, or endangered in California and elsewhere.
List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere.
List 3: Plants about which more information is needed – a review list.
List 4: Plants of limited distribution – a watch list.
An extension reflecting the level of threat to each species is appended to each rarity category as follows:
4.1 = Seriously endangered in California.
4.2 = Fairly endangered in California.
4.3 = Not very endangered in California.

SOURCES: CNDDB, 2009; USFWS, 2009a; San Francisco Planning Department, 2008; May and Associates, 2008; ESA+Orion, 2010, SFPUC, 2011b.

CRLF are active year-round along the coast, but inland populations may estivate from late summer to early winter. Adults consume insects such as beetles, caterpillars, and isopods, while tadpoles forage on algae and detritus.

Historically, CRLF was found along the coast from the vicinity of Point Reyes National Seashore (Marin County) and inland from Redding (Shasta County) southward to northwestern Baja California, Mexico (Jennings and Hayes, 1994), with most Bay Area occurrences in Contra Costa and Alameda Counties. CRLF is known to be present in Alameda Creek, with occurrences approximately 1.6 miles upstream and downstream of the project area, as well as in San Antonio Creek near the foot of Turner Dam, 0.9 mile from the project area. The nearest documented breeding habitat is in a small shallow pond located 1.4 miles northeast of the project area (CNDDB, 2009). During surveys for the Alameda Siphons project near the SABPL project area, one CRLF was observed within a seasonal wetland and one in an overflow ditch south of Pit F6 and just east of Calaveras Road (SFPUC, 2011a). The wetland feature was recently removed as part of the Alameda Siphons project. The small pools at the southern end of quarry Pit F6, which is leased by Oliver De Silva, Inc. under Surface Mining Permit 30 (SMP-30), may provide potential low-quality breeding habitat for CRLF (Irvington Partners Joint Venture, 2008). Additionally, the small pond at the northern end of the study area and east of Pit F4 may provide breeding habitat for CRLF. Potential aquatic refugia for nonbreeding CRLF in the project area may be present in the freshwater marsh near the Sunol Valley Chloramination Facility and in the quarry pits operated by Hanson Aggregates, Inc. under Surface Mining Permit 24 (SMP-24), and infrequent small mammal burrows and rock and debris piles in project-area grasslands offer summer habitat. Based on the proximity of known occurrences and the presence of suitable habitat, this species could occasionally occur in the project area.

Alameda whipsnake (*Masticophis lateralis euryxanthus*) is a federally and state-listed threatened species. Critical habitat was designated in Alameda County on October 2, 2006 (70 CFR 60608–60656). The project area is situated between Critical Habitat Unit 5B (3 miles to the south) and Unit 3 (about 2 miles to the north). Alameda whipsnakes generally utilize open chaparral, sage scrub, and coastal scrub on east-, southeast-, south-, and southwest-facing slopes (Federal Register, 2000). However, surveys indicate that whipsnakes extensively utilize adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland (ESA, 2010a). Rock outcrops are an important feature of Alameda whipsnake habitat because they provide retreat opportunities and support lizard populations—a favored prey item (USFWS, 2002; 2005).

Historically, Alameda whipsnakes were probably found in the coastal scrub and oak woodland communities of the East Bay in Contra Costa, Alameda, western San Joaquin, and northern Santa Clara Counties (USFWS, 2002). Five isolated populations of Alameda whipsnake are now recognized within the species' historical range: Tilden–Briones, Oakland–Las Trampas, Hayward–Pleasanton Ridge, Sunol–Cedar Mountain, and Mt. Diablo–Black Hills (USFWS, 2009b).

There are three known occurrences of Alameda whipsnake in the La Costa Valley and Niles USGS 7.5-minute quadrangles. The nearest occurrence is 5 miles south of the project area (McGriff, 2009, as cited in SFPUC, 2009c). Sage scrub habitat is absent from the project area, but is present in small, discontinuous patches on the south- and west-facing slopes east of Calaveras Road. Alameda whipsnakes have been found at distances of over 4 miles from core habitat (Alvarez et al., 2005). Limited low quality foraging and dispersal habitat is present within the project area in grasslands and ruderal habitat between Calaveras Road and Alameda Creek; thus, there is a low to moderate potential for Alameda whipsnake to disperse through, or forage in, the project area. However, much of the habitat within the SABPL project area was recently cleared and fenced for the NIT and Alameda Siphons projects and no longer provides foraging and dispersal habitat for this species.

San Joaquin kit fox (*Vulpes macrotis mutica*) is federally listed as endangered and state listed as threatened. Although the full historical range of San Joaquin kit fox is not known with certainty, it is believed to have extended from Stanislaus and eastern Contra Costa Counties southward to northern Kern County. Currently, San Joaquin kit foxes are present in some areas of suitable habitat, primarily on the San Joaquin Valley floor and surrounding foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains. San Joaquin kit foxes primarily inhabit grassland and open scrubland habitats, but also occupy marginal habitats in agricultural areas, oil fields, and urban areas. They prefer loose-textured soils suitable for den excavation, but in less favorable soils they can enlarge or modify burrows of other animals such as California ground squirrel.

There are no CNDDB records for San Joaquin kit fox within the project area itself, but two adult San Joaquin kit foxes were recently sighted approximately 3 miles northwest of the North Spoils Site, and another more than 5 miles away (CNDDB, 2009). Because the first of these sightings was within the estimated home-range distance for the species and suitable foraging and dispersal habitat are present within and adjacent to the project area, kit fox presence cannot be ruled out. Grasslands areas within the project area are not well suited for San Joaquin kit fox denning due to cobbly and poorly consolidated soils as well as the low population of California ground squirrels. San Joaquin kit foxes depend largely on ground squirrels to create burrows, which the kit foxes then enlarge and inhabit, and few burrows and burrow complexes attributable to ground squirrels (or to any other small mammal species) were observed in the project area. At most, San Joaquin kit foxes are likely to use the project area occasionally for foraging and dispersal. However, the USFWS (2008) Alameda Siphons Biological Opinion states that there is a reasonable certainty for San Joaquin kit fox to occur in habitat within and adjacent to that project area (which overlaps the southern portion of the SABPL project area). To maintain consistency with the Alameda Siphons Biological Opinion, this EIR provides full consideration of San Joaquin kit fox; however, the potential for this species to occur in the SABPL project area is considered low, and that potential was further diminished by the extensive site clearance for the NIT and Alameda Siphons projects.

Other Special-Status Species

Reptiles and Amphibians

Western pond turtle (*Actinemys marmorata*) is a California species of special concern. Western pond turtles are commonly found in vegetated ponds, lakes, marshes, rivers, streams, and irrigation ditches with rocky or muddy substrates. Turtles bask on logs or other objects when water temperatures are lower than air temperatures. Nests are located at upland sites, often up to 0.25 mile from an aquatic site (Jennings and Hayes, 1994; Stebbins, 2003; Zeiner et al., 1988). General dispersal may occur throughout upland habitat.

Western pond turtles are uncommon and discontinuously distributed throughout California west of the Cascade–Sierran crest (Jennings and Hayes, 1994). They are known to inhabit Alameda Creek and its tributaries, with records documenting species presence near within 1.2 miles of the project area to the north and south on Alameda Creek and also in San Antonio Creek near the base of Turner Dam. Suitable habitat for western pond turtle is present in Alameda Creek near the project area (San Francisco Planning Department, 2008) and in some of the quarry pits (San Francisco Planning Department, 2009b). However, due to their steeply sloping sides and limited vegetation development, quarry Pits F3-East and F3-West offer poor-quality habitat for this species.

Birds

Cooper's hawk (*Accipiter cooperii*) is a California species of special concern and a year-round resident throughout much of California. These hawks nest in riparian, deciduous, conifer, and mixed woodlands, but will also nest in urban areas and seem to tolerate at least moderate levels of human activity near their nesting sites (SFPUC, 2009c). Cooper's hawks forage along forest edges and in broken habitats for small birds and small mammals such as rodents.

Cooper's hawks are fairly common in the Alameda Creek watershed and have been observed foraging in the vicinity of the project area. Because there are few trees and little woodland within the project area, this species is considered to have only a moderate potential to nest in the vicinity.

Tricolored blackbird (*Agelaius tricolor*) is a California species of special concern. Tricolored blackbird is a colonial (that is, breeding in large congregations) species that nests in dense vegetation in and around freshwater wetlands. These blackbirds prefer large freshwater emergent wetlands with tall, dense cattails or tules for nesting, but will also breed in thickets of willow, blackberry, wild rose, or tall herbs. During the nonbreeding season, flocks are highly mobile and forage in grasslands, croplands, and wetlands (Shuford and Gardali, 2008).

Tricolored blackbirds are locally common throughout the Sacramento and San Joaquin River valleys, and breeding habitat has been documented in the Sunol Valley (CNDDB, 2009; San Francisco Planning Department, 2008). During the reconnaissance survey for the proposed project, a flock of about 100 tricolored blackbirds was observed foraging in the floodplain of Alameda Creek near the Alameda Siphons, and flying back and forth over the quarry area. Breeding may occur in an approximately 6-acre freshwater marsh west of Pit F4 (just to the south of Pit F3), which contains abundant cattails, and may occur in an approximately 8-acre freshwater marsh offsite and west of Pit F6. Only low-quality, weedy upland nesting habitat is present in the project area, and tricolored blackbirds are not expected to nest there because high-quality marsh habitat is present nearby.

Golden eagle (*Aquila chrysaetos*) is a California fully protected species. Golden eagles prefer open habitats such as rolling grasslands, deserts, savannas, and early successional forest and shrub habitats, with cliffs or large trees for nesting and cover; they often construct multiple nests in one breeding territory (Zeiner et al., 1988).

Nest locations have been documented in oak woodland on slopes to the southwest of Turner Dam, at a distance of 0.5 mile from the project area (SFPUC, 2009c). Additional nests are documented east of San Antonio Reservoir, approximately 3.6 miles from the project area, and in hills west of the Sunol Valley, approximately 4 miles south of the project area. This species was not observed during field assessments and is not expected to nest within the project area.

Short-eared owl (*Asio flammeus)* is a California species of special concern. The short-eared owl is an open-country bird seen most often at dawn and dusk. These owls usually nest on dry ground in depressions concealed by vegetation, sometimes within burrows. Breeding is from early March through July, with a typical clutch size of five to seven eggs. Short-eared owl is a widespread winter migrant with resident populations in portions of California (Shuford and Gardali, 2008).

Short-eared owl nesting is documented in western La Costa Valley, 2.7 miles east of the project area; however, this species was not observed during field assessments. Very limited suitable habitat is present in the project area due to the extensive clearance of non-native grassland and ruderal areas during construction of other SFPUC projects.

White-tailed kite (*Elanus leucurus*) is a California fully protected species. White-tailed kites forage in open grasslands, meadows, farmlands, and emergent wetlands. They typically nest in oak woodlands or trees, especially along marsh or river margins, although they will use any suitable tree or shrub of moderate height. They are rarely found far from agricultural areas (Zeiner et al., 1988).

No nest locations are documented within 6 miles of the project area, but suitable habitat is available along San Antonio Creek at the location where the proposed backup pipeline would cross the creek and in oak woodlands east of Calaveras Road. White-tailed kites were observed foraging east of Calaveras Road, north of the project area. Potential foraging habitat has become increasingly limited within the project area due to site clearance for other SFPUC projects.

Horned lark (*Eremophila actia alpestris)* is a California species of special concern. California horned larks build grass-lined nests directly on the ground, in dry open habitats with sparse vegetation. They form large flocks for foraging and roosting. This species is a common to abundant resident songbird in a variety of open habitats. Range-wide, California horned larks breed in level or gently sloping shortgrass prairie, montane meadows, barren fields, open coastal plains, fallow grain fields, row crops, and alkali flats.

Horned larks range across North America, from Alaska and the Canadian arctic southward to southern Mexico. Within the project vicinity, nesting has been documented within the grasslands on the north slopes of San Antonio Reservoir. In the project area, suitable habitat is present in the grasslands on the margins of access roads, but is very limited because of site clearance and fencing for other SFPUC projects.

Loggerhead shrike (*Elanus leucurus*) is a California species of special concern. Loggerhead shrikes are a semi-permanent resident species in California, occurring in abundance in the Central Valley and Central Coast where shrub habitats and open woodlands are present. Shrikes generally forage on the fringes of open habitats where suitable hunting perches are available. Breeding is often associated with blackberry and willows ranging in size from individual shrubs to dense thickets. This species typically hunts from dead trees, tall shrubs, utility wires, and fences, impaling their prey on sharp twigs, thorns, or barbed wire.

Shrikes are common throughout California and are expected to occur in the project area along San Antonio Creek, along an intermittent drainage northwest of the San Antonio Pump Station, and along the southeast fringes of Pit F3-East, where shrubby willows provide adequate cover and nesting sites. Foraging habitat is limited within the project area because of recent or imminent site clearance for other SFPUC projects in the Sunol Valley. Breeding has been documented to occur on the northern slopes of San Antonio Reservoir (SFPUC, 2008). Loggerhead shrikes were observed during the reconnaissance survey.

Other migratory birds, including raptors, could nest in and adjacent to the project area based on the presence of suitable nesting habitat (e.g., grasslands, isolated trees, open woodlands, and open scrublands). The breeding season for most birds is generally from February 15 to August 15. Federal and state laws, including the Migratory Bird Treat Act (MBTA) and California Fish and Game Code Sections 3503 and 3503.5, protect the occupied nests and eggs of these birds. The CDFG is responsible for overseeing compliance with the codes and makes recommendations on nesting bird and raptor protection (San Francisco Planning Department, 2009a).

Mammals

California bat species of special concern include **pallid bat** (*Antrozous pallidus*), **hoary bat** (*Lasiurus cinereus*), **Yuma myotis** (*Myotis yumanensis*), and **Townsend's western big-eared bat** (*Plecotus townsendii*). Pallid bat has been reported about 2 miles from the project area, but habitat within the project area is limited due to the lack of large trees. Yuma myotis has been documented in the hills approximately 2.5 miles west of the project area. Hoary bat, pallid bat, and Townsend's big-eared bat are also known to occur in the project vicinity (CNDDB, 2009). Quarry pits and the Alameda Creek channel provide potential foraging habitat for these insectivorous bats, and potential roosting habitat is available in project area buildings, with limited potential in tree hollows due to the lack of large mature trees. The Calaveras Road bridge over San Antonio Creek and two wooden bridges crossing Alameda Creek near the southern project area were also inspected, but no bats were observed. Large tree hollows present in the project vicinity could provide habitat for tree-roosting bats near the access gate to Pits F3-East and F3-West at Calaveras Road and west of the San Antonio Pump Station in the southern project area. These hollows were observed in large sycamore, oak, and cottonwood trees along San Antonio Creek, on slopes east of Calaveras Road, and in grasslands west of the proposed chemical facility. Although extensive site clearance has temporarily removed foraging habitat in much of the project area, the large trees in the vicinity have, for the most part, been preserved.

Fishes

The USFWS has listed eight fish species in Alameda County as special-status species. Sacramento River winter-run Chinook salmon, Central California Coast (CCC) coho salmon (*Oncorhynchus kisutch*), and tidewater goby (*Eucyclogobius newberryi*) are federally listed as endangered. Delta smelt (*Hypomesus transpacificus*), Central Valley spring-run Chinook salmon, and CCC and California Central Valley steelhead are federally listed as threatened. Central Valley fall-run Chinook salmon is listed as a federal species of concern.

Fall-run Chinook and coho salmon are not found in the project area due to several downstream barriers that block their migratory pathway. Coho salmon are also believed to be extirpated from San Francisco Bay drainages. The aquatic habitats in the vicinity of the project site are outside of the range of the delta smelt, tidewater goby, and spring and winter-run Chinook salmon.

The species *Oncorhynchus mykiss* is known as steelhead when it is anadromous, and as rainbow trout when it resides exclusively in freshwater. Steelhead are born in freshwater, migrate to the ocean, and then return to freshwater to spawn. Rainbow trout complete their life cycle entirely in freshwater. The NMFS has listed steelhead in the San Francisco Bay Area as threatened. The landlocked, resident rainbow trout found in the upper watershed are related to steelhead of the CCC Distinct Population Segment (DPS), but are not considered part of this DPS (NMFS, 2006). However, this listing does not include rainbow trout upstream of migration barriers in Alameda Creek. For many decades, impassible barriers along Alameda Creek in the lower watershed have blocked migratory steelhead from entering the upper Alameda Creek watershed in the Sunol Valley to spawn. The SFPUC has removed two of the barriers, the Niles and Sunol Dams; however, even with removal of these dams, other barriers along Alameda Creek, including the BART weir, still block anadromous fish passage. Occasionally, adult steelhead below the BART weir are captured and transported above the weir by volunteer groups; in 2008, successful spawning of a pair of transported adult steelhead was documented in Stonybrook Creek (ACA, 2008). However, artificially transported steelhead upstream of total passage barriers do not represent a naturally occurring, self-sustaining population; thus, they are not considered part of the CCC steelhead DPS. Even if successful in spawning, rearing, and juvenile migration to the ocean, the offspring of artificially transported steelhead cannot return to the watershed upstream of the BART weir to complete a full life cycle without again being assisted. Suitable fish passage for resident rainbow trout is present seasonally in Alameda Creek in the vicinity of the SABPL project, but is extremely limited in San Antonio Creek because of the limited flows and limited upstream habitat.

Fall-run Chinook salmon are also not considered a special-status species in the project area due to the current presence of barriers. If and when the remaining downstream passage barriers are removed and steelhead and Chinook salmon can naturally access the project area, both species would be considered potentially present special-status species. Thus, potential project-related impacts on steelhead and fall-run Chinook salmon that may, in future, be present in the project area are cumulative in nature and are discussed below in Section 5.14.3.7. Potential impacts on resident rainbow trout and other native species are also addressed in this section.

Special-Status Plants

May and Associates (2008) carried out a literature and protocol-level botanical assessment for special-status plants in the SABPL project area (report presented in **Appendix J**). Because the botanical surveys were initiated in 2008, ESA+Orion (2010) performed additional investigations in 2009 and 2010—early-season surveys as well as a habitat assessment for late-blooming species within portions of the project area not surveyed in 2008—to complete the data set. As indicated in Table 5.14-3 and Figure 5.14-4, based on the habitat types that occur in the project area, 19 special-status plant species were considered to have some potential to occur (SFPUC, 2011b); however, suitable habitat is either not present or is of very poor quality within the project area, and no special-status plant species were observed in the project area during the protocol-level field surveys in 2008 and 2009 or the habitat assessment surveys in 2010. It was therefore concluded that no special-status plants were present in this highly disturbed, low-diversity area. Furthermore, no plants considered "unusual and significant in the East Bay" (Lake, 2010) were observed in the project area, further supporting the conclusion that the project area is highly disturbed and of low ecological quality.

5.14.2 Regulatory Framework

5.14.2.1 Federal Regulations

Endangered Species Act

FESA, which is administered by the USFWS and NMFS, protects fish and wildlife species identified by these agencies as threatened or endangered, as well as the habitats of identified species. In general, the NMFS is responsible for the protection of FESA-listed marine species and anadromous fishes, whereas the USFWS has jurisdiction over wildlife, plant, and commercial fish species listed as proposed or candidate species.

Endangered refers to species, subspecies, or distinct population segments that are in danger of extinction throughout all or a significant portion of their range. *Threatened* refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future.

Take[6] of listed species can be authorized through either the Section 7 consultation process for actions undertaken by federal agencies, or through the Section 10 permit process for actions undertaken by non-federal agencies where a Section 404 permit or other federal approval is not required.

Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits and licenses). Under Section 7, the federal agency conducting, funding, or permitting an action (the federal lead agency) must consult the USFWS and/or NMFS, as appropriate, to ensure

[6] FESA defines *take* as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed project "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a Biological Assessment evaluating the nature and severity of the expected effect. In response, the USFWS issues a Biological Opinion with a determination that the proposed action may either jeopardize the continued existence of one or more listed species (jeopardy finding), result in the destruction or adverse modification of critical habitat (adverse modification finding), not jeopardize the continued existence of any listed species (no jeopardy finding), or result in adverse modification of critical habitat (no adverse modification finding).

The Biological Opinion issued by the USFWS may stipulate discretionary "reasonable and prudent" conservation measures. If the project would not jeopardize a listed species, the USFWS issues an incidental take statement to authorize the proposed activity.

Migratory Bird Treaty Act

The MBTA (16 USC 703) authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 10, 12). Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of the MBTA. Examples of permitted actions that do not violate the MBTA are the possession of a hunting license to pursue specific gamebirds, legitimate research activities, display in zoological gardens, bird-banding, and other similar activities. The USFWS is responsible for overseeing compliance with the MBTA, and the U.S. Department of Agriculture's Animal Damage Control Officer makes recommendations on related animal protection issues.

Clean Water Act Section 404

The federal Clean Water Act (CWA) was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

Waters of the United States are areas subject to federal jurisdiction pursuant to Section 404 of the CWA. Waters of the United States are typically divided into two types: (1) wetlands and (2) other waters of the United States. Wetlands are "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR Section 328.3[b], 40 CFR Section 230.3). To be considered subject to federal jurisdiction, a wetland must normally support hydrophytic vegetation (plants growing in water or wet soils), hydric soils, and wetland hydrology (Environmental Laboratory, 1987). Other waters of the United States are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for the three wetland parameters (33 CFR 328.4).

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Applicants must obtain a permit from the Corps for discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. The Corps may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. Nationwide permits (NWPs) are a type of general permit issued to cover particular activities that would result in the deposition of fill material into waters of the United States. Each NWP specifies particular conditions that must be met for the NWP to apply to a particular project. Waters of the United States in the project area are under the jurisdiction of the San Francisco District of the Corps.

Water Quality Certification (Clean Water Act Section 401)

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected water at the point where the discharge would originate. The California RWQCB administers this certification. Therefore, all projects that have a federal component and that may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401.

5.14.2.2 State Regulations

California Endangered Species Act

CESA (Fish and Game Code Sections 2050–2097), which is administered by the CDFG, prohibits the take[7] of plant and animal species designated by the Fish and Game Commission as either threatened or endangered in the State of California. Section 2081 of CESA allows the CDFG to authorize exceptions to the state's prohibition against take of a listed species, such as for educational, scientific, or management purposes. Private developers whose projects do not involve a state lead agency under CEQA may not take a listed species without formally consulting with the CDFG and agreeing to strict measures and standards for managing the listed species.

California Fish and Game Code

Fully Protected Species

California Fish and Game Code Section 2080 provides protection from take for a variety of species, referred to as fully protected species. Except for take of species related to scientific research, all take of fully protected species is prohibited. Fully protected wildlife species that have the potential to occur in the project area include white-tailed kite and golden eagle.

[7] *Take* in the context of CESA means to hunt, pursue, kill, or capture a listed species, as well as any other actions that may result in adverse impacts when attempting to take individuals of a listed species. The take prohibitions also apply to candidates for listing under CESA.

Streambed Alteration Agreements

Under California Fish and Game Code Section 1602 et seq., the CDFG has jurisdictional authority over wetland resources associated with rivers, streams, and lakes. The CDFG can regulate all work under the jurisdiction of California that would: substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed.

In practice, the CDFG marks its jurisdictional limit at the top of the stream or lake bank or the outer edge of the riparian vegetation, where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries (as defined by CWA Section 404) sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under Section 1602 may encompass a greater area than those regulated under CWA Section 404.

The CDFG enters into a Streambed Alteration Agreement with an applicant and can request conditions to ensure "no net loss" of wetland values or acreage will be incurred. The streambed or lakebed alteration agreement is not a permit, but rather a mutual agreement between the CDFG and the applicant.

Bird/Raptor Protections in the Fish and Game Code

Section 3503 of the California Fish and Game Code prohibits take, possession, or destruction of the eggs and nests of all birds. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Take or possession of any migratory, non-game bird as designated in the MBTA is prohibited under Sections 3513 and 3800.

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act established the State Water Resources Control Board (SWRCB) and divided the state into nine basins, each with its own regional board (RWQCB). The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, while the RWQCBs are responsible for developing and enforcing water quality objectives and implementation plans.

The Porter-Cologne Water Quality Control Act authorizes the SWRCB to enact state policies regarding water quality in accordance with Section 303 of the CWA. In addition, the act authorizes the SWRCB to issue Water Discharge Requirements for projects that would discharge to state waters.

With respect to biological resources, the SWRCB and RWQCBs have authority over any fill activities within state waters, including isolated water/wetlands that may be outside the jurisdiction of the Corps.

5.14.2.3 Local Regulations

The SFPUC, as a government agency and public utility, has intergovernmental immunity from the building and zoning ordinances of other cities and counties for activities conducted on the land it owns, leases, or acquires. The issue of intergovernmental immunity is discussed in greater detail in Chapter 4, Plans and Policies.

The proposed project would be constructed on SFPUC watershed lands within the Sunol Valley in unincorporated Alameda County. The City and County of San Francisco (CCSF) exerts land use control over CCSF-owned lands and has adopted the *Alameda Watershed Management Plan* (Alameda WMP) to manage these SFPUC watershed lands.

The section below discusses city and county tree ordinances because they are specifically related to the significance criteria applied to assess impacts on biological resources. This discussion is followed by a summary of the relevant requirements of the Alameda WMP.

Alameda County Tree Ordinance

The Alameda County Tree Ordinance (Ordinance No. 0-2004-23, Chapter 12.11 of the Alameda County General Ordinance Code) applies only to trees within a county right-of-way. Alameda County does not have a tree ordinance that applies to land outside of the county right-of-way. The Alameda County Tree Ordinance requires project sponsors to obtain an encroachment permit for planting, pruning, or removing trees in the right-of-way of a county road, and to replace any removed trees.

Alameda Watershed Management Plan

The Alameda WMP, adopted by the CCSF in 2000, includes actions and guidelines for watershed management. Those relevant to the proposed project are summarized below.

- *Action veg2*: Prior to planning or initiating any watershed activity, and in conjunction with the review process for proposed plans and projects, consult the SFPUC Geographic Information Systems (GIS) database, which identifies specific vegetation communities and their associated rare, threatened, endangered, and sensitive species, to determine the level of impact of the activity on sensitive vegetation communities and species. Specific communities and areas of concern in the Alameda watershed include: Sycamore Alluvial Woodland; Freshwater Marsh; Valley Oak Woodland; Serpentine Bunchgrass; Central Coast Arroyo Willow Riparian Forest; Central Coast Live Oak Riparian Woodland; Blue Oak Woodland; and Valley Needle Grassland.

- *Action veg3*: Prior to the initiation of any watershed activity that may affect an Ecological Sensitivity Zone (ESZ, a defined area containing special-status resources), conduct surveys for special-status species and map observed occurrences in the GIS database. Update ESZ mapping based on surveys. Develop and implement effective mitigation measures to avoid and minimize adverse effects on species and their natural communities.

- *Action veg4*: Prior to the initiation of any construction project involving grading, a grading plan shall be prepared by the project proponent and approved by appropriate SFPUC staff.

Revegetation of all graded areas shall be required to the maximum extent practicable. Grading plans shall include, but not be limited to, a map of the site, prepared at a scale of 1 inch to 500 feet or greater. The map shall include contour intervals of at least 5 feet, including: pre-project land contours; post-construction land contours (finished grade); location of all areas to be graded, with cut banks and fill slopes delineated; and estimated dimensions of graded areas. A narrative description of the proposed grading activity shall include: its purpose; an estimate of the total volume of material to be moved; a description of the height of all cut banks and fill slopes (may be delineated on the map); a description of the provisions to be used for compaction, drainage and stabilization of graded areas; a description of all plant materials used to revegetate exposed slopes and banks, including type of species, number of plants, size and location (may be delineated on the map), and a description of irrigation provisions or other measures necessary to ensure the survival of plantings; and a description of any other interim or permanent erosion control measures to be utilized.

- *Action wil1*: Prior to planning or construction, and in conjunction with the review process for proposed plants and projects, conduct site-specific review of new structures, linear facilities, parking lots, roads, or trails to be located in any habitat to avoid and minimize adverse impact on wildlife, their movement, and habitat. Where new facilities are needed and/or construction is required, adhere to the following guidelines:
  - Consolidate siting of linear facilities, such as trails and utility corridors, to the periphery of the watershed.
  - Design projects to maintain connectivity between habitat types.
  - Minimize stream crossings and locate facilities outside of High Water Quality Vulnerability Zones (WQVZs).
  - Avoid disturbance to bird nests during construction. Follow all stipulations of Title 14 – Forest Practice Act when performing tree removal, including the identification of active nest sites and establishment of required buffers around those sites. Nests discovered during preconstruction surveys should be flagged and avoided until the nests are abandoned or young have fledged.
- *Action wil2*: Conduct comprehensive (if broad-based activity) or site-specific surveys of affected habitats to more completely determine the presence or absence of listed or sensitive taxa. When making decisions related to watershed activities that may affect a high ESZ, develop and implement effective mitigation measures to avoid and minimize adverse effects on species and habitat. Specific requirements and guidelines include:
  - Clear deadwood and perform timber operations outside of bird breeding season, or conduct bird nesting surveys prior to operations.
  - Prevent disruption to any breeding areas encountered during surveys or operations.
  - Evaluate old structures (barns, buildings, tunnels) or disturbed areas to determine if they are being used by species with specialized habitat needs (e.g., bats, owls, nesting raptors) prior to conducting restoration and/or demolition.
- *Action wil3*: Identify and protect primary wildlife movement corridors such as riparian corridors, and accommodate wildlife passage when designing fencing, culverts, stream crossings, and underpasses.

- *Action wil4*: Relocate or eliminate unnecessary infrastructure and facilities as opportunities arise in an effort to reduce fragmentation and disruption of terrestrial habitat over the long term.

- *Action wil6*: Establish a standard for number of snags/fallen trees/nesting trees per acre by vegetation type and implement and protect them for wildlife use and nutrient cycling. Downwood and brush piles should be left as habitat and cover where safety and fire hazard are not concerns.

- *Action wil10*: Institute seasonal prohibition of activities during breeding periods and enact appropriate mitigation measures (e.g., buffer zones, restricted access) to adequately protect special-status or sensitive species in the absence of site-specific surveys.

- *Action aqu1*: Prior to undertaking or constructing any non-water dependent facility or watershed activity, conduct site-specific review in conjunction with the review process for proposed plans and projects (Actions des1 and des2) to ensure that the facility or activity is not located within a high WQVZ. If feasible, relocate the activity or facility to an alternative upland site. If no feasible site exists, follow best management practices (BMPs) as set forth in Alameda WMP Appendix C-6 and minimize stream crossings.

- *Action fis1*: Maintain access for fish species of concern from reservoir to upstream spawning grounds in streams tributary to San Antonio and Calaveras Reservoirs by eliminating unnecessary artificial barriers, creating fish passage structures, and allowing sufficient flows (where regulated) during critical breeding periods.

- *Action fis4*: Where stream alterations and diversions exist or cannot be avoided, consult with the CDFG regarding installation of fish screens and/or fish passage structures to prevent entrapment and mortality.

5.14.3 Impacts and Mitigation Measures

5.14.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to biological resources, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the CDFG or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS;

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act and as protected under the Porter-Cologne Water Quality Control Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites[8];

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

5.14.3.2 Approach to Analysis

Due to the nature of the SABPL project, there would be no impacts related to the following significance criterion; therefore, no impact discussion is provided for these topics for the reasons described below:

- *Conflict with the Provisions of an Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other Adopted Local, Regional, or State Habitat Conservation Plan*. There are no adopted habitat conservation plans, natural community conservation plans, or other approved plans that apply to the proposed SABPL project area. Thus, this criterion is not applicable to construction or operation of the proposed project and is not discussed further.

- *Conflict with Local Policies or Ordinances Protecting Biological Resources During Project Operations*. There are no local policies or ordinances protecting biological resources that apply to SABPL project operations. Thus, this criterion is addressed below only as it relates to project-related construction activities (see Impact BI-6).

- *Interfere Substantially with the Movement of Wildlife Species or With Established Native Resident or Migratory Wildlife Corridors, or Impede Use of Wildlife Nursery Sites During Project Operations*. Once construction is completed, the buildings and aboveground structures proposed under the SABPL project (chemical facility, discharge facility, discharge valve vault, electrical control building for new discharge facility, Alameda Creek Pump Station and control building, vaults, and manhole risers) would be too small to adversely affect wildlife movement or wildlife nursery sites. All other proposed facilities and improvements would be constructed underground and would also have no affect on wildlife movement or wildlife nursery sites. Therefore, no impact to wildlife corridors or wildlife nursery sites would result during project operations; this criterion is addressed below only as it relates to project-related construction activities (see Impact BI-5).

For this EIR, the definition of the word "substantial" as used in the significance criteria above has three principal components:

- Magnitude and duration of the impact (e.g., substantial/not substantial)
- Uniqueness of the affected resource (rarity)
- Susceptibility of the affected resource to disturbance

[8] A wildlife nursery site is an area containing essential habitat features and is used by wildlife over generations for rearing young.

The evaluation of significance also considers the interrelationships among these three components. For example, a relatively small-magnitude impact on a federally endangered species (e.g., CRLF egg destruction) would be considered significant because the species is rare and believed to be very susceptible to disturbance. Conversely, a natural community such as California non-native grassland is not necessarily rare or sensitive to disturbance, and thus a much larger magnitude of impact would be required to result in a significant impact.

Three basic changes in existing biological conditions could result from implementation of the proposed project:

- Effects on wetlands, aquatic resources, or riparian habitat
- Effects on other sensitive habitats (i.e., sensitive natural communities and wildlife movement corridors)
- Effects on special-status wildlife or fish species – direct mortality and/or alteration of habitat

For each of the above, this EIR provides a project-level evaluation of the direct and indirect impacts resulting from project-related construction and operational activities as well as an analysis of the project's contribution to cumulative impacts. As described in Section 5.14.1.3, above, construction and operation of the proposed project would have no effect on special-status plants because none are known to occur within or adjacent to the project area.

5.14.3.3 Impact Summary

Table 5.14-4 lists the SABPL project's biological resources impacts and significance determinations.

TABLE 5.14-4
SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES

Impact	Significance Determinations
Impact BI-1: The proposed project could have a substantial adverse effect on special-status animal species during construction.	LSM
Impact BI-2: The proposed project could have a substantial adverse effect on riparian habitat and other sensitive habitats during construction.	LSM
Impact BI-3: The proposed project could have a substantial adverse effect on jurisdictional waters during construction.	LSM
Impact BI-4: The proposed project could have a substantial adverse effect on resident trout and other native fishes during construction, either by impeding movement or adversely affecting aquatic habitat.	LSM
Impact BI-5: The proposed project would not have a substantial adverse effect on wildlife corridors or wildlife nursery sites during construction.	LS
Impact BI-6: Construction activities associated with the proposed project could conflict with local policies or ordinances protecting biological resources.	LSM
Impact BI-7: Project operations could have a substantial adverse effect on special-status animal species.	LSM
Impact BI-8: Project operations would not have a substantial adverse effect on jurisdictional waters, riparian habitat, or aquatic resources.	LS

TABLE 5.14-4 (Continued)
SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES

Impact	Significance Determinations
Impact BI-9: The proposed project would not have a substantial adverse effect on sensitive habitats during project operations.	LS
Impact BI-10: The proposed project would not interfere with the movement of native resident trout and other migratory fishes during project operations.	LS
Impact C-BI: Project implementation would result in a cumulatively considerable contribution to cumulative impacts on biological resources during project construction and operation.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.14.3.4 Construction Impacts and Mitigation Measures

Impact BI-1: The proposed project could have a substantial adverse effect on special-status animal species during construction. (Less than Significant with Mitigation)

As previously discussed, no special-status plants are known to occur within or adjacent to the project area. Therefore, this impact discussion focuses on special-status animal species.

California Red-Legged Frog and California Tiger Salamander

Project construction activities would occur in areas that potentially serve as upland refugia or movement corridors for CTS and CRLF. Thus, site clearing and preparation for construction activities could remove upland refugia and movement/dispersal habitat for these species. The movement of construction vehicles across the project area could cause direct mortality of individuals by crushing them or their burrows. Trenches and excavations, if left open during the night, could trap and injure CTS and CRLF that are moving through the construction area. Construction activities could also impede the dispersal movement of juveniles or the movement of adults between breeding ponds and upland refugia. Noise, vibration, the presence of human activities, and degradation of water quality during construction could affect habitat and cause injury or mortality to CTS and CRLF.

Much of the project area, including the North Spoils Site and the southern two-thirds of the backup pipeline alignment, has already been cleared, graded, and fenced for the NIT and Alameda Siphons projects. Potential upland burrows identified in these areas during preconstruction surveys for these projects have been excavated and collapsed to avoid direct loss of these species during construction. Areas remaining where habitat loss and mortality could occur as a result of the SABPL project include the northern one-third of the backup pipeline alignment, including San Antonio Creek, quarry Pits F3-East and F3-West, and Staging Area A. In addition, installation of the backup pipeline would temporarily block movement corridors from east to west for about 2 miles along Calaveras Road. Impacts on CTS and CRLF potential upland refugial and dispersal habitat will primarily be temporary; however, construction of access roads, air gaps along the backup pipeline, and other facilities would also result in permanent losses of approximately 0.5 acre of habitat for these species. Loss of habitat and the potential for direct mortality of CRLF and CTS in these areas would be a potentially significant impact.

Alameda Whipsnake

Alameda whipsnake could be affected by construction activities because of habitat loss; vehicle roadkill; crushing of burrows or other refugia; disruption of movement patterns due to temporary access roads and staging areas; excavation and trenching; and spoils hauling. Noise, vibration, and increased human activity could cause Alameda whipsnake to abandon foraging areas in or near the project area. Accidental releases of hazardous materials could cause illness or mortality if the snakes were to come into contact with these toxic materials.

However, much of the project area has already been cleared, graded, and fenced for the NIT and Alameda Siphons projects, and any potential habitat in these areas has been eliminated and excluded from potential use by Alameda whipsnakes. The North Spoils Site and most of the southern two-thirds of the backup pipeline alignment have already been fenced and cleared. Areas remaining where temporary and permanent impacts on Alameda whipsnake habitat could occur include the northern one-third of the backup pipeline alignment (including San Antonio Creek) and Staging Area A. In addition, installation of the backup pipeline would temporarily block movement corridors for Alameda whipsnake for about 2 miles along Calaveras Road. Impacts on potential foraging and dispersal habitat for Alameda whipsnake would primarily be temporary; however, construction of access roads, air gaps along the backup pipeline, and other facilities would also result in permanent losses of approximately 0.5 acre of habitat for this species. Loss of this habitat and the potential for direct mortality of Alameda whipsnake in these areas would be a potentially significant impact.

San Joaquin Kit Fox

Foraging and denning habitat for San Joaquin kit fox could be temporarily lost as a result of pipeline installation, staging, spoils placement, and construction vehicles traveling along access roads associated with the proposed project. In addition, there is a remote possibility of injury or mortality if a kit fox were to become trapped in open trenches or be crushed by construction equipment or vehicles while foraging or dispersing through the project area. However, the habitat assessment for the SABPL project (ESA, 2010a) found that the project area offered minimal foraging and denning habitat for San Joaquin kit fox, and this species is absent or extremely scarce in the Sunol Valley. Furthermore, most of the recently available habitat within the project area has been cleared, burrows collapsed, and exclusion fencing erected for the NIT and Alameda Siphons projects. No evidence of San Joaquin kit fox was detected during these activities (SFPUC, 2011a), and the remaining potential habitat within the project area is limited. Therefore, the potential for project-related impacts on San Joaquin kit fox due to habitat loss, injury, or mortality is considered less than significant. In addition, protective measures for other special-status species, such as exclosure fencing, inspection of burrows and trenches, and construction monitoring, would further minimize the already limited potential for impacts on this species.

Burrowing Owl

Nesting and foraging habitat for burrowing owl could be temporarily lost as a result of pipeline installation, staging, spoils placement, and construction vehicles traveling along access roads associated with the proposed project. In addition, there is a remote possibility of injury or mortality if a burrowing owl were to become trapped or buried in a burrow or crushed by construction equipment or vehicles while foraging in the project area. However, the habitat assessment for the SABPL project (ESA, 2010a) found that the project area offered minimal nesting habitat because of the limited presence of suitably sized burrows. Foraging habitat, already of limited quality in the Sunol Valley, has been further reduced within the project area because of site clearance, grading, and fencing for the NIT and Alameda Siphons projects. No evidence of burrowing owl usage was detected during these activities (SFPUC, 2011a). Therefore, the potential for project-related impacts on burrowing owl due to habitat loss, injury, or mortality is considered less than significant. Protective measures for other special-status species, such as exclosure fencing, inspection of burrows and trenches, and construction monitoring, would further minimize the already limited potential for impacts on this species.

Western Pond Turtle

Construction activities in the vicinity of quarry Pits F3-East and F3-West, including construction of the proposed discharge facility, cutoff wall, Alameda Creek Pump Station, and transfer pipeline, could result in loss or degradation of aquatic habitat and adjacent upland nesting habitat for western pond turtle. These activities could result in loss of habitat and direct mortality from the crushing of western pond turtles or pond turtle nests containing eggs or young. However, because habitat conditions in quarry Pits F3-East and F3-West are marginal, potential impacts on western pond turtles are considered to be less than significant. Protective measures for other special-status species, such as exclosure fencing and construction monitoring, would further minimize the already limited potential for impacts on this species.

Nesting Birds, Raptors, and Bats

Construction activities could remove the nesting and foraging habitat of special-status birds and other wildlife that depend on grassland, woodland, and riparian habitat through direct removal of habitat, or could result in disruption of breeding and foraging habitat due to construction noise and activities. Project construction could result in the removal of large mature trees in developed and ruderal areas that provide important nesting habitat for nesting birds, raptors, and bats. In addition, the two quarry buildings located east of Pit F3-East—the residential-type building and the shed-roofed barn structure—that are proposed for demolition (see Figure 3-6 in Chapter 3, Project Description) and removal may provide roosting habitat for bats. Potentially affected bird and raptor species include nesting white-tailed kite, Cooper's hawk, tricolored blackbird, horned lark, golden eagle, short-eared owl, and loggerhead shrike. Potentially affected bat species include pallid bat, hoary bat, Yuma myotis, and Townsend's big-eared bat. These species are sensitive to human activity, and noise from construction activity with 500 feet of an active nest or maternity site (for bats) could disrupt breeding of these species.

Much of the project area, including the North Spoils Site and the southern two-thirds of the backup pipeline alignment, has already been cleared, graded, and fenced for the NIT and Alameda Siphons projects. Use of the project area by nesting birds and raptors may be limited during the construction period because of the high levels of human activity, even though several large mature trees exist along the southern and northern portions of the backup pipeline alignment on the west side of Calaveras Road; in the vicinity of the office buildings located north of the SMP-30 aggregate processing facility; and in the vicinity of Staging Areas A, B, and C. The potential for temporary and permanent habitat loss and disruption of breeding and foraging habitat in these areas, and in the mature trees that were preserved in the southern backup pipeline alignment, would be a potentially significant impact.

Impact Conclusion

Potential impacts on San Joaquin kit fox, burrowing owl, and western pond turtle during project construction activities are considered less than significant. Construction of the proposed project could result in potentially significant impacts associated with the temporary and permanent loss of habitat and the potential for direct mortality of CRLF, CTS, and Alameda whipsnake, and habitat loss and disruption of breeding and foraging habitat for nesting birds, raptors, and bats. However, with implementation of Mitigation Measures M-BI-1a through M-BI-1h, described below, these impacts would be reduced to a less-than-significant level.

Mitigation Measure M-BI-1a: General Protection Measures.

The SFPUC shall ensure that the following general measures are implemented by the contractor(s) during construction to minimize or avoid impacts on biological resources:

- Construction contractor(s) shall minimize the extent of the construction disturbance as much as feasible.
- Prior to the start of construction, the construction contractor, in coordination with a qualified biologist, shall install 4-foot-tall fencing at the limits of construction. In addition, fencing shall be installed outside the driplines of all trees to be retained that are located within 50 feet of any grading, road improvements, underground utilities, or other construction activity. A qualified biologist and the SFPUC must first approve any encroachment beyond these fenced areas. The contractor shall maintain the temporary fencing until all construction activities are completed. No construction activities, parking, or staging shall occur beyond the fenced areas.
- Project-related vehicles shall observe a 15-mile-per-hour speed limit on unpaved roads in the work area, or as otherwise determined by the applicable regulatory agencies.
- The contractor shall provide closed garbage containers for the disposal of all food-related trash items (e.g., wrappers, cans, bottles, food scraps). All garbage shall be collected daily from the project site and placed in a closed container, from which garbage shall be removed weekly.

- Construction personnel shall not feed or otherwise attract fish or wildlife in the project area.

- No pets shall be allowed in the project area.

- No firearms shall be allowed in the project area.

- Staging areas shall be located at least 50 feet from riparian habitat, creeks, and wetlands, where feasible.

- If vehicle or equipment fueling or maintenance is necessary, it shall be performed in the designated staging areas.

- In cases where excavations require dewatering, the intakes shall be screened with a maximum mesh size of 5 millimeters.

Mitigation Measure M-BI-1b: Worker Training and Awareness Program.

The SFPUC shall ensure that mandatory biological-resources awareness training is provided to all construction personnel as follows:

- The training shall be developed and provided by a qualified biologist or construction compliance manager familiar with the sensitive species that may occur in the project area. If a consulting biologist prepares the training program, SFPUC staff shall approve the program prior to implementation.

- The training shall be provided before any work, including vegetation clearing and grading, occurs within the work area boundaries.

- The training shall provide education on the natural history of the special-status species potentially occurring in the project area, and discuss the required mitigation measures to avoid impacts on the special-status species and the penalties for failing to comply with biological mitigation requirements.

- If new construction personnel are added to the project, the contractor shall ensure that they receive training prior to starting work. The subsequent training of personnel can include a videotape of the initial training and/or the use of written materials rather than in-person training by a biologist.

Mitigation Measure M-BI-1c: Minimize Disturbance to Riparian Habitat.

To minimize disturbance to creeks and riparian habitat, the SFPUC and its contractors shall conduct in-channel work in San Antonio Creek during the dry season.

Mitigation Measure M-BI-1d: Prevent Movement of Specific Species through the Work Areas.

To prevent CTS, CRLF, Alameda whipsnake, and other special-status species from moving through the project area, the SFPUC or its contractors shall install temporary exclusion fencing at selected locations along the work area boundaries (including access roads, staging areas, etc.) prior to the start of project construction activities. Fencing locations will be based on observations of these specific species or the presence of habitats that are likely to support higher densities of these species. Other portions of the work area boundaries would not be fenced, based on coordination with the CDFG and USFWS. The SFPUC shall monitor disturbance areas to determine whether additional fencing is necessary to minimize potential impacts. The SFPUC shall ensure that the temporary fencing is continuously maintained until all construction activities are completed and that construction equipment is confined to the designated work areas. The fencing shall be made of suitable material that does not allow any of the animals listed above to pass through, and the bottom shall be buried to a depth of 6 inches (or to a sufficient depth as specified by the applicable resource agencies) so that these species cannot crawl under the fence.

During fence installation, a qualified biological monitor shall be present onsite to relocate any animals to outside the work area boundaries. The biologist must be authorized by the federal (USFWS) and/or state (CDFG) regulatory agencies to relocate animals. After construction is completed, the exclusion fencing shall be removed.

Mitigation Measure M-BI-1e: Preconstruction Surveys and Construction Monitoring and Protocols for California Tiger Salamander, California Red-Legged Frog, and Alameda Whipsnake.

Preconstruction Surveys

Prior to initial ground-disturbing activities in the project area, a qualified biologist shall survey the construction areas as well as undeveloped areas in the immediate vicinity for the presence of CTS, CRLF, and Alameda whipsnake, as follows:

> *California tiger salamander and California red-legged frog*. Not more than two weeks prior to the onset of work activities (including equipment mobilization) and immediately prior to commencing work, the qualified biologist shall survey upland habitat in the project area for CTS and CRLF, and potential refuge or burrow/estivation sites. As feasible, burrow/estivation areas identified within the project boundaries shall be temporarily fenced (per Mitigation Measure M-BI-1d) and avoided. At locations where potential refuge/estivation burrows are identified and cannot be avoided, the burrows shall be excavated by hand or by other means approved by the CDFG and USFWS prior to construction. If a burrow is occupied, the individual animal shall be moved to a natural burrow or artificial burrow constructed of PVC pipe within 0.25 mile of the project area or other location as agreed to by the appropriate agencies.
>
> *Alameda whipsnake*. Not more than two weeks prior to the onset of work activities (including equipment mobilization) and immediately prior to commencing work, a qualified biologist shall conduct a reconnaissance survey of suitable upland habitat for Alameda whipsnake in the project area. If an Alameda whipsnake is found, the qualified biologist shall relocate the animal outside of the construction area.

Excavation, relocation, or collapse of burrows shall only be conducted as authorized by the USFWS (for federally listed species), by the CDFG (for state-listed species), or by both agencies (for species protected at both the federal and state levels).

Construction Monitoring and Protocols

At the beginning of each workday that includes initial ground disturbance, including grading, excavation, and vegetation-removal activities, a qualified biologist shall conduct onsite monitoring for the presence of CTS, CRLF, and Alameda whipsnake in the area where ground disturbance shall occur, as follows:

- San Antonio Creek shall be surveyed prior to any ground-disturbing or vegetation removal activities at or near this creek.
- Perimeter fences shall be inspected to ensure they do not have any tears or holes, that the bottoms of the fences are still buried, and that no individuals have been trapped in the fences.
- Any CTS, CRLF, or Alameda whipsnakes found along and inside the fence shall be closely monitored until they move away from the construction area.
- All open trenches or holes and areas under parked vehicles shall be checked for the presence of CTS, CRLF, and whipsnakes.
- All excavated or deep-walled holes or trenches greater than 2 feet shall be covered at the end of each workday using plywood or similar materials, or escape ramps shall be constructed of earth fill or wooden planks. Before such holes are filled, they shall be thoroughly inspected for trapped animals.
- Project personnel shall be required to immediately report any harm, injury, or mortality of a special-status species during construction (including entrapment) to the construction foreman or biological monitor, and the construction foreman or biological monitor shall immediately notify the SFPUC. The SFPUC shall provide verbal notification to the USFWS Endangered Species Office in Sacramento, California and/or to the local CDFG warden or biologist (as applicable) within one working day of the incident. The SFPUC shall follow up with written notification to the USFWS and/or CDFG (as applicable) within five working days of the incident. All observations of federally and state-listed species shall be recorded on CNDDB field sheets and sent to the CDFG by the SFPUC or representative biological monitor.

While it is not necessary that the biological monitor stay onsite for the entire day, the monitor shall remain on-call in case any of these animals are discovered and it is necessary to move them. The SFPUC shall designate an SFPUC representative as the point of contact in the event that a CTS, CRLF, or Alameda whipsnake is discovered onsite when the biological monitor is not present.

If the biological monitor or construction personnel find any of these species within the work area, construction activities shall cease in the immediate vicinity of the individual until: (1) the USFWS and/or CDFG are contacted and/or the animal has been removed from the construction area, in accordance with permits, by an approved biologist and released near a suitable burrow or other suitable habitat within 0.25 mile of the construction area, or (2) the animal moves away from the construction area on its own.

Once all initial ground-disturbing activities are completed, the biological monitor shall perform spot checks of the project area at least once a week for the duration of construction to ensure that the perimeter fence is in good order, trenches are being covered if left open overnight (or escape ramps provided), project personnel are conducting checks beneath parked vehicles prior to their movement, and all other required biological protection measures are being followed.

Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation.

The SFPUC shall prepare and implement a vegetation restoration plan with detailed specifications for minimizing the introduction of invasive weeds and restoring all temporarily disturbed areas, and shall ensure that the contractor successfully implements the plan. The plan shall indicate the best time of year for seeding to occur.

To facilitate preparation of the plan, the SFPUC shall ensure that, prior to construction, a qualified botanist (i.e., one experienced in identifying sensitive plant species in the project area) performs additional preconstruction surveys of the areas to collect more detailed vegetation composition data, including species occurrence, vegetation characterization (tree diameter size, etc.), and percent cover of plant species. Photo documentation shall be used to show pre-project conditions.

If required, the SFPUC shall provide the vegetation restoration plan to the Corps, the CDFG, the RWQCB, and the USFWS during the permitting process, as any vegetation to be removed may provide habitat for special-status species and may also be within areas under the jurisdiction of the Corps and the RWQCB. The minimum avoidance, minimization, and restoration measures as well as success criteria to be included in the vegetation restoration plan are described below.

Invasive Weed Control Measures

Invasive weeds such as yellow star-thistle, purple star-thistle, Italian thistle, bull thistle, and stinkwort readily colonize soils that have been disturbed by grading or other mechanical disturbance. Although the project area has an extensive weed infestation and relatively few native species, the SFPUC shall incorporate the following measures into the construction plans and specifications to prevent the further spread of invasive weeds into nearby areas:

- Construction equipment shall arrive at the project area free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species.
- Any imported fill material, soil amendments, gravel etc., required for construction and/or restoration activities that would be placed within the upper 12 inches of the ground surface shall be free of vegetation and plant material.
- Certified, weed-free, imported erosion-control materials (or rice straw in upland areas) shall be used exclusively, as applicable (this measure concerns biological material and does not preclude the use of silt fences, etc.).

- The environmental awareness training program for construction personnel shall include an orientation regarding the importance of preventing the spread of invasive weeds.

- To reduce the seed bank in weed-dominated ruderal areas, the contractor shall mow, disk, apply spot-applications of herbicide to weeds, and/or remove weeds, as appropriate and as early as feasible prior to surface clearing and site preparation.

- Before construction equipment leaves the project area, any accumulation of plant debris, soil, and mud shall be washed off the equipment or otherwise removed onsite, and air filters shall be blown out.

- The restoration plan shall specify measures to remove and/or control weeds in the project area.

- No invasive species shall be used in any restoration plantings.

- Implementation of these measures during construction and site restoration activities shall be verified and documented by a biological or environmental monitor.

Minimum Restoration Measures

Restoration areas are areas within the project area that would be disturbed during project-related construction activities but would subsequently be restored to their preconstruction conditions as defined by the success criteria described below. In order to restore these areas, the SFPUC shall ensure the following:

- The SFPUC shall ensure that topsoil is salvaged during grading and earthmoving activities (including during the preparation of spoils sites), stockpiled separately from subsoils, and protected from erosion (e.g., covered or watered); that composting amendments are added, if needed; and that potentially compacted construction work areas are properly prepared prior to reuse of the soil in the post-construction restoration of temporarily disturbed areas. The SFPUC shall ensure that a minimum of 12 inches of topsoil is salvaged, or if there is less than 12 inches of topsoil, as much as practicable.

- For grassland and ruderal areas, the affected areas shall be reseeded with a native or non-invasive grass and forb seed mix. High seed application rates shall be used to help compete with the weedy seed bank.

- For riparian and wetland habitats, the affected areas shall be replanted with similar plants of appropriate species and density as those removed. If possible, locally native stock shall be used.

- For any isolated mature native tree (i.e., one that is not part of a woodland or riparian cover) or any tree to be removed from the Alameda County Calaveras Road right-of-way that meets the criteria described below, the SFPUC shall ensure that replacement trees are planted within or in the vicinity of the project area as follows:

  - At a minimum, for each removed mature native tree (i.e., trees that are 6 inches in diameter at breast height [dbh] or ten inches aggregate dbh for multi-trunk trees), affected areas shall be replanted with the same species on an inch-by-inch basis for any native mature tree outside the county right-of-way or as otherwise agreed to in consultation with the USFWS and CDFG. For example, eight tube trees (each 1-inch in diameter) could be planted to replace one 8-inch native tree. Other tree sizes could also be used as long as the total dbh replaces the dbh of the removed tree or trees.

- Trees shall be replaced within the first year after the completion of construction or as soon as possible in an area where construction is completed during a favorable time period as determined by a qualified arborist or biologist.
- Replacement trees shall be planted in or near the area experiencing surface disturbance from project construction and in locations suitable for the replacement species.
- Selection of replacement sites and installation of replacement plantings shall be supervised by a qualified arborist or biologist. Irrigation of trees during the initial establishment period shall be provided as deemed necessary by a qualified arborist or biologist.
- A qualified arborist or biologist shall monitor newly planted trees at least twice a year for 5 years (7 years for oaks).
- Any trees planted as remediation for failed plantings shall be planted as stipulated here for original plantings, and shall be monitored for a period of 5 years (7 years for oaks) following installation, or as otherwise determined by the applicable resource agencies.
- To replace trees removed from the Calaveras Road right-of-way, the SFPUC shall plant replacement trees along Calaveras Road, where feasible. If additional mitigation trees are required but their spacing cannot be accommodated along Calaveras Road, the trees shall be planted in the vicinity of the project area.
- For non-native trees that are between 2 and 6 inches dbh within the Calaveras Road right-of-way, replacement trees shall be planted on a one-to-one basis for any trees removed.

Minimum Success Criteria

Unless otherwise determined by the applicable resource agencies, the success criteria for restoring temporarily disturbed areas shall be as follows:

- All temporarily disturbed areas shall be restored to approximate their baseline condition.
- Vegetation within restoration areas shall be functional, fully established, and self-sustaining as evidenced by successive years of healthy vegetative growth; observed increase in vegetative cover, canopy cover, and/or plant height; successful flowering, seed set, and/or or vegetative reproduction over the 5-year monitoring period.
- Revegetation work shall start within one year of construction completion.
- Revegetation of grassland areas shall be monitored at least once a year for 5 years. With the exception of Oak trees, which shall be monitored for up to 7 years, all other replacement trees shall be monitored for 5 years.

- Restoration areas shall be monitored for target invasive plants quarterly in the first 5 years following replanting. If invasive plants are found during the 5-year monitoring period, they shall be removed as necessary to support meeting the cover and vegetation composition success criteria.

- Monitoring and maintenance shall continue until the minimum success criteria specified in the table below are met, or as otherwise determined by the applicable resource agencies.

MINIMUM SUCCESS CRITERIA FOR VEGETATION RESTORATION

Parameter	Field Indicator/Measurement
Vegetative Cover	**Grassland:** 70 percent absolute cover of typical native and naturalized grassland species known from the Sunol Region by the end of the fifth monitoring year. **Individual Native Mature Trees:** 65 percent plant survivorship by the fifth monitoring year. **Alameda Creek Channel and Willow Riparian Forest/Scrub:** Greater than or equal to 45 percent canopy cover of target willow and/or mulefat species by the end of the fifth monitoring year.
Target Invasive Species	No more than 5 percent or 10 percent absolute cover of target invasive species shall remain in the in any given restoration area by the end of the fifth monitoring year.

Compensatory Mitigation

The SFPUC shall fully compensate for permanent losses of non-native grassland and ruderal habitat that provide potential low-quality upland refugial and dispersal habitat for CTS and CRLF, as well as potential low quality foraging and dispersal habitat for Alameda whipsnake (approximately 0.5 acre). Compensatory mitigation may occur through habitat enhancements at two of the SFPUC's Bioregional Habitat Restoration sites: the Goat Rock compensation site and the San Antonio Creek compensation site. Habitat enhancement shall occur at a location and at compensation ratios to be determined in consultation with USFWS and CDFG. Enhancements to grassland habitat may occur at the Goat Rock compensation site and enhancements to riparian habitat at the San Antonio Creek compensation site shall be conducted in accordance with the SFPUC's Sunol Region Mitigation and Monitoring Plan, which specifies the success criteria and mechanisms for monitoring to ensure compensation.

Mitigation Measure M-BI-1g: Measures to Minimize Disturbance to Special-Status Bird Species.

As feasible, the SFPUC shall conduct tree and shrub removal in the project area and the habitat compensation areas during the nonbreeding season (generally August 16 through February 14) for migratory birds, raptors, and special-status bat species.

If construction activities must occur during the breeding season for special-status birds (February 15 to August 15), the SFPUC shall retain a qualified wildlife biologist who is experienced in identifying birds and their habitat to conduct nesting-raptor surveys in and within 500 feet of the project area. Migratory bird surveys shall be conducted within 100 feet of all work areas (as feasible) unless otherwise directed by CDFG. All migratory bird and active raptor nests within these areas shall be mapped. These surveys must be conducted within two weeks prior to initiation of construction activities at any time between February 15 and August 15. If no active nests are detected during surveys, no additional mitigation is required.

If migratory bird and/or active raptor nests are found in the project area or in the adjacent surveyed area, the SFPUC shall establish a no-disturbance buffer around the nesting location to avoid disturbance or destruction of the nest site until after the breeding season or after a wildlife biologist determines that the young have fledged (usually late June through mid-July). The extent of these buffers would be determined by a wildlife biologist in consultation with CDFG and would depend on the species' sensitivity to disturbance (which can vary among species); the level of noise or construction disturbance; line of sight between the nest and the disturbance; ambient levels of noise and other disturbances; and consideration of other topographical or artificial barriers. The wildlife biologist shall analyze and use these factors to assist the CDFG in making an appropriate decision on buffer distances.

Mitigation Measure M-BI-1h: Conduct Preconstruction Surveys for Any Special-Status Bats Found and Implement Avoidance and Minimization Measures.

Not more than one week prior to tree removal and demolition of the two quarry buildings located to the east of Pit F3-East, a qualified biologist (i.e., one familiar with the identification of bats and signs of bats) shall survey the trees to be removed and the buildings to be demolished for the presence of roosting bats. Bats may be present any time of the year. The biologist shall thoroughly search the two buildings and any trees that provide appropriate habitat (trees with foliage or cavities or that are hollow) for the presence of roosting bats or evidence of bats. If no roosting bats or evidence of bats are found in the trees, tree removal may proceed. Similarly, if no roosting bats or evidence of bats are found in the quarry buildings, demolition may proceed. If bats are found or evidence of use by bats is present, the biologist shall map and mark the trees and/or locations within the buildings with flagging. As appropriate, the SFPUC shall ensure that the trees are not removed and/or the buildings are not demolished until the CDFG has been consulted for guidance on measures to avoid and minimize disturbance of the special-status bats. Measures may include: monitoring trees or structures and excluding bats from the tree(s) or structures to be removed/demolished; timing tree removal and building demolition to minimize disturbance to bats; and/or use of a construction buffer to avoid disturbance of young before they are able to fly (for pallid bats, this period is between April and August).

Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

Mitigation Measure M-HY-1b: Creek Restoration and Revegetation.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

These measures would address impacts on CRLF, CTS, and Alameda whipsnake as well as impacts related to habitat loss and disruption of breeding and foraging habitat for nesting birds, raptors, and bats by requiring general protection measures, biological monitoring, a worker training and awareness program, exclusion fencing, implementation of protocols if individuals are found in the project area during construction, revegetation and site restoration, and preparation and implementation of a stormwater pollution prevention plan (SWPPP) to avoid construction-related water quality impacts, which would also provide some protection for aquatic-dependent special-status species. Therefore, this impact would be less than significant with mitigation.

Impact BI-2: The proposed project could have a substantial adverse effect on riparian habitat and other sensitive habitats during construction. (Less than Significant with Mitigation)

The mule fat scrub riparian habitat along San Antonio Creek is a sensitive habitat because of its jurisdictional designation as riparian habitat under Fish and Game Code. Open-trench construction across San Antonio Creek during installation of the backup pipeline would temporarily remove approximately 0.35 acre of mule fat scrub and streambank vegetation.

Dozens of small (2- to 6-inch dbh) native and non-native trees located along the backup pipeline alignment and within the Calaveras Road right-of-way could be removed during construction (as described under Impact BI-6, below, these trees are protected by the Alameda County Tree Ordinance). Other isolated, mature native trees, such as valley oak and California sycamore, that exist along the southern and northern portions of the backup pipeline alignment on the west side of Calaveras Road and in the vicinity of Staging Areas A, B, and C could also require removal during construction. Several of these mature native trees have already been protected in the construction areas for the NIT and Alameda Siphons projects in areas mapped as disturbed (the surrounding herbaceous habitat has been removed) (see Figure 5.14-1). In addition, the permanent placement of spoils in the proposed earthen berms at the North Spoils Site and at the former nursery site located within Staging Area C could extend to areas within the dripline of the numerous native and planted oaks along Calaveras Road (although neither the North Spoils Site nor the former nursery site are within the Calaveras Road right-of-way), and earthmoving activities within the dripline of oaks could result in increased pathology and death of these oak trees. Habitat in these disturbed areas with a few isolated trees can no longer be considered oak woodland, sycamore alluvial woodland, or any other natural community. However, these mature trees provide essential habitat for many species of birds and mammals that depend on them for breeding, cover, and foraging. Although a number of these isolated mature native trees were preserved during construction of other SFPUC projects in the Sunol Valley, some trees are within the construction zone for the SABPL project and could be lost as a result of this project. Impacts on riparian habitat along San Antonio Creek, native trees along Calaveras Road, and large, isolated, mature trees would be potentially significant. However, with implementation of the mitigation measures described below, this potential impact would be reduced to a less-than-significant level.

Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1a: General Protection Measures.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1b: Worker Training and Awareness Program.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1c: Minimize Disturbance to Riparian Habitat.

(See Impact BI-1, above, for description.)

These measures would protect sensitive habitats and mature native trees by minimizing the overall area of construction disturbance and avoiding sensitive habitats, implementing a worker training and awareness program, and establishing protocols and performance standards for revegetation and restoration of disturbed areas. Therefore, this impact would be less than significant with mitigation.

Impact BI-3: The proposed project could have a substantial adverse effect on jurisdictional waters during construction. (Less than Significant with Mitigation)

Construction-related impacts on jurisdictional waters could occur within or immediately adjacent to San Antonio Creek, in the unnamed ephemeral tributary located near pipeline station 18+00, and in an area of freshwater marsh at Staging Area A. Impacts on riparian habitat and jurisdictional waters associated with trenching across San Antonio Creek were discussed in Impact BI-2, above, and would be potentially significant.

Construction activities in these areas could potentially result in the temporary loss of habitat, discharge of fill into jurisdictional waters, erosion and sedimentation, and loss of water quality from pollution and dewatering discharges.

The proposed backup pipeline alignment near pipeline station 18+00 crosses an ephemeral drainage. Originally a tributary to Alameda Creek, the drainage now empties into Pit F6. Project construction activities would temporarily affect approximately 0.02 acre of unvegetated channel and streambank during the dry season when open-trench construction is used to install the backup pipeline and the water pipeline to the town of Sunol across this drainage. Because this ephemeral drainage was confirmed to be a water of the United States by the Corps, the impacts on this drainage would be significant.

A 0.07-acre area delineated as freshwater marsh is located within the proposed Staging Area A. This area receives continual overflow water from a water sampling station at the Sunol Valley Chloramination Facility (SFPUC, 2009c). The Corps does not consider this freshwater marsh to be jurisdictional due to the lack of a significant nexus with Alameda Creek (SFPUC, 2009c), but the RWQCB does consider this feature to be jurisdictional (SFPUC, 2008) as it has a relatively high value for wildlife. Because of the habitat value of this wetland, the use of this area for construction staging would be a significant impact.

Facilities proposed in the vicinity of quarry Pits F3-East and F3-West include the baffled outfall, concrete splash pad, dewatering facilities, cutoff wall, Alameda Creek Pump Station and wet well, transfer pipeline, and dewatering pipeline. All of these facilities would be situated in or near lacustrine habitat; however, the quarry pits are not jurisdictional because they are part of active quarrying operations and support little or no wetland or riparian vegetation. Because of the disturbed nature of the quarry pits and the general lack of developed wetland habitat features, disturbance to the quarry pits during project construction would have no impact on jurisdictional waters.

Implementation of Mitigation Measure M-BI-3 and the other mitigation measures described below, in addition to compliance with the requirements of the Corps Section 404 permit, RWQCB Section 401 permit, and CDFG Streambed Alteration Agreement, would reduce impacts on jurisdictional waters to a less-than-significant level.

Mitigation Measure M-BI-3: Avoidance and Protection Measures for Jurisdictional Water Bodies.

The SFPUC and its contractors shall minimize impacts on waters of the United States and waters of the state, including wetlands, by implementing the following measures:

- Construction activities in saturated or ponded wetlands and streams (typically during the spring and winter) shall be avoided to the maximum extent feasible. Where wetlands or other water features must be disturbed, the minimum area of disturbance necessary for construction shall be identified and the area outside avoided.

- A silt fence shall be installed adjacent to all wetlands and drainages to be avoided within 50 feet of any proposed construction activity, and signs installed indicating the required avoidance. No equipment mobilization, grading, clearing, or storage of equipment or machinery, or similar activity, shall occur until a representative of the SFPUC has inspected and approved the fencing installed around these features. This restriction applies to both onsite construction and any offsite mitigation area. The SFPUC shall ensure that the temporary fencing is continuously maintained until all construction activities are completed. No construction activities, including equipment movement, material storage, or temporary spoil stockpiling, shall be allowed within the fenced areas protecting wetlands.

- To minimize the degradation of wetland soils and vegetation where avoidance is infeasible, protective practices such as geotextile cushions and other materials (e.g., timber pads, prefabricated equipment pads, geotextile fabric) or vehicles with balloon tires shall be employed in saturated conditions (e.g., when there is noticeable rutting due to saturated conditions and mixing of topsoil and subsoil).

- In areas of temporary disturbance the bed and banks of the ephemeral drainage and San Antonio Creek shall be restored to pre-construction conditions after construction is complete.
- Exposed slopes and streambanks shall be stabilized immediately upon the completion of construction activities.
- The banks of San Antonio Creek shall be stabilized (if disturbed during construction) using a non-vegetative material that will bind the soil initially and break down within a few years (e.g., jute mat). More aggressive erosion control treatments shall be implemented as needed for stabilization, such as geotextile mats, excelsior blankets, or other soil stabilization products.

Mitigation Measure M-BI-1a: General Protection Measures.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1b: Worker Training and Awareness Program.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1c: Minimize Disturbance to Riparian Habitat.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1d: Prevent Movement of Specific Species through the Work Areas.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation.

(See Impact BI-1, above, for description.)

Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

Mitigation Measure M-HY-1b: Creek Restoration and Revegetation.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

These measures would address impacts on wetlands and aquatic resources by requiring staging areas to be sited at least 50 feet from riparian areas, requiring worker training regarding the resources present and general impact avoidance, requiring temporary fencing around the construction zone, establishing protocols and performance standards for revegetation and restoration activities for impacted riparian and wetland areas, and requiring preparation and implementation of a SWPPP that prescribes BMPs to protect water quality in receiving water bodies during construction activities. Therefore, this impact would be less than significant with mitigation.

Impact BI-4: The proposed project could have a substantial adverse effect on resident trout and other native fishes during construction, either by impeding movement or adversely affecting aquatic habitat. (Less than Significant with Mitigation)

The backup pipeline would be installed using open-trench construction methods across San Antonio Creek. Construction activities could result in direct injury or mortality of resident trout and other native fishes in San Antonio Creek and could restrict their movements if surface flows and fish are present during construction of the creek crossing. However, as discussed above under Impact BI-1, open-trench construction would only occur during the dry season when San Antonio Creek is the least likely to contain flow, in accordance with Mitigation Measure M-BI-1c (Minimize Disturbance to Riparian Habitat). As a result, direct construction impacts on resident trout and other fishes in San Antonio Creek would be less than significant.

Construction activities outside of the Alameda and San Antonio Creek channels but adjacent to the creeks could adversely affect resident trout and other native fishes during construction if both flow and fish are present in the creeks. Disturbance could result from the movement of construction equipment and personnel, removal of riparian vegetation, grading activities, and construction of access roads and staging areas near creek channels. Disturbance of adjacent soils could increase erosion and cause sedimentation in the creeks; if the creeks are flowing, such soil disturbance could affect water quality by increasing turbidity (i.e., the relative clarity of water, which can be reduced by suspended sediment). This could in turn affect the behavior, growth, reproduction, and movement of fish and other aquatic organisms. Sediment deposition could potentially alter channel morphology by changing the shape or configuration of the creeks, which would affect the creek characteristics such as pools and riffles. Resident rainbow trout and other native fish species could also be affected if hazardous materials such as oil, lubricants, concrete, or other chemicals used during construction are released to the creeks. Assuming fish were present, the effect on fish would depend on several factors, including the concentration, duration, and frequency of exposure, as well as water temperature. Contaminants can reduce growth, reproduction, movement, and survival of fish. Potential impacts on aquatic habitat during construction are considered significant. However, implementation of the mitigation measures identified below would reduce construction-related impacts on resident trout and other native fish species to a less-than-significant level.

Mitigation Measure M-BI-1b: Worker Training and Awareness Program.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-1c: Minimize Disturbance to Riparian Habitat.

(See Impact BI-1, above, for description.)

Mitigation Measure M-BI-3: Avoidance and Protection Measures for Jurisdictional Water Bodies.

(See Impact BI-3, above, for description.)

Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

Mitigation Measure M-HY-1b: Creek Restoration and Revegetation.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

These measures would minimize the adverse effects of construction activities on fish by requiring implementation of erosion control measures and water quality BMPs, creek restoration, construction worker awareness training, and implementation of measures to protect surface waters and wetlands. Therefore, this impact would be less than significant with mitigation.

Impact BI-5: The proposed project would not have a substantial adverse effect on wildlife corridors or wildlife nursery sites during construction. (Less than Significant)

Construction of the proposed project would impede wildlife movement from east to west for nearly 2 miles along Calaveras Road. At the time of publication of the SABPL project Draft EIR, construction fencing was in place for the NIT and Alameda Siphons projects; thus, wildlife movement in much of the project area is already restricted. Construction activity related to the SABPL project would extend the period of restricted wildlife movements incrementally, but would not substantially alter the existing conditions. Therefore, this impact would be less than significant.

Impact BI-6: Construction activities associated with the proposed project could conflict with local policies or ordinances protecting biological resources. (Less than Significant with Mitigation)

The relevant policies and ordinances protecting biological resources in the project area are the Alameda WMP and the Alameda County Tree Ordinance. As noted earlier, the Alameda County Tree Ordinance only protects trees within the Calaveras Road right-of-way. The actions and guidelines of the Alameda WMP were used to inventory the resources in the project area, assess the impact of the project, and develop appropriate mitigation where necessary to address potentially significant impacts. It is the standard practice of the SFPUC to conduct construction activities in accordance with the policies of the Alameda WMP. These standard practices include reviewing relevant information sources, conducting appropriate surveys, minimizing the extent of the construction zone in areas of sensitive biological features, and carrying out construction so as to minimize impacts on biological resources. Because the project could adversely affect trees within the Alameda County right-of-way, this impact would be significant. However, implementation of Mitigation Measure M-BI-1f described below would ensure consistency with the Alameda County Tree Ordinance and would reduce this impact to a less-than-significant level.

Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation.

(See Impact BI-1, above, for description.)

This measure addresses impacts on trees protected by Alameda County and requires the development of a revegetation plan that specifies a replacement ratio for removed trees, including replacement of trees removed along the Calaveras Road right-of-way. Therefore, this impact would be less than significant with mitigation.

5.14.3.5 Operational Impacts and Mitigation Measures

Impact BI-7: Project operations could have a substantial adverse effect on special-status animal species. (Less than Significant with Mitigation)

Although quarry Pits F3-East and F3-West do not provide breeding habitat for CRLF, the pits could provide aquatic refugia for this species. As part of future project operations, the SFPUC would discharge quality-impaired Hetch Hetchy water to quarry Pit F3-East during planned maintenance and emergency events. All discharges would be dechlorinated prior to discharge into the quarry pit. The backup pipeline would terminate at a baffled outfall, which would dissipate the energy and decrease the velocity of the water stream, and direct the flow onto a concrete splash pad constructed over the slope of the quarry pit. Discharged water would flow over the concrete splash pad and into the quarry pit. Since CRLF would not utilize a barren concrete slab, discharges from the backup pipeline are not expected to result in direct injury to, or mortality of, CRLF.

As described in Section 3.5.4.2 of Chapter 3, Project Description, following a discharge from the backup pipeline that raises water elevations in the quarry pit above 195 feet mean sea level (msl), the discharged water would be recovered by pumping the water to the wet well beneath the Alameda Creek Pump Station using submersible pumps in the concrete splash pad at Pit F3-East, and flexible hoses and pumps mounted on floating platforms in Pit F3-West. Should CRLF become entrained in the intakes for the dewatering pumps (e.g., the submersible pumps and the pumps mounted on floating platforms), it is likely that mortality of the CRLF would result. This would be a significant impact. However, implementation of Mitigation Measure M-BI-7, described below, would reduce this impact to a less-than-significant level.

Mitigation Measure M-BI-7: Screen Dewatering Pump Intakes.

The SFPUC shall screen the intake pipes for the submersible pumps at Pit F3-East, and the intakes for the pumps on floating platforms in Pit F3-West to prevent the entrainment of CRLF into these pipes. The screens shall be made of wire mesh with openings not larger than 5 millimeters.

By requiring that intakes for the dewatering pumps be designed to prevent entrainment of CRLF and the resulting potential for mortality, this measure addresses impacts on CRLF during dewatering of Pits F3-East and F3-West. Therefore, this impact would be less than significant with mitigation.

As discussed above in Section 5.14.1.3 and summarized in Table 5.14-2, habitat in Pits F3-East and F3-West for western pond turtle, California tiger salamander, and Alameda whipsnake is marginal or absent. Therefore, operational impacts on these species are considered to be less than significant.

Impact BI-8: Project operations would not have a substantial adverse effect on jurisdictional waters, riparian habitat, or aquatic resources. (Less than Significant)

Under the proposed project, the SFPUC would discharge quality-impaired Hetch Hetchy water to quarry Pit F3-East during planned maintenance and water quality emergency events. Pits F3-East and F3-West are not considered jurisdictional water bodies because they are part of active mining operations. Although the uppermost alluvial deposits located between the ground surface and 50 feet below the ground surface currently provide a hydraulic connection between Alameda Creek and Pits F3-East and F3-West when water elevations are between 0 and 50 feet below grade (see Section 5.16.1.6, in Section 5.16, Hydrology and Water Quality), construction of the cutoff wall around the perimeter of Pits F3-East and F3-West would minimize this hydraulic connection. Thus, with implementation of the proposed project and construction of the associated cutoff wall, Pits F3-East and F3-West would have limited or no hydrologic connection to Alameda Creek. Because these quarry pits would continue to be operated as part of active mining operations, the pits would maintain their non-jurisdictional status during SABPL project operations. Pits F3-East and F3-West support little to no wetland or riparian vegetation that could be adversely affected by project operations.

No direct discharges of water into Alameda or San Antonio Creeks are proposed as part of project operations. However, although not expected, it is possible that implementation of the proposed project would require that Hanson Aggregates increase the volume or frequency of discharges to Alameda Creek during wet years, or following heavy precipitation periods in winter months, to maintain water levels in Pits F3-East and F3-West at or below 195 feet msl. As under the existing condition, the quarry company would discharge to creeks in accordance with the requirements of National Pollutant Discharge Elimination System (NPDES) General Permit No. CAG982001 (Aggregate Mining, Sand Washing, and Sand Offloading General Permit), which allows Hanson Aggregates to discharge up to 10 million gallons per day (mgd) (or 15.5 cfs) into Alameda Creek (see Section 5.16.1.3 in Section 5.16, Hydrology and Water Quality). The permit also sets effluent limitations for total suspended solids, turbidity, pH, total dissolved solids, and chlorine. Based on the permitted discharge flow rate, Hanson Aggregates could discharge the maximum future volume of project discharge (485 acre-feet) to Alameda Creek over a period of 16 days. Given the discharge rate and effluent limitations, in the event that SABPL project operations were to increase the frequency or volume of discharges to Alameda Creek, compliance with NPDES permit requirements would ensure that any resulting impacts on creeks are less than significant.

As described in Section 3.7.2 in Chapter 3, Project Description, in the event that Hanson Aggregates' lease is not extended, the SFPUC would solely manage the water levels in Pits F3-East and F3-West to maintain sufficient capacity for discharges from the proposed project. Under these circumstances, the SFPUC may be required to obtain a new NPDES permit to discharge water from the quarry pits to Alameda Creek. Under this scenario, the SFPUC would conduct discharges using a series of portable pumps and flexible hoses similar to the system used by Hanson Aggregates, as well as the existing outfall at Alameda Creek. The conditions included in a new NPDES permit would likely be similar to those in Hansen's NPDES permit and similarly protective of in-stream resources. Since any discharges to creeks would be conducted at the existing outfall in Alameda Creek in accordance with regulatory requirements, impacts on jurisdictional waters, riparian habitat, or aquatic resources would also be less than significant under this operating scenario.

Thus, project operations would not have a substantial adverse effect on jurisdictional waters, riparian habitat, and aquatic resources; therefore, this impact is considered less than significant.

Impact BI-9: The proposed project would not have a substantial adverse effect on sensitive habitats during project operations. (Less than Significant)

Once the proposed facilities are in place, no further surface disturbance would occur as a part of project operations; therefore, no long-term operational impacts on sensitive habitats, common habitats, or mature native trees would occur.

Over the lifetime of the project, leaks in the proposed backup pipeline, 12-inch-diameter water pipeline to the town of Sunol, transfer pipeline, and dewatering pipeline could occur, which would necessitate surface disturbance if a section of pipe needed to be repaired or replaced. The proposed facilities are situated in areas characterized by developed and ruderal habitats that are expected to continue experiencing disturbance. Any maintenance of these facilities would be conducted in accordance with the requirements of the Alameda WMP, which provides for protection of these habitats. Due to the minor level of surface disturbance required to conduct ongoing maintenance and repairs, this impact would be less than significant.

Impact BI-10: The proposed project would not interfere with the movement of native resident trout and other native migratory fishes during project operations. (Less than Significant)

The proposed project would result in discharges of up to 184 acre-feet (60 million gallons) of quality-impaired Hetch Hetchy water to Pit F3-East over a six-hour period following planned maintenance activities, and up to 485 acre-feet (158 million gallons) over a 12-hour period during emergency operations. Discharges associated with planned maintenance are anticipated to occur up to twice per year. The frequency of discharges associated with emergency operations is difficult to estimate, but is anticipated to occur approximately once every two years. As described above under Impact BI-7, construction of the proposed cutoff wall around the perimeter of Pits F3-East and F3-West would minimize the existing hydraulic connection between surface flow in Alameda Creek and water in Pits F3-East and F3-West, thereby substantially reducing and possibly eliminating the seepage of water from Alameda Creek into the quarry pits as well as the potential for water in the quarry pits to seep into Alameda Creek.

The SFPUC currently leases Pits F3-East and F3-West, as well as the majority of the SMP-24 area located east of Alameda Creek, to Hanson Aggregates for gravel mining. Under the proposed project, it is expected that Hanson Aggregates would continue to lease the SMP-24 area east of Alameda Creek and would continue to utilize water from Pits F3-East and F3-West to support active mining operations. The SFPUC and Hanson Aggregates would cooperatively manage water levels within Pits F3-East and F3-West to ensure that sufficient capacity is maintained in quarry Pit F3-East to accommodate discharges from the backup pipeline. Hanson Aggregates would continue to manage water levels in the quarry pits by pumping water from Pits F3-East and F3-West to other gravel pits in the area, as well as to the aggregate processing facility and other portions of the SMP-24 area for consumptive use. If Hanson Aggregates' lease is not extended, the SFPUC would manage water levels in Pits F3-East and F3-West using similar methods (see above discussion under Impact BI-8). Under either circumstance, following a discharge from the backup pipeline, the SFPUC would manage water levels in Pits F3-East and F3-West by pumping water from the quarry pits to San Antonio Reservoir or to the SVWTP within 30 days of a discharge.

As described above under Impact BI-8, no direct discharges of water into Alameda or San Antonio Creeks are proposed as part of project operations; however, if the proposed project were to result in an increase in the volume or frequency of discharges to Alameda Creek in order to maintain water levels in Pits F3-East and F3-West at or below 195 feet msl, these discharges would occur in accordance with NPDES permit requirements. Mandatory compliance with NPDES permit flow rate and effluent requirements would ensure that any impacts on resident trout and other native fishes associated with project operations are less than significant.

5.14.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Since Pumping Variant 1 does not propose construction of the Alameda Creek Pump Station, wet well, control building for the pump station, transfer pipeline, or retaining wall along the southern boundary of the pump station site adjacent to the access road, the overall soil and surface disturbance associated with Pumping Variant 1 would be slightly less than that of the proposed project. As a result, secondary construction-related impacts associated with sedimentation of jurisdictional waters (e.g., Alameda and San Antonio Creeks) and impacts on aquatic resources would be slightly less than under the proposed project. However, because all other facilities and improvements would still be constructed, overall impacts on jurisdictional waters associated with this variant would be similar to those of the proposed project, and this variant would not change the conclusions or mitigation measures identified above in Section 5.14.3.4 related to jurisdictional waters. All other construction-related impacts associated with Pumping Variant 1 would be the same as under the proposed project. The one-step pumping under Pumping Variant 1 (e.g., discharged water would be pumped directly from quarry Pit F3-East to San Antonio Reservoir or the SVWTP) would also result in the same operational impacts as identified for the proposed project in Section 5.14.3.5, above. Thus, construction and operation of Pumping Variant 1 would not change the analysis or conclusions presented in Sections 5.14.3.4 and 5.14.3.5.

Pumping Variant 2

Pumping Variant 2 would result in the same area of disturbance as the proposed project. Therefore, construction-related impacts would be the same as those identified for the proposed project in Section 5.14.3.4, above. Pumping Variant 2 (i.e., one-step pumping vs. two-step pumping) would also result in the same operational impacts as identified for the proposed project in Section 5.14.3.5, above. Thus, construction and operation of Pumping Variant 2 would not change the analysis or conclusions presented in Sections 5.14.3.4 and 5.14.3.5.

5.14.3.7 Cumulative Impacts and Mitigation Measures

Impact C-BI: Project implementation could result in a cumulatively considerable contribution to cumulative impacts on biological resources during project construction and operation. (Less than Significant with Mitigation)

The geographic scope for potential cumulative impacts on biological resources encompasses the jurisdictional waters, sensitive habitats, riparian habitat, and common habitats in the project area as well as other areas in the region that are biologically linked. This regional approach is appropriate because the habitats and wildlife species that could be affected by the SABPL project and the cumulative projects identified in Table 5.1-6 are part of a broader ecosystem, and any disturbance of individual areas could have repercussions for the region as a whole, beyond the immediate project vicinity. Past development, particularly in the northern part of the Sunol Valley near I-680 and elsewhere (such as roadways, mining, and water infrastructure), has resulted in the current condition of the project area, including the relative rarity of special-status species, the degraded state of riparian vegetation and other sensitive natural communities, and the reduced extent of wetlands and jurisdictional waters.

Impacts on Special-Status Species during Construction

As discussed in Impact BI-1, construction of the SABPL project would result in potentially significant impacts associated with the temporary and permanent loss of habitat and the potential for direct mortality of CRLF, CTS, and Alameda whipsnake, as well as temporary and permanent habitat loss and disruption of breeding and foraging habitat for nesting birds, raptors, and bats. It is assumed that several of the cumulative projects listed in Table 5.1-6, particularly those projects located in the Sunol Valley, could adversely affect some of the same special-status species, a potentially significant cumulative impact, and the SABPL project's contribution to this impact would be cumulatively considerable.

However, the SABPL project's temporary and permanent impacts on special-status species would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-BI-1a (General Protection Measures), M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat), M-BI-1d (Prevent Movement of Specific Species through the Work Areas), M-BI-1e (Preconstruction Surveys and Construction Monitoring and Protocols for California Tiger Salamander, Red-Legged Frog, and Alameda Whipsnake), M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation), M-BI-1g (Measures to Minimize Disturbance to Special-Status Bird Species), M-BI-1h (Conduct Preconstruction Surveys for Any Special-Status Bats Found and Implement Avoidance and Minimization Measures), M-HY-1a (Preparation and Implementation of a SWPPP),** and **M-HY-1b (Creek Restoration and Revegetation)**. These measures address temporary impacts on special-status species by requiring general protection and avoidance measures, worker training, preconstruction surveys and construction monitoring, implementation of erosion control and water quality BMPs during construction, and revegetation and restoration of disturbed areas after construction. Permanent impacts on habitat for CTS, CRLF, and Alameda whipsnake are addressed by requiring compensatory mitigation through habitat enhancement at compensation ratios to be determined in consultation with the USFWS and CDFG. With implementation of these mitigation measures, the project's residual contribution to temporary and permanent cumulative impacts on special-status species would not be cumulatively considerable (less than significant).

Impacts on Riparian Habitat and other Sensitive Habitats during Construction

As discussed in Impact BI-2, the proposed project could adversely affect riparian habitat along San Antonio Creek, native trees along Calaveras Road, as well as large, isolated, mature trees. Several of the cumulative projects listed in Table 5.1-6 could also affect riparian resources and native or mature trees in the region, resulting in a potentially significant cumulative impact, and the SABPL project's contribution to this impact would be cumulatively considerable. However, the SABPL project's impact on these resources would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-BI-1a (General Protection Measures), M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat),** and **M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)**. Implementation of these mitigation measures would protect sensitive habitats and mature native trees by minimizing the overall area of construction disturbance and avoiding sensitive habitats, providing a worker training and awareness program, and establishing protocols and performance standards for revegetation and restoration of disturbed areas. Therefore, with implementation of these mitigation measures, the SABPL project's residual contribution to cumulative impacts on riparian habitat and other sensitive habitats would not be cumulatively considerable (less than significant).

Impacts on Jurisdictional Waters during Construction

As discussed in Impact BI-3, the proposed project could degrade the habitat value of the freshwater marsh located within proposed Staging Area A. Many of the cumulative projects listed in Table 5.1-6 could also adversely affect jurisdictional waters, resulting in a potentially significant cumulative impact, and the SABPL project's contribution to this cumulative impact could be cumulatively considerable. However, the SABPL project's impact on jurisdictional waters would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-BI-3 (Avoidance and Protection Measures for Jurisdictional Water Bodies)** as well as **Mitigation Measures M-BI-1a (General Protection Measures), M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat), M-BI-1d (Prevent Movement of Specific Species through the Work Areas), M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation), M-HY-1a (Preparation and Implementation of a SWPPP),** and **M-HY-1b (Creek Restoration and Revegetation)**. These measures would address impacts on jurisdictional waters and aquatic resources by requiring staging areas to be sited at least 50 feet from riparian areas, requiring worker training regarding the resources present and general impact avoidance, requiring temporary fencing around the construction zone, establishing protocols and performance standards for revegetation and restoration activities for affected riparian areas, and requiring preparation and implementation of a SWPPP that prescribes BMPs to protect water quality in receiving water bodies during construction activities. With implementation of these mitigation measures, the project's residual contribution to cumulative impacts on jurisdictional waters would not be cumulatively considerable (less than significant).

Impacts on Resident Trout and other Native Fishes during Construction

As discussed in Impact BI-4, the SABPL project could adversely affect resident trout and other fishes in San Antonio Creek as a result of construction across the creek as well as on-land construction near Alameda and San Antonio Creeks. Other cumulative projects listed in Table 5.6-1 could also result in construction within the creeks, or sedimentation of the creeks, resulting in a potentially significant cumulative impact on resident trout and other native fishes during construction, and the SABPL project's contribution to this cumulative impact could be cumulatively considerable. However, the SABPL project's impact on resident trout and other native fishes during construction would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-HY-1a (Preparation and Implementation of a SWPPP), M-HY-1b (Creek Restoration and Revegetation), M-BI-1b (Worker Training and Awareness Program),** and **M-BI-3 (Avoidance and Protection Measures for Jurisdictional Water Bodies)**. These measures would minimize the adverse effects of construction activities on fish by requiring implementation of erosion control measures and water quality BMPs, creek restoration, construction worker awareness training, and measures to protect surface waters and wetlands. With implementation of these mitigation measures, the project's residual contribution to cumulative impacts on resident trout and other native fishes would not be cumulatively considerable (less than significant).

Impacts related to Conflicts with Local Policies or Ordinances Protecting Biological Resources

As discussed in Impact BI-6, the SABPL project could adversely affect trees within the Alameda County right-of-way. Many of the projects listed in Table 5.1-6 could also adversely affect trees within the right-of-way that are protected by the Alameda County Tree Ordinance, resulting in a potentially significant cumulative impact related to conflicts with local policies or ordinances protecting biological resources, and the SABPL project's contribution to this cumulative impact would be cumulatively considerable. However, the SABPL project's impact related to conflicts with local policies or ordinances protecting biological resources would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation)**. This mitigation measure addresses impacts on trees protected by Alameda County and requires the development of a revegetation plan that specifies a replacement ratio for removed trees, including replacement of trees removed along the Calaveras Road right-of-way. With implementation of this mitigation measure, the project's residual contribution to cumulative impacts related to conflicts with local policies or ordinances protecting biological resources would not be cumulatively considerable (less than significant).

Impacts on Special-Status Animal Species during Operations

As discussed in Impact BI-7, CRLF could become entrained in the intakes of the SABPL project dewatering pumps, potentially resulting in mortality of the CRLF. Operational discharges from Pits F3-East and F3-West by Hanson Aggregates could also result in mortality to this species resulting in a significant cumulative impact and the SABPL project's contribution would be cumulatively considerable. However, the SABPL project's impact would be reduced to a less-than-significant level with implementation **Mitigation Measure M-BI-7 (Screen Dewatering Pump Intakes)** which would require that the intakes pipes for the pumps at Pits F3-East and F3-West are screened to prevent entrainment of the CRLF. With implementation of this mitigation measure, the SABPL project's residual contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Impacts on Jurisdictional Waters, Riparian Habitat, or Aquatic Resources during Operations

As discussed above under Impact BI-8, although unlikely, implementation of the SABPL project could result in an increase in the volume or frequency of discharges to Alameda Creek following a discharge from the backup pipeline to Pit F3-East. However, no substantial degradation of the Alameda Creek channel is anticipated to result from any potential alteration in creek discharges because future creek discharges would be conducted within the flow limitations specified by NPDES permit requirements. Thus, no alteration of the creek channel or riparian habitat would be expected. The Calaveras Dam Replacement project, listed in the Table 5.1-6, would also result in an increase of discharges to Alameda Creek. The Calaveras Dam Replacement project EIR did not identify any adverse impacts on aquatic resources related to increases in discharges (San Francisco Planning Department, 2011). Therefore, cumulative impacts related to increases in discharges to Alameda Creek during operations would be less than significant.

Impacts on Resident and Migratory Fish during Operations

As indicated above in Section 5.14.1.3, the CCC steelhead DPS is listed as threatened under the Federal Endangered Species Act. Steelhead of the CCC DPS do not occur in Alameda Creek upstream of the Alameda County Water District's Rubber Dam No. 1 and BART weir in Fremont under existing conditions. Implementation of planned and proposed cumulative projects, including three projects identified in Table 5.1-6: the Rubber Dam No. 1 and BART Weir Fish Passage project in Fremont, the PG&E Gas Pipeline Crossing project in the Sunol Valley, and the SFPUC Calaveras Dam Replacement project located upstream of the Sunol Valley, would result in conditions facilitating the restoration of steelhead in Alameda Creek. These three cumulative projects would either remove barriers to fish passage or increase flows to the creek, which would improve fish passage conditions in Alameda Creek. These projects would not have adverse impacts on steelhead or other native fish, and implementation of these projects would be beneficial by creating conditions conducive to fish passage.

As discussed above under Impact BI-10, the SABPL project's proposed cutoff wall would reduce or eliminate the existing hydraulic connection between Alameda Creek and Pits F3-East and F3-West, thereby minimizing the seepage of water from the creek into the quarry pits and potentially resulting in a slight increase in Alameda Creek flow. Although no direct discharges to Alameda Creek are proposed as part of SABPL project operations, project implementation could potentially result in an increase in the volume or frequency of discharges to Alameda Creek following a discharge from the backup pipeline to Pit F3-East. However, since all creek discharges would be conducted within the flow limitations specified by NPDES permit requirements, and because any associated increase in Alameda Creek flow is expected to be beneficial for fish passage, the SABPL project would not contribute to any adverse cumulative impacts on resident or migratory fish during operations.

The effects of the SABPL project, in combination with the effects of the cumulative projects identified above, would not result in any significant adverse effects to steelhead or other native fish during operations.

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are the same as or similar to those of the proposed project (refer to Section 5.14.3.6, Impacts of Pumping Variants), the cumulative impact analysis and related conclusions provided above apply to both project variants.

5.14.3.8 Impacts of Mitigation Measures

Measure M-BI-1f: Preparation and Implementation of a Vegetation Restoration Plan and Compensatory Mitigation.

Enhancement to grassland at the Goat Rock compensation site and riparian habitat at the San Antonio Creek compensation site that may occur under Measure M-BI-1f could result in environmental impacts. The Goat Rock compensation site and San Antonio Creek compensation site are proposed to provide compensatory mitigation for multiple SFPUC projects in the Sunol Valley, including the Calaveras Dam Replacement project. The Goat Rock compensation site is a 35-acre area located on SFPUC-owned land on Valpe Ridge and Alameda Creek, just downstream of the Alameda Creek Diversion Dam. The San Antonio compensation site is a 254-acre area located on SFPUC-owned land on the northeast shore of San Antonio Reservoir at the mouths of San Antonio and Indian Creeks.

Compensatory mitigation activities at these sites were previously addressed in the *Final Environmental Impact Report for the San Francisco Public Utilities Commission Calaveras Dam Replacement Project* (San Francisco Planning Department, 2011).

As described in the Calaveras Dam Replacement project EIR (beginning on page 5-14 in Chapter 5, Mitigation Measures), potential impacts on resources at these sites could occur through ground disturbance associated with enhancement activities (digging holes for plantings, grading for riparian restoration, grading for access roads, etc.), which could affect special status species and water quality. In addition, the Goat Rock and San Antonio Creek compensation sites are located within an archeologically sensitive region, and ground-disturbing habitat enhancement activities could disrupt archeological resources. Impacts on sensitive wildlife at the compensation sites would be avoided through implementation of measures adopted as conditions of approval for the Calaveras Dam Replacement project, including Mitigation Measure 5.7.1 (to protect and maintain water quality), Mitigation Measure 5.4.1 (to avoid impacts on sensitive wildlife through preconstruction surveys), and Mitigation Measure 5.4.2 (restoration of disturbed areas), and Mitigation Measure 5.10.2 (to mitigate for accidental discovery of archeological resources). These measures would ensure that impacts associated with habitat enhancement at these locations undertaken to compensate for impacts attributable to the SABPL project would be mitigated to less-than-significant levels.

Selection of the final compensation sites would occur in consultation with USFWS and CDFG and may result in the implementation of habitat enhancement at a compensation site other than Goat Rock or San Antonio Creek. Implementation of mitigation at another compensation site could have short-term but potentially significant impacts, which could include impacts on biological resources, cultural resources, sensitive noise receptors, air quality, geology and soils, hydrology and water quality, and hazards and hazardous materials. Any significant impacts associated with habitat enhancement at an alternate compensation site would be subject to the mitigation measures identified throughout this EIR, as appropriate, to reduce the impacts to a less-than-significant level.

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5.15 Geology and Soils

This section analyzes the potential for the proposed San Antonio Backup Pipeline (SABPL) project to be affected by, or to increase risks associated with, geologic, soils, and seismic hazards.

5.15.1 Setting

5.15.1.1 Regional Physiography

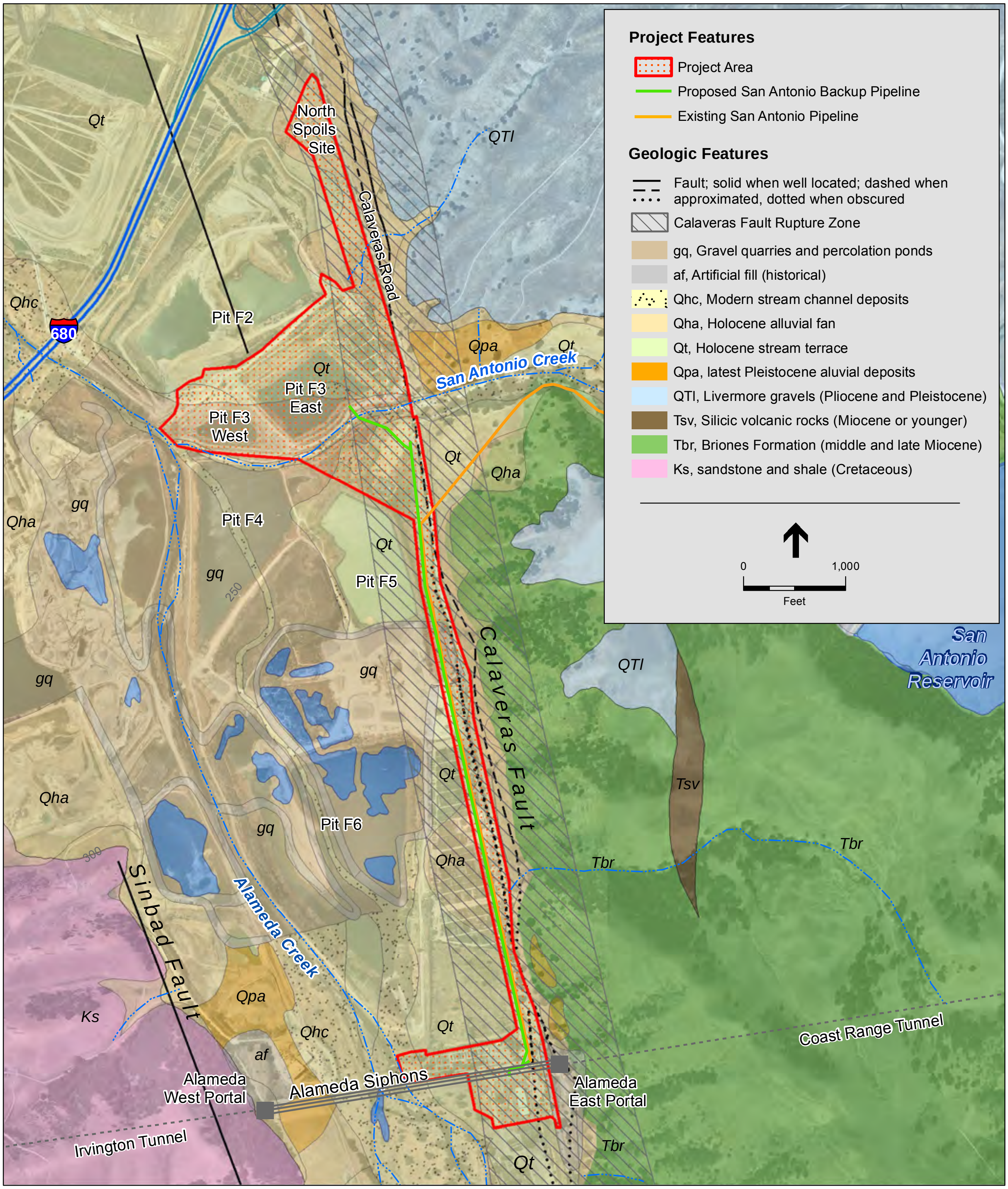
The project area is in the Sunol Valley within the Alameda Creek watershed, which is part of the Coast Ranges Geomorphic Province (Coast Ranges). The topography of the Coast Ranges is characterized by northwest-southeast-trending mountain ridges and intervening valleys that have formed over millions of years due to movements of the earth's crust. Most of the hills and mountains in the Coast Ranges are comprised of consolidated bedrock units. In the vicinity of the proposed project, geologically younger sediments deposited by Calaveras and San Antonio Creeks overlie the bedrock.

5.15.1.2 Site Geology

The Sunol Valley is a northwest-trending rift valley following the Calaveras fault and Alameda Creek. The valley is bounded on the east by the Calaveras fault and on the west by the foothills of the Diablo Range. On the east side of the Calaveras fault, the bedrock consists of the Briones Formation (*Tbr*) and Livermore Gravels (*QTl*), as shown in **Figure 5.15-1** (USGS, 1996, 2006). On the west side of the Calaveras fault, the bedrock consists of older, Cretaceous-age unnamed sandstone (*Ks*). Alluvial material[1] fills the valley floor, including older alluvium (*Qpa*), alluvial fan deposits (*Qha*), steam terrace deposits (*Qt*), gravel deposits of the Oliver De Silva, Inc. (Oliver De Silva) and Hanson Aggregates quarries (*gq*), and modern stream channel deposits (*Qhc*) of Calaveras and San Antonio Creeks. These regional units are described as follows:

- Unnamed Sandstone (*Ks*) – Cretaceous-age (65 million to 144 million years ago) coarse- to fine-grained sandstone, siltstone, and shale. In places, the sandstone contains fragments of preexisting rock and siltstone (*Kss*).
- Briones Formation (*Tbr*) – Miocene-age (5.3 million to 23.7 million years ago) sandstone, siltstone, conglomerate,[2] and shell breccia.[3]
- Livermore Gravels (*QTl*) – Pliocene- to Pleistocene-age (10,000 to 5.3 million years ago) poorly to moderately consolidated cobble conglomerate and coarse-grained sandstone.
- Older Alluvium (*Qpa*) – Pleistocene-age (10,000 to 1.8 million years ago) poorly to moderately sorted, unconsolidated deposits of sand, silt, and gravel.

[1] Alluvial materials consist of unconsolidated mixtures of gravel, sand, clay, and silt typically deposited by streams. An alluvial fan is a fan-shaped deposit formed where a fast-flowing stream flattens, slows, and spreads, typically at the exit of a canyon onto a flatter plain.
[2] Conglomerate is a type of rock consisting of rounded pebbles or rock fragments held together by silica or clay.
[3] Shell breccia is a sedimentary rock comprised of shell fragments cemented together.



SOURCE: Alameda County, 2006; CGS, 2002; USGS, 1996; USGS, 2006; ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project
Figure 5.15-1
Geologic Map

- <u>*Stream Terrace Deposits (Qt)*</u> – Late Pleistocene- to Holocene-age (0.8 million years ago to present) deposits on stream terraces, consisting of unconsolidated, moderately to well-sorted and moderately well-bedded deposits of sand, gravel, and silt with minor clay.

- <u>*Alluvial Fan Deposits (Qha)*</u> – Holocene-age (10,000 years ago to present) unconsolidated alluvial deposits of poorly to moderately sorted sand, silt, and gravel.

- <u>*Gravel Quarries and Percolation Ponds (gq)*</u> – Consisting of excavations, associated soil piles, and disturbed ground in stream channels or alluvial deposits that were or are being used for the purposes of extracting sand and gravel. Recharge and percolation ponds are included in this map unit because many gravel pits are eventually used for these purposes.

- <u>*Modern Stream Channel Deposits (Qhc)*</u> – Historical (younger than 150 years old) unconsolidated deposits of poorly to well-sorted sand, gravel, and cobbles with minor silt and clay within existing streambeds.

In the majority of the proposed project area, fill and alluvial materials overlie the Briones Formation bedrock. The Briones Formation within the project area consists of olive to yellowish brown, fine-grained, very closely fractured sandstone; very closely fractured shale; very weak, intensely fractured silty sandstone and clayey siltstone; and olive gray to gray closely fractured siltstone. Along the southern portion of the backup pipeline alignment and in the vicinity of the proposed chemical facility, the fill thickness ranges from 4 to 5.5 feet (URS, 2009). The fill thickness in the vicinity of Pits F3-East and F3-West is approximately 15 feet (T&R/RYGC, 2011). The thickness of the alluvium ranges from a minimum of 13.5 feet at the southernmost end of the proposed backup pipeline alignment (URS, 2009) to a maximum of 66 feet in the vicinity of Pits F3-East and F3-West. During subsurface explorations conducted during preparation of the geotechnical investigation for the proposed cutoff wall, stream terrace deposits were encountered beneath the alluvial materials in the vicinity of Pits F3-East and F3-West (T&R/RYGC, 2011). Although no Pleistocene-age alluvial materials (*Qpa*) have been mapped within the project boundaries, this unit may underlie the Holocene-age alluvial materials (*Qt* and *Qha*) in some areas (USGS, 1996, 2006).

5.15.1.3 Geologic Hazards

Slope Failures

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience soil slumps, rapid debris flows, and deep-seated rotational slides. Slope stability can depend on a number of complex variables, including the geology, structure, and amount of groundwater, as well as external processes such as climate, topography, slope geometry, and human activity. The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope. Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges.

The best available predictor of where slides and earth flows might occur is the distribution of past movements (Nilsen and Turner, 1975). In 1997, the U.S. Geological Survey (USGS) released a preliminary map and geographic information system (GIS) database that provides a summary of the distribution of landslides evident in the landscape of the San Francisco Bay region (USGS, 1997). The map is a digitized nine-county compilation of existing landslides that has been used to divide the area into four landslide zones, including "mostly landslides," "many landslides," "few landslides," and "flatland." Although portions of the hillslopes to the west of the project area are mapped as "mostly landslides," the project area is mapped as "flatland," which is defined as "areas of gentle slope at low elevations that have little or no potential for the formation of slumps, landslides, or earth flows, except along stream banks and terrace margins."

In the vicinity of the proposed project, the quarry pits at the Hanson Aggregates and Oliver De Silva gravel mining facilities typically have steep sidewalls. The slope of the Hanson Aggregates Pit F3-East wall at the location of the proposed outfall is approximately 70 percent. The geotechnical investigation for the pipeline project analyzed this slope for static stability and found it to be stable (URS, 2009). The geotechnical investigation for the cutoff wall determined that under static conditions the slopes in both Pits F3-East and F3-West are stable (T&R/RYCG, 2011).

Corrosive and Expansive Soils

Problematic soils, such as those that are expansive and corrosive, can damage structures and buried utilities and increase maintenance requirements. The corrosivity of soils is commonly related to several key parameters, including soil resistivity, the presence of chlorides and sulfates, oxygen content, and pH. Typically, the most corrosive soils are those with the lowest pH and highest concentration of chlorides and sulfates. Wet/dry conditions can result in a concentration of chlorides and sulfates as well as movement in the soil, both of which tend to break down the protective corrosion films and coatings on the surfaces of building materials. High-sulfate soils are also corrosive to concrete and may prevent complete curing, reducing its strength considerably. Low pH and/or low-resistivity soils can corrode buried or partially buried metal structures. Depending on the degree of corrosivity of the subsurface soils, building materials such as concrete, reinforcing steel in concrete structures, and bare-metal structures exposed to these soils can deteriorate, eventually leading to structural failure. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

Expansive soils are characterized by their ability to undergo significant volume change (i.e., to shrink and swell) due to variations in moisture content. Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, and/or perched groundwater.[4] Expansive soils are typically very fine grained and have a high to very high percentage of clay. Expansion and contraction of expansive soils in response to changes in moisture content can lead to differential and cyclical movements that can cause damage and/or distress to structures and equipment.

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[4] Perched groundwater is a local saturated zone above the water table that typically exists above an impervious layer (such as clay) of limited extent.

Soil mapping performed by the Natural Resources Conservation Service (NRCS) has provided information on surface and near-surface subsurface soil materials in the project area. **Table 5.15-1** lists each soil type identified in the project area, based on the NRCS web soil survey, and describes the key properties of each soil type, including erosion potential, corrosion potential to concrete and uncoated steel, and shrink/swell potential. As noted in Table 5.15-1, the soils identified in the project area generally include loams, which are soils typically composed of sand, silt, clay, and organic matter in evenly mixed particles of various sizes. **Figure 5.15-2** presents soil types in the project area.

TABLE 5.15-1
SOIL TYPES IDENTIFIED IN THE PROJECT AREA AND KEY SOIL PROPERTIES

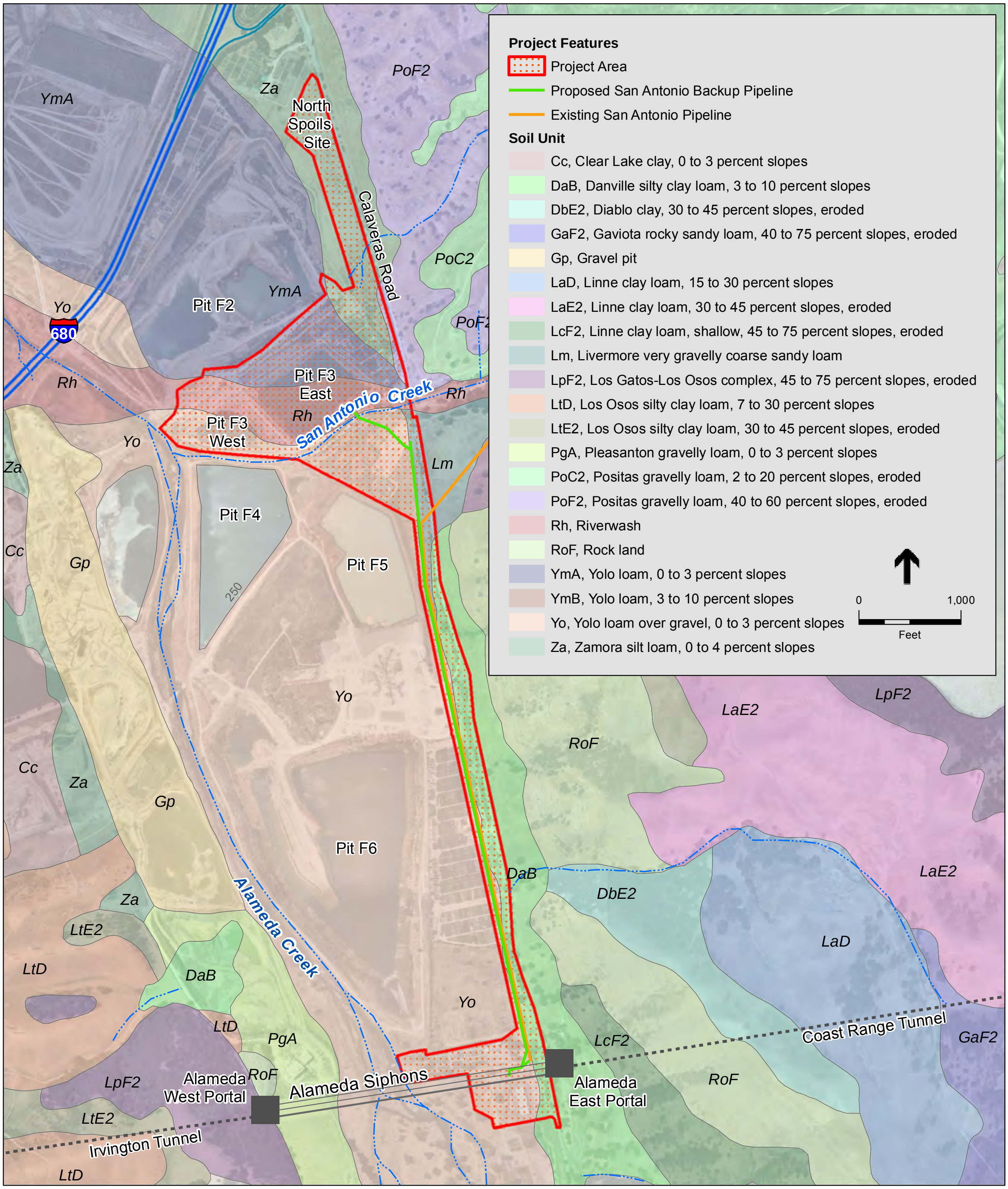
	Risk of Corrosion[a]		**Shrink/Swell Potential**
Map Symbol and Soil Name	**Uncoated Steel**[b]	**Concrete**[c]	**Highest Value**[d]
DaB, Danville silty clay loam	Moderate	Low	High
Lm, Livermore very gravelly coarse sandy loam	Moderate	Low	Low
PoF2, Positas gravelly loam	High	Moderate	High
Rh, Riverwash	N/A	N/A	N/A
Yo, Yolo loam over gravel	High	Low	Low
Yma, Yolo loam	High	Low	Low
Za, Zamora silt loam	High	Low	Moderate

[a] "Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete.
[b] For uncoated steel, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near-field capacity, and electrical conductivity of the saturation extract.
[c] For concrete, the risk of corrosion is also expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.
[d] The shrink/swell potential is based on the highest value for linear extensibility within the soil profile. The shrink/swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3 percent, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots, and special design is commonly needed.

N/A = Not Available or Not Applicable.

SOURCE: NRCS, 2009.

As summarized in Table 5.15-1, soils in the project area generally exhibit a moderate to high corrosivity to uncoated steel, and a low to moderate corrosivity to concrete. Based on analysis of soils samples from the project area for resistivity, pH, chloride, and sulfates, the project-specific geotechnical investigation concluded that the project area soils exhibit a low to moderate risk of corrosion to buried iron, steel, mortar-coated steel, and reinforced-concrete structures (URS, 2009). The project area soils also exhibit a low to high shrink/swell potential. Based on analysis of soil samples from the project area, the project-specific geotechnical investigation identified a 2- to 4-foot-thick layer of moderately expansive soil along a limited area of the southern backup pipeline alignment (URS, 2009).



SOURCE: Alameda County, 2006; NRCS, 2009; ESA+Orion, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.15-2
Soil Map

5.15.1.4 Regional Faulting and Seismic Hazards

Seismicity

The San Francisco Bay Area is situated near the boundary between two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast. Since the Miocene epoch (approximately 23 million years ago), about 200 miles of right-lateral movement has occurred along the San Andreas Fault Zone[5] to accommodate the relative movement between these two plates. The movement between the Pacific Plate and the North American Plate generally occurs across a 50-mile zone extending from the San Gregorio fault in the southwest to the Great Valley Thrust Belt in the northeast. In addition to the right-lateral slip movement between the two tectonic plates, portions of the North American Plate have moved toward each other during the last 3.5 million years, resulting in compressional forces at the latitude of San Francisco Bay (Fenton and Hitchcock, 2001).

Figure 5.15-3 shows the locations of major active[6] and potentially active[7] faults in the San Francisco Bay region. The San Andreas, San Gregorio, Hayward, Rodgers Creek, Calaveras, and Greenville strike-slip faults[8] are active faults of the San Andreas fault system that predominantly accommodate lateral movement between the North American and Pacific tectonic plates. Active blind- and reverse-thrust faults[9] in the San Francisco Bay region that accommodate compressional movement include the Monte Vista–Shannon and Mount Diablo faults. Other potentially active faults in the region include the Verona fault and the Las Positas fault, both located 3 or more miles from the proposed pipeline alignment (URS, 2009).

The USGS estimates that there is a 63 percent probability of a strong earthquake (magnitude 6.7 or higher) occurring on one of the regional faults in the 30-year period between 2003 and 2032, with a 7 percent chance of such an earthquake on the Calaveras fault (USGS, 2008). The northern Calaveras fault, which is approximately 28 miles in length, extends from Calaveras Reservoir south of the project area to the town of Danville to the north. In the project area, the fault lies along the eastern side of the Sunol Valley, roughly following Calaveras Road. The fault exhibits right-lateral offset, with a lesser component of vertical displacement (URS, 2009). Although only one historical earthquake—a magnitude 5.6 event in San Ramon Valley—has occurred on the northern Calaveras fault, it is considered capable of generating large earthquakes (greater than magnitude 6.7), with a recurrence interval ranging from 250 to 850 years (URS, 2009).

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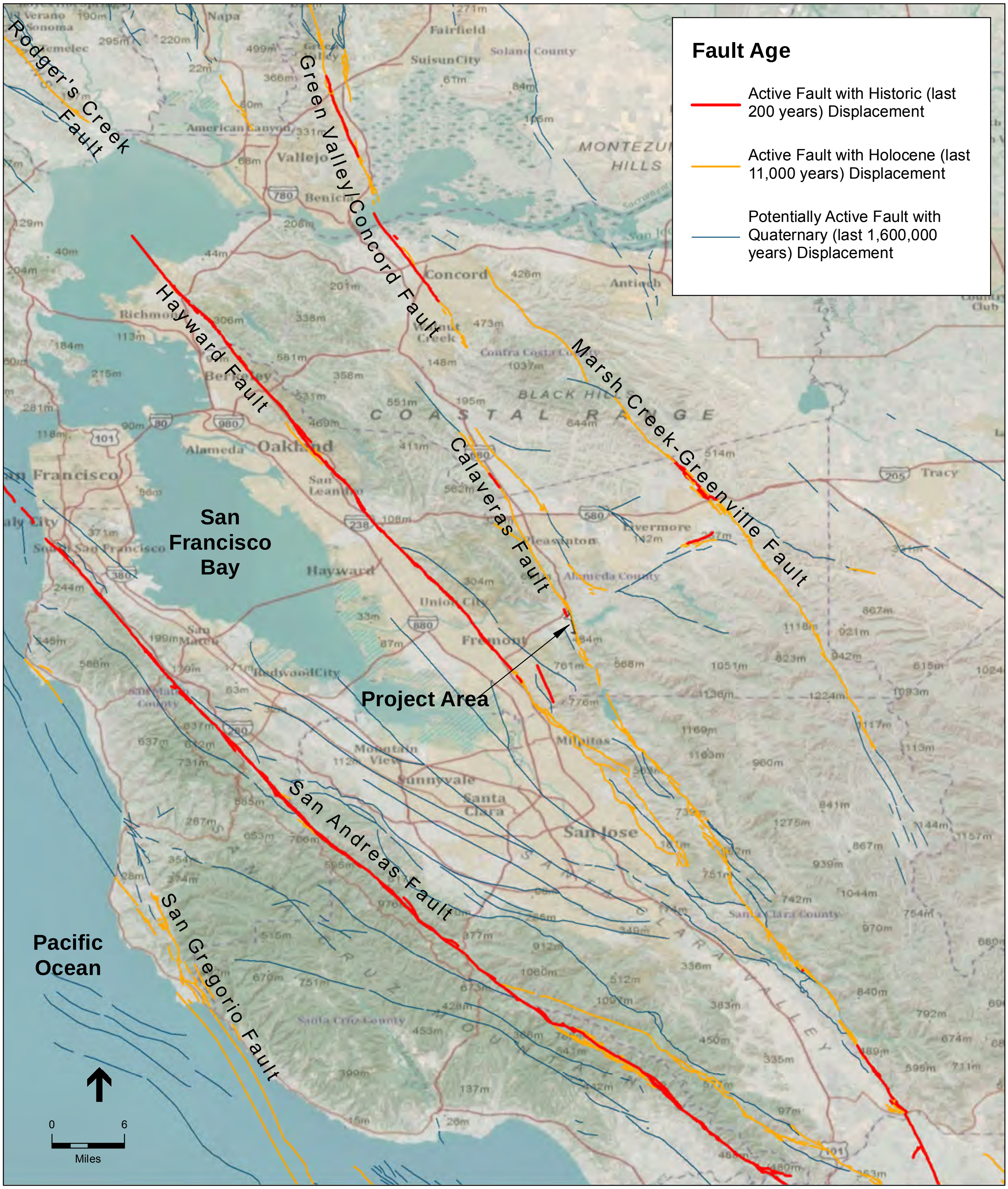
5 A "fault" is a fracture in the earth's crust along which movement has occurred, and a 'fault zone' is an area of numerous fractures. The San Andreas Fault Zone extends along the coastline of California from northern California to the Gulf of California.

6 An active fault is one that shows geologic evidence of movement within Holocene time (approximately the last 11,000 years).

7 A potentially active fault is one that shows geologic evidence of movement during the Quaternary (approximately the last 1.6 million years).

8 Strike-slip faults involve the two blocks moving parallel to each other without a vertical component of movement.

9 A reverse fault is one with predominantly vertical movement in which the upper block moves upward in relation to the lower block; a thrust fault is a low-angle reverse fault. Blind-thrust faults are low-angled subterranean faults that have no surface expression.



SOURCE: ESRI, 2008; Bryant, 2005

SFPUC San Antonio Backup Pipeline Project

Figure 5.15-3
Major Regional Faults

Fault rupture could occur within the project area as a result of movement on the Calaveras fault, and strong groundshaking and other earthquake-related phenomena could also occur in the project area due to a major earthquake on this fault or one of the other regional faults, including the Hayward, Greenville, and San Andreas faults—each of which parallels the Calaveras fault and is capable of generating large (greater than magnitude 6.7) earthquakes. The Hayward fault is approximately 4 miles to the west of the project area; the Greenville fault is approximately 12 miles to the northeast; and the San Andreas fault is approximately 23 miles to the west (Figure 5.15-3). The Las Positas fault, located approximately 9 miles to the northeast, could also contribute to groundshaking in the project area (URS, 2009).

Fault Rupture

As stated above, fault rupture could occur in the project area as a result of movement on the Calaveras fault. Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Surface ruptures associated with the 1906 San Francisco earthquake extended for more than 260 miles, with displacements of up to 21 feet. However, not all earthquakes result in surface rupture. The Loma Prieta earthquake of 1989 caused major damage in the San Francisco Bay Area, but the fault movement did not break through to the ground surface.

Fault rupture almost always follows preexisting faults, which are zones of weakness. Rupture can occur suddenly during an earthquake or slowly in the form of fault creep. Sudden rupture is more damaging because it can displace structures and is accompanied by shaking. Fault creep is the slow rupture of the earth's crust. In developed areas, fault creep can offset and deform curbs, streets, buildings, and other structures that lie on the fault trace.[10]

Overall, the Calaveras fault has a geologic slip rate of approximately 0.2 inches (5.8 to 6.2 millimeters) per year and is actively creeping at a rate of 0.08 to 0.16 inches (2 to 4 millimeters) per year.[11] In the existing San Antonio Pipeline, a total of 3.6 inches of pipe joint separation due to active fault creep has been observed between 1967 and 1998.

In the Sunol Valley, Holocene-age movement (within the last 11,000 years) along the Calaveras fault has occurred in a zone as wide as 250 to 300 feet (URS, 2009). However, displacement is typically more localized, within a zone about 10 to 30 feet wide. The proposed alignments for the backup pipeline and 12-inch-diameter water pipeline to the town of Sunol, the new chemical facility, and the discharge facility at Pit F3-East are located almost entirely within the earthquake fault rupture zone for the Calaveras fault, and the backup pipeline alignment is generally parallel and adjacent to the mapped fault trace. In this area, the expected horizontal displacement along the fault during a major seismic event is between 2 and 5 feet, and the vertical displacement is between 0.4 to 1 foot (approximately one-fifth of the horizontal displacement) (URS, 2009).

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10 A fault trace is the intersection of a geological fault with the ground surface.

11 The geologic slip rate is higher than the active creep rate because the geologic slip rate incorporates movement over time, including sudden fault displacement, while the active creep rate incorporates only the amount of creep that is currently taking place.

Groundshaking

The intensity of seismic shaking, or strong ground motion, during an earthquake is dependent on the distance from the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the project area. Earthquakes occurring on faults closest to the project area would most likely generate the largest ground motions.

The intensity of earthquake-induced ground motions and the potential forces affecting structures within the project area can be described in terms of "peak ground acceleration," which is represented as a fraction of the acceleration of gravity (g).[12] **Table 5.15-2** presents the site-specific peak ground accelerations for the 10 percent, 5 percent, and 2 percent probabilities of exceedance in 50 years (475-, 975-, and 2,475-year return periods, respectively), based on the site-specific seismic analysis for the proposed project (URS, 2009). All of the peak ground accelerations are greater than 0.75 g and could cause widespread damage, such as severe structural and foundation damage and slope failure. Because of its proximity, the Calaveras fault is the primary contributor to the ground motions that would be experienced in the project area. The Hayward, San Andreas, Greenville, and Las Positas faults also contribute to the ground motions because of their proximity to the project area and because the Hayward and San Andreas faults can generate large-sized (greater than magnitude 7) earthquakes.

TABLE 5.15-2
SUMMARY OF PROBABILISTIC PEAK GROUND ACCELERATIONS

	Peak Ground Acceleration (g)[a]	
Return Period (years)	**Rock Site Conditions**	**Soil Site Conditions**
475	0.72	0.78
975	0.90	0.96
2,475	1.16	1.21

[a] The values presented in the table represent the fraction of the acceleration due to gravity that would be expected to occur within the project area for the given return period.

SOURCE: URS, 2009.

Liquefaction

Liquefaction is a phenomenon in which saturated granular sediments (those below the water table) temporarily lose their shear strength during periods of earthquake-induced strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include vertical

[12] 1 g = 980 centimeters per second squared and is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

settlement from densification, lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects.

The USGS has mapped the Pleistocene-age alluvial materials in the project area (*Qpa*) as having a low liquefaction potential, Holocene-age alluvial materials (*Qt* and *Qha*) and gravel quarry deposits (*gq*) as having a moderate liquefaction potential, and the modern stream channel deposits associated with Calaveras and San Antonio Creeks (*Qhc*) as having a very high liquefaction potential (USGS, 2006). The USGS estimates that about 2 percent of future liquefaction effects would occur within geologic units assigned a low liquefaction potential; 20 to 30 percent of future liquefaction effects would occur within geologic units assigned a moderate liquefaction potential; and 20 to 30 percent of future liquefaction effects would occur within geologic units assigned a very high liquefaction potential.

The USGS maps liquefaction susceptibility based on the general characteristics of the geologic formations in the region. To determine liquefaction susceptibility, project proponents must conduct a site-specific geotechnical investigation to evaluate liquefaction hazards on a project-specific basis. The geotechnical investigation for the proposed project determined that the overall potential for liquefaction within the project area is low (URS, 2009). Although liquefiable materials were identified in three borings within the project area near the southern terminus of the proposed backup pipeline alignment (pipeline station 2+00) and adjacent to the former nursery site located between Pit F6 and Calaveras Road (pipeline stations 22+00 and 30+00), the geotechnical investigation for the project concluded that seismically induced settlement at the top of these liquefiable materials would only be on the order of 1 inch. The geotechnical investigation for the proposed cutoff wall determined that the potential for liquefaction along the perimeter of Pits F3-East and F3-West is low because of the density of the granular material below the groundwater table (T&R/RYGC, 2011).

Lateral Spreading

Of the liquefaction hazards, lateral spreading generally causes the most damage. This phenomenon occurs when large blocks of intact, nonliquefied soil move downslope on a liquefied substrate of large areal extent (Youd et al., 1978). The mass moves toward an unconfined area, such as a descending slope or stream-cut bluff, and this movement can occur on slope gradients as gentle as 0.3 percent. Drainages and swales between hill slopes are generally filled by unconsolidated alluvium, colluvium, landslide debris, and slope wash and can experience lateral spreading. The geotechnical report for the proposed project concluded that there is a low potential for lateral spreading throughout the majority of the project area (URS, 2009). The geotechnical investigation for the proposed cutoff wall concluded that the potential for lateral spreading along the perimeter of Pits F3-East and F3-West is low because of the absence of potentially liquefiable layers (T&R/RYGC, 2011).

Earthquake-Induced Settlement

Compaction settlement, or cyclic densification, occurs when loose, granular soils above the water table increase in density due to earthquake-induced seismic shaking. Settlement can result from the relatively rapid rearrangement, compaction, and settling of dry subsurface materials above the water table (particularly loose, non-compacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments such as poorly engineered artificial fill or bay mud. The geotechnical report for the proposed project concluded that seismic settlement due to cyclic densification would be on the order of 0.5 to 1.5 inches along the proposed pipeline alignment (URS, 2009). The geotechnical report for the proposed cutoff wall concluded that seismic settlement resulting from differential compaction along the perimeter of Pits F3-East and F3-West would be less than 0.25 inches (T&R/RYGC, 2011).

Seismic Slope Instability and Ground Cracking

Earthquake motions can also induce substantial stresses in slopes, causing earthquake-induced landslides or ground cracking when the slope fails. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake triggered thousands of landslides over an area of 770 square miles.

The California Geological Survey (CGS) develops inventory maps of earthquake-induced landslide zones as part of the Landslide Inventory Map Series. Earthquake-induced landslide zones have not been mapped for the project area. However, with the exception of Pits F3-East and F3-West, the project area is relatively flat. Further, USGS landslide distribution mapping indicates there is little or no potential for landslides in the immediate vicinity of the project area, including the quarry pits (USGS, 1997). Therefore, the potential for earthquake-induced landslides or ground cracking to occur in the project area is low.

5.15.2 Regulatory Framework

5.15.2.1 Federal Regulations

No federal regulations related to geology and soils are applicable to the proposed project.

5.15.2.2 State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to address the hazard of surface faulting to structures for human occupancy. In accordance with this act, the state geologist has established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace, because many active faults are complex and consist of more than one branch that may experience ground surface rupture.

Title 14 of the California Code of Regulations (CCR), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. The project improvements would be located within the Alquist-Priolo Earthquake Fault Zone for the Calaveras fault (indicated as the Calaveras Fault Rupture Zone on Figure 5.15-1). However, as the proposed project does not include any buildings that meet the criterion for human occupancy, this act does not apply to the proposed project.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The act directs the Department of Conservation to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified groundshaking. For structures intended for human occupancy, the act requires project proponents to perform site-specific geotechnical investigations to identify potential seismic hazards, and also requires them to formulate mitigation measures prior to permitting most developments designed for human occupancy within the Zones of Required Investigation. Seismic hazard mapping has not been completed for the project area. However, because the project does not propose the construction of any structures for human occupancy, the provisions of the act do not apply to the proposed project.

Building Codes

The California Building Code (CBC), which is codified in CCR Title 24, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction.

The 2010 CBC is based on the 2009 International Building Code. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

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

While construction of the aboveground facilities proposed under the SABPL project would generally be subject to the CBC, the Building Seismic Safety Council (BSSC) acknowledges that structures that require special considerations, such as hydraulic structures, buried utility lines, and their appurtenances, are not typical structures (BSSC, 2009). These types of structures require technical considerations beyond the scope of the CBC and are covered by other well-established industry design criteria such as the American Water Works Association's standards for design and installation of steel pipe as well as pipe welding and flanges; standards of the American Society of Mechanical Engineers; and standards of the American Welding Society for structural welding.

5.15.2.3 Local Regulations

Alameda Watershed Management Plan

The *Alameda Watershed Management Plan* provides a policy framework that allows the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on SFPUC lands in the Alameda watershed, where the SABPL project would be located. A number of policies are intended to reduce risks from geologic and seismic hazards, including:

- *Policy S4*: Minimize damage from future seismic hazards by avoiding construction of facilities in active fault zones and traces, where feasible.
- *Policy S5*: Minimize damage from potential mass movement hazards by avoiding construction or other disturbances in known dormant landslides and on slopes greater than 30 percent, without proper engineering.
- *Policy S6*: Conduct (for City-owned) and require (for easements) inspection of facilities and utilities near active landslide areas and fault traces following earthquakes and slope failures to assess their stability and integrity, and complete repairs or further monitoring as needed to prevent geohazards.
- *Policy S7*: Require adequate seismic and static geohazards engineering studies for proposed facilities, infrastructure, and utilities easements within the watershed.
- *Policy S8*: Require that utility pipelines within the watershed meet current seismic standards and comply with applicable hazardous materials regulations.

5.15.3 Impacts and Mitigation Measures

5.15.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to geology, soils, and seismicity, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated 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),

- Strong seismic groundshaking,
- Seismic-related ground failure, including liquefaction, or
- Landslides;

- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- Substantially change the topography or any unique geologic or physical features of the site.

5.1.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the following significance criteria during project construction and/or operation.

- *Have Soils Incapable of Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems*. Construction and operation of the proposed project would not result in the disposal of wastewater via infiltration to soils. Therefore, the significance criterion related to the capacity of soils in the project area to support septic tanks or alternative wastewater disposal systems is not applicable to construction or operation of the proposed project and is not discussed further.
- *Expose People or Structures to Risk of Loss, Injury, or Death Involving Rupture of a Known Earthquake Fault, Seismic Groundshaking, Seismic-Related Ground Failure, or Landslides During Project Construction*. This significance criterion is intended to address facility siting and design impacts and does not apply to temporary construction impacts. Therefore, this significance criterion is not applicable to project construction activities and is only discussed below as it relates to long-term operational impacts.
- *Be Located on an Expansive Soil, Creating Substantial Risks to Life or Property During Project Construction*. This significance criterion is intended to address facility siting and design impacts and does not apply to temporary construction impacts. Therefore, this significance criterion is not applicable to project construction activities and is only discussed below as it relates to long-term operational impacts.
- *Substantially Change the Topography or Any Unique Geologic or Physical Features of the Site*. Like the two significance criteria above, this criterion is intended to address facility siting and design impacts and does not apply to temporary construction impacts. Therefore, this significance criterion is not applicable to project construction activities and is only discussed below as it relates to long-term operational impacts.

The SFPUC would incorporate applicable seismic criteria and procedures provided in the International Building Code, California Building Code, and Uniform Building Code (described above in Section 5.15.2.2, State Regulations) into the design of the project. Therefore, impacts related to seismic hazards, including ground motions generated by earthquakes (groundshaking), seismic-related ground failure (liquefaction and settlement), and landslides, would generally be less than significant, as discussed below. These design requirements specify that the project proponent must perform a site-specific investigation, develop project-specific design criteria, and assess site-specific geologic and seismic hazards. For other impact topics (landsliding, soil erosion, loss of topsoil, expansive and corrosive soils, and alteration of topography), the section below evaluates the potential for significant effects based on the site-specific geologic conditions and the proposed project improvements.

5.15.3.3 Summary of Impacts

Table 5.15-3 summarizes the proposed project's geology and soils impacts and significance determinations.

TABLE 5.15-3
SUMMARY OF IMPACTS – GEOLOGY AND SOILS

Impacts	Significance Determinations
Impact GE-1: The project is located on a geologic unit that could become unstable as a result of project construction.	LSM
Impact GE-2: The project could result in substantial soil erosion or the loss of topsoil during construction.	LSM
Impact GE-3: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to rupture of a known earthquake fault.	LS
Impact GE-4: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced groundshaking.	LS
Impact GE-5: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced ground failure, including liquefaction, lateral spreading, or settlement.	LS
Impact GE-6: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced landslides or other slope failures.	LS
Impact GE-7: The project would not create substantial risks to life or property due to expansive or corrosive soil.	LS
Impact GE-8: Project operations would not result in substantial soil erosion or loss of topsoil.	LS
Impact GE-9: The project would not substantially change the topography or any unique geologic or physical features of the project area.	LS
Impact C-GE: Project construction could result in a cumulatively considerable contribution to cumulative impacts related to the loss of topsoil.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.15.3.4 Construction Impacts and Mitigation Measures

Impact GE-1: The project is located on a geologic unit that could become unstable as a result of project construction. (Less than Significant with Mitigation)

Natural or constructed slopes can become destabilized during construction-related excavation and/or grading operations, particularly if material is added to the head of the slope or removed from the toe (or bottom) of the slope. The potential for this to occur under the proposed project is discussed below.

Baffled Outfall and Concrete Splash Pad at Pit F3-East

The majority of the project area is relatively flat and is located on USGS-designated "flatland" (USGS, 1997); however, the proposed discharge facility would require construction of a baffled outfall and concrete splash pad on the southern edge of quarry Pit F3-East. The outfall would be constructed at an elevation of 254 feet and would be supported on a pile foundation. The approximately 175-foot-long concrete splash pad would extend from the baffled outfall to an elevation of 160 feet above mean sea level (msl). The splash pad would be reinforced with steel and secured to the slope using a series of ground anchors, with a width of approximately 210 feet at the top of the slope and 35 feet at the bottom of the slope.

As discussed in Section 5.15.1, above, the southern wall of quarry Pit F3-East has a slope of approximately 70 percent. Although the geotechnical report for the proposed project concluded that the slope of the quarry pit wall is stable under static conditions, construction of the new outfall and splash pad would require excavation of approximately 11,000 cubic yards of soil to reduce the slope to approximately 67 percent (URS, 2010). Earthwork and excavation of the quarry pit wall during construction of these project components could destabilize the slope and result in slope failure, which would be a significant impact. However, this impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-GE-1.

Mitigation Measure M-GE-1: Shoring Plan for Pit F3-East.

The SFPUC shall contract with a licensed geotechnical engineer to implement a shoring plan assessing potential slope instability risks associated with the final design for construction of the outfall and splash pad at quarry Pit F3-East. The shoring plan shall specify measures to minimize the potential for slope failure during construction and shall include: a dimensioned site plan showing the location of the shoring; data regarding the expected loads on the shoring (surcharge); details of the shoring system; a soils report; and structural calculations for the shoring system. A qualified geotechnical or civil engineer shall prepare the soils report, and a civil and/or structural engineer shall prepare structural plans and calculations for the shoring. The SFPUC shall ensure that the construction contractor implements the plan; that the shoring is inspected by a qualified civil or structural engineer for compliance with the provisions of the shoring plan prior to beginning construction; and that construction activities are periodically observed to verify that all work conforms to the approved shoring plan.

This measure would address slope instability by requiring the construction contractor(s) to implement appropriate measures during construction of the new discharge facility at Pit F3-East, thus ensuring that the slope of the quarry pit is not destabilized. Therefore, this impact would be less than significant with mitigation.

Cutoff Wall Around Pits F3-East and F3-West

Excavation of the trench for the cutoff wall around Pits F3-East and F3-West could result in slope instability during construction due to the proximity to the existing slopes of the quarry pits and the depth of excavation. Excavation for the cutoff wall would extend to a depth of 80 feet and could result in unstable slopes within the trench, or potentially destabilize the slopes of quarry Pits F3-East and F3-West. However, the geotechnical report for the cutoff wall concluded that if properly designed and constructed, would not affect the stability of the existing slopes (T&R/RYGC, 2011). As described in Section 3.6.6 in Chapter 3, Project Description, the trench for the cutoff wall would be kept full of bentonite-cement slurry to stabilize the trench walls and prevent collapse during construction. Therefore, impacts related to slope instability during cutoff wall construction would be less than significant.

Alameda Creek Pump Station, Wet Well, and Transfer Pipeline

The Alameda Creek Pump Station and wet well would be constructed west of Pit F3-West, east of Alameda Creek, and north of an existing access road. The pump station site slopes steeply south towards the existing access road. The transfer pipeline would be constructed along the northern edge of this slope, along the north side of the access road. Construction of the wet well would require excavation of a pit approximately 55 feet long, 25 feet wide, and 45 feet deep. (The Alameda Creek Pump Station would be constructed above the wet well and would not require any additional excavation.) Installation of the transfer pipeline would require excavation of a 1,250-foot-long, 6-foot-wide, and 10-foot-deep trench. These excavations could destabilize the adjacent slope. However, as described in Section 3.6.4 in Chapter 3, sheetpiles would be used to stabilize the sidewalls in the excavation for the wet well at the pump station, and other excavations would be appropriately sloped or shored during construction, which would prevent destabilization of the trenches during construction. In addition, as described in Section 3.6.4 in Chapter 3, the SFPUC would construct an approximately 500-foot-long, 10-foot-tall retaining wall along the southern boundary of the pump station site to establish site grading and maintain the existing access road. The retaining wall would extend along the entire length of the transfer pipeline to prevent destabilization of the adjacent slope and to protect the Alameda Creek Pump Station, wet well, and transfer pipeline from collapse. Thus, impacts related to slope instability during construction of the Alameda Creek Pump Station, wet well, and transfer pipeline would be less than significant.

All Other Project Components

Excavation for all other project components, including the backup pipeline, discharge valve vault and electrical control building for the new discharge facility, the 12-inch-diameter water pipeline to the town of Sunol, and the new chemical facility, would extend to a maximum depth of 22 feet and would be located in flat areas that are not susceptible to landslides or slope instability. Excavation sidewalls for these components would be appropriately sloped or shored during construction, and the removal of soil would not create an unstable slope. Thus, with the exception of the baffled outfall and concrete splash pad at Pit F3-East, impacts related to slope instability during construction of all other project components would be less than significant.

Impact GE-2: The project could result in substantial soil erosion or the loss of topsoil during construction. (Less than Significant with Mitigation)

Soil Erosion

During construction, vegetation and groundcover that serve to stabilize site soils would be removed from portions of the project area. Without proper soil stabilization controls, construction activities such as excavation, backfilling, and grading could increase the potential for exposed soils to be eroded by wind or stormwater runoff, resulting in long-term soil loss—a potentially significant impact. However, with implementation of Mitigation Measure M-HY-1a potential impacts related to soil erosion would be reduced to a less-than-significant level.

> **Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.**
>
> (See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

Mitigation Measure M-HY-1a addresses soil erosion by requiring the SFPUC's construction contractor to prepare and implement a stormwater pollution prevention plan (SWPPP) that specifies erosion control measures to be implemented during construction activities. Therefore, this impact would be less than significant with mitigation.

Loss of Topsoil

Project construction activities could also result in the loss of topsoil (a fertile soil horizon that typically contains a seed base) if there is a well-developed topsoil horizon and it is mixed with other soil horizons or otherwise lost during excavation and backfilling. The construction of project components south of San Antonio Creek could result in the loss of topsoil through the following activities: grading of the proposed staging areas; excavation for the proposed backup pipeline and 12-inch-diameter water pipeline to the town of Sunol; construction of the discharge valve vault and electrical control building, construction of the new chemical facility, and construction of ancillary structures. Impacts related to the loss of topsoil during construction would be significant. However, the impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-BI-1f.

> **Mitigation Measure M-BI-1f: Prepare and Implement a Vegetation Restoration and Compensatory Mitigation Plan.**
>
> (See Impact BI-1 in Section 5.14, Biological Resources, for description.)

Mitigation Measure M-BI-1f addresses impacts related to the loss of topsoil by requiring the construction contractor to salvage topsoil generated during excavations for subsequent use as part of site restoration activities. Therefore, this impact would be less than significant with mitigation.

North of San Antonio Creek, there is no topsoil on the steep banks of the quarry pits or adjacent areas because surface materials were removed during gravel mining operations; therefore, impacts related to the loss of topsoil in the areas north of San Antonio Creek would be less than significant.

5.15.3.5 Operational Impacts and Mitigation Measures

Impact GE-3: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to rupture of a known earthquake fault. (Less than Significant)

Although the proposed project would not alter the seismic environment or increase the risk of fault rupture, there is the potential for proposed improvements to be damaged by surface fault rupture once they are operational.

SABPL Alignment and Water Pipeline to the Town of Sunol

As described above in Section 5.15.1.4, the proposed backup pipeline alignment and 12-inch-diameter water pipeline to the town of Sunol would parallel the mapped fault trace of the Calaveras fault. In addition, these pipelines as well as the discharge facility at Pit F3-East and the new chemical facility would be constructed within the earthquake fault zone of the Calaveras fault. In the project area, the expected horizontal displacement along the fault is between 2 and 5 feet and the vertical displacement is between 0.4 and 1 foot. Horizontal fault movement would parallel the proposed pipelines and impose strain along the length of the pipelines, potentially resulting in pipeline rupture.

The backup pipeline would be filled with water when not in use, and SFPUC system operators would use the proposed 66-inch-diameter backup pipeline infrequently for managing planned and emergency discharges of Hetch Hetchy water (refer to Table 3-4 in Chapter 3, Project Description). Discharges resulting from planned operations would occur approximately two times per year. The frequency of emergency discharges is difficult to predict but is estimated to occur approximately once every two years. If the backup pipeline were to rupture during an earthquake, the volume of water released would vary, depending on whether the pipeline was actively being used for a discharge. In the unlikely event that the backup pipeline was discharging when it ruptured, the volume of water released would depend on the flow of water in the pipeline and the extent of the pipeline damage, but the maximum volume would be equal to the maximum discharge to Pit F3-East—that is, 485 acre-feet over a 12-hour period (SFPUC, 2009). If the backup pipeline were to rupture when it was not in use, the discharge would be limited to the volume of the pipeline (approximately 4 acre-feet). Flooding and erosion could occur in the event of a pipeline rupture; the nearby features that could be adversely affected are

SFPUC facilities near the San Antonio Pump Station, the Surface Mining Permit 30 (SMP-30) aggregate processing facility, and Calaveras Road. Although these features could be damaged if a major displacement on the Calaveras fault caused the backup pipeline to rupture, they would also suffer substantial direct damage from the seismic event because Calaveras Road is adjacent and parallel to the Calaveras fault, and these features are within 250 feet of the fault trace. It is unlikely that any flooding and erosion caused by the ruptured pipeline would substantially increase the damage because the volume of discharge from the ruptured backup pipeline would most likely be limited to 4 acre-feet, based on the approximate volume of the proposed backup pipeline. While the volume of discharge from the ruptured pipeline could be as much as 485 acre-feet, this would only occur in the highly unlikely event that a large earthquake occurred during the two to three times per year when the backup pipeline was being actively used for discharge purposes. Furthermore, such an event would expose few people, if any, to substantial adverse effects (i.e., the risk of property loss, injury, or death), as there are no habitable structures near the pipeline that could be flooded in the event of a pipeline rupture. For the reasons described above, potential impacts related to fault rupture would be less than significant for the SABPL project.

The proposed water pipeline to the town of Sunol would parallel the Calaveras fault within the earthquake fault zone and would have a diameter of 12 inches (far less than the existing 36-inch-diameter pipeline it is replacing). The pipeline would be less vulnerable to earthquake damage than the existing pipeline because it has a smaller diameter and would be made of high-density polyethylene, and therefore would be more flexible. If this pipeline were to rupture, it would not cause substantial flooding or erosion because of the limited volume of water that would be in the pipeline (approximately 0.1 acre-foot). Although damage to this pipeline could result in temporary service disruptions to the town of Sunol, such disruptions could also occur with the pipeline it is replacing. The proposed project would not increase the risk of damage due to fault rupture. Therefore, impacts related to fault rupture would be less than significant for the 12-inch-diameter water pipeline to the town of Sunol because: the new pipe is more flexible than the pipe it is replacing and less vulnerable to earthquake damage; rupture of the pipeline is unlikely to expose people to adverse effects associated with flooding or erosion; and rupture of the pipeline would not result in substantial damage to Calaveras Road or nearby facilities.

All Other Project Components

The new chemical facility, the discharge facility at Pit F3-East (baffled outfall, concrete splash pad, discharge valve vault, and electrical control building), a portion of the new overhead powerlines, and the portion of the cutoff wall around Pit F3-East would also be constructed within the earthquake fault zone for the Calaveras fault. More specifically, the new chemical facility would be constructed approximately 50 feet from the active trace of the Calaveras fault (URS, 2009); the discharge facility and eastern terminus of the new overhead powerlines would be constructed approximately 400 feet from the active trace; and the cutoff wall would be constructed approximately 200 feet from the active trace. Although the Calaveras fault could experience up to 2 to 5 feet of horizontal displacement and 0.4 to 1 foot of vertical displacement during a seismic event, these structures would not be constructed on an active fault trace and would not likely suffer damage from fault rupture. The Alameda Creek Pump Station, wet well, control building for the pump station, and transfer pipeline would not be constructed within the fault zone. Therefore, impacts related to fault rupture would be less than significant for all project components.

Impact GE-4: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced groundshaking. (Less than Significant)

Groundshaking is the most widespread effect of earthquakes. Depending on the level of groundshaking, an earthquake on the Calaveras fault or one of the regional faults could damage the proposed improvements. As stated in Section 5.15.1.4 and shown in Table 5.15-2, above, the project area could experience peak ground accelerations of 72 to 121 percent of gravity (0.72 g to 1.21 g). All of the peak ground accelerations are greater than 0.70 g, which would result in very strong groundshaking that could cause widespread damage.

Backup Pipeline and Water Pipeline to the Town of Sunol

Strong groundshaking could rupture the 66-inch-diameter backup pipeline. The potential effects of rupture are discussed above under Impact GE-3. Similar to fault rupture impacts, groundshaking impacts would be less than significant for the proposed project because rupture of the backup pipeline as a result of strong groundshaking would expose few people, if any, to adverse effects and would not substantially increase damage to nearby features, such as SFPUC facilities near the San Antonio Pump Station, the SMP-30 aggregate processing facility, and Calaveras Road.

Similarly, strong groundshaking could rupture the 12-inch-diameter pipeline to the town of Sunol. The potential effects of rupture are discussed above under Impact GE-3. Similar to fault rupture, impacts related to groundshaking would be less than significant for this pipeline because rupture of this pipeline as a result of strong groundshaking would expose few people, if any, to adverse effects and would not substantially increase damage to nearby features. Thus, potential groundshaking impacts related to the backup pipeline and water pipeline to the town of Sunol would be less than significant.

All Other Project Components

All other project improvements, including the new chemical facility, discharge facility at Pit F3-East, Alameda Creek Pump Station, wet well, transfer pipeline, and new overhead powerlines, would be designed to withstand groundshaking consistent with an earthquake with a 475-year return period (i.e., an earthquake with a 10 percent chance of occurring in 50 years), which meets or exceeds applicable building code requirements (URS, 2009). Because these improvements would be designed to comply with current seismic standards, and damage to these improvements would expose few people, if any, to adverse effects, impacts related to seismically induced groundshaking would be less than significant.

Impact GE-5: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced ground failure, including liquefaction, lateral spreading, or settlement. (Less than Significant)

Liquefaction-related phenomena can include lateral spreading, ground oscillation, loss of bearing strength, subsidence, and buoyancy effects, all of which can cause damage to structures. As described in Section 5.15.1.2, above, the USGS has mapped the Pleistocene-age alluvial materials in the project area (*Qpa*) as having a low liquefaction potential, the Holocene-age alluvial materials (*Qt* and *Qha*) and gravel quarry deposits (*gq*) as having a moderate liquefaction potential, and the modern stream channel deposits associated with Calaveras and San Antonio Creeks (*Qhc*) as having a very high liquefaction potential (USGS, 2006). However, the geotechnical investigations for the proposed project concluded that the overall potential for liquefaction within the project area is low (URS, 2009; T&R/RYCG, 2011). Although liquefiable materials were identified in three borings within the project area near the southern terminus of the proposed backup pipeline and the former nursery located east of Pit F6 and west of Calaveras Road, the geotechnical investigations for the proposed project concluded that seismically induced settlement at the top of these saturated liquefiable materials would only be on the order of up to 1 inch. Furthermore, the geotechnical reports concluded that settlement of the dry sediments above the water table as a result of cyclic densification would be limited to approximately 1.5 inches, and that the potential for lateral spreading would be low. Therefore, impacts related to liquefaction and related phenomena would be less than significant, because the fill and alluvial materials that overlie the project area have a low potential for liquefaction and lateral spreading and a limited potential for seismic settlement. Further, all proposed facilities and improvements would be designed in accordance with applicable building code and seismic design requirements, which would address these hazards.

Impact GE-6: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced landslides or other slope failures. (Less than Significant)

As described in Section 5.15.1.3, above, the majority of the project area is relatively flat and is located in an area designated by the USGS as "flatland" (USGS, 1997). However, the existing sidewalls of Pits F3-East and F3-West and the slope along the southern boundary of the Alameda Creek Pump Station site could become destabilized during strong groundshaking. Seismically induced instability of the sidewall in Pit F3-East could damage or destroy the proposed outfall structure and concrete splash pad. Instability of the slope along the southern boundary of the pump station site could damage or destroy the proposed Alameda Creek Pump Station, wet well, control building, and transfer pipeline. In addition, the permanent placement of spoils to construct the earthen berms at the North Spoils Site and former nursery site to the east of Pit F3-East, within Staging Area C would create new slopes at these sites potentially increasing slope instability hazards.

The baffled outfall and concrete splash pad would be constructed in the sidewall of quarry Pit F3-East on steep slopes that could become destabilized during strong groundshaking. However, the splash pad would be reinforced with steel and secured to the slope using a series of ground anchors that would protect the slope from erosion (see Chapter 3, Section 3.5.2, Discharge Facility at Pit F3-East). In addition, the proposed 500-foot-long, 15-foot-tall retaining wall along the southern boundary of the proposed Alameda Creek Pump Station site would secure the existing slope and protect against slope instability.

As described in Chapter 3, Project Description, excess spoils generated during construction of the proposed project could be permanently placed in earthen berms at the North Spoils Site and former nursery site located within Staging Area C. The berms would be constructed with 2:1 (horizontal:vertical) slopes and with maximum heights of 20 feet above Calaveras Road and 25 feet above ground level, respectively. The spoils would be placed and lightly compacted by the equipment used for hauling and spreading, and the berms would be vegetated to protect the spoils from erosion. Although construction of the berm at the North Spoils Site and former nursery site would create new slopes, there would be a low potential for seismically induced slope failure because of the limited fill height, modest slope inclinations, stabilization through revegetation of the berm, and design of the berm to be stable in the event of an earthquake.

Thus, impacts related to seismically induced landslides or other slope failures would be less than significant for all project components.

Impact GE-7: The project would not create substantial risks to life or property due to expansive or corrosive soil. (Less than Significant)

Problematic soils, such as expansive and corrosive soils, can cause damage to structures and buried utilities and can also increase required maintenance. As described in Section 5.15.1.3 and presented in Table 5.15-1, above, soils in the project area generally exhibit a low to high shrink/swell potential. Analysis of soil samples from the project area identified a 2- to 4-foot-thick layer of moderately expansive soil along a limited portion of the proposed pipeline alignment at the southern terminus of the backup pipeline alignment. However, in accordance with the recommendations of the project-specific geotechnical investigation (URS, 2009), the pipeline trench would be backfilled with compacted, non-expansive fills, and the footings of the proposed new structures would be at least 24 inches below grade to minimize the effects of any expansive soils. As the proposed project would be designed and constructed in accordance with the recommendations of the geotechnical investigation, impacts related to expansive soils would be less than significant for all project components.

Regionally, the project area soils generally exhibit a moderate to high corrosivity to uncoated steel and a low to moderate corrosivity to concrete. However, based on analysis of soil samples from the project area, the site-specific geotechnical investigation concluded that these soils exhibit a low to moderate risk of corrosion to buried iron, steel, mortar-coated steel, and reinforced-concrete structures, and that all buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric steel or iron should be properly protected from corrosion, depending on the critical nature of the structure (URS, 2009). As described in Chapter 3, Project Description, the backup pipeline and transfer pipeline would be protected from corrosion with a cement mortar coating or a dielectric coating (a coating that does not conduct electricity). A passive cathodic protection system, consisting of "sacrificial" anodes placed along the pipelines that would corrode in place of the pipelines, would also be installed to prevent corrosion. Although reinforcing steel bars could be required for construction of some of the remaining project components, the SFPUC would implement the recommendations of the geotechnical engineer to properly protect the steel from corrosion. Since the project would incorporate cathodic protection into pipeline design and would implement the recommendations of the geotechnical engineer for the remaining structures, impacts related to corrosive soils would be less than significant for all project components.

Impact GE-8: Project operations would not result in substantial soil erosion or loss of topsoil. (Less than Significant)

Newly constructed and compacted engineered slopes can undergo substantial erosion through dispersed sheet-flow runoff. More concentrated runoff can cause the formation of small erosional channels and larger gullies, each compromising the integrity of the slope and potentially resulting in substantial soil loss. The permanent berms at the North Spoils Site and former nursery site located within Staging Area C, and the proposed outfall/splash pad at Pit F3-East would involve construction of new slopes and an altered slope, respectively. None of the other project components would create or modify a slope. Operational impacts related to erosion of the earthen berms and the new discharge facility at Pit F3-East are discussed below.

Earthen Berms

The earthen berms at the North Spoils Site and the former nursery site located within Staging Area C would be created using excess spoils generated during construction of the proposed project and other SFPUC projects in the Sunol Valley. As described in Chapter 3, Section 3.6.9, Spoils Management and Disposal, the berms would be constructed with 2:1 (horizontal:vertical) slopes and with maximum heights of 20 and 25 feet, respectively. Further, the North Spoils Site would be set back 20 feet from Calaveras Road. At both sites, the spoils would be lightly compacted and revegetated to protect the berms from erosion. Thus, given the slope characteristics and revegetation, potential impacts related to erosion of the berms would be less than significant.

New Discharge Facility at Quarry Pit F3-East

The proposed outfall at quarry Pit F3-East would be constructed at an elevation of 254 feet msl and would direct the discharge to an approximately 175-foot-long concrete splash pad extending from the outfall to an elevation of 160 feet msl. The lower portion of the concrete splash pad would be below the established water elevation threshold of 195 feet msl (see Chapter 3, Section 3.4, Proposed Water Management in Pits F3-East and F3-West), which would minimize the potential for discharges from the backup pipeline to result in erosion of the quarry pit wall. Therefore, impacts related to erosion of Pit F3-East during project operations would be less than significant.

Impact GE-9: The project would not substantially change the topography or any unique geologic or physical features of the project area. (Less than Significant)

Substantial alteration of topography (defined as changes in the character of the slope and gradient due to grading, excavation, or cut and fill) could result in unstable slopes or increased wind or water erosion due to drainage pattern changes and/or slope changes.

The proposed project would not substantially alter the topography of the project area; with the exceptions of the baffled outfall and concrete apron on the southern wall of Pit F3-East and the earthen berms at the North Spoils Site and the former nursery site located within Staging Area C, all excavations would be backfilled to the original grade upon the completion of construction activities. Although the southern slope of Pit F3-East would be slightly modified to reduce the slope from 70 to 67 percent, this modification would not substantially change the topography of the quarry pit. The only permanent topographic changes would occur at the North Spoils Site and the former nursery site located within Staging Area C, where spoils from the proposed project and other SFPUC projects in the Sunol Valley would be placed to create earthen berms. Although the topography of these sites would be altered by the berms, impacts related to changes in topography would be less than significant because of the limited fill height, setback from neighboring properties, modest slope inclinations, and stabilization through revegetation of the berms, which would limit erosion (as described above in Impact GE-8). Thus, impacts related to changes in topography would be less than significant.

5.15.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Under Pumping Variant 1, the proposed Alameda Creek Pump Station, wet well, transfer pipeline, and retaining wall along the southern boundary of the pump station site would not be constructed. The impact identified for the proposed project related to siting of facilities on a geologic unit that could become unstable during project construction would remain potentially significant under Pumping Variant 1 because the baffled outfall and concrete splash pad would still be constructed within the sidewall of Pit F3-East; however, the overall magnitude of this impact would be incrementally less than under the proposed project due to the eliminated facilities. Similarly, impacts related to seismically induced slope failures, including landslides, during project operations would remain less than significant, but the magnitude of this impact would also be reduced because the slope bordering the southern boundary of the pump station site would not be developed. The impact related to soil erosion and loss of topsoil would be slightly less than with the proposed project due to the reduced excavation needed to construct Pumping Variant 1, but the overall conclusion would not change. All other geology and soils impacts related to construction and operation of Pumping Variant 1 would be the same as those described for the proposed project. Thus, this variant would not change the conclusions or mitigation measures identified in Sections 5.15.3.4 and 5.15.3.5, above.

Pumping Variant 2

Since Pumping Variant 2 would construct all of the same facilities and improvements as the proposed project, all of the geology and soils impacts related to construction and operation of this pumping variant would be the same as those described for the proposed project. Thus, implementation of Pumping Variant 2 would not change the analysis, conclusions, or mitigation measures presented in Sections 5.15.3.4 and 5.15.3.5, above.

5.15.3.7 Cumulative Impacts and Mitigation Measures

Impact C-GE: Project construction could result in a cumulatively considerable contribution to cumulative impacts related to the loss of topsoil. (Less than Significant with Mitigation)

The geographic scope for potential cumulative geologic and seismic impacts consists of the project area and immediate vicinity. Geologic and seismic impacts are generally site-specific and depend on the local geology and soil conditions. Past projects, including previous SFPUC water supply projects, and ongoing mining operations, have modified the topographic and geologic landscape in the vicinity of the project area.

Because of the localized nature of the impacts, the projects listed on Table 5.1-6 would not contribute to potential cumulative geologic or seismic impacts associated with the SABPL project, including fault rupture (Impact GE-3), groundshaking (Impact GE-4), liquefaction (Impact GE-5), and expansive or corrosive soils (Impact GE-7). Although rupture of the backup pipeline and/or the water pipeline to the town of Sunol could result in secondary flooding and erosion impacts, such an event would expose few, if any, people to substantial adverse effects (i.e., the risk of loss, injury, or death), as there are no nearby habitable structures. For this reason, and because all other project components would be designed to withstand seismic hazards and expansive and corrosive soils, cumulative impacts related to these issues would be less than significant.

As described under Impact GE-1 (slope instability during construction) and Impact GE-6 (seismically induced landslides or other slope failures), construction of the SABPL project could result in instability of the existing slopes to the south and west of Pit F3-West during construction of the proposed Alameda Creek Pump Station, wet well, and transfer pipeline, and instability of the slopes of Pits F3-East and F3-West during construction of the cutoff wall. The SFPUC Upper Alameda Creek Filter Gallery (Filter Gallery) project would also involve construction in or adjacent to these slopes. However, most of the facilities that would be constructed in the vicinity of Pits F3-East and F3-West under the Filter Gallery project are also part of the SABPL project as these are dual-purpose facilities. Therefore, the construction-related impacts associated with these facilities would only occur once during construction of the project that constructs these facilities; no cumulative impacts associated with construction of these facilities would occur. Furthermore, no other cumulative projects are expected to cause slope instability in this area. Therefore, there would be no cumulative impacts associated with instability of a geologic unit. Several of the cumulative SFPUC projects in the Sunol Valley would contribute to potential cumulative impacts associated with earthquake-induced landslides at the North Spoils Site, and the Filter Gallery project would contribute to potential cumulative impacts associated with earthquake induced landslides at the former nursery site located within Staging Area C (see Impact GE-6). However, as with the proposed project, the engineered slopes and revegetation of the earthen berms at each spoils site would limit the potential for substantial adverse effects. Thus, there would be no significant cumulative impacts related to slope instability.

As discussed in Impact GE-2, the SABPL project would have a significant impact related to soil erosion and loss of topsoil during construction. Most of the cumulative projects listed in Table 5.1-6 could also result in soil erosion and loss of topsoil, resulting in a significant cumulative impact, and the SABPL project's contribution to this cumulative impact would be cumulatively considerable. However, as described above under Impact GE-2, the SABPL project's impact related to soil erosion and loss of topsoil would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-HY-1a** (**Preparation and Implementation of a SWPPP**) (see Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description) and **M-BI-1f** (**Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation**) (see Impact BI-1 in Section 5.14, Biological Resources, for description). Mitigation Measure M-HY-1a requires preparation and implementation of a stormwater pollution prevention plan that describes erosion control measures to be implemented during construction, and Mitigation Measure M-BI-1f requires the construction contractors to salvage topsoil produced during excavation activities for use during site restoration activities. With implementation of these measures, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

The SABPL project and other SFPUC projects in the Sunol Valley may permanently place spoils within the earthen berms at the North Spoils Site and former nursery site to the east of Pit F3+-East, resulting in a cumulative impacts related to long-term soil erosion and substantial alteration of the topography. However, as discussed above under Impact GE-8, the berms would be would be lightly compacted and revegetated to protect the new slopes from soil erosion. As discussed under Impact GE-9, because of the limited height of the berms (20 feet and 28 feet), setback from neighboring properties, and modest slope inclinations, significant impacts related to alteration of the topography would not result. Thus, cumulative impacts associated with alteration of topography and long-term soil erosion from permanent placement of spoils at the North Spoils Site and former nursery site to the east of Pit F3-East would be less than significant.

Cumulative Impacts of Pumping Variants

If Pumping Variant 1 is implemented, the Alameda Creek Pump Station, wet well, transfer pipeline, and retaining wall along the southern boundary of the pump station site would not be constructed. As described in Chapter 3, Section 3.5.5.3, Relationship of the SABPL Project to the

Upper Alameda Creek Filter Gallery Project, these facilities are also proposed under the Filter Gallery project. Thus, if these facilities were constructed under the Filter Gallery project, both projects could contribute to impacts related to instability of the existing slopes in the walls of Pit F3-West since Pumping Variant 1 would still require construction of the cutoff wall around Pits F3-East and F3-West. However, as described above under Impact GE-1, during construction of the cutoff wall, the trench for the cutoff wall would be kept full of bentonite slurry to stabilize the trench walls and prevent collapse. Therefore, project-level impacts related to slope instability in the vicinity of Pit F3-West would be less than significant, and the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant). Thus, the cumulative impact analysis and related conclusions provided above for the proposed project also apply to Pumping Variant 1. Otherwise, because implementation of Pumping Variant 1 would result in impacts that are the same as those of the proposed project (refer to Section 5.15.3.6, Impact Analysis of Pumping Variants), the cumulative impact analysis and related conclusions provided above also apply to Pumping Variant 1.

Because implementation of Pumping Variant 2 would result in impacts that are the same as those of the proposed project (refer to Section 5.15.3.6, Impact Analysis of Pumping Variants), the cumulative impact analysis and related conclusions provided above also apply to Pumping Variant 2.

5.15.4 References

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5.16 Hydrology and Water Quality

This section describes the existing surface water and groundwater resources that could be affected by the proposed San Antonio Backup Pipeline (SABPL) project. The regulatory framework discussion summarizes applicable federal, state, and local regulations and policies related to stormwater drainage, water quality, and beneficial uses of surface water and groundwater. This section analyzes potential impacts on surface water and groundwater and identifies mitigation measures for potentially significant impacts, as appropriate.

5.16.1 Setting

5.16.1.1 Climate and Precipitation

The climate of the Sunol Valley is characterized by warm, dry summers and mild, rainy winters. Average temperatures range from the mid-50s in winter to the high 70s in summer (in degrees Fahrenheit [°F]). Average annual precipitation is 20 inches (WRCC, 2009).

5.16.1.2 Regional Surface Water Hydrology

The proposed SABPL project is located within the hydrologic boundaries of the greater Alameda Creek watershed (see **Figure 5.16-1**). The Alameda Creek watershed, which drains approximately 633 square miles, extends from Mount Diablo in the north, Altamont Pass in the east, Mount Hamilton in the south, and Niles Canyon in the west. The Alameda Creek watershed includes remote wildlands within the Sunol-Ohlone Regional Wilderness, which is managed by the East Bay Regional Park District, and Alameda watershed[1] lands, owned by the City and County of San Francisco (CCSF) and managed by the SFPUC.

Two major drainage basins lie within the greater Alameda Creek watershed: the Livermore Drainage Unit and the Sunol Drainage Unit (SFPUC, 2001). The 458-square-mile Livermore Drainage Unit is located in the northern and eastern portions of the Alameda Creek watershed. The major streams in the Livermore Drainage Unit are Arroyo del Valle, Arroyo las Positas, Arroyo Mocho, and San Ramon and Tassajara Creeks. The California Department of Water Resources (DWR) operates Del Valle Reservoir, which is part of the State Water Project and is located on Arroyo del Valle (Geomatrix, 2003).

The proposed project lies within the 175-square-mile Sunol Drainage Unit, which is located in the southern portion of the Alameda Creek watershed. The major streams in this drainage unit are Alameda Creek, Arroyo Hondo, Calaveras Creek, San Antonio Creek, La Costa Creek, and Indian Creek (Geomatrix, 2003). The natural hydrology of the Sunol Drainage Unit has been altered by water supply activities as well as by urban development and flood control activities. The SFPUC

[1] The term “Alameda watershed” refers specifically to CCSF-owned lands managed by the SFPUC as part of the regional water system; the Alameda watershed is located within the greater hydrologic boundary of the Alameda Creek watershed.

operates Calaveras and San Antonio Reservoirs, which are located on Calaveras and San Antonio Creeks, respectively.

5.16.1.3 Surface Water Bodies

The major surface water bodies in the project area and vicinity are Alameda Creek, San Antonio Creek, Calaveras Reservoir, and San Antonio Reservoir. The project area and vicinity also includes large quarry pits operated under Surface Mining Permit 24 (SMP-24) and Surface Mining Permit 30 (SMP-30), which are typically filled with water.

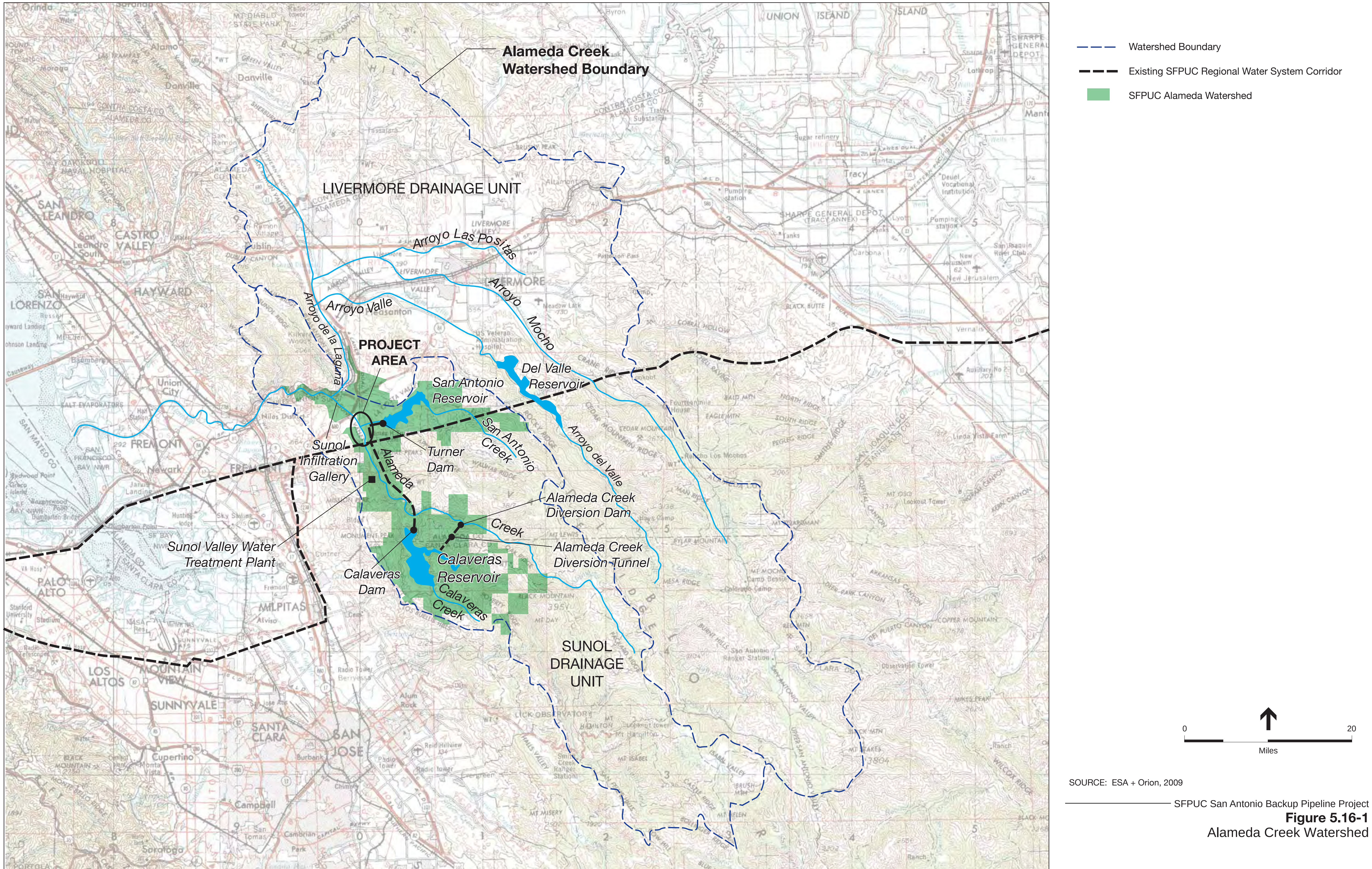
Alameda Creek

Alameda Creek flows from its headwaters near Mount Hamilton northward through the Sunol Valley, continues through Niles Canyon, and eventually drains to San Francisco Bay. In the Sunol Valley, major tributaries to Alameda Creek include Calaveras Creek, which conveys releases from Calaveras Reservoir; Welch Creek, which flows into Alameda Creek near the Sunol Valley Water Treatment Plant (SVWTP); Pirate Creek, which flows into Alameda Creek just south of the Alameda Siphons; San Antonio Creek, which conveys releases from San Antonio Reservoir; Sheridan Creek, which flows into Alameda Creek near the Interstate 680 (I-680) overpass; and Arroyo de la Laguna, which conveys flows from the Livermore Drainage Unit at the northern end of the valley. Many of the tributaries that supply flows to Alameda Creek are intermittent; flow in these Alameda Creek tributaries can fluctuate as a result of varying levels of stormwater runoff from precipitation events, as well as from rising and falling groundwater levels in the area (Gunther et al., 2000).

In the vicinity of the proposed project and through the Sunol Valley, Alameda Creek has a low gradient channel (average of 0.3 percent). The Alameda Creek channel in the Sunol Valley is broad and braided in places but is bordered in parts by steep slopes (Center for Ecosystem Management and Restoration, 2002). Alameda Creek is a perennial stream in the upper parts of the Alameda Creek watershed; however, in the Sunol Valley and other alluvial flats, a high rate of infiltration coupled with a low-gradient stream channel typically result in a dry creek bed during the summer months.

Commercial gravel quarries operated by Hanson Aggregates and CEMEX (leased to Oliver De Silva, Inc.) under SMP-24 and SMP-30, respectively, are present along Alameda Creek between the Alameda Siphons and I-680, and some of the streamflow in this area is lost to groundwater that seeps into quarry pits. However, due to year-round flow contributions from Arroyo de la Laguna, Alameda Creek typically flows perennially farther downstream in Niles Canyon.

Since October 1999, the U.S. Geological Survey (USGS) has monitored mean daily flows in Alameda Creek downstream of Welch Creek, just near the SVWTP. Mean daily flows generally range from near zero during dry months to above 1,000 cubic feet per second (cfs) in wet months. During the month of May, flow rates are usually on the order of 50 to 100 cfs, decreasing to 20 to 50 cfs in June and 0 to 20 cfs between July and November (USGS, 2005).



SOURCE: ESA + Orion, 2009

SFPUC San Antonio Backup Pipeline Project

Figure 5.16-1
Alameda Creek Watershed

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San Antonio Creek

San Antonio Creek is an intermittent drainage that originates approximately 9 miles east of Alameda Creek. Flow from the upper reaches of San Antonio Creek is captured in San Antonio Reservoir. Flows in the lower reach of San Antonio Creek are limited to: seepage from James H. Turner Dam (Turner Dam) (CDM, 2007); periodic releases from San Antonio Reservoir during testing of the cone valve at Turner Dam; emergency discharges of Hetch Hetchy water via the existing San Antonio Pipeline and outlet works at the base of Turner Dam; discharges from dewatering activities at the SMP-30 quarry; and stormwater runoff during heavy rain events. Between Turner Dam to just downstream of the USGS stream gage weir (located approximately 0.4 mile upstream of the Calaveras Road crossing), there is measurable flow in San Antonio Creek for much of the year due to continuous seepage from the dam. During the dry season (typically late spring through fall), flow in the reach of San Antonio Creek between Calaveras Road and Alameda Creek is absent, as this stretch of the creek typically receives water only from quarry dewatering discharges and stormwater runoff (SFPUC, 2008a; USGS, 2010). San Antonio Creek flows into Alameda Creek at the western end of the project area near the proposed Alameda Creek Pump Station.

Calaveras Reservoir

Calaveras Reservoir, completed in 1925, is located upstream of the southern end of the Sunol Valley and is formed by Calaveras Dam. The reservoir collects and stores water from Calaveras Creek and Arroyo Hondo as well as from local drainages along the western perimeter of the reservoir, which has a total drainage area of approximately 98 square miles. The Alameda Creek Diversion Dam and Tunnel, operated by the SFPUC as part of the regional water system, diverts flows and drainage from Alameda Creek to Calaveras Reservoir. As part of system operations, the SFPUC can release water from Calaveras Reservoir to Calaveras Creek, which then flows to Alameda Creek. The SFPUC manages Calaveras Reservoir with the primary objectives of conserving local watershed runoff and maximizing storage. However, DWR’s Division of Safety of Dams (DSOD) currently restricts water storage in Calaveras Reservoir due to concern regarding the seismic stability of the dam (San Francisco Planning Department, 2008).

San Antonio Reservoir

San Antonio Reservoir is formed by Turner Dam (an earthen dam constructed in 1965), approximately 1.5 miles upstream of San Antonio Creek’s confluence with Alameda Creek. The reservoir has a drainage area of approximately 40 square miles and collects and stores water primarily from upper San Antonio Creek, with contributions from Indian Creek, La Costa Creek, and Williams Gulch. In addition to storing local runoff, San Antonio Reservoir can be used to store Calaveras Reservoir surplus water, Hetch Hetchy water diverted from Alameda Siphon No. 3 via the existing San Antonio Pipeline, and groundwater (influenced by surface water from Alameda Creek) that is pumped from the Sunol Infiltration Gallery (San Francisco Planning Department, 2008).

As part of system operations, the SFPUC can make controlled releases from San Antonio Reservoir to San Antonio Creek through the existing outlet structure at Turner Dam, which then flow to Alameda Creek.

Quarry Pits

As stated above, commercial gravel quarries operated by Hanson Aggregates and Oliver De Silva are present along Alameda Creek between the Alameda Siphons and I-680. These quarries are the predominant feature along this reach of Alameda Creek. Individual quarry pit depths vary with changing mining operations; however, several quarry pits reportedly approach 250 feet in depth (URS, 2009a).

The SMP-24 area, operated by Hanson Aggregates, includes quarry Pits F3-East, F3-West, and F2, which are all located north of San Antonio Creek, south of I-680, east of Alameda Creek, and west of Calaveras Road, as well as several quarry pits and ponds located west of Alameda Creek (see **Figure 5.16-2**). The quarry pits in the SMP-24 area are not classified as waters of the United States[2] or waters of the state because they are part of active mining activities. As described in Chapter 3, Project Description, the SFPUC proposes to discharge quality-impaired Hetch Hetchy water into Pit F3-East as part of the proposed project. To facilitate mining operations in the SMP-32 area, Hanson Aggregates currently pumps groundwater that seeps into active mining areas to various SMP-24 quarry pits, including Pits F3-East and F3-West. The pits also receive water from groundwater seepage and precipitation. Hanson Aggregates manages the water stored in Pits F3-East and F3-West by pumping it directly to a 2,000-gallon tank to be used for dust control and irrigation in the SMP-32 and SMP-24 areas, and to the "Ready Mix Pond" located west of Alameda Creek near the aggregate processing facility (see Figure 5.16-2) for consumptive use during quarry operations; in addition, during wet years or following heavy precipitation periods in winter months (January to May), excess water stored in Pits F3-East and F3-West is discharged to Alameda Creek just north of the confluence with San Antonio Creek under National Pollutant Discharge Elimination System (NPDES) General Permit No. CAG982001 (Aggregate Mining, Sand Washing, and Sand Offloading General Permit). The NPDES permit allows Hanson Aggregates to discharge up to 10 million gallons per day (mgd) (or 15.5 cfs) into Alameda Creek (URS, 2009a). Hanson Aggregates pumps 4,000 to 5,000 gallons per minute of water from the Ready Mix Pond for aggregate processing. This pumping is not continuous; it is only performed during operational hours, which are dependent on market demand (SFPUC, 2010a). In addition to providing storage for water produced during dewatering activities, Pits F3-East and F3-West also function as settling ponds, allowing sediment from the dewatering effluent to settle out of the water column before the water is pumped to other quarry pits for consumptive use or to Alameda Creek.

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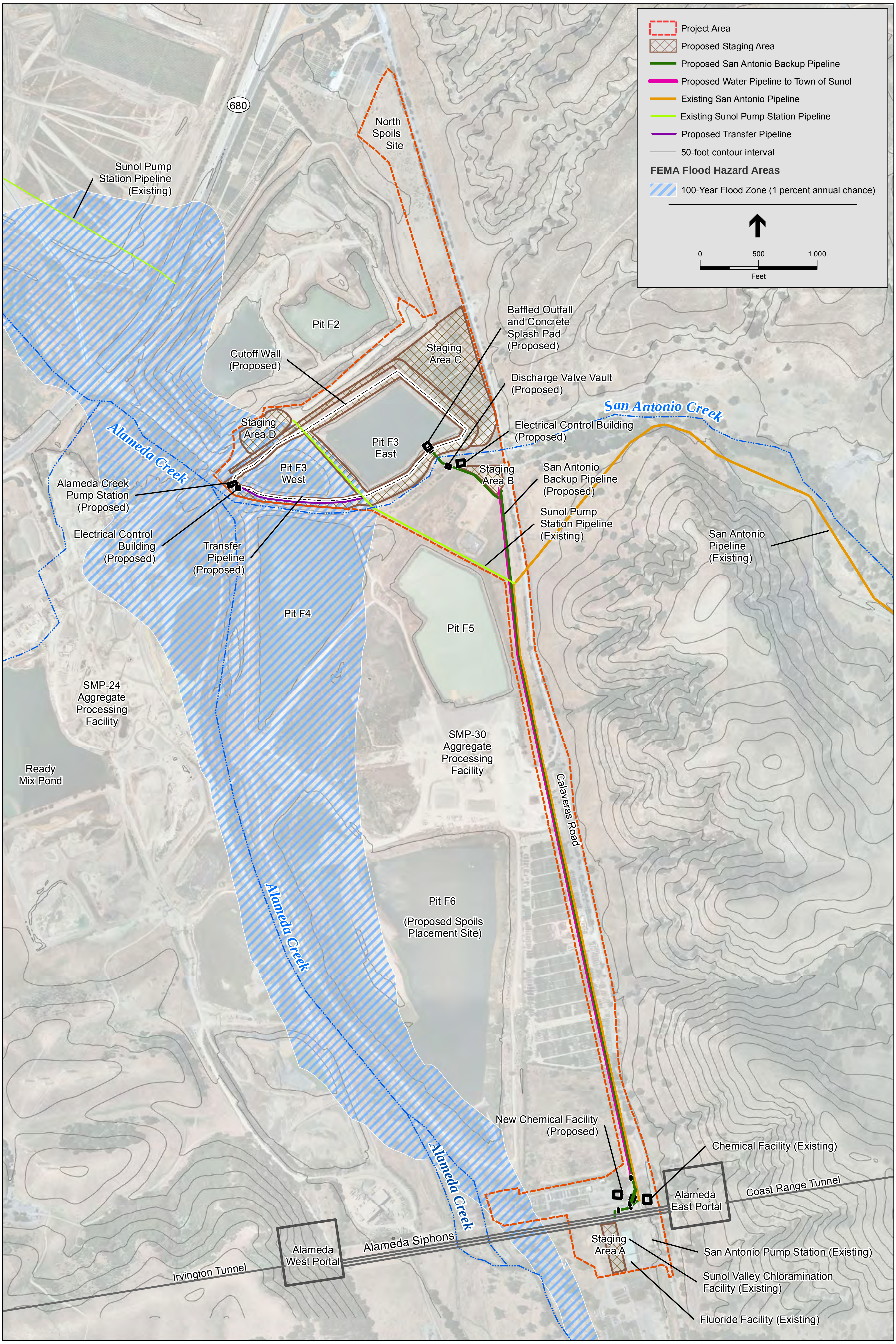
[2] "Waters of the United States" is a broad federal definition that describes legal jurisdiction over deep water habitats and special aquatic sites, including wetlands.



SOURCE: ESA + Orion, 2011; FEMA, 2009; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project
Figure 5.16-2
100-Year Flood Hazard Zone

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5.16.1.4 Stormwater Drainage

Precipitation and stormwater runoff in the Sunol Valley is collected and conveyed through a system of culverts, open channels, and natural drainages that ultimately discharge into local watercourses, including Alameda Creek and San Antonio Creek. Stormwater drainage facilities along Calaveras Road are maintained by the Alameda County Department of Public Works. Culverts and storm drains along Calaveras Road convey runoff from the road surface and the upslope areas east of Calaveras Road west towards Alameda and San Antonio Creeks.

5.16.1.5 Surface Water Quality

Beneficial Uses

The *Water Quality Control Plan for the San Francisco Bay Region* (Basin Plan), prepared by the San Francisco Bay Regional Water Quality Control Board (RWQCB), designates beneficial uses of the surface water bodies in the project area. The beneficial uses provide the basis for determining appropriate water quality objectives for these water bodies. Beneficial uses and water quality objectives under the Basin Plan are discussed in detail in Section 5.16.2, Regulatory Framework. The designated beneficial uses of surface water bodies and groundwater in the Sunol Valley are shown in **Table 5.16-1**. The assigned beneficial uses of Alameda Creek include agricultural water supply; cold freshwater habitat; groundwater recharge; migratory habitat for fisheries; fish spawning; recreation; and preservation and enhancement of wildlife, fish, and other terrestrial and aquatic resources (RWQCB, 2010).

TABLE 5.16-1
DESIGNATED BENEFICIAL USES OF SURFACE WATER BODIES AND GROUNDWATER

Water Body	Designated Beneficial Uses
Alameda Creek	AGR, COLD, GWR, MIGR, REC-1, REC-2, SPWN, WARM, WILD
Arroyo de la Laguna	GWR, MIGR, SPWN, WILD, REC-1, REC-2, COLD (potential), WARM (potential)
Calaveras Reservoir	COLD, MUN, REC-1 (limited), REC-2, SPWN, WARM, WILD
San Antonio Reservoir	COLD, MUN, REC-1 (limited), REC-2, SPWN, WARM, WILD
Sunol Valley Groundwater Basin	MUN, PROC, IND, AGR
Alameda Creek Quarry Pits	GWR, COLD, WARM, REC-1, REC-2

Beneficial Uses Key:

MUN (Municipal and Domestic Supply); AGR (Agriculture); IND (Industrial Service Supply); REC-1 (Body Contact Recreation); REC-2 (Noncontact Recreation); WARM (Warm Freshwater Habitat); COLD (Cold Freshwater Habitat); MIGR (Fish Migration); SPWN (Fish Spawning); WILD (Wildlife Habitat); GWR (Groundwater Recharge); PROC (Industrial Process)

SOURCE: RWQCB, 2007.

Water Quality Vulnerability Zones

The SFPUC *Alameda Watershed Management Plan* (Alameda WMP) designates water quality vulnerability zones for lands within the CCSF-owned Alameda watershed. The Alameda WMP classifies water quality vulnerability zones as having high, moderate, and low water quality, and defines these zones as those areas where activities or disturbance have the greatest potential to affect the water quality primarily of local surface runoff and water supplies stored in local reservoirs. The project area is not within an assigned water quality vulnerability zone (SFPUC, 2001).

Water Quality Monitoring

This section summarizes available water quality information for surface water bodies in the project vicinity. The discussion focuses on surface water bodies that could be adversely affected by implementation of the proposed project or that could adversely affect the recovery of discharges under the proposed project, namely Alameda and San Antonio Creeks and Pits F3-East and F3-West.

Alameda Creek

Water quality in Alameda Creek is generally good and is protective of beneficial uses. The key water quality parameter for supporting aquatic wildlife is temperature, which is directly related to hydrologic flow conditions. **Table 5.16-2** summarizes average monthly water temperature data collected by the Alameda County Water District (ACWD) from 1997 through 2005 in Alameda Creek above Arroyo de la Laguna, approximately 2 miles downstream of the proposed project. Average monthly water temperatures exhibit a seasonal trend (i.e., cooler during the winter and warmer during the summer). Water temperatures in Alameda Creek have been shown to vary widely in Niles Canyon; average daily temperatures generally peak in late August in the 20 to 30 degrees Celsius (°C) range (68 to 86 °F), and daily temperature fluctuations range from 1 to 11 °C (34 to 52 °F) depending on geographic location and the degree of riparian shading (San Francisco Planning Department, 2006).

TABLE 5.16-2
AVERAGE MONTHLY WATER TEMPERATURES, ALAMEDA CREEK NEAR SUNOL (°C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1997	10	13	15	18	21	23	–	–	–	–	–	10
1998	11	11	14	16	16	18	23	26	22	15	13	11
1999	7	11	13	16	17	23	–	–	–	–	–	–
2000	13	13	15	16	22	25	22	21	–	18	13	11
2001	10	11	17	18	22	–	–	–	–	–	15	12
2002	12	12	13	17	18	21	19	22	21	21	15	10
2003	–	–	–	–	–	–	–	22	–	–	–	12
2004	13	12	15	16	18	20	19	–	–	–	–	–
2005	9	13	12	13	18	22	23	24	21	19	14	11
Average	11	12	14	16	19	22	21	23	21	18	14	11

SOURCE: San Francisco Planning Department, 2008.

Total dissolved solids (TDS) is a measure of the overall content of inorganic materials in solution (e.g., water). TDS is an indicator of nonpoint-source pollution problems associated with various land use practices. **Table 5.16-3** summarizes TDS monitoring data for the same location in Alameda Creek and time period as presented for temperature, above. Unlike temperature, TDS does not exhibit a seasonal trend. As shown in the table, TDS is well below the secondary maximum contaminant level for drinking water (established to protect aesthetic quality) of 500 milligrams per liter (mg/L). Average nitrate concentrations were 0.8 mg/L over the 1997–2005 period—well below the primary drinking water standard of 10 mg/L (San Francisco Planning Department, 2008).

TABLE 5.16-3
SUMMARY OF TDS DATA, ALAMEDA CREEK NEAR SUNOL, 1997–2005
(milligrams per liter)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1997	–	–	190	266	280	268	–	–	–	–	–	306
1998	233	148	180	195	235	260	279	284	283	309	233	381
1999	315	228	259	276	309	298	–	–	–	–	–	–
2000	361	286	209	305	304	315	319	320	–	331	359	367
2001	486	389	361	367	355	–	–	–	–	–	338	277
2002	186	258	273	278	278	278	291	260	323	334	368	332
2003	–	–	–	–	–	–	–	365	–	–	–	407
2004	315	299	366	307	322	343	348	–	–	–	–	–
2005	246	297	205	192	247	256	290	281	304	302	337	314
Average	305	272	255	273	291	288	305	302	303	319	327	341

SOURCE: San Francisco Planning Department, 2008.

San Antonio Creek

Due to the ephemeral nature of San Antonio Creek, creek-specific water quality information is not available. However, the lands draining to San Antonio Creek below Turner Dam consist of open space with sparse cattle grazing and gravel mining. Thus, the water quality of local runoff that drains to lower San Antonio Creek is expected to be characteristic of rangeland and quarry activities, and the runoff may have elevated sediment loads and nutrient concentrations.

Quarry Pits

Water quality sampling in Pits F3-East and F3-West has not been conducted. However, water quality in Pits F3-East and F3-West is expected to be similar to that of the discharges to Alameda Creek conducted by Hanson Aggregates. As described above in Section 5.16.1.3, although discharges may occur at any time, Hanson Aggregates typically discharges excess water stored in Pits F3-East and F3-West to Alameda Creek during wet years or following heavy precipitation events in winter months. As part of NPDES permit requirements, Hanson Aggregates reports water quality at the discharge point in Alameda Creek for turbidity, pH[3], chloride, suspended

[3] pH is a measure of the acidity or alkalinity of water. As a reference point, pure water is neutral, with a pH of 7. Measurements less than 7 are increasingly acidic and measurements more than 7 are increasingly alkaline.

solids, and TDS. Water quality data were collected at the discharge point during 2007 (except between October 4 and December 28, 2007, when no discharges occurred). Turbidity was monitored at approximately weekly intervals (40 samples collected prior to October 4, 2007), and was typically less than 5 Nephelometric Turbidity Units (NTUs)[4] for all except two samples, which were taken on September 26, 2007 (12.8 NTU) and October 3, 2007 (12.9 NTU), just before discharges ceased for the remainder of the year. Chloride levels ranged from 13 to 51 mg/L (the suggested secondary drinking water standard is 250 mg/L); TDS ranged from 250 to 420 mg/L (the secondary drinking water standard is 500 mg/L); and pH ranged from 7.6 to 8.4 (the secondary drinking water standard is 6.5 to 8.5). Generally, the turbidity greatly increased as the flow per period decreased, while the chloride levels and TDS more gradually increased as flow decreased.

5.16.1.6 Flood Hazards

Flooding hazards in the Sunol Valley are influenced by the SFPUC's operation of the Alameda Creek Diversion Dam and Tunnel, and Calaveras and San Antonio Reservoirs, as well as by floodplain modifications resulting from gravel mining operations and other development. The presence of multiple inactive channels in a relatively flat alluvial floodplain indicates this reach of Alameda Creek is dynamic and prone to lateral migration.

The Federal Emergency Management Agency (FEMA) delineates regional flooding hazards as part of the National Flood Insurance Program. The official FEMA Flood Insurance Rate Maps (FIRMs) for the Sunol Valley were most recently updated in August 2009. As delineated in the 2009 FIRMs and as shown in Figure 5.16-2, quarry Pit F3-West and the western boundary of Pit F6 are within the designated 100-year flood hazard zone of Alameda Creek, including the proposed Alameda Creek Pump Station and control building, electrical transformer, dewatering pipeline, and transfer pipeline (FEMA, 2009).

Water supply reservoirs in the Alameda Creek watershed present the remote risk of downstream inundation in the event of dam failure. Dam failure inundation maps prepared by the Association of Bay Area Governments (ABAG) indicate that the entire project area is within the dam failure inundation zone for Calaveras Dam, and northern portions of the project area are within the dam inundation zones for Turner and Del Valle Dams (ABAG, 2009). Although unlikely, dam failure could occur during a major earthquake or major flood event.

Calaveras Dam, located approximately 6 miles south of the proposed project, is near the seismically active Calaveras Fault Zone, and the DSOD determined this fault zone to be seismically vulnerable. Since 2001, the DSOD has limited the amount of water that can be stored in the reservoir to approximately 40 percent of its former full storage capacity until such time that the safety deficiencies are corrected (San Francisco Planning Department, 2008). In early 2011, the

[4] Measuring NTU is a standard method for quantifying the degree to which light traveling through a water column is scattered by suspended organic and inorganic particles. Particulate matter in a water sample will cause a light beam to be scattered in directions other than a straight line through the sample. The scattering of light increases with a greater suspended load. Turbidity is caused by suspended solids in water such as silt, clay, algae, organic matter, various microorganisms, colloidal material, and even large dissolved molecules.

SFPUC approved the Calaveras Dam Replacement project, which will replace the existing dam and restore the reservoir storage to its original design capacity. The SFPUC expects to complete construction of the Calaveras Dam Replacement project in 2014.

5.16.1.7 Groundwater

Hydrogeology

The project area is located in the Sunol Valley Groundwater Basin (Subbasin No. 2-11) (DWR, 2003). The designated beneficial uses of the Sunol Valley Groundwater Basin, as defined in the Basin Plan, are presented in Table 5.16-1. No groundwater production wells have been identified in the immediate vicinity of the project area.

The subsurface geologic materials in the Sunol Valley can be divided into two main groups, each with distinctly different aquifer characteristics: (1) the older geologic units, including the Briones Formation, consisting of compacted sedimentary rocks (generally non-water-bearing to low yielding), and (2) younger geologic units consisting of unconsolidated alluvial-fan and stream-channel deposits (generally water-bearing). The oldest of the younger units is the Livermore Gravels, which locally extends to depths of up to 500 feet below the central portion of the Sunol Valley. The Livermore Gravels consist of pebbly gravel beds that are interbedded with layers of fine-grained sand, silt, and weakly lithified mudstone. Only minor quantities of groundwater can be pumped from the Livermore Gravels, and the unit is considered to be non-water-bearing. The youngest of the younger units is a sequence of alluvial fan stream deposits. The shallow alluvial deposits average about 40 feet in thickness and represent the most significant aquifer in the Sunol Valley (URS, 2009a). Depth to groundwater in the shallow alluvium typically ranges from 20 to 30 feet below the ground surface (bgs) (Luhdorff and Scalmanini, 1993). Groundwater recharge to the shallow aquifer occurs primarily through the infiltration of surface water along Alameda Creek.

Groundwater / Surface Water Interaction

The underlying geology in the vicinity of the proposed discharge facility at Hanson Aggregates' quarry Pit F3-East consists of the Briones Formation, overlain by the Livermore Gravels and shallow alluvium, respectively. In some areas, significant alluvial deposits have been removed by gravel mining operations. The quarry pits in the SMP-24 and SMP-30 areas act as sumps and retain water from a combination of rainfall, runoff, and, most significantly, groundwater infiltration. Quarry operators currently dewater groundwater that seeps into active mining areas as needed to facilitate mining operations. Groundwater from dewatering activities is pumped to Pit F3-East for storage and subsequently used for quarry operations, including irrigation, dust control, and aggregate processing at Hanson Aggregates' processing mill located west of Alameda Creek, opposite the San Antonio Creek confluence. Information from Hanson Aggregates indicates a strong correlation between streamflow in Alameda Creek and the need to dewater quarry Pit F3-East and Pit F3-West. As flows in Alameda Creek increase during the wet season, and as local groundwater levels subsequently reach an elevation of approximately 50 feet bgs or higher, there is an increased need to pump to maintain a dewatered condition in the active mining areas. This information suggests that the uppermost alluvial deposits located between the ground surface and

50 feet bgs are more permeable than those located deeper than approximately 50 feet bgs. It also indicates that the upper layers of the shallow aquifer are hydraulically connected to Alameda Creek and create a highly permeable flow path capable of transmitting large quantities of water from Alameda Creek to Pits F3-East and F3-West (URS, 2009a).

Groundwater Quality

Based on water quality measurements collected from several monitoring wells, the pH of groundwater in the Sunol Valley generally ranges between 6.7 and 7.5 (Luhdorff and Scalmanini, 1993). As a comparison, the Basin Plan (RWQCB, 2010) has set pH objectives for surface waters at 6.5 to 8.5 (pH objectives for groundwater have not been established). Groundwater within the Sunol Valley area is calcium-magnesium bicarbonate water, with concentrations of individual constituents at generally low levels. Total dissolved solids are low (from about 350 to 500 mg/L), as are nitrate concentrations (from 1 to 6 mg/L), with the exception of some localized and elevated nitrate and total dissolved solids concentrations in shallow groundwater due to historical agricultural practices (Bookman-Edmonston, 1995).

In August 2009, the SFPUC analyzed water quality samples from two groundwater monitoring wells located on Alameda Creek just south of the San Antonio Creek confluence, and two samples from SMP-30 quarry Pit F4. Regulated volatile and synthetic organic chemicals were not detected in any of the four samples collected. Aluminum, arsenic, chromium, and nickel were detected at levels that were elevated but below the primary Maximum Contaminant Level (MCL). However, a number of secondary contaminants (i.e., color, iron, and manganese) were detected above their respective secondary MCLs. Radiological and microbiological contaminants (e.g., Giardia, coliform bacteria) were either not detected or measured at levels well below their MCLs (SFPUC, 2009a).

5.16.2 Regulatory Framework

5.16.2.1 Federal and State Regulations

Clean Water Act

The federal Clean Water Act, enacted by Congress in 1972 and amended several times since its inception, is the primary federal law regulating water quality in the U.S. and forms the basis for several state and local laws throughout the country. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The Clean Water Act gave the U.S. Environmental Protection Agency (U.S. EPA) the authority to implement federal pollution control programs such as setting water quality standards for contaminants in surface water, establishing wastewater and effluent discharge limits for various industry categories, and imposing requirements for controlling nonpoint-source pollution. At the federal level, the Clean Water Act is administered by the U.S. EPA. and U.S. Army Corps of Engineers (Corps). At the state and regional levels, the act is administered and enforced by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs).

Section 303(d) List of Impaired Water Bodies and Total Maximum Daily Loads

In accordance with Section 303(d) of the Clean Water Act, state governments must present the U.S. EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology.

Placement of a water body on the Section 303(d) List of Impaired Water Bodies acts as the trigger for developing a Total Maximum Daily Load (TMDL) pollution control plan for each water body and associated pollutant/stressor on the list. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. The TMDL serves as the means to attain and maintain water quality standards for the impaired water body to support designated and potential beneficial uses identified in the Basin Plan. During each Section 303(d) listing cycle, the water bodies on the list are prioritized, and a schedule is established for completing the TMDLs. The Section 303(d) List designates Alameda Creek and all other Bay Area urban creeks as impaired by diazinon. Diazinon is an insecticide that has been used on lawns, gardens, agricultural crops, and livestock. The SWRCB approved the TMDL for diazinon in 2007 (SWRCB, 2010). No other surface waters in the Sunol Valley are listed as impaired in the Section 303(d) List.

Clean Water Act Section 401 Water Quality Certification

Under Section 401 of the Clean Water Act, the RWQCB has regulatory authority over actions in waters of the United States and/or the state through the issuance of water quality certifications, which are issued in conjunction with any federal permit (e.g., permits issued by the Corps under Section 404 of the Clean Water Act, described below). Section 401 of the Clean Water Act provides the SWRCB and the RWQCBs with the regulatory authority to waive, certify, or deny any proposed activity that could result in a discharge to surface waters of the state. To waive or certify an activity, these agencies must find that the proposed discharge would comply with state water quality standards, including those protecting beneficial uses and water quality. If these agencies deny the proposed activity, the federal permit cannot be issued. This water quality certification is generally required for projects involving the discharge of dredged or fill material to wetlands or other water bodies.

Section 404 – Discharges of Dredged or Fill Material

The discharge of dredged or fill material into waters of the United States, including wetlands, is subject to permitting specified under Clean Water Act Title IV (Permits and Licenses) and specifically under Section 404 of the act (Discharges of Dredged or Fill Material). A 404 permit would be required for the placement of fill in waters of the U.S., including wetlands. Following the U.S. Supreme Court's decision in *Rapanos v. United States*, the U.S. EPA determined that jurisdiction over waters of the United States under the Clean Water Act applies to wetlands adjacent to traditional navigable waters or where a significant nexus exists between a wetland and a traditionally navigable water that can significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters (U.S. EPA, 2008). As codified under Title 40 of the Code of Federal Regulations (CFR), Part 230.3(s), waters of the United States are defined as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

   (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

   (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

   (iii) Which are used or could be used for industrial purposes by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under this definition;

5. Tributaries of waters identified in numbers 1 through 4, above;

6. The territorial sea; and

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in numbers 1 through 6, above. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States (U.S. EPA, 2011).

NPDES Waste Discharge Regulations

In 1987, amendments to the Clean Water Act added Section 402, which established a framework to protect water quality by regulating industrial, municipal, and construction-related sources of pollutant discharges to waters of the United States. In California, the NPDES program is administered by the SWRCB through the RWQCBs and requires that municipalities obtain permits that outline programs and activities to control wastewater and stormwater pollution.

The NPDES program provides two levels of control for the protection of water quality: technology-based limits and water-quality-based limits. Technology-based limits are based on the ability of dischargers to treat the water, while water-quality-based limits are required if technology-based limits are not sufficient to protect the water body. The water-quality-based effluent limitations required to meet water quality criteria in the receiving water are based on the National Toxics Rule, the California Toxics Rule, and the Basin Plan. NPDES permits must also incorporate TMDL waste load allocations when they are developed.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is the primary statute covering the quality of waters in California. Under the act, the SWRCB has the ultimate authority over state water rights and water quality policy. The nine RWQCBs regulate water quality under the Porter-Cologne Water Quality Control Act through the regulatory standards and objectives set forth in Water Quality Control Plans (also referred to as Basin Plans) prepared for each region.

Regional Water Quality Control Plan

Each RWQCB is required to develop, adopt, and implement a Basin Plan for its respective region. The Basin Plan, prepared by the San Francisco Bay RWQCB, identifies the beneficial uses of surface waters within its region and specifies water quality objectives to maintain the continued beneficial uses of these waters. The RWQCB is responsible for protecting the beneficial uses of San Francisco Bay Area water resources, including water bodies in the Peninsula and San Francisco regions. The Basin Plan was last revised on December 31, 2010 (RWQCB, 2010). Table 5.16-1 lists the assigned beneficial uses for water bodies in the vicinity of the proposed project. In general, the assigned beneficial uses of a surface water body also apply to its tributaries. Water quality objectives to protect designated beneficial uses are shown below in **Table 5.16-4**.

TABLE 5.16-4
WATER QUALITY OBJECTIVES TO PROTECT DESIGNATED BENEFICIAL USES

Water Quality Constituent	Water Quality Objective
Dissolved Oxygen	COLD[a] – minimum of 7.0 mg/L; WARM[b] – minimum of 5.0 mg/L.
pH	Between 6.5 and 8.5.
Temperature	The temperature of any water body designated as COLD[a] or WARM[b] shall not be increased by more than 5 degrees Fahrenheit (2.8 °C).
Turbidity	Increases in turbidity related to waste discharge shall not be greater than 10 percent.[c]

[a] WARM = Warm Freshwater Habitat.
[b] COLD = Cold Freshwater Habitat.
[c] Turbidity is measured in Nephelometric Turbidity Units (NTUs).

SOURCE: RWQCB, 2007.

NPDES Construction General Permit

The federal Clean Water Act prohibits discharges of stormwater from construction projects unless the discharge is in compliance with an NPDES permit. The SWRCB, the permitting authority in California, adopted an NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (construction general permit), (Order No. 2009-0009, as amended by Order No. 2010-0014). Order No. 2009-0009 became effective on July 1, 2010 and was amended on February 14, 2011. The Order applies to construction sites that include 1 or more acre of soil disturbance. Construction activities include clearing, grading, grubbing, excavation, stockpiling, and reconstruction of existing facilities involving removal or replacement.

The construction general permit requires that the landowner and/or contractor file permit registration documents prior to commencing construction, and then pay an annual fee. These documents include a notice of intent, risk assessment, site map, stormwater pollution prevention plan (SWPPP), and signed certification statement. The permit specifies a risk-based permitting approach that includes requirements specific to three overall levels of risk, which are determined based on the potential for the project to cause sedimentation as well as the sensitivity of the receiving water to sedimentation. The three risk levels are used to determine specific numeric action levels and effluent limitations for pH and turbidity, and the requirements for a rain event action plan, best management practice (BMP) implementation, monitoring, and reporting.

The SWPPP must include measures to ensure that: all pollutants and their sources are controlled; non-stormwater discharges are identified and eliminated, controlled, or treated; site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges; and BMPs installed to reduce or eliminate pollutants after construction are completed and maintained. The SWPPP must demonstrate that calculations and design details as well as BMP controls for site runoff are complete and correct. Non-stormwater discharges include those from improper dumping, accidental spills, and leakage from storage tanks or transfer areas. The construction general permit specifies minimum BMP requirements for stormwater control based on the risk level of the site. Post-construction stormwater runoff reduction requirements must be implemented at project sites not covered by a Phase I or Phase II municipal stormwater permit. The post-construction stormwater standards address water quality, runoff reduction, drainage density, and channel protection requirements for the receiving water. Alameda County, including the SABPL project area, is covered under a Phase I municipal stormwater permit. Thus, the SABPL project is not subject to the post-construction stormwater standards specified in the construction general permit.

The construction general permit stipulates that effluent and receiving water monitoring must demonstrate compliance with permit requirements, and that project proponents must take corrective action if these limitations are exceeded. The results of the monitoring and corrective actions must be reported annually to the SWRCB. The construction general permit specifies minimum qualifications for a qualified SWPPP developer and qualified SWPPP practitioner (SWRCB, 2010).

Waste Discharge Requirements for the SFPUC Drinking Water Transmission System

RWQCB Order No. R2-2008-0102 (Order) regulates discharges of altered water from the SFPUC Drinking Water Transmission System (RWQCB, 2008b). The Order regulates planned discharges resulting from routine operations and maintenance that can be scheduled in advance, as well as unplanned and emergency discharges resulting from system failures or natural disasters. Planned discharges include draining pipelines and tunnels to allow for inspection, repair, and/or replacement; and flushing disinfection water from the system after bringing pipelines back online. The SWRCB issued the Order—pursuant to Section 402 of the Clean Water Act, and

Chapter 5.5, Division 7 of the California Water Code (commencing with Section 13370)—to serve as an NPDES permit for point-source discharges from the SFPUC regional water system to surface waters of the United States or of the state. The Order also serves as Waste Discharge Requirements pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with Section 13260). The Order does not apply to discharges to quarry pits that are part of active mining operations, including Pits F3-East and F3-West, as such quarry pits are not classified as waters of the United States or waters of the state.

For planned and emergency discharges of treated water from the regional water system to waters of the United States or waters of the state, including discharges to San Antonio Creek and San Antonio Reservoir, the Order mandates that the treated water be dechlorinated and pH-adjusted prior to discharge. In addition, flow rates of planned discharges are controlled (generally less than or equal to 3,500 gallons per minute) using BMPs to limit potential erosion in receiving waters. The Order contains: (1) specific effluent limitations for discharges to creek and estuarine waters; (2) erosion control BMPs and Standard Operating Procedures that include discharge limits and measures to reduce stream scour; (3) receiving water limitations that are based on water quality objectives contained in the Basin Plan; and (4) compliance procedures that include a monitoring and reporting program and an annual compliance evaluation. In accordance with the Order, the SFPUC is required to monitor and report all discharges to creeks providing habitat for salmonids, regardless of flow rate. **Appendix L** provides additional detail on the requirements of the Order. As discussed in Chapter 3, Project Description, although discharges from the backup pipeline to quarry Pits F3-East and F3-West are not subject to this Order (the quarry pits are part of active mining operations and are not considered waters of the United States or waters of the state), the SFPUC proposes as part of the SABPL project to dechlorinate and pH-adjust all treated water that is diverted from the Hetch Hetchy system to the quarry pits prior to discharge. Further, RWQCB Order No. R2-2008-0102 would be amended or a new discharge permit would be issued to regulate discharges of water from Pit F3-East to San Antonio Reservoir.

NPDES General Permit for Aggregate Mining, Sand Washing, and Sand Offloading

Discharges from the SMP-24 commercial quarry operations are regulated under San Francisco Bay RWQCB Order No. R2-2008-0011, NPDES General Permit No. CAG982001 (Aggregate Mining, Sand Washing, and Sand Offloading). This general permit covers discharges from treatment facilities such as settling ponds, sand and gravel filter systems, stormwater runoff from the aggregate mining and sand washing facilities commingled with other wastewater from the facilities, water used for sand screening and washing, and flows returned during hydraulic sand dredging and reclamation for commercial purposes (RWQCB, 2008a). These requirements apply when Hanson Aggregates discharges water to Alameda Creek or other waters of the United States or waters of the state. Pits F3-East and F3-West are part of active mining operations and currently function as settling ponds and water storage reservoirs for aggregate processing water. Discharges of dewatering effluent into the quarry pits are not subject to the requirements of this general permit because the pits are not considered waters of the United States or waters of the state.

NPDES General Permit for Discharges with Low Threat to Water Quality

Discharges from the flow meter vault, chemical injection station, and sampling station to the adjacent ground surface would be conducted in accordance with and regulated under the statewide general Waste Discharge Requirements (WDRs) for discharges to land with a low threat to water quality (General WDRs; Order No. 2003-003-DWQ). Section 13260(a) of the California Water Code requires that any person discharging waste or proposing to discharge waste within any region (other than to a community sewer system) file a Report of Waste Discharge if the discharge could affect the quality of the waters of the state. The discharges to land with a low threat to water quality are low-volume discharges with minimal pollutant concentrations. These discharges are regulated under General WDRs. These General WDRs require dischargers to comply with all applicable Basin Plan provisions, including any prohibitions and water quality objectives governing the discharge (SWRCB, 2003).

5.16.2.2 Local and Regional Regulations

SFPUC Alameda Watershed Management Plan

The SFPUC adopted the Alameda WMP (SFPUC, 2001) to provide a policy framework for the SFPUC to make decisions about activities that are appropriate on Alameda watershed lands. The plan considers water quality protection as the first and foremost goal for its watershed lands, and the goals and policies of the plan are organized around the primary goal of water quality protection. As described in Chapter 4, Plans and Policies, the SFPUC reviews all plans, projects, and activities that occur within the Alameda watershed—including the SABPL project—for conformity with the management plan as well as for compliance with environmental codes and regulations.

San Francisco Floodplain Management Program

The CCSF's Floodplain Management Ordinance (San Francisco Administrative Code, Chapter 2, Article XX) requires new or substantially improved structures in flood hazard areas be protected against flood damage, and prohibits uses that would increase flood risks. The ordinance requires that all construction on CCSF-owned property located outside the boundaries of San Francisco, and in areas designated by FEMA as flood-prone, be consistent with the requirements of the ordinance and applicable federal and state floodplain management regulations. The ordinance clarifies that CCSF-owned extraterritorial lands are not subject to the floodplain ordinance requirements of other local jurisdictions (CCSF, 2010).

Alameda Countywide Clean Water Program

The Alameda Countywide Clean Water Program is a consortium of Alameda County agencies that have Phase I municipal stormwater systems that discharge stormwater to San Francisco Bay. Consistent with Section 402(p) of the federal Clean Water Act, stormwater discharges are conducted in accordance with San Francisco Bay RWQCB Order No. R2-2008-0011, NPDES General Permit No. CAS612008 (San Francisco Bay Region Municipal Regional Stormwater NPDES Permit). The Alameda County agencies prepared a stormwater quality management plan that describes the Alameda Countywide Clean Water Program's approach to reducing stormwater pollution. The program maintains compliance with RWQCB requirements by ensuring that new development and redevelopment projects mitigate, to the maximum extent practicable, water quality impacts related to stormwater runoff both during construction and operational periods of projects, including:

- *Numeric Sizing Criteria for Pollutant Removal Treatment Systems*. A development project creating more than 10,000 square feet of new impervious cover must include source controls, site design measures, and treatment controls to minimize stormwater pollutant discharges. Pollution treatment controls shall be sized to treat the volume of annual runoff required to achieve 80 percent or more capture of average annual runoff (in the Bay Area, this is equivalent to having the capacity to treat storm events of about 1 inch of precipitation). Since the proposed SABPL project would create less than 10,000 square feet of new impervious cover, the numeric sizing criterion does not apply.

- *Limitation on Increase of Peak Stormwater Runoff Discharge Rates*. Hydromodification is a general term that encompasses the effects of projects on the natural hydrologic, geochemical, and physical functions of streams and wetlands that maintain or enhance water quality. Urbanization creates impervious surfaces that reduce the landscape's natural ability to absorb water and release it slowly to creeks. These impervious surfaces increase peak flows in creeks and can cause erosion and other hydromodification impacts. Projects that create more than 1 acre of new impervious cover must evaluate the potential for these types of effects and provide mitigation, as necessary. Since the proposed SABPL project would create less than 1 acre of new impervious cover, requirements related to hydromodification effects do not apply.

Zone 7 Water Agency Groundwater Protection Ordinance

Zone 7 Water Agency (Zone 7) maintains jurisdiction over activities that involve drilling new wells, conducting soil borings, and destroying existing wells in the Sunol Valley, including the project area. Zone 7's Groundwater Protection Ordinance requires that Zone 7 authorize any planned new well, soil boring, or well destruction before the work is started (Zone 7, 2011). Since the SABPL project does not propose a new well, soil boring, or well destruction, this ordinance is not relevant to the proposed project.

5.16.3 Impacts and Mitigation Measures

5.16.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to hydrology and water quality, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Violate any water quality standards or waste discharge requirements;

- 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 preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off the site;
- 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 the site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or FIRM or other authoritative flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

5.16.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the following significance criteria for the reasons described below:

- *Place Housing within a 100-year Flood Hazard Zone*. The proposed project does not include the construction of new housing or structures for human occupancy. Therefore, the significance criterion related to the placement of housing within a 100-year flood hazard zone is not applicable to the proposed project and is not discussed further.
- *Expose People or Structures to Inundation by Seiche, Tsunami, or Mudflow*. The proposed improvements would be located too far inland to be at risk for tsunami hazards. The proposed project would have no effect on the frequency or probability of seiches (i.e., earthquake-induced oscillating waves in an enclosed water body) in the quarry pits because the project would not create new enclosed water bodies or affect the frequency of earthquakes. Further, as the proposed project would not include the construction of habitable structures, there would be no impacts related to property loss, injury, or death from a seiche in Pit F3-East or Pit F3-West. The relatively flat topography of the project area would not be susceptible to mudflows. Therefore, the significance criterion related to inundation by seiche, tsunami, or mudflow is not applicable to the proposed project and is not discussed further.

- *Interfere Substantially with Groundwater Recharge*. The proposed improvements would result in a total of approximately 7,750 square feet of new impervious surfaces. This additional impervious area would be negligible when compared to the overall recharge area of the Sunol Valley Groundwater Basin and would not constitute a significant impediment to groundwater recharge. Thus, the significance criterion related to interference with groundwater recharge is not applicable to the proposed project and is not discussed further.

This analysis evaluates the proposed project's potential effects on hydrology and water quality during project construction and operations. Construction-related effects on hydrology and water quality relate strictly to direct and indirect impacts that could occur during construction activities, including site preparation and clearing, excavation and demolition, dewatering, construction of improvements, and demobilization and site restoration. Operational impacts involve long-term effects related to facility siting, future operations, and maintenance activities.

5.16.3.3 Summary of Impacts

Table 5.16-5 summarizes the proposed project's hydrology and water quality impacts and significance determinations.

TABLE 5.16-5
SUMMARY OF IMPACTS – HYDROLOGY AND WATER QUALITY

Impacts	Significance Determinations
Impact HY-1: Project construction could substantially degrade water quality as a result of erosion and sedimentation or an accidental release of hazardous chemicals.	LSM
Impact HY-2: Dewatering of excavated areas during project construction would not substantially deplete groundwater supplies.	LS
Impact HY-3: Discharges of dewatering effluent from excavated areas during project construction could substantially degrade water quality.	LSM
Impact HY-4: Discharges of treated water from existing and newly installed pipelines during project construction would not substantially degrade water quality.	LS
Impact HY-5: The placement of project facilities within a 100-year flood hazard zone would not substantially impede or redirect flood flows or result in damage to SFPUC facilities or private property.	LS
Impact HY-6: Project implementation would not expose people or structures to a significant risk of property loss, injury, or death involving flooding as a result of dam failure.	LS
Impact HY-7: Project implementation would not alter drainage patterns such that there would be a substantial increase in erosion, siltation, or the rate or amount of surface runoff.	LS
Impact HY-8: Future discharges from the backup pipeline would not substantially degrade water quality or exceed the capacity of Pit F3-East.	LS
Impact C-HY: Project construction could result in a cumulatively considerable contribution to cumulative impacts on hydrology and water quality.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.16.3.4 Construction Impacts and Mitigation Measures

Impact HY-1: Project construction could substantially degrade water quality as a result of erosion and sedimentation or an accidental release of hazardous chemicals. (Less than Significant with Mitigation)

Earthmoving activities associated with project construction would include vegetation removal, grading, excavation, soil stockpiling, and backfilling. Prior to construction mobilization, the contractor would prepare construction work areas and staging areas by removing vegetation and debris, and grading these areas to provide a relatively level surface for the movement of construction equipment. Approximately 25.6 acres of ground surface would be disturbed to establish staging areas (i.e., A, B, C, and D, and the work platform for the cutoff wall) and roughly 50 acres would be disturbed in the construction work areas, although ground disturbance could occur in any part of the 132-acre project area due to the movement of construction vehicles and equipment.

New pipelines, including the backup pipeline, transfer pipeline, dewatering pipeline, and 12-inch-diameter water pipeline to the town of Sunol, would be installed using open-trench construction methods. Open excavations would also be required for construction of the new chemical facility and the wet well at the Alameda Creek Pump Station. Grading and earthwork would be required for parking areas, access road improvements, and the retaining wall along the southern perimeter of the Alameda Creek Pump Station site. Eroded and stockpiled soil generated during these earthmoving activities could migrate outside of the construction work areas and degrade water quality in Alameda and San Antonio Creeks.

As discussed above, construction workers would install the backup pipeline beneath the San Antonio Creek channel using open-trench techniques. Open-trench construction could destabilize the creek bottom, increasing the potential for erosion of the creek channel. Open-trench construction could also alter the geometry of the creek channel, resulting in increased channel erosion and possible undercutting of the adjacent creek banks.

The proposed discharge facility at Pit F3-East would require the installation of a baffled outfall and reinforced-concrete splash pad on a slope of approximately 70 percent on the quarry pit wall. Approximately 11,000 cubic yards of soil would be excavated from the quarry pit wall to reduce the slope to approximately 67 percent (URS, 2010). The stockpiling and movement of the 11,000 cubic yards of soil excavated from the quarry pit wall could result in sedimentation of downstream water bodies, including Alameda and San Antonio Creeks, and adversely affect water quality. Although the slope of the quarry pit wall is considered stable under static conditions (URS, 2009b), earthwork and excavation of the quarry pit wall during construction could result in slope instability and erosion. Loose soil and slope material generated during installation of the outfall and splash pad would fall into the quarry pit and settle to the bottom of the pit. The use of Pit F3-East as a settling pond is consistent with existing mining operations and would not adversely affect water quality in Alameda or San Antonio Creeks, or any other waters classified as waters of the United States or waters of the state.[5]

5 Quarry pits F3-East and F3-West are not classified as waters of the United States or of the state because they are part of active mining activities.

Installation of the cutoff wall along the outer perimeter of Pits F3-East and F3-West would require excavation of an approximately 5,000-foot-long and 80-foot-deep trench. Trench excavation, bentonite-cement slurry mixing, and slurry pumping operations associated with the cutoff wall would be performed from an approximately 125-foot-wide temporary work platform around the cutoff wall alignment. Although earthen containment dikes would be constructed along the work platform to prevent the slurry generated during slurry mixing from flowing outside of the project work area, uncontained slurry and eroded materials could migrate offsite and degrade water quality in Alameda and San Antonio Creeks.

Construction activities could also result in the accidental release of hazardous construction chemicals such as adhesives, solvents, fuels, and drilling and petroleum lubricants that, if not managed appropriately, could adhere to soil particles, become mobilized by rain or runoff, and degrade water quality. Hazardous construction chemicals could also infiltrate into groundwater, potentially degrading groundwater quality.

Impact Conclusion

As stated in Chapter 3, Section 3.6, Project Construction, construction activities would generate an estimated total of 118,250 cubic yards of excess soil and rock material. Exposed soil from stockpiles, excavated areas, and other areas where ground cover has been removed could be transported by wind or water and, if not properly managed, could increase sediment loads in receiving water bodies. Installation of the backup pipeline across San Antonio Creek could destabilize the creek channel and increase channel erosion. Slurry and eroded materials generated during cutoff wall construction could migrate out of the work platform and into Alameda and San Antonio Creeks, increasing sediment loads in these creeks. Increased erosion and sediment loads in receiving waters and suspended sediment levels (turbidity) could adversely affect water quality and the designated beneficial uses of surface waters and groundwater, a potentially significant impact. Potentially significant water quality impacts could also result from accidental releases of hazardous construction chemicals into surface waters or groundwater. However, these impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures M-HY-1a and M-HY-1b described below.

Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.

Consistent with the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction Activity, the SFPUC or its contractor(s) shall submit a notice of intent to the SWRCB's Division of Water Quality, develop a SWPPP, and implement site-specific BMPs to prevent discharges of nonpoint-source pollutants in construction-related stormwater runoff into downstream water bodies, including Alameda and San Antonio Creeks. The San Francisco Bay RWQCB, the primary agency responsible for protecting water quality in the project area, would review the SWPPP to ensure compliance with the general permit.

The BMPs contained in the SWPPP are also subject to review and approval by the RWQCB. The recommended BMPs are listed below. However, the measures themselves may be altered, supplemented, or deleted during the review process, since the RWQCB has final authority over the terms of the SWPPP.

Scheduling

- Schedule construction to minimize ground disturbance during the rainy season.
- Stabilize all disturbed soils as soon as possible following the completion of soil-disturbing work in the project area.
- Provide plans to stabilize soil with vegetation or physical means in the event rainfall is expected.
- Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities.

Erosion and Sedimentation

- Preserve existing vegetation in areas where no construction activity is planned or where construction activity will occur at a later date.
- Stabilize and revegetate disturbed areas as soon as possible after construction by planting or seeding and/or using mulch (e.g., straw or hay, erosion control blankets, hydromulch, or other similar material) except in actively cultivated areas.
- Install silt fences or fiber rolls or implement other suitable measures around the perimeters of the construction zone, staging areas, temporary stockpiles, spoil areas, stream channels, and swales, as well as down-slope of all exposed soil areas and in other locations determined necessary to prevent offsite sedimentation.
- Install temporary slope breakers during the rainy season on slopes greater than 5 percent where the base of the slope is less than 50 feet from a water body, wetland, or road crossing at spacing intervals required by the RWQCB.
- Use filter fabric or other appropriate measures to prevent sediment from entering storm drain inlets.
- Detain and treat water produced by construction site dewatering using sedimentation basins, sediment traps (when water is flowing and there is sediment), or other measures to ensure that discharges to receiving waters meet applicable water quality objectives.

Tracking Controls

- Grade and stabilize construction site entrances and exits to prevent runoff from the site and to prevent erosion.
- Install a track-out control device (e.g., gravel pad, grizzlie, wash facility, etc.) at site access points to allow for carry-out and track-out prevention when vehicles exit the site. This provision may be omitted if the RWQCB determines that vacuum sweepers, as required by Mitigation Measure M-AQ-1a (BAAQMD Basic Construction Measures), are sufficient to prevent trucks from tracking dirt.
- Remove any soil or sediment tracked off paved roads during construction by employing street sweeping.

Instream Construction BMPs

- Minimize disturbance of the ground surface and substrate within San Antonio Creek during installation of the backup pipeline.
- Limit the use of construction vehicles in the San Antonio Creek channel not actively involved in construction across the creek.
- Monitor instream construction activity and coordinate with the contractor to identify periods when localized increases in turbidity may occur.
- Prevent raw cement, concrete or concrete washings, asphalt, paint or other coatings, oil or other petroleum products, or any other substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses.
- Any physical barriers within San Antonio Creek that are needed to isolate the construction area for dewatering purposes or for erosion and sediment control shall be installed under the direction of a qualified biologist to minimize stress, injury, and mortality to wildlife.
- Keep visible oil, grease, or foam from forming on soil or water surfaces.
- In the event that construction activities create a visible plume in surface waters, initiate monitoring of turbidity concentrations at the discharge site and 50 feet downstream while the visible plume persists, and initiate corrective action to reduce construction-related turbidity so that it complies with turbidity criteria specified in the Basin Plan for the "coldwater fish habitat" beneficial use, as measured in surface waters 50 feet downstream of the working area. Implement corrective actions as needed to ensure construction activities are within the Basin Plan's surface water quality objective for turbidity, which states that turbidity increases shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU. Corrective actions would depend on the cause of the sediment discharge and could include installing additional silt fences and other erosion control devices, covering stockpiled material, and improving the system for treating water from the dewatering operation.
- Avoid operation of construction vehicles and equipment in flowing water.

Non-stormwater Control

- Keep construction vehicles and equipment clean; do not allow excessive buildup of oil and grease.
- Check construction vehicles and equipment daily at startup for leaks, and repair any leaks immediately.
- Do not refuel vehicles and equipment within 100 feet of surface waters to prevent run-on and runoff and to contain spills.
- Conduct all refueling and servicing of equipment with absorbent material or drip pans underneath to contain spilled fuel. Collect any fluid drained from machinery during servicing in leak-proof containers and deliver to an appropriate disposal or recycling facility.
- Contain fueling areas to prevent run-on and runoff and to contain spills.
- Cover all storm drain inlets when paving or applying seals or similar materials to prevent the offsite discharge of these materials.

Waste Management and Hazardous Materials Pollution Control

- Remove trash and construction debris from the project area regularly. Provide an adequate number of waste containers with lids or covers to keep rain out of the containers and to prevent trash and debris from being blown away during high winds.
- Locate sanitary facilities a minimum of 200 feet from Alameda and San Antonio Creeks.
- Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the stormwater drainage system or receiving water.
- Maintain sanitary facilities regularly.
- Store all hazardous materials in an area protected from rainfall and stormwater run-on and prevent the offsite discharge of leaks or spills.
- Minimize the potential for contamination of surface water bodies, including Pits F3-East and F3-West, and Alameda and San Antonio Creeks, by maintaining spill containment and cleanup equipment onsite, and by properly labeling and disposing of hazardous wastes.
- Locate waste collection areas close to construction entrances and away from roadways, Alameda and San Antonio Creeks, and Pits F3-East and F3-West.
- Inspect dumpsters and other waste and debris containers regularly for leaks, and remove and properly dispose of any hazardous materials and liquid wastes placed in these containers.
- Train construction personnel in proper material delivery, handling, storage, cleanup, and disposal procedures.

BMP Inspection, Maintenance, and Repair

- Inspect all BMPs on a regular basis to confirm proper installation and function.
- Inspect all stormwater BMPs daily during storms.
- Inspect sediment basins, sediment traps, and other detention and treatment facilities regularly throughout the construction period.
- Provide sufficient devices and materials (e.g., silt fence, fiber rolls, erosion blankets, etc.) throughout project construction to enable immediate repair or replacement of failed BMPs.
- Inspect all seeded areas regularly for failures, and remediate or repair as soon as feasible.

Permitting, Monitoring, and Reporting

- Obtain and comply with the RWQCB Section 401 Water Quality Certification and California Department of Fish and Game Streambed Alteration Agreement.
- Provide the required documentation for SWPPP inspections, maintenance, and repair requirements.
- Maintain written records of inspections, spills, BMP-related maintenance activities, corrective actions, and visual observations of any offsite discharge of sediment or other pollutants, as required by the RWQCB.

- Monitor water quality to assess the effectiveness of control measures.
- Notify the RWQCB and other agencies as required (e.g., California Department of Fish and Game) if the criteria for turbidity, oil/grease, or foam are exceeded, and undertake corrective actions.
- Immediately notify the RWQCB and other agencies as required (e.g., California Department of Fish and Game) of any spill of petroleum products or other organic or earthen materials, and undertake corrective action.

Post-construction BMPs

- Revegetate all temporarily disturbed areas as required after construction activities are completed.
- Remove any remaining construction debris and trash from the project area and staging areas upon project completion.
- Phase the removal of temporary BMPs as necessary to ensure stabilization of the site.
- Maintain post-construction site conditions to avoid any unintended drainage channels, erosion, or areas of sedimentation.
- Correct post-construction site conditions as necessary to comply with the SWPPP and any other pertinent RWQCB requirements.

Mitigation Measure M-HY-1b: Creek Restoration and Revegetation.

Following installation of the backup pipeline at the San Antonio Creek crossing, the SFPUC shall revegetate the disturbed creek banks with native vegetation and restore the geometry of the disturbed creek channel to preexisting conditions. Plantings shall be monitored and maintained for up to two years to ensure stabilization of the creek channel. This mitigation measure shall be implemented in conjunction with Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation) (see Impact BI-1 in Section 5.14, Biological Resources).

Mitigation Measure M-HY-1a would address water quality impacts during project construction activities by requiring the SFPUC or its contractor to prepare a SWPPP detailing the construction BMPs that would be implemented during construction to control erosion and sedimentation of receiving water bodies and minimize the risk of hazardous materials releases to surface water bodies. Mitigation Measure M-HY-1b would serve to protect water quality after construction by requiring the construction contractor to revegetate the disturbed creek banks and restore the geometry of the disturbed creek channel to pre-construction conditions. Therefore, this impact would be less than significant with mitigation.

Impact HY-2: Dewatering of excavated areas during project construction would not substantially deplete groundwater supplies. (Less than Significant)

Dewatering of excavated areas would be necessary to create a dry work area only if groundwater or surface water is encountered. Groundwater is likely to be encountered near San Antonio Creek during installation of the backup pipeline and construction of the discharge valve vault, and in areas where deeper excavation is needed such as at the Alameda Creek Pump Station site during wet well construction. In addition, it would be necessary to lower water levels in Pit F3-East during construction of the baffled outfall and reinforced-concrete splash pad in the quarry pit wall. Groundwater would be encountered near Pits F3-East and F3-West during construction of the cutoff wall and could require substantial dewatering. Dewatering effluent from excavated areas would be discharged to vegetated upland areas, San Antonio Creek, or Alameda Creek in accordance with regulatory requirements.

Dewatering of groundwater during project construction activities (discussed in Chapter 3, Section 3.6.7.1) could temporarily lower groundwater levels in the vicinity of the proposed facilities. However, as discussed in Section 5.16.1.7, no groundwater production wells have been identified in the immediate vicinity of the project area. The majority of groundwater removed by dewatering would be returned to the subsurface to recharge the shallow aquifer. Furthermore, any effects related to lowering the shallow groundwater table would be temporary in nature, as dewatering would be required only during certain phases of construction, and only if groundwater is encountered. Thus, potential impacts related to the depletion of groundwater resources would be less than significant.

Impact HY-3: Discharges of dewatering effluent from excavated areas during project construction could substantially degrade water quality. (Less than Significant with Mitigation)

As described above under Impact HY-2 and in Chapter 3, Section 3.6.7.1, construction dewatering would be required to create a dry work area if surface water or groundwater is encountered in excavations. Dewatering effluent from excavated areas would be treated, as necessary, and discharged to a containment facility to allow sediment to settle out prior to discharging the effluent to vegetated upland areas, San Antonio Creek, or Alameda Creek. Depending on the site-specific conditions and construction methods, high levels of suspended sediment and/or trace amounts of construction-related chemicals (e.g., fuels, lubricants, cement products) could be present in the dewatering effluent. The discharge of polluted dewatering effluent to creeks could degrade water quality and violate water quality standards. Depending on the rate of discharge, the discharged effluent could also cause erosion in the receiving water body. Potential water quality impacts from construction-related dewatering discharges would be potentially significant. However, with implementation of Mitigation Measure M-HY-3 described below, potential water quality impacts associated with the discharge of dewatering effluent from excavated areas would be reduced to a less-than-significant level.

M**itigation Measure M-HY-3: Management of Dewatering Effluent Discharges.**

To address potential impacts on the water quality of receiving water bodies during the construction period related to dewatering effluent discharges and to comply with NPDES requirements, the construction contractor(s) shall prepare and implement a project-specific dewatering plan. Discharges of dewatering effluent during project construction shall be conducted in accordance with NPDES construction general permit requirements.

Construction Dewatering Plan

The dewatering plan shall specify how the water will be collected, contained, treated, monitored, and discharged to vegetated areas, Alameda Creek, and San Antonio Creek. Subject to review and approval by the RWQCB, the plan shall at a minimum:

- Identify methods and locations for collecting and handling water onsite prior to discharge, determine treatment requirements, and determine the capacity of settling basins, treatment ponds, and/or holding tanks.
- Identify methods for treating water onsite prior to discharge, such as filtration, coagulation, sedimentation settlement areas, oil skimmers, pH adjustment, and other BMPs.
- Establish procedures and methods for maintaining and monitoring dewatering operations to ensure that no breach in the process occurs that could result in an exceedance of applicable water quality objectives.
- Identify discharge locations and include details regarding how the discharge will be conducted to minimize erosion and scour.

Relevant Water Quality Objectives

At a minimum, the project discharges to surface waters shall not exceed the water quality objectives for receiving waters included in the current San Francisco Bay Basin Plan, including (but not limited to):

- pH shall not be depressed below 6.5 nor raised above 8.5.
- Turbidity shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU.
- Temperature shall not be increased by more than 5 °F (2.8 °C) above natural receiving water temperature.
- Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
- Waters shall not contain floating material, including solids, liquids, foams, or scum, in concentrations that cause nuisance or adversely affect beneficial uses.
- Waters shall not contain oils, greases, waxes, or other materials in concentrations that: result in a visible film or coating on the surface of the water or on objects in the water, cause nuisance, or otherwise adversely affect beneficial uses.
- All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms.

Construction contractor(s) shall comply with all monitoring and reporting requirements established by the RWQCB. Any exceedances of established narrative or numeric water quality objectives shall be reported to the RWQCB and corrective action taken. Corrective action may include an increase in residence time in treatment features (e.g., longer holding time in settling basins) and/or incorporation of additional treatment measures (e.g., addition of sand filtration prior to discharge).

Mitigation Measure M-HY-3 would address water quality impacts from construction dewatering by requiring the construction contractor to prepare and implement a project-specific dewatering plan that specifies how dewatering effluent would be managed to protect water quality. Therefore, this impact would be less than significant with mitigation.

Impact HY-4: Discharges of treated water from existing and newly installed pipelines during project construction would not substantially degrade water quality. (Less than Significant)

Prior to constructing cross-connections between existing and new pipelines, segments of existing pipelines (e.g., Alameda Siphon No. 3 and the San Antonio Pipeline) would have to be drained and later disinfected prior to being put back into service. Newly installed pipes, including the proposed backup pipeline, 12-inch-diameter water pipeline to the town of Sunol, transfer pipeline, and dewatering pipeline, would also need to be disinfected before being put into service. Dewatering effluent from existing and newly installed pipelines would be discharged to Pit F3-East, San Antonio Creek, or Alameda Creek. Without proper controls, these discharges of treated water could adversely affect receiving water bodies by scouring the creek banks, or by increasing turbidity (if discharged directly without appropriate treatment), chlorine concentrations (the primary disinfectant in the drinking water), and pH, thus degrading water quality and affecting aquatic organisms.

The Waste Discharge Requirements for the SFPUC Drinking Water Transmission System (RWQCB Order No. R2-2008-0102), described above in Section 5.16.2.1, regulates discharges of treated water from the regional water system to waters of the United States and waters of the state.[6] The Order contains specific effluent limitations for discharges of treated water to creeks and reservoirs; requires implementation of erosion control BMPs and Standard Operating Procedures; and specifies compliance procedures that include a monitoring and reporting program and an annual compliance evaluation. These requirements mandate that treated water be dechlorinated and pH-adjusted prior to discharge to waters of the United States and waters of the state to protect downstream water quality. The Order also specifies that dischargers must control the flow rates of planned discharges (generally, rates must be less than or equal to 3,500 gallons per minute), and that the discharges may not alter the temperature of the receiving water from ambient levels unless it can be demonstrated that the temperature changes would not affect beneficial uses (refer to **Appendix L** for more information). Mandatory compliance with the Order and SFPUC Standard Operating Procedures would ensure that water quality impacts due to discharges of treated water from existing and newly installed pipelines during construction would be less than significant.

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[6] Future discharges to Pits F3-East and F3-West are not subject to these requirements because the quarry pits are not classified as waters of the United States or waters of the state.

5.16.3.5 Operational Impacts and Mitigation Measures

Impact HY-5: The placement of project facilities within a 100-year flood hazard zone would not substantially impede or redirect flood flows or result in damage to SFPUC facilities or private property. (Less than Significant)

The placement of fill and construction of aboveground facilities within a flood hazard zone have the potential to impede or redirect flood flows. Aboveground facilities that are not designed to withstand inundation can be damaged during flood events. Underground facilities do not affect flood flows and are typically designed to withstand inundation.

As described in Section 5.16.1.6, according to the current FEMA FIRM for the project area, the proposed Alameda Creek Pump Station, control building, and new electrical transformer are within the mapped 100-year flood hazard zone for Alameda Creek (FEMA, 2009). However, as indicated in the proposed grading plan for the Pit F3-West area, the ground surface in the vicinity of the Alameda Creek Pump Station, control building, and electrical transformer would be graded at approximately 253 feet above mean sea level (msl), over 2 feet above the 100-year base flood elevation in this area, which is calculated to be 250.2 feet (SFPUC, 2010c). Therefore, these structures would be above the inundation zone associated with the 100-year flood event. Further, these facilities would be designed to withstand natural hazards, including groundshaking associated with a major seismic event, and would therefore be of robust construction. Thus, no flood damage to these facilities would be expected. None of the other project components are within or immediately adjacent to the mapped 100-year flood hazard zone. Thus, the potential for project components to be damaged by flooding or associated flood hazards would be less than significant.

Construction of the Alameda Creek Pump Station, control building, and electrical transformer would require the placement of approximately 100 cubic yards of new fill within the mapped 100-year flood hazard zone for Alameda Creek (SFPUC, 2010c). The placement of fill within a flood hazard zone could potentially displace floodwaters, raise flood elevations, create new flooding impacts (e.g., by causing flooding of existing facilities or structures that previously would not have been inundated), and/or exacerbate existing flooding problems (e.g., by increasing the severity or frequency of flooding relative to pre-project conditions). Although it is unlikely that the placement of 100 cubic yards of fill in the Sunol Valley would substantially displace or redirect flood flows—particularly since ongoing mining activities have modified and continue to modify the floodplain of Alameda Creek—this EIR nonetheless provides an analysis of the project's potential effects related to 100-year flood hazards.

For a significant flooding impact to occur, a sensitive resource would need to be affected by impeded or redirected floodflows. The potential sensitive flood "receptors" within the Sunol Valley are:

- **Garcia residence, located south of the Alameda West Portal.** This residence is well over 10 feet in elevation above the calculated FEMA 100-year flood elevations and would therefore not be affected by flooding under existing conditions or under future project conditions. Therefore, the Garcia residence is not considered a sensitive receptor with respect to flooding.

- **Offices, structures, and equipment associated with quarry operations.** Quarry operations have substantially altered the topography of the Sunol Valley for many years, creating large open pits and large piles of aggregate and soil material. These active operations continue to alter the floodplain on an ongoing basis. Currently, portions of the Oliver De Silva and Hanson Aggregates mining operations are within the 100-year flood hazard zone of Alameda Creek. Based on the inherent risks associated with the operation of equipment and temporary administrative facilities within or adjacent to the floodplain, the quarry operators have, over time, developed procedures to respond to the threat of flooding. These procedures include weather monitoring, early warning, moving equipment, and flood-proofing facilities (Riddiough, 2008; Schipper, 2008). Therefore, quarry operations are not considered a sensitive receptor with respect to flooding.

- **Existing SFPUC facilities.** Many of the SFPUC facilities in the vicinity of Alameda Creek are underground and are not susceptible to flooding impacts. The Sunol Valley Chloramination Facility, the existing chemical facility, the San Antonio Pump Station, and other aboveground SFPUC facilities in the vicinity of the Alameda Siphons are located outside of the FEMA 100-year flood hazard zone. Due to the relatively small volume of new fill that would be placed within the 100-year flood hazard zone in the vicinity of Pit F3-West, the proposed floodplain encroachment would not raise the 100-year flood elevation such that existing SFPUC facilities would be inundated in a major flood. Even if the existing facilities were inundated, no significant damage to the facilities or releases of chemicals would be expected; the buildings and chemical storage units are designed to withstand natural hazards, including groundshaking associated with a major seismic event on the Calaveras fault, and therefore are of robust construction. Further, the chemical storage units are fully enclosed in secondary containment, thereby limiting the potential for floodwater to contact hazardous materials. Therefore, no significant impact is expected.

In summary, if the proposed floodplain encroachment in the vicinity of Pit F3-West were to result in an increase in 100-year flood elevations, no sensitive receptors would be adversely affected. Thus, impacts related to the placement of project facilities within a 100-year flood hazard zone would be less than significant.

Impact HY-6: Project implementation would not expose people or structures to a significant risk of property loss, injury, or death involving flooding as a result of dam failure. (Less than Significant)

The entire project area is within the mapped dam inundation zone for Calaveras Dam, and the northern portions of the site are within the mapped dam inundation zones for Turner and Del Valle Dams. Although unlikely, catastrophic failure of either one of these three dams could cause inundation of the Sunol Valley, potentially exposing people or structures to a significant risk of loss, injury, or death involving flooding. Calaveras Dam poses a greater risk of dam failure than Turner and Del Valle Dams because Calaveras Dam has been identified as having safety issues. However, in early 2011 the SFPUC approved the Calaveras Dam Replacement project, which will correct the seismic safety deficiencies of the existing dam, and construction of the project is expected to be complete by 2014. In the interim, the current DSOD restrictions on water storage in Calaveras Reservoir serve to limit the risk of dam failure. Therefore, the likelihood of dam failure at Calaveras Reservoir is low for both existing and future conditions.

Regardless, in the unlikely event of dam failure, proposed aboveground facilities such as the new chemical facility, the electrical control building for the new discharge facility at Pit F3-East, and the Alameda Creek Pump Station and control building could be susceptible to inundation. In particular, construction of the new chemical facility within the dam inundation zone of Calaveras Dam could pose risks to water quality if chemicals were accidentally released to surface waters during inundation. All project facilities would be designed to withstand natural hazards, including groundshaking associated with a major seismic event, and would therefore be of robust construction. Hazardous chemicals to be used at the new chemical facility would be stored in an aboveground storage tank with secondary concrete containment to contain any releases. No other hazardous chemicals would be stored in the proposed facilities. Given the low risk of dam failure, and because the proposed facilities would be designed to withstand natural hazards (including secondary containment at the chemical facility), potential impacts related to dam failure are considered less than significant. Project improvements constructed belowground would not be affected by potential dam inundation hazards because these facilities would be designed to withstand inundation.

Impact HY-7: Project implementation would not alter drainage patterns such that there would be a substantial increase in erosion, siltation, or the rate or amount of surface runoff. (Less than Significant)

Stormwater runoff volumes and rates generated from undeveloped, unpaved areas can increase significantly when a site is paved, the impervious surface area is increased, and the ability of surface water to infiltrate the ground surface is reduced or eliminated. Impervious surfaces can increase peak flows in creeks, cause erosion, and result in greater nonpoint-source pollution in downstream water bodies. The majority of the proposed improvements would be constructed belowground and would not increase impervious surfaces or alter drainage patterns. However, several project components, including the new chemical facility, electrical control building for the new discharge facility, the Alameda Creek Pump Station and control building, and paved parking areas, would create a combined total of approximately 7,750 square feet of new impervious surfaces, resulting in a small increase in stormwater runoff from these impervious areas. The Alameda Countywide Clean Water Program requires that projects creating more than 10,000 square feet of new impervious cover implement operational BMPs to treat the runoff and maintain the BMPs for the life of the project. Due to the relatively minor increase in impervious surface area from implementation of the proposed project, and consistent with the requirements of the Alameda Countywide Clean Water Program, project-related increases in stormwater runoff and associated increases in erosion or siltation resulting from increases in impervious surface area would be less than significant.

At the San Antonio Creek crossing, the proposed backup pipeline would be encased in concrete and the top of the concrete encasement buried approximately 4 feet beneath the creek channel. The SFPUC analyzed the potential for scouring of the concrete-encased backup pipeline at the San Antonio Creek crossing when large flows are released from Turner Dam (SFPUC, 2010b). The scouring analysis found that, at this depth, it would be unlikely for the creek bed to erode and expose the concrete-encased backup pipeline, or cause flows that would otherwise continue downstream towards Alameda Creek to back up behind the exposed backup pipeline. Thus, impacts related to altered drainage patterns resulting from installation of the backup pipeline below San Antonio Creek would be less than significant.

Impact HY-8: Future discharges from the backup pipeline would not substantially degrade water quality or exceed the capacity of Pit F3-East. (Less than Significant)

Under the proposed project, quality-impaired Hetch Hetchy water diverted out of the regional water system would be discharged to quarry Pit F3-East through a new outfall and concrete splash pad in the quarry pit wall. The new discharge facility would be capable of discharging the maximum future Hetch Hetchy flow to the quarry pit. Following planned maintenance of the upstream San Joaquin Pipelines, SFPUC system operators could discharge up to 184 acre-feet (60 million gallons) of quality-impaired Hetch Hetchy water into Pit F3-East over a six-hour period. During emergency water quality events occurring above the Tesla Portal, SFPUC system operators could discharge up to 485 acre-feet (158 million gallons) of Hetch Hetchy water into Pit F3-East over a 12-hour period. Prior to discharge, the Hetch Hetchy water would be dechlorinated and pH-adjusted at the new chemical facility.

Based on a February 2009 field survey, the total capacity of Pit F3-East when the water surface elevation is at 195 feet is approximately 657 acre-feet (214 million gallons) (SFPUC, 2009b). Therefore, if water levels are maintained below 195 feet msl, Pit F3-East could accommodate up to a 12-hour water discharge event at the rate of 315 mgd (equal to 485 acre-feet, or 158 million gallons) (SFPUC, 2010a). As described in Chapter 3, Section 3.4, Water Management in Pits F3-East and F3-West, the SFPUC would work cooperatively with Hanson Aggregates to maintain water levels in Pits F3-East and F3-West at or below 195 feet msl to ensure sufficient storage capacity is maintained in Pit F3-East for project discharges. Hanson Aggregates would continue to pump water into and out of the SMP-24 quarry pits using the quarry company's existing network of pumps and flexible hoses. During wet periods and when there is surplus water in the quarry pits, it is assumed Hanson Aggregates would continue to discharge water from Pits F3-East and F3-West into Alameda Creek via the quarry company's existing creek outfall and in accordance with NPDES requirements. Under the proposed project, Hanson Aggregates would maintain water levels in Pits F3-East and F3-West at or below 195 feet msl in a similar manner. Because the water levels in Pit F3-East would be maintained at or below 195 feet msl to accommodate up to a 12-hour water discharge event at the rate of 315 mgd, there would be sufficient storage capacity available at all times to ensure that emergency or planned discharges do not overtop the banks of the quarry pits or spill over into Alameda or San Antonio Creeks. Moreover, installation of the proposed cutoff wall around Pits F3-East and F3-West as part of the SABPL project would minimize the seepage of groundwater into the quarry pits.

If a discharge from the backup pipeline were to cause water levels in Pit F3-East to rise above 195 feet msl, the SFPUC would recover the discharged water in 30 days or less until water levels in the quarry pit reached 195 feet msl or lower by pumping the water to either San Antonio Reservoir or the SVWTP. The volume of water recovered by the SFPUC would not exceed the volume of water discharged from the backup pipeline. Any discharged water below 190 feet msl would remain in the quarry pit due to the elevations of the proposed pumping facilities. Although the discharged water is considered impaired for purposes of potable water supplies, the quality of the discharged Hetch Hetchy water is generally expected to be equal to or better than the water currently stored in the quarry pits.[7] Thus, if Hanson Aggregates were to discharge the Hetch Hetchy water to Alameda Creek, such discharges are expected to be in accordance with the quarry company's NPDES permit requirements and thus would not be anticipated to adversely affect water quality in the creek.

If the SFPUC were unable to recover some or all of the discharged water due to equipment failure or another unforeseen circumstance, Hanson Aggregates could be required to discharge to Alameda Creek to ensure there would be sufficient capacity for a subsequent discharge. Hanson Aggregates' NPDES permit allows the quarry company to discharge water to Alameda Creek at a maximum flow rate of 10 mgd to Alameda Creek. Given this maximum discharge flow rate, Hanson Aggregates would be permitted to discharge the maximum future volume of project discharge to Alameda Creek over a period of 16 days. Therefore, impacts related to the degradation of water quality and increased flows due to future discharges to Pit F3-East would be less than significant.

In the event that Hanson Aggregates' lease is not extended, the SFPUC would solely manage the water levels in Pits F3-East and F3-West to maintain sufficient capacity for discharges from the proposed project. Under these circumstances, the SFPUC might need to obtain a new NPDES permit to discharge water from the quarry pits to Alameda Creek and/or San Antonio Creek. It is expected that the SFPUC would use a series of portable pumps and flexible hoses (similar to the system used by Hanson Aggregates), as well as Hanson Aggregates' existing outfall at Alameda Creek, to conduct these discharges. Since any creek discharge would be conducted at the existing outfall in Alameda Creek in a similar manner as the existing discharges and in accordance with regulatory requirements, impacts on water quality during project operations under this scenario would also be less than significant.

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[7] The quality-impaired Hetch Hetchy water that is discharged out of the regional water system in the Sunol Valley does not meet drinking water standards; however, this water is otherwise of good quality and does not pose risks to aquatic life once it is dechlorinated.

5.16.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Since Pumping Variant 1 does not include construction of the Alameda Creek Pump Station, wet well, control building for the pump station, retaining wall along the southern boundary of the pump station site adjacent to the access road, or transfer pipeline, the overall soil and surface disturbance under Pumping Variant 1 would be slightly less than that of the proposed project. As a result, construction-related water quality impacts associated with sedimentation of receiving water bodies (e.g., Alameda and San Antonio Creeks) would be slightly less than under the proposed project. In addition, since the 45-foot-deep excavation for the wet well adjacent to Alameda Creek would not occur under this variant, impacts related to dewatering of excavated areas during project construction could also be slightly reduced when compared to those of the proposed project. However, because all other facilities and improvements under the proposed project would still be constructed, overall construction-related water quality impacts associated with this variant would be similar to those of the proposed project, and this variant would not change the conclusions or mitigation measures identified for the proposed project. All other construction-related impacts under Pumping Variant 1 would be the same as those of the proposed project. With respect to hydrology and water quality, future operations under Pumping Variant 1 (e.g., one-step pumping) would be the same as under the proposed project and would result in the same operational impacts as identified for the proposed project. Thus, construction and operation of Pumping Variant 1 would not change the analysis, mitigation measures, or conclusions presented in Sections 5.16.3.4 and 5.16.3.5.

Pumping Variant 2

Pumping Variant 2 would result in the same area of disturbance as the proposed project. Therefore, construction-related impacts would be the same as those identified for the proposed project in Section 5.16.3.4, above. The operational flexibility that would be provided by Pumping Variant 2 (i.e., one-step pumping vs. two-step pumping) would also result in the same operational impacts on hydrology and water quality as identified for the proposed project. Thus, construction and operation of Pumping Variant 2 would not change the analysis or conclusions presented in Sections 5.16.3.4 and 5.16.3.5.

5.16.3.7 Cumulative Impacts and Mitigation Measures

Impact C-HY: Project construction could result in a cumulatively considerable contribution to cumulative impacts on hydrology and water quality. (Less than Significant with Mitigation)

The geographic scope for potential cumulative hydrology and water quality impacts consists of the project area and surrounding Alameda watershed lands. The analysis of potential cumulative impacts on hydrology and water quality considers those cumulative projects listed in Table 5.1-6 and shown in Figure 5.1-1. The analysis focuses on the projects that could adversely affect water quality during construction, specifically activities that involve dewatering of groundwater in open excavations or treated water from pipelines, the placement of fill or structures within the 100-year flood hazard zone, construction within the inundation zone for Calaveras Dam, an increase in impervious surfaces, and/or increased discharges to Alameda Creek.

Degradation of Water Quality

Construction activities associated with the SABPL project could result in the degradation of water quality from increased soil erosion and associated sedimentation of water bodies, as well as an accidental release of hazardous materials (Impact HY-1). In addition, discharges of dewatering effluent from excavated areas and treated water in pipelines could also adversely affect water quality (see Impacts HY-3 and HY-4). The SFPUC Upper Alameda Creek Filter Gallery (Filter Gallery) project would involve substantial excavation within Alameda Creek. The creek improvements that would be constructed by the SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project could also affect the creek channels of both Alameda and San Antonio Creeks. The SFPUC New Irvington Tunnel (NIT) project includes the replacement of two bridges over Alameda Creek. The SFPUC Calaveras Dam Replacement (CDRP) project would include construction in Alameda Creek and Calaveras Creek (which drains to Alameda Creek) approximately 6 miles upstream of the SABPL project. These and other cumulative projects in Table 5.1-6 have the potential to degrade water quality in Alameda Creek or San Antonio Creek as a result of construction-related soil erosion or accidental discharges of hazardous materials into receiving water bodies. Many of the cumulative projects would also require dewatering groundwater that enters open trenches during construction. Other SFPUC projects, including the Alameda Siphons Seismic Reliability Upgrades project, NIT project, and various pipeline inspection projects also involve discharges of treated water produced during pipeline draining and disinfection. These projects could result in a potentially significant cumulative impact related to degradation of water quality. The SABPL project's contribution to this cumulative impact would be cumulatively considerable.

However, as described above under Impact HY-1,the SABPL project's construction-related water quality impacts related to soil erosion and sedimentation of downstream water bodies, and accidental releases of hazardous materials would be reduced to less than significant with implementation of **Mitigation Measures M-HY-1a (Preparation and Implementation of a SWPPP)** and **M-HY-1b (Creek Restoration and Revegetation)** (see Impact HY-1, above, for descriptions). These measures would require preparation and implementation of a SWPPP to protect water quality during construction, as well as restoration and revegetation of the disturbed portion of the San Antonio Creek channel to restore the channel to preexisting conditions at the completion of construction. Project-related water quality impacts related to discharges of dewatering effluent from open excavations would be less than significant with implementation of **Mitigation Measure M-HY-3 (Management of Dewatering Effluent Discharges)** (see Impact HY-3, above, for description). This measure requires preparation of a project-specific dewatering plan specifying how the water would be collected, contained, treated, and discharged in accordance with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (see Impact HY-3). Impacts related to discharges of treated water from existing and newly installed pipelines during construction would be less than significant with mandatory adherence to the Waste Discharge Requirements for the SFPUC Drinking Water Transmission System (RWQCB Order No. R2-2008-0102). The permit establishes numerical restrictions on water quality constituents, including the requirement that all chlorine residual be removed from treated water supplies prior to discharge (see Impact HY-4).

In addition, most of the cumulative projects in Table 5.1-6 would also be subject to the NPDES construction general permit requirements and would be required to implement BMPs to protect water quality during construction, including measures to avoid water quality impacts related to dewatering discharges from excavated areas. Other cumulative SFPUC projects that would involve discharges of treated water from the regional water system would also be subject to the Waste Discharge Requirements for the SFPUC Drinking Water Transmission System. Because the NPDES construction general permit and the Waste Discharge Requirements for the SFPUC Drinking Water Transmission System were developed in consideration of regional water quality issues, compliance with regulatory requirements would serve to limit the potential for cumulatively significant water quality impacts. With implementation of **Mitigation Measures M-HY-1a (Preparation and Implementation of a SWPPP)**; **M-HY-1b (Creek Restoration and Revegetation)**; and **M-HY-3 (Management of Dewatering Effluent Discharges),** and compliance with the Waste Discharge Requirements for the SFPUC Drinking Water Transmission System, the SABPL project's residual contribution to cumulative water quality impacts would not be cumulatively considerable (less than significant).

Depletion of Groundwater Resources during Construction Dewatering

The SABPL project and many of the cumulative projects listed in Table 5.1-6 involve earthwork and excavation activities that would require groundwater dewatering, and could result in a cumulatively significant impact related to the depletion of groundwater resources. However, as discussed under Impact HY-2, the SABPL project would not result in the depletion of groundwater resources; there are no groundwater production wells identified in the immediate vicinity of the project area and any effects of dewatering would be temporary in nature, as dewatering would be required only during certain phases of construction and only if groundwater were encountered. Additionally, since the dewatering effluent from excavated areas would be discharged to vegetated upland areas, San Antonio Creek, or Alameda Creek, the majority of groundwater removed by dewatering would return to the subsurface and recharge the shallow aquifer. The SABPL project could only temporarily lower localized groundwater levels and would not cause or substantially contribute to the lowering of regional groundwater levels. Therefore, the SABPL project's contribution to potentially significant cumulative impacts related to the depletion of groundwater resources would not be cumulatively considerable (less than significant).

Increased Flood Hazards

As described in Impact HY-5, the placement of fill within the 100-year flood hazard zone of Alameda Creek associated with the SABPL project could theoretically result in increased flooding hazards. The potential flooding effects of the SABPL project resulting from the placement of fill or structures in the 100-year flood hazard zone could be exacerbated when combined with the incremental effects of other cumulative projects that also encroach on the floodplain of Alameda Creek, including the NIT and Filter Gallery projects. The NIT project involves the construction of bridges over Alameda Creek and the placement of fill within the 100-year flood hazard zone; the Filter Gallery project would involve construction and restoration within the Alameda Creek channel and could also include the placement of fill within the 100-year flood hazard zone. However, as discussed above under Impact HY-5, there are no sensitive receptors that would be adversely affected by any incremental increases in base flood elevations. Therefore, cumulative impacts related to increased 100-year flood hazards would be less than significant.

Risk of Property Loss, Injury, or Death Involving Flooding as a Result of Dam Failure

The SABPL project and other cumulative projects listed in Table 5.1-6 that are in the Sunol Valley, including the SVWTP Expansion and Treated Water Reservoir (SVWTP Expansion) project, Filter Gallery project, Alameda Siphons project, NIT project, San Antonio Pump Station Upgrade project, and SMP-30 Expansion project, would be constructed within the mapped inundation zone for the Calaveras Dam. However, as discussed in Impact HY-6, the SFPUC approved the Calaveras Dam Replacement project in early 2011, which will correct the seismic safety deficiencies of the existing dam, and construction of the project is expected to be complete by 2014. In the interim, the current DSOD restrictions on water storage in Calaveras Reservoir serve to limit the risk of dam failure. Therefore, the likelihood of dam failure at Calaveras Reservoir is low for both existing and future conditions. Further, the facilities constructed under these cumulative projects would be designed to withstand natural hazards. Based on this, cumulative impacts related to risk of property loss, injury, or death involving flooding as a result of dam failure would be less than significant.

Alteration of Drainage Patterns

As discussed above under Impact HY-7, the SABPL project would result in the construction of approximately 7,750 square feet of new impervious surfaces, which could increase erosion and siltation or increase the rate or amount of stormwater runoff. Other cumulative projects listed in Table 5.1-6 would also create new impervious surfaces and could result in the same effects, a potentially significant cumulative impact. However, due to the relatively minor increase in impervious surface area associated with implementation of the SABPL project, the SABPL project's contribution to this impact is not considered cumulatively considerable (less than significant).

Discharges to Alameda Creek

As described above under Impact HY-8, under the worst case scenario, subsequent to a discharge from the backup pipeline to Pit F3-East, Hanson Aggregates or the SFPUC could be required to pump the full 485 acre-feet of water out of Pit F3-East and discharge it to Alameda Creek, potentially resulting in water quality impacts to Alameda Creek, such as erosion. The Various Pipeline Inspection projects and other cumulative projects listed in Table 5.1-6 could also involve discharges to Alameda Creek and result in similar water quality effects, a significant cumulative impact. However, because any project-related discharges to creeks by Hanson Aggregates or the

SFPUC would be conducted in accordance with regulatory requirements, the SABPL project's contribution to cumulative water quality impacts would not be cumulatively considerable (less than significant).

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are substantially similar to the proposed project (refer to Section 5.16.3.6, Impact Analysis for Pumping Variants), the cumulative impact analysis and related conclusions provided above would not change if either project variant is implemented.

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5.17 Hazards and Hazardous Materials

This section provides an assessment of potential impacts related to hazards and hazardous materials that could be present in the vicinity of the proposed San Antonio Backup Pipeline (SABPL) project. Potential hazards addressed in this section include exposure to hazardous materials in soil and groundwater during construction, releases of hazardous materials during construction and operation, and wildfires.

5.17.1 Setting

5.17.1.1 Hazardous Materials in Soil and Groundwater

This section assesses the potential for hazardous materials to be present in the soil or groundwater as a result of a previously unidentified release of hazardous materials in the project area or a documented release of hazardous materials in or near the project area. Historical land uses were determined based on a review of aerial photographs from 1939 through 1998 and topographic maps from 1906 through 1996 included as part of a Phase I Environmental Site Assessment for the New Irvington Tunnel project (Baseline, 2008). The discussion of past and present uses of hazardous materials and documented releases is based on the Phase I Environmental Site Assessment, an updated environmental database review conducted for the proposed project (EDR, 2009), review of Alameda County Department of Health Local Oversight Program files, and the hazardous materials business plan (HMBP) prepared for the San Antonio Pump Station (SFPUC, 2007).

Historical Land Uses

Based on the review of historical topographic maps and aerial photographs, the project area was largely undeveloped prior to 1906, the date of the first available topographic map (Baseline, 2008). Construction of the Alameda West Portal, Alameda East Portal, and Alameda Siphons, which are located partially within the project area, was underway in 1940. At that time, the lands adjacent to the project area contained orchards. Mining operations were also apparent in the present-day Surface Mining Permit 30 (SMP-30) area, northeast of the current Alameda West Portal, although the original mining permit was granted in the 1960s.

Between 1946 and 1961, gravel mining operations moved to areas approximately 1,000 feet north of the Alameda West Portal and west of the SABPL project area, and these operations expanded between 1968 and 1982. Pit F6 was in use by 1982; this pit is currently part of the gravel mining operations under SMP-30 on land leased to Oliver De Silva, Inc. and could be used to temporarily store excavation spoils under the SABPL project. Hanson Aggregates mined SMP-24 Pits F3-West and F3-East sometime between 1998 and 2002. Prior to the mining operations, this area was used for agricultural purposes. The existing chemical facility, San Antonio Pump Station, the Sunol Valley Chloramination Facility, and the fluoride facility were also constructed between 1968 and 1982. By 1982, a tree nursery had been developed adjacent to and east of quarry Pit F6, and was vacated in 2009. The proposed alignments of the backup pipeline and the water pipeline to the town of Sunol traverse this former nursery site.

Past and Present Hazardous Materials Uses in the Project Vicinity

Past and present hazardous materials uses in the vicinity of the project area include the following:

- *San Antonio Pump Station*. This SFPUC facility is approximately 350 feet south of the proposed new chemical facility. There are two 9,000-gallon aboveground diesel tanks and one 550-gallon lubrication oil tank at this facility (SFPUC, 2007). Both of these materials are used in pump station operations.

- *Existing Chemical Facility at San Antonio Pump Station*. The existing chemical facility is approximately 200 feet east of the proposed chemical facility. The existing chemical facility at the San Antonio Pump Station was constructed in 1968 and upgraded in 1992. The chemical facility is used to dechlorinate and pH-adjust Hetch Hetchy water prior to discharging it to San Antonio Creek or San Antonio Reservoir. The existing chemical feed system includes two 1,500-gallon sodium bisulfite storage tanks; four chemical feed pumps; and the piping, valves, and controls required to convey sodium bisulfite to the injection point on the existing San Antonio Pipeline. The sodium bisulfite tanks have secondary containment to contain any accidental release from the tanks.

- *Sunol Valley Chloramination Facility*. This SFPUC facility is approximately 300 feet to the south of the proposed chemical facility and stores sodium hypochlorite, ammonia, and sodium hydroxide to chloraminate and pH-adjust Hetch Hetchy and local water supplies from the Alameda watershed that have been treated at the Sunol Valley Water Treatment Plant (SVWTP) prior to delivery to customers.

- *Fluoride Facility*. This SFPUC facility, located at the south end of the Sunol Valley Chloramination Facility, houses two 12,000-gallon tanks of hydrofluorosilicic acid (fluoride). SFPUC system operators use the hydrofluorosilicic acid stored at the fluoride facility to fluoridate both Hetch Hetchy supplies and local water supplies from the Alameda watershed that have been treated at the SVWTP prior to delivery to customers.

- *Former Site of the Valley Crest Tree Company Nursery (located between Pit F6 and Calaveras Road, between pipeline stations 12+00 and 32+00)*. The backup pipeline and water pipeline to the town of Sunol would traverse the former Valley Crest Tree Company nursery site. This former nursery site selectively applied fungicides, herbicides, and insecticides (registered with Alameda County) to its trees (Baseline, 2008). These pesticides were stored in a locked containment shed near the center of the nursery, and another shed housed an aboveground storage tank containing liquid fertilizer. This aboveground storage tank was not designed with secondary containment. The nursery also stored gasoline and diesel for its vehicles in two approximately 250-gallon aboveground storage tanks located under a shed. The fuel storage tanks had concrete secondary containment. As of 2008, an empty aboveground fuel storage tank at the site had not been used for many years. There are no documented underground storage tanks at this nursery. A 30-gallon drum of antifreeze was observed during a site visit in 2008. On its manifests, this facility operator also listed hazardous wastes consisting of organic liquids for offsite disposal (EDR, 2009). In 2008, there was no indication of a release of hazardous materials at this site. This nursery was vacated in 2009, and all structures (including the associated storage sheds and aboveground storage tanks) were removed at that time.

- *Former Commercial Nursery Site (located within Staging Area C)*. Specific information regarding past hazardous materials use at this former nursery site is not available.

However, it is assumed that fungicides, herbicides, and insecticides were applied to crops, as is customary at nursery sites. This nursery was vacated in 2010.

- *Oliver De Silva and Hanson Aggregates Quarries*. Two gravel quarries are within and immediately adjacent to the project area. The gravel mining areas are Pits F3-East, F3-West, and F3, which Hanson Aggregates operates under SMP-24; and Pits F4, F5, and F6 and an aggregate processing facility, which is operated under SMP-30 on CCSF-owned land leased to Oliver De Silva. Although mining operations typically require the use of fuels and lubricants, these materials are not stored at the quarry areas within or immediately adjacent to the project area.

Documented Releases of Hazardous Materials

An environmental database review (EDR, 2009) was conducted for the proposed project to identify environmental cases within ASTM-specified search distances of the project area where a documented release of hazardous materials has occurred. The database search identified the following two sites that have a potential to affect soil or groundwater quality within the project area:

- *Oliver De Silva (Sunol) Quarry/Santa Clara Sand and Gravel (6527 Calaveras Road)*. This site is located immediately west and southeast of the project area and is listed in the Spills, Leaks, Investigations, and Cleanups Program database, indicating a release to groundwater (EDR, 2009). Based on a review of reports available from the Alameda County Department of Environmental Health Local Oversight Program, a release of approximately 2,700 gallons of diesel fuel occurred at this site in 1990 (GeoStrategies, 1991). Approximately 3,000 cubic yards of soil was excavated and bioremediated at the site, and the treated soil was used for road base within the facility currently operated under SMP 30 on property leased to Oliver De Silva (ACHCSA, 2001). Three groundwater monitoring wells were subsequently installed to evaluate groundwater quality. Petroleum products, including diesel, benzene, toluene, ethylbenzene, and xylenes, were not detected in the groundwater samples collected between September 1991 and December 1993, the last date of groundwater sampling for this environmental case (RMC Lonestar, 1994). In addition, diesel fuel was not detected in a water sample collected from one of the SMP-30 quarry pits (GeoStrategies, 1991). The Alameda County Health Care Services Agency granted closure of the case in 2001, indicating that remediation was completed to the satisfaction of the responsible agency (ACHCSA, 2001).

  Based on the environmental database review conducted for the proposed project, a separate release of diesel occurred in 1997 when a pipeline broke (EDR, 2009). In addition, Regional Water Quality Control Board (RWQCB) files indicate that a release of waste oil occurred in 1989, and a gasoline underground storage tank was removed from the site in 1997. Although no additional information is available in the files regarding these incidents, the Alameda County Department of Environmental Health and RWQCB databases both indicate that the case involving these releases at the site has been closed.

- *San Antonio Pump Station (5555 Calaveras Road)*. The San Antonio Pump Station is located in the southern portion of the proposed project area. In 1991, the SFPUC removed three underground storage tanks from the San Antonio Pump Station, including two 10,000-gallon diesel tanks and one 550-gallon waste oil tank (Environmental Bio-Systems, 1992). Following the tank removals, approximately 1,500 cubic yards of contaminated soil was excavated. However, elevated levels of total petroleum hydrocarbons (such as diesel, total oil and grease, and semivolatile organic compounds) were left in place beneath and adjacent to the pump station because access for further excavation was restricted by the pump station and associated water lines. The excavated soil was disposed of at the Vasco Road Sanitary Landfill in Livermore. The report documenting the soil excavation activities concluded that total oil and grease is ubiquitous in the vicinity of the San Antonio Pump Station at concentrations of up to 560 milligrams per kilogram, and may not be associated with the former underground storage tanks at the site.

There are three groundwater monitoring wells in the vicinity of the tanks that are used to monitor groundwater quality in that location. No petroleum products, including total petroleum hydrocarbons (such as diesel, gasoline, and oil/grease) or the semivolatile organic compounds found in petroleum hydrocarbons (such as benzene, toluene, ethylbenzene, and xylenes) were detected in any of the groundwater samples collected in 1993 and 1994 (CDM, 1994).[1] The Alameda County Health Care Services Agency granted closure of the case at this site in August 1996 without requiring additional remediation to remove residual petroleum hydrocarbons and semivolatile organic compounds in the soil (ACHCSA, 1996).

Mission Valley Rock & Asphalt at 7999 Athenour Way (the SMP-24 aggregate processing facility now owned and operated by Hanson Aggregates) is located approximately 0.25 mile to the west of the project area. Two former diesel gasoline and one former leaded gasoline underground storage tanks at this site that were removed in 1996 resulted in soil and groundwater contamination. Remediation has been completed but routine groundwater monitoring from 29 groundwater wells in and around the location of the former underground storage tanks is conducted quarterly (Arcadis, 2011). Although a dissolved petroleum hydrocarbon plume has been detected at different depths in and around the aggregate processing facility, this site is considered to have a low potential to affect groundwater quality in the project area because groundwater that is flowing east towards the project area is likely intercepted by Alameda Creek.

Previous Soil Sampling Results

In 2010, the SFPUC conducted surface soil sampling within the North Spoils Site and the former Valley Crest Tree Company nursery site located between Pit F6 and Calaveras Road to evaluate residual concentrations of pesticides and metals in the soils from historical agricultural activities (Baseline, 2010); the results are summarized below and discussed in more detail in **Appendix M**. Sampling within the former nursery site included the collection and analysis of soil samples along the proposed backup pipeline alignment between pipeline stations 12+00 and 32+00. As presented in Appendix M, the maximum concentrations of constituents identified in soil samples from each site are compared to the federal, state, and regional hazardous waste criteria, including the (a) federal Toxicity Characteristic Leaching Procedure (TCLP) regulatory level, (b) the state total threshold limit concentration (TTLC) and soluble threshold limit concentration (STLC), and (c) the San Francisco Bay RWQCB Environmental Screening Levels (ESLs) for residential land uses and for construction workers (RWQCB, 2008). These waste classification criteria and ESLs are discussed below in Section 5.17.2. Based on these applicable criteria, options for disposing of soil excavated from each area are as follows:

1 Groundwater samples in 1994 contained phenol and 4-methylphenol; however, these constituents are not related to the petroleum products that were stored in the underground storage tanks, and were considered to be the result of field or laboratory contamination.

- Eleven pesticides and 13 metals were detected in discrete soil samples from the North Spoils Site. Based on a comparison of analytical results to waste classification criteria, soil excavated at the North Spoils Site would not be classified as a hazardous waste. Based on a comparison of analytical results to the RWQCB ESLs for construction workers, excavation of the soil would not present an unacceptable risk to construction workers during earthwork at the North Spoils Site. However, this soil is not necessarily suitable for unrestricted land uses because some of the chemical concentrations exceed the residential ESL. If any excavated soil were removed from the North Spoils Site, further analysis would be required to identify appropriate disposal options.

- Pesticides were not detected in composite soil samples from the former nursery site, and 12 metals were detected in the discrete soil samples from this site. Based on a comparison of analytical results to hazardous waste criteria, soil excavated from the former nursery site would not be classified as a hazardous waste. Based on a comparison of analytical results to the RWQCB ESLs for construction workers, excavation of the soil from this area would not present an unacceptable risk to construction workers. However, the soil would not necessarily be suitable for unrestricted land uses because some chemical concentrations exceed the residential ESL. Thus, if soil were excavated and removed from the former nursery site, further analysis would be required to identify appropriate disposal options.

Existing Hazardous Building Materials

Two quarry buildings—a single-story residential-type building and a shed-roofed barn structure located just east of quarry Pit F3-East—would be demolished to facilitate construction of the cutoff wall. These buildings were constructed circa 1970 and may contain hazardous building materials that could present a public health risk if disturbed during an accident or during demolition. Potential hazardous building materials that may be encountered include asbestos-containing materials;[2] electrical equipment such as transformers and fluorescent light ballasts that contain polychlorinated biphenyls (PCBs)[3] or di (2-ethylhexyl) phthalate (DEHP);[4] fluorescent light tubes containing mercury;[5] and lead-based paint.[6]

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2 Because of its physical properties, asbestos was commonly used until the 1970s as a component of numerous building materials, including use in insulation materials, shingles and siding, roofing felt, floor tiles, the mastic used to affix floor tiles to the floor, and acoustical ceiling material. Asbestos was also used in pipe gaskets, valve packing, and automotive brakes and clutches. Today, asbestos continues to be used in roofing mastic. Asbestos is a known carcinogen and may present a public health hazard if it is present and exposed in the friable (easily crumbled) form. Long-term, chronic inhalation of asbestos can cause lung diseases such as asbestosis, mesothelioma, and lung cancer.

3 PCBs are mixtures of synthetic organic chemicals with physical properties ranging from oily liquids to waxy solids. PCBs are a known human carcinogen; they are highly toxic substances that remain persistent in the environment, accumulate in biological systems, interfere with the reproductive system, and act as immuno-suppressants. Under the Toxic Substances Control Act, the U.S. Environmental Protection Agency (U.S. EPA) began to impose bans on PCB manufacturing and sales and on most PCB uses in 1978.

4 Between 1979 and the early 1990s, DEHP was used in place of PCB as a dielectric fluid in some fluorescent light ballasts and other electrical equipment. DEHP is classified as a probable human carcinogen by the U.S. Department of Health and Human Services and as a hazardous substance by the U.S. EPA. Because of this, ballasts containing DEHP must be legally disposed of; ballast incineration or a combination of ballast recycling and incineration are recommended for complete destruction of DEHP.

5 Spent fluorescent lamps and tubes commonly contain mercury vapors and are considered a hazardous waste in California (California Code of Regulations [CCR], Title 22, Section 66261.50). In 2004, new regulations classified all fluorescent lamps and tubes in California as a hazardous waste, because they contain mercury. Since they are considered a hazardous waste, all fluorescent lamps and tubes must be recycled or taken to a universal waste handler.

5.17.1.2 SFPUC Emergency Response Plan

The HMBP for the San Antonio Pump Station contains an emergency response plan to be implemented in the event of a release of hazardous materials at the San Antonio Pump Station, including the existing chemical facility. The plan specifies: the responsibilities for SFPUC and offsite emergency response personnel; mandatory employee training; procedures for responding to and reporting a release of hazardous materials or a fire/explosion involving hazardous materials; procedures for responding to an earthquake; emergency response equipment to be maintained onsite; methods for alerting employees and others within the facility; notification requirements for nearby businesses and residences; procedures for shutting down existing utilities in the event of an emergency; evacuation procedures; and cleanup requirements that must be completed before facility operations can resume after a release has occurred.

5.17.1.3 Wildfire Hazards

The project area's Mediterranean climate is characterized by long, dry, hot summers and cool, rainy winters. The majority of measurable rainfall occurs from mid-October to mid-April, and in most years this precipitation results in abundant grass growth. May to October is the main fire season, and July is the time of the highest fire danger. During this period the grasses dry and provide a fuel source for fires, with fire conditions exacerbated by warm air temperatures and the lack of precipitation.

The new chemical facility, chemical injection station, Air Gaps Nos. 1 and 3, the southern terminus of the backup pipeline, southern terminus of the water pipeline to the town of Sunol, and Staging Area A are located in an area identified by the California Department of Forestry and Fire Prevention (CAL FIRE) as a "High Fire Hazards Severity Zone" within a State Responsibility Area (CAL FIRE, 2007). The remainder of the backup pipeline alignment; the discharge facility (discharge valve vault, electrical control building, and outfall); Alameda Creek Pump Station and transfer pipeline; quarry Pits F3-East and F3-West; Air Gap No. 2; Staging Areas B, C, and D; and the North Spoils Site are not located within this high fire hazard area. However, CAL FIRE has identified the watershed lands outside of the project area and immediately to the east of Calaveras Road as a "Wildland Area That May Contain Substantial Forest Fire Risks and Hazards."

In addition to CAL FIRE's designations, the *Alameda Watershed Management Plan* (Alameda WMP) further characterizes areas of the watershed as "low," "moderate," or "high" fire severity areas. The entire project area is within an area mapped as having a "low" fire severity, although areas to the east of Calaveras Road are mapped as having a "moderate" and "high" fire severity.

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[6] Lead-based paint is paint that contains lead, a heavy metal historically added to paint as pigment and to speed drying, increase durability, retain a fresh appearance, and resist moisture (which causes corrosion). Because of its toxicity, paint containing more than 0.6 percent lead was banned for residential use in 1978 by the U.S. Consumer Product Safety Commission, but continues to be used in some industrial applications. Lead is toxic to humans, particularly young children, and can cause a range of human health effects depending on the level of exposure. When adhered to the surface of a material, lead-based paint poses little health risk. However, lead dust presents health risks to workers during the demolition of structures that contain lead-based paint, particularly when metal coated with paint containing lead is torch cut. Lead-based paint that has separated from a structure may also contaminate nearby soil.

5.17.2 Regulatory Framework

5.17.2.1 Federal and State Regulations

Definition of Hazardous Materials

Hazardous materials and wastes can result in public health hazards if released to soil, groundwater, or air. Hazardous materials as defined in Section 25501(o) of the California Health and Safety Code are materials that, because of their "quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment." Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications and, to a limited extent, in residential areas.

Aboveground Storage of Petroleum Products

The State Water Resources Control Board requires registration of an aboveground fuel storage tank at a construction site only if the tank is 20,000 gallons or larger, or if the aggregate volume of aboveground petroleum storage is over 100,000 gallons. As described in Section 5.16, Hydrology and Water Quality, the stormwater pollution prevention plan (SWPPP) prepared for the project would address any smaller temporary tanks used during construction, methods for controlling releases, and measures to clean up accidental releases and prevent degradation of water quality.

Transportation of Hazardous Materials

Within California, the state agencies with primary responsibility for enforcing federal and state regulations regarding the transport of hazardous materials are the California Highway Patrol, the Department of Toxic Substances Control (DTSC), and the California Department of Transportation (Caltrans). Together, federal and state agencies determine driver training requirements for trucks transporting hazardous materials, load labeling procedures, and container specifications. Although certain requirements apply to the transport of hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.

Environmental Screening Levels

The RWQCB ESLs (RWQCB, 2008) are guidelines used to evaluate the potential risk associated with chemicals found in soil or groundwater where a release of hazardous materials has occurred. ESLs have been established for both residential and commercial/industrial land uses, and also for construction workers. Residential screening levels are the most restrictive; soil with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed of offsite. Commercial/industrial screening levels are generally higher than residential screening levels because they are based on potential worker exposure to hazardous materials in the soil (and these are generally less than residential exposures). Screening levels for construction workers are also higher than for commercial/industrial workers because construction workers are only exposed to the chemical of concern during the duration of construction, while industrial workers are assumed to be exposed over a working lifetime.

Waste Classification Criteria

In accordance with Title 22 of the California Code of Regulations (CCR) Section 66261.20 et seq., excavated soil is classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, and/or toxicity. A waste is considered toxic in accordance with 22 CCR 66261.24 if it contains:

- Total concentrations of certain substances at concentrations greater than the TTLC;
- Soluble concentrations greater than the STLC;
- Soluble concentrations of certain substances greater than federal toxicity regulatory levels using the TCLP; or
- Specified carcinogenic substances at a single or combined concentration of 0.001 percent.

Soil that is not classified as a hazardous waste can be accepted at a Class II or Class III designated landfill, depending on the waste acceptance criteria for the specific landfill.

Hazardous Materials Worker Safety Requirements

The California Occupational Safety and Health Administration (Cal/OSHA) is responsible for ensuring worker safety. The federal regulations for worker safety are contained in Title 29 of the Code of Federal Regulations (CFR), as authorized in the Occupational Safety and Health Act of 1970; these regulations provide standards for safe workplaces and work practices, including those related to hazardous materials handling. In California, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations; Cal/OSHA standards incorporated federal OSHA regulations and are generally more stringent than the federal OSHA standards.

The state regulations concerning the use of hazardous materials in the workplace are included in Title 8 of the CCR, which contain requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparing health and safety plans to protect workers.

Lead in Construction

Cal/OSHA's Lead in Construction Standard (8 CCR 1532.1) requires project proponents to develop and implement a lead compliance plan when lead-based paint would be disturbed during construction. The plan must describe activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA requires 24-hour notification if more than 100 square feet of lead-based paint would be disturbed.

Abatement of Asbestos in Buildings and Structures

Section 19827.5 of the California Health and Safety Code (CHSC), adopted January 1, 1991, requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants in the Bay Area, including asbestos. The Bay Area Air Quality Management District (BAAQMD) is vested by the California legislature with authority to regulate airborne pollutants, including asbestos. BAAQMD regulations pertaining to abatement of asbestos-containing materials are specified in Regulation 11, Hazardous Pollutants, Rule 2, Asbestos Demolition, Renovation and Manufacture.

In accordance with this regulation, the BAAQMD is to be notified 10 days in advance of any proposed demolition or abatement work. Notification includes the names and addresses of operations and persons responsible; description and location of the structure to be demolished/altered, including size, age, and prior use; approximate amount of friable asbestos; scheduled starting and completion dates of demolition or abatement; nature of planned work and methods to be employed; procedures to be employed to meet BAAQMD requirements; and the name and location of the waste disposal site to be used. In accordance with this regulation, a survey must be conducted to identify asbestos-containing materials prior to demolition. Containment must be provided during work that disturbs asbestos-containing materials, and there must be no visible emissions to the outside air from demolition operations that involve asbestos-containing materials. The contractor must use methods specified in the regulations for control of emissions, such as wetting of exposed asbestos-containing materials; use of a HEPA exhaust, ventilation, and control system; or removal in an entirely contained chute. In addition asbestos-containing materials must be removed prior to demolition and the work site must be cleaned of asbestos-materials. The BAAQMD randomly inspects asbestos removal operations and will inspect any removal operation that is the subject of a complaint.

Contractors who conduct asbestos-related work activities (including abatement) in buildings and structures must follow state regulations contained in 8 CCR Section 1529 and 8 CCR Sections 341.6 through 341.14 where the work would involve 100 square feet or more of asbestos containing material. Specifically, under 8 CCR Section 341.6, Cal/OSHA must be notified of asbestos-related work activities to be carried out. Contractors must be licensed as an Asbestos Qualified Contractor by the Contractors Licensing Board of the State of California, and registered as such with Cal/OSHA. In addition, a one-time report of the use of carcinogens must be made to Cal/OSHA under 8 CCR Chapter 4, Section 5203. The owner of the property where abatement is to occur must have a Hazardous Waste Generator Number assigned by and registered with the DTSC. The contractor and hauler of the material are required to file a Hazardous Waste Manifest which details the hauling of the material from the site and its disposal. Title 8 CCR Section 1529(b) defines asbestos-containing material as any material that contains more than one percent asbestos.

Naturally Occurring Asbestos

In 2001, the California Air Resources Board adopted the Asbestos Airborne Toxic Control Measure (Asbestos ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations in areas of serpentine[7] and other ultramafic rocks[8] (17 CCR 93105), which became effective in July 2002. The ATCM protects public health and the environment by requiring the use of best available dust mitigation measures to prevent the offsite migration of asbestos-containing dust from road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas of ultramafic rock, serpentine, or asbestos.[9] The Bay Area Air Quality Management District implements the regulation. As discussed in Section 5.15, Geology and Soils, geologic bedrock units present in the project area include the Briones Formation, Livermore Gravels, and Cretaceous-age unnamed sandstone. Alluvial material fills the Sunol Valley floor, including older alluvium, alluvial fan deposits, stream terrace deposits, gravel deposits, and modern stream channel deposits. None of these are comprised of ultramafic rock and thus are not expected to contain naturally occurring asbestos. Therefore, the Asbestos ATCM would not apply to the proposed project.

Wildfires

The State Office of the Fire Marshall and CAL FIRE administer state policies regarding wildland fire safety. CAL FIRE also provides firefighting personnel and equipment in response to wildland fires. Because the new chemical facility, chemical injection station, Air Gaps Nos. 1 and 3, the southern terminus of the backup pipeline and water pipeline to the town of Sunol, and Staging Area A are in an area identified by CAL FIRE as a "High Fire Hazard Severity Zone" within a State Responsibility Area, construction activities in these areas would need to comply with the California Public Resources Code (PRC), beginning with Section 4427. This code includes: fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on any piece of construction equipment that uses an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas.

To reduce wildfire hazards during operation, new buildings constructed in a "High Fire Hazard Severity Zone" within a State Responsibility Area, which would include the new chemical facility, must also comply with minimum requirements set forth in Title 24 of the CCR, Division 1.5, Chapter 7, Subchapter 2, Article 5. These requirements are designed to reduce the volume and density of flammable vegetation by requiring project sponsors and work crews to:

- Dispose of flammable vegetation and fuels caused by site development and construction;

[7] Serpentine is a naturally occurring group of minerals that can be formed when ultramafic rocks are metamorphosed during uplift to the earth's surface. Serpentinite is a rock consisting of one or more serpentine minerals. This rock type is commonly associated with ultramatic rock along earthquake faults. Small amounts of chrysotile asbestos, a fibrous form of serpentine minerals, are common in serpentinite.
[8] Ultramafic rocks are formed in high-temperature environments well below the surface of the earth.
[9] Asbestos includes several types of naturally occurring fibrous materials found in many parts of California.

- Maintain a 30-foot firebreak around structures that is cleared of all flammable vegetation and other combustible growth; and
- Maintain a reduced fuel zone between 30 and 100 feet where the vertical and/or horizontal continuity of flammable and combustible vegetation is disrupted to reduce fire intensity, inhibit fire in the crown of the trees, slow the rate of fire spread, and create a safer environment for the firefighters suppressing a wildfire.

Uniform Fire Code

The Uniform Fire Code, Article 80, includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment:

- Separation of incompatible materials with a noncombustible partition;
- Spill control in all storage, handling, and dispensing areas; and
- Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

5.17.2.2 Local Regulations

Certified Unified Program Agency

The Alameda County Department of Environmental Health (ACDEH) Certified Unified Program Agency (CUPA) is the administrative agency that coordinates and enforces numerous local, state, and federal hazardous materials management and environmental protection programs in Alameda County. The CUPA administers the following programs:

- Hazardous Materials Business Program
- Hazardous Waste Generator Program
- Underground Storage Tank Program
- California Accidental Release Program
- Tiered Permitting Program
- Aboveground Storage Tank Program

Hazardous Materials Business Program

In accordance with the Hazardous Materials Business Program, businesses that use, handle, or store hazardous materials in excess of threshold quantities are required to submit a HMBP in accordance with community right-to-know laws. Threshold quantities are 500 pounds for solids, 55 gallons for liquids, and 200 cubic feet for compressed gases. The HMBP allows local agencies to plan appropriately for a chemical release, fire, or other incident. In Alameda County, the HMBP must include the following:

- An inventory of hazardous materials and wastes with specific quantity data, storage or containment descriptions, ingredients of mixtures, and physical and health hazard information;
- Site and facility layouts that must be coded for chemical storage areas and other facility safety information;
- Emergency response/contingency plan for a release or threatened release of hazardous materials; and
- An employee training plan.

In Alameda County, the HMBP is filed with and administered by the ACDEH, which ensures review by and distribution to other potentially affected agencies. The plan must be reviewed every three years to determine if any revision is needed, and must be updated within 30 days when there is a 100 percent or more increase in the quantity of previously disclosed hazardous materials, or when a facility begins storing a new hazardous material at or above threshold quantities. The SFPUC has prepared and implemented HMBPs for its facilities that use hazardous materials above threshold limits, including the existing chemical facility at the San Antonio Pump Station (SFPUC, 2007).

Facility Closure Requirements

For closure of facilities that handle hazardous materials, the ACDEH requires: facility operators to prepare a closure plan to ensure that hazardous materials used or stored in the facility are removed, disposed of, or reused in an appropriate manner; that the threat to public health or safety or to the environment from residual hazardous materials in the storage facility is eliminated or minimized; and that the need for future maintenance or monitoring is eliminated or minimized. Hazardous materials and associated equipment may not be removed from the facility until the ACDEH approves the closure plan. Within 30 days of completion of closure activities, the responsible party must submit a final closure report to the ACDEH documenting the actions taken during closure. The report must include receipts for chemical waste and equipment disposal/handling and the results of any soil or water sampling conducted during closure.

Alameda Watershed Management Plan

The Alameda WMP provides a policy framework for the SFPUC to make management decisions about the activities, practices, and procedures that are appropriate on SFPUC lands in the Alameda watershed. Several WMP actions are intended to reduce risks from wildfires and releases of hazardous materials, including:

- *Action haz1:* Develop hazardous chemical management procedures addressing the type, use, storage, transport, and disposal of hazardous chemicals and pesticides used in watershed activities (e.g., SFPUC operations, nurseries, quarries, pest management, easements and leases, etc.). Guidelines include:

A. Ensure proper material transport procedures (e.g., tie-down/attach material to vehicle).

B. Carry appropriate spill response chemicals when transporting hazardous chemicals and pesticides.

- *Action haz4*: Conduct regular servicing for the SFPUC vehicle fleet and equipment so that leaks/drips/spills of contaminants are minimized. Guidelines include the following:

A. Immediately report accidental spills of hazardous materials into surface waters to the Water Quality Bureau and the appropriate state agencies.

B. Require that buckets and absorbent materials be carried in all SFPUC vehicles in case of an accident or breakdown in which vehicle-related fluids are released.

C. Follow appropriate BMPs [best management practices] in Appendix C-6 of the WMP to minimize leaching of vehicle-related contaminants into the soil or groundwater from facilities.

D. For fire protection purposes, ensure that all vehicles and equipment are equipped with spark arrestors and that each vehicle carries fire suppression equipment.

- *Action haz6*: Identify high-risk spill potential areas and implement measures (e.g., fines, barricades, etc.) to reduce the risk of hazardous spills.

- *Action haz7*: Develop spill response and containment measures for SFPUC vehicles on the watershed. These measures should be coordinated with the overall Emergency Response Plan developed in Action saf7.

- *Action haz8:* Train staff members, as appropriate, in spill response and containment measures for SFPUC vehicles as well as for other types of spills on the watershed.

- *Action fir1*: Prior to authorizing the use of any vehicle or equipment on the watershed, require that SFPUC vehicle/equipment comply with the fire prevention regulations established by CDF for use in the watershed. Non-SFPUC equipment must be certified by CDF. All vehicles/equipment shall include spark arrestors and carry fire suppression equipment during fire season.

5.17.3 Impacts and Mitigation Measures

5.17.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to hazards and hazardous materials, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;

- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;

- For a project located within an area covered by an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;

- For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

- Expose people or structures to a significant risk of loss, injury, or death involving fires.

5.17.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for these topics for the reasons described below:

- *Use or Emission of Hazardous Materials within 0.25 Mile of a School*. Hazardous air emissions are toxic air contaminants identified by the California Air Resources Board and the Bay Area Air Quality Management District. Extremely hazardous materials are defined by the State of California in Section 25532 (2)(g) of the Health and Safety Code. During project construction, only common hazardous materials such as paints, solvents, cements, adhesives, and petroleum products (such as asphalt, oil, and fuel) would be used—none of which are considered extremely hazardous materials. During operation, the proposed project would not require the use or storage of any extremely hazardous materials or result in emissions of toxic air contaminants (see Section 5.8, Air Quality). Diesel particulate matter, a toxic air contaminant, would be emitted during construction along with very small amounts toxic air contaminants associated with the liquid propane gas-powered emergency generator for the new chemical facility. However, there are no schools within 0.25 mile of the SABPL project area. Therefore, the criterion related to the use or emission of hazardous materials within 0.25 mile of a school is not applicable to the proposed project and is not discussed further.

- *Safety Hazards in the Vicinity of a Public Airport or Private Airstrip*. The nearest public airport to the proposed project is the San Jose International Airport, which is approximately 14 miles to the southwest. The nearest private airstrips are the First Interstate Bank Operations Center Heliport and the Washington Hospital Heliport in Fremont, both of which are approximately 6 miles to the west. Because the project is more than 2 miles from a public airport or private airstrip and would not involve the construction of aboveground structures that could interfere with air traffic, the criterion related to safety hazards in the vicinity of an airport is not applicable to the proposed project and is not discussed further.

This analysis focuses on the potential to encounter hazardous substances in soil and groundwater during construction and is based on: (1) the regulatory database review performed to identify permitted hazardous materials uses and environmental cases that could affect project area soil and groundwater (EDR, 2009), and (2) surface soil sampling conducted by the SFPUC in 2010 (Baseline, 2010). The analysis also addresses the potential for the project to encounter hazardous materials during facility decommissioning; result in a release of hazardous materials from construction equipment; interfere with an adopted emergency response plan or emergency evacuation plan; create fire hazards; or result in a release of hazardous materials during operation. Each potential impact is assessed in terms of the applicable regulatory requirements, and mitigation measures are identified as appropriate.

5.17.3.3 Summary of Impacts

Table 5.17-1 lists the proposed project's hazards and hazardous materials impacts and significance determinations.

TABLE 5.17-1
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Significance Determinations
Impact HZ-1: Project construction could result in a substantial adverse effect related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	LSM
Impact HZ-2: Project construction could result in a substantial adverse effect related to accident conditions involving the release of hazardous construction chemicals into the environment.	LSM
Impact HZ-3: Project construction would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.	LS
Impact HZ-4: Project construction would not expose people or structures to a significant risk of property loss, injury, or death involving fires.	LS
Impact HZ-5: Project operations would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LS
Impact HZ-6: Project operations would not expose people or structures to a significant risk of property loss, injury, or death involving fires.	LS
Impact C-HZ: Construction of the proposed project would result in cumulatively considerable impacts related to hazards and hazardous materials.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.17.3.4 Construction Impacts and Mitigation Measures

Impact HZ-1: Project construction could result in a substantial adverse effect related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less than Significant with Mitigation)

Hazardous Materials in Soil or Groundwater

Any hazardous materials encountered in excavated soil or groundwater during project construction could result in a release to the environment, potentially exposing construction workers and the public to hazardous materials and chemical vapors. Depending on the nature and extent of any contamination encountered, adverse health effects and nuisance vapors could result if proper precautions are not taken. Contaminated soil and groundwater could also require disposal as a restricted or hazardous waste. Areas where releases of hazardous materials have occurred (including leaking fuel or chemical storage tanks) present the greatest potential for exposure to contaminated soil and groundwater during construction.

As discussed in Section 5.17.1.1, above, two environmental cases have been identified within the project area: the San Antonio Pump Station, where a previous release of diesel and waste oil affected soil quality; and the SMP-30 area, where a previous release of diesel affected soil quality. In addition, agricultural chemicals have historically been used in the project area and vicinity for nursery operations. The proposed backup pipeline and water pipeline to the town of Sunol would traverse the former Valley Crest Tree Company nursery site located east of Pit F6 and west of Calaveras Road, where fungicides, herbicides, and insecticides have been used. It is assumed that hazardous agricultural chemicals were also previously used at the former nursery site located within Staging Area C (see Figures 3-5 and 3-6 in Chapter 3, Project Description). In addition to construction staging, the former nursery site would also be utilized as a permanent spoils disposal site, meaning excess spoils generated during construction could be placed in an earthen berm at this site. Prior to construction mobilization, the former nursery site would be cleared of vegetation and debris, and graded to provide a relatively level surface for the movement of construction vehicles. Throughout construction, the site would be disturbed due to the movement of construction vehicles and equipment across the site and due to grading and earthwork associated with the earthen berm. As a result, the potential exists for workers to encounter hazardous materials in the soil during construction of the proposed project.

As discussed in Section 5.17.1.1, above, the results of soil sampling conducted by the SFPUC in 2010 at the former Valley Crest Tree Company nursery site and North Spoils Site indicate that soil excavated from these areas would not be classified as a hazardous waste and would not present an unacceptable health risk to construction workers. However, the concentrations of certain contaminants detected in soil at these sites are greater than the RWQCB residential screening levels; thus, soils removed from these sites might not be suitable for unrestricted offsite use, but could be disposed of at a permitted nonhazardous waste landfill. Because landfills have specific acceptance criteria, the acceptable disposal site would be determined based on the results of sampling performed to characterize the soil.

For the reasons described above, the impact related to reasonably foreseeable upset and/or accidental release of hazardous materials in soil during construction would be potentially significant. However, implementation of the mitigation measures described below would reduce this impact to a less-than-significant level.

Mitigation Measure M-HZ-1a: Evaluate Soil Quality.

Prior to project construction, the SFPUC shall perform a soil investigation to determine the presence of chemical residues within shallow soils in proposed construction work areas where sampling has not been previously conducted, and in the area south of the Alameda Siphons (in the vicinity of the San Antonio Pump Station, where a release of diesel and waste oil was previously remediated and concentrations of total oil and grease are reported to be ubiquitous). Samples shall be collected from surface soils (from the ground surface to 1.5 feet below the surface) in each of the proposed work areas and spoils sites that will be disturbed during project construction, and to the depth of the planned excavation in the vicinity of the San Antonio Pump Station. At a minimum, surface soil samples shall be analyzed for total copper, arsenic, lead, mercury, and organochlorine pesticides. To evaluate the potential for petroleum products and semivolatile organic compounds to be present, subsurface soil samples from the vicinity of the San Antonio Pump Station shall be analyzed for total petroleum hydrocarbons (as gasoline, diesel, and waste oil) and for semivolatile organic compounds. The results of the soil investigation shall be incorporated into the construction risk and spoils management plan prepared in accordance with Mitigation Measure M-HZ-1b below, to determine whether: specific soils management and disposal procedures for contaminated materials are required; excavated soils are suitable for reuse; and appropriate construction worker health and safety procedures for working with contaminated materials are required.

Mitigation Measure M-HZ-1b: Implement a Construction Risk and Spoils Management Plan.

The SFPUC shall require the construction contractor to prepare and implement a construction risk and spoils management plan (CRSMP), subject to review by the SFPUC, to address hazardous materials and other worker health and safety issues during construction of the proposed project. The CRSMP shall include all necessary procedures to ensure that excavated materials are stored, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The SFPUC shall ensure that the CRSMP includes the following information:

- Results of previous soil sampling within the construction work areas as well as sampling conducted in accordance with Mitigation Measure M-HZ-1a.

- A site-specific health and safety plan (HASP) prepared by a qualified environmental professional in accordance with federal OSHA regulations (29 CFR 1910.120) and Cal/OSHA regulations (8 CCR 5192). The HASP shall include all required measures to protect construction workers and the general public by including engineering controls, monitoring, and security measures to prevent unauthorized entry to the construction area and to reduce hazards outside of the construction area. If prescribed contaminant exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. Submission of the CRSMP to the SFPUC, or any review of the contractor’s CRSMP or HASP by the SFPUC, shall not be construed as approval of the adequacy of the contractor’s health and safety professional, the contractor’s HASP, or any safety measure taken in or near the construction site. The contractor shall be solely and fully responsible for compliance with all laws, rules, and regulations applicable to health and safety during the performance of the construction work.

- Step-by-step procedures for evaluation, handling, stockpiling, storage, testing, and disposal of excavated material, including criteria for: reuse within the pipeline trenches; placement at the North Spoils Site; temporary storage in SMP-30 Pit F6 or aggregate processing facility prior to processing for resale and reuse; and offsite disposal. All excavated materials shall be inspected prior to initial stockpiling, and spoils that are visibly stained and/or have a noticeable odor shall be stockpiled separately to minimize the amount of material that may require special handling. In addition, excavated materials shall be stored away from Alameda and San Antonio Creeks and other water features in accordance with the storm water pollution prevention plan (SWPPP) prepared in accordance with Mitigation Measure M-HY-1a (Preparation and Implementation of a SWPPP) and inspected for buried building materials, debris, and evidence of underground storage tanks; if identified, these materials shall be stockpiled separately and characterized in accordance with landfill disposal requirements. The chemical quality of the spoils intended for reuse shall be characterized, and spoils may be permanently placed at the North Spoils Site, or temporarily placed in Pit F6 or at the SMP-30 aggregate processing facility if they are found to meet the reuse criteria established in the CRSMP. Any spoils that do not meet the reuse criteria shall be segregated and disposed of at a permitted landfill facility.

- Procedures to be implemented if unknown subsurface conditions or contamination are encountered, such as previously unreported tanks, wells, or contaminated soils.

- Detailed control measures for use and storage of hazardous materials to prevent the release of pollutants to the environment, and emergency procedures for the containment and cleanup of accidental releases of hazardous materials to minimize the impacts of any such release. These procedures shall also include reporting requirements in the event of a reportable spill or other emergency incident. At a minimum, the SFPUC or its contractor shall notify applicable agencies in accordance with guidance from the California Office of Emergency Services as well as the Alameda County Water District.

- Fire-prevention measures, including cigarette smoking in disturbed areas only and disposing of cigarette butts in waste bins, parking in non-vegetated areas, and complying with the requirements of the California PRC, beginning with Section 4427.

- Required worker health and safety provisions for all workers potentially exposed to contaminated materials, in accordance with state and federal worker safety regulations, and designated personnel responsible for implementation of the CRSMP.

Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

These measures would address impacts related to upset and/or accidental release of hazardous materials in soil during construction by requiring sampling to characterize soil quality within the construction work areas; preparation and implementation of a CRSMP specifying necessary procedures to ensure that excavated materials are stored, managed, and disposed of in a manner that is protective of human health and the environment, and in accordance with applicable laws and regulations; and preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) specifying the measures that would be taken during construction to minimize increased sedimentation in downstream waterbodies. By reducing the potential for eroded soil to migrate to downstream waterbodies, the SWPPP would address water quality impacts related to contaminated soil. Therefore, this impact would be less than significant with mitigation.

Based on the lack of identified environmental cases with documented groundwater contamination within or in the vicinity of the project area, and the results of historical groundwater sampling in the SMP-30 area and in the vicinity of the San Antonio Pump Station (described in Section 5.17.1.1, above), there is a low potential to encounter contaminated groundwater that could expose workers or the public to adverse effects during groundwater dewatering. Thus, impacts related to exposure to hazardous materials in groundwater would be less than significant.

Hazardous Building Materials

The two quarry buildings constructed circa 1970 that would be demolished to facilitate construction of the cutoff wall could include hazardous building materials such as asbestos-containing materials, lead-based paint, PCB-containing electrical equipment, fluorescent light ballasts containing DEHP, and fluorescent light tubes containing mercury.

There are well-established regulatory requirements for asbestos abatement in structures, described above in Section 5.17.2.1. The required handling and disposal procedures, already established as a part of the permit review process, would ensure that any potential impacts due to disturbance of asbestos during demolition would be reduced to a less-than-significant level.

Cal/OSHA's Lead in Construction Standard (8 CCR Section 1532.1, described above in Section 5.17.2.1), addresses safe handling of lead-based paint during demolition. To determine if this standard would apply, the SFPUC would sample the paint to be disturbed to determine the lead content. If lead is detected, the construction contractor would be required to comply with the Lead in Construction Standard. This standard requires that the contractor develop and implement a lead compliance plan describing activities that could emit lead, methods that will be used to comply with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA would require 24-hour notification if more than 100 square feet of lead-based paint would be disturbed. Safe work practices employed in accordance with the Lead in Construction Standard would likely prevent the paint from becoming separated during demolition and contaminating surrounding soil. These regulations and the procedures, already established as a part of the permit review process, would ensure that any potential impacts due to disturbance of lead-based paint during demolition would be reduced to a less-than-significant level.

Impacts related to disposal of electrical equipment that could contain PCBs, fluorescent light ballasts that could contain DEHP or PCBs, and fluorescent light tubes that contain mercury would be significant because these materials are considered hazardous wastes. Implementation of Mitigation Measure M-HZ-1c would reduce this impact to a less-than-significant level.

> **Mitigation Measure M-HZ-1c: Hazardous Building Materials**
>
> Prior to demolishing the residential-style building and associated shed, the SFPUC shall ensure that a qualified environmental professional surveys the buildings for electrical equipment containing polychlorinated biphenyls (PCBs), fluorescent lights containing mercury vapors or fluorescent light ballasts containing PCBs or di (2-ethylhexyl) phthalate (DEHP). Any of these materials shall be removed and disposed of properly prior to demolition of the buildings.

Mitigation Measure M-HZ-1c would address impacts related to disposal of electrical equipment that could contain PCBs, fluorescent light ballasts that could contain DEHP or PCBs, and fluorescent light tubes that contain mercury by requiring legal disposal of electrical equipment containing PCBs as well as fluorescent light tubes and ballasts. Therefore, this impact would be less than significant with mitigation.

Water Treatment Chemicals and Lead-Based Paint

Under the proposed project, the existing chemical facility at the San Antonio Pump Station, which houses two 1,500-gallon sodium bisulfite tanks, would be decommissioned by removing the stored sodium bisulfite and the equipment in the building, including the tanks, pumps, and piping. The equipment would be removed and recycled or disposed of. During decommissioning, a release of sodium bisulfite could occur, and lead-based paint (which continues to be used in industrial applications today) could be encountered. In accordance with ACDEH requirements, the SFPUC would prepare a closure plan for the existing chemical facility to ensure that the sodium bisulfite used and stored in the facility is removed, disposed of, or reused in an appropriate manner; that the threat to public health and safety or to the environment from residual sodium bisulfite in the storage facility is eliminated or minimized; and that the need for future maintenance or monitoring is eliminated or minimized (see Section 5.17.2, above, for a description of closure plan requirements). In accordance with ACDEH requirements, the plan would include:

- A completed closure notification form
- General site and facility diagrams and maps
- A site history
- A history of soil and/or groundwater sampling conducted at the facility
- A summary of all facilities to be closed
- A description of the analytical testing that would be used to determine whether materials/residues are classified as hazardous waste or a potential contamination problem
- A statement that all receipts for hazardous waste disposal and/or hazardous materials sales will be kept, made available for inspection, and included in the final closure report
- A description of sampling that would be conducted to determine whether there are any residual impacts at the site due to past facility activities
- A description of activities that would be undertaken to remove, dispose of, neutralize, or reuse any hazardous or potentially hazardous items or areas
- Certification that disposal of hazardous wastes will meet federal and state requirements
- A spill contingency and safety plan

Within 30 days of completing closure activities, the SFPUC would submit a final closure report to the ACDEH documenting the actions taken during closure. The report would include receipts for chemical waste and equipment disposal/handling and the results of any soil or water sampling conducted during closure.

In the absence of proper abatement procedures, removal of the tanks, pumps, and piping could expose workers to lead-based paint, if present. Disturbed lead-based paint could contaminate the surrounding soil or water. However, Cal/OSHA's Lead in Construction Standard (8 CCR 1532.1), described in Section 5.17.2.1, above, addresses the safe handling of lead-based paint during demolition. To determine if this standard applies, the SFPUC would sample any paint to be disturbed to measure the lead content. If lead is detected, the construction contractor would be required to comply with the Lead in Construction Standard. This standard requires that the contractor develop and implement a lead compliance plan describing activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA would require 24-hour notification if more than 100 square feet of lead-based paint would be disturbed. Safe work practices employed in accordance with the Lead in Construction Standard would likely prevent the paint from being separated from material surfaces during demolition and contaminating surrounding soil or water.

Compliance with ACDEH requirements for closure of the existing chemical facility at the San Antonio Pump Station as well as the Lead in Construction Standard would ensure that impacts during decommissioning of the existing chemical facility related to a release of sodium bisulfite and disturbance of lead-based paint, if present, would be less than significant.

Impact HZ-2: Project construction could result in a substantial adverse effect related to accident conditions involving the release of hazardous construction chemicals into the environment. (Less than Significant with Mitigation)

It is expected that fuels, lubricants, paints, and solvents would be used during construction activities. Storage and use of hazardous materials at the construction sites and staging areas could result in the accidental release of small quantities of hazardous materials, which could degrade soil, groundwater, and surface water in Alameda or San Antonio Creeks. This impact would be potentially significant. As discussed under Impact HY-1 in Section 5.16, Hydrology and Water Quality, impacts related to a potential release of hazardous materials would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HY-1a (Preparation and Implementation of a SWPPP), which would require preparation of a SWPPP and implementation of best management practices (BMPs) to minimize the risk of a hazardous materials release during construction activities.

As part of standard procedures, the SFPUC would implement Alameda WMP actions that pertain to spills of hazardous materials. These include Action haz4, requiring regular servicing of fleet vehicles to minimize spills; Action haz6, requiring identification of high-risk spill areas; Action haz7, requiring development of spill response and containment measures for SFPUC vehicles; and Action haz8, requiring training of SFPUC staff members in spill response and containment measures. Even with these standard procedures, potential impacts on soil, groundwater, and surface water related to the accidental release of hazardous construction chemicals would be significant. However, implementation of Mitigation Measure M-HY-1a described below would reduce this impact to a less-than-significant level.

Mitigation Measure M-HY-1a: Preparation and Implementation of a SWPPP.

(See Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description.)

Mitigation Measure M-HY-1a would address impacts related to the accidental release of hazardous chemicals during project construction by requiring the SFPUC or its contractor to prepare a SWPPP. The SWPPP must detail the construction BMPs that would be implemented during construction to minimize the risk of hazardous materials releases and protect surface water bodies from contamination. Therefore, this impact would be less than significant with mitigation.

Impact HZ-3: Project construction would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

Alameda County does not have an adopted emergency response plan or emergency evacuation plan that encompasses the project area. However, the proposed project could interfere with emergency response services or an emergency evacuation if construction activities involved the complete or partial closure of roadways, otherwise restricted access for emergency response vehicles, or restricted access to critical facilities such as hospitals or fire stations. As discussed under Impact TR-2 in Section 5.6, Transportation and Circulation, no construction would be conducted within the travel lanes of Calaveras Road. Temporary closure of a single lane for up to approximately 10 minutes could be required periodically throughout construction to accommodate large construction vehicles accessing the project area; however, traffic flow along Calaveras Road would be maintained at all times, and construction vehicles would move to the side of the road to allow any emergency vehicles to pass. Therefore, emergency response vehicles would have continuous access to all public roadways. There are no critical emergency facilities (i.e., hospitals, fire departments, or police stations) in the immediate vicinity of the project area that could be adversely affected by these temporary delays, and access to private property (e.g., driveways and access roads to the SMP-30 area, Garcia residence, and SFPUC watershed keeper's residence) would be maintained at all times. Where the pipeline trenches for the backup pipeline and water pipeline to the town of Sunol would cross access roads and driveways along the west side of Calaveras Road, access would be maintained by placing steel plates over excavated areas as needed. In addition, project construction would not change traffic patterns such that emergency response activities would be disrupted. Therefore, the impact related to interference with an adopted emergency response plan or emergency evacuation plan during construction would be less than significant.

Impact HZ-4: Project construction would not expose people or structures to a significant risk of property loss, injury, or death involving fires. (Less than Significant)

The use of construction equipment and the temporary onsite storage of diesel fuel could pose a wildfire risk resulting in injury to workers or the public during construction in those portions of the project area mapped by CAL FIRE as a "High Fire Hazard Severity Zone" within a State Responsibility Area. The time of the greatest fire danger would be during the clearing phase, when people and machines are working in vegetated areas that can be highly flammable. If piled onsite, the cleared dry vegetation could also become a fire fuel.

Potential sources of ignition include equipment with internal combustion engines, gasoline-powered tools, and equipment or tools that produce a spark, fire, or flame. Such sources include sparks from blades or other metal parts scraping against rock, overheated brakes on wheeled equipment, heated emissions-control devices or vehicles, friction from worn or unaligned belts and drive chains, and burned-out bearings or bushings. Sparking as a result of scraping against rock is difficult to prevent. The other hazards result primarily from poor maintenance of the equipment. Smoking by construction personnel is also a potential source of ignition during construction.

Regulations governing the use of construction equipment in fire-prone areas (described in Section 5.17.2, above) are designed to minimize the risk of wildfires during construction activity. As discussed below, during times of high fire danger, enhanced fire prevention measures apply to all construction projects.

In accordance with the PRC, the construction contractor would be required to comply with the following requirements during construction of the new chemical facility, chemical injection station, Air Gaps Nos. 1 and 3, the southern terminus of the backup pipeline and water pipeline to the town of Sunol, and Staging Area A, which are located in a "High Fire Hazard Severity Zone" within a State Responsibility Area:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildfire (PRC Section 4442).
- Appropriate fire suppression equipment must be maintained during the highest fire danger period—from April 1 to December 1 (PRC Section 4428).
- During times of high fire danger, flammable materials must be moved to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire suppression equipment (PRC Section 4427).[10]
- During times of high fire danger, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (PRC Section 4431).

In addition, project construction activities would be conducted in accordance with Action fir1 of the Alameda WMP, which requires SFPUC vehicles and equipment to comply with the fire prevention regulations established by CAL FIRE for use in the watershed, and non-SFPUC equipment to be certified by CAL FIRE. This action also requires all vehicles and equipment to include spark arrestors and to carry fire suppression equipment during the fire season. Because the SFPUC's construction contractor(s) would implement the requirements of the PRC pertaining to fire safety in

[10] The SABPL project would not require a burning permit, but these restrictions apply when burning permits are required for projects that do involve burning.

a high fire severity area as well as the SFPUC fire safety provisions of the Alameda WMP, impacts related to the risk of fire during construction would be less than significant.

5.17.3.5 Operational Impacts and Mitigation Measures

Impact HZ-5: Project operations would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Less than Significant)

The SABPL project would include construction of a new chemical facility near the San Antonio Pump Station, just east of the existing chemical facility, to dechlorinate and pH-adjust planned and emergency discharges of Hetch Hetchy water. The new chemical facility would house one 8,000-gallon calcium thiosulfate chemical storage tank that would be used for dechlorination of Hetch Hetchy supplies prior to discharge to Pit F3-East. Underground chemical feed lines would be constructed to deliver fluoride for pH adjustment from the existing fluoride facility, located on the south end of the Sunol Valley Chloramination Facility, to the new chemical facility. The calcium thiosulfate and fluoride would be mixed at the new chemical facility and delivered via new underground feed lines to the chemical injection vault along the backup pipeline alignment. An accidental release of calcium thiosulfate or fluoride associated with transportation, storage, or use of these chemicals could potentially affect public health or the environment.

The calcium thiosulfate would be transported in compliance with federal and state regulations regarding the transport of hazardous materials, including the requirements of the California Highway Patrol and Caltrans. These requirements specify driver training requirements, load labeling procedures, and container specifications.

As described in Chapter 3, Section 3.5, Proposed Project Components, the new chemical facility would replace the existing chemical facility at the San Antonio Pump Station, which currently houses two 1,500-gallon sodium bisulfite tanks. The chemical storage and containment area and chemical loading area of the new chemical facility would be covered with a pre-engineered weather canopy with a metal roof to prevent contact with rainwater. Secondary containment would be provided for the calcium thiosulfate tank in the chemical storage and containment area, as required by Article 80 of the Uniform Fire Code. Sumps and sump pumps would be provided within the secondary containment to contain and remove any calcium thiosulfate spilled during operations, thereby preventing a release to the environment. Double-contained Schedule 80 PVC piping would be used for all chemical feed lines located outside of the new chemical facility building, and the lines would be sloped toward the secondary containment in the new facility so that any leak from feed lines would be collected at the sump in the secondary containment. Alarms would be activated in the event of a leak. Furthermore, the SFPUC would revise the existing HMBP for the existing chemical facility at the San Antonio Pump Station to account for the new building and changes in the storage of hazardous materials. The HMBP would include an emergency response/contingency plan specifying procedures to contain a release or threatened release of calcium thiosulfate or fluoride, as well as required training for employees involved in hazardous materials handling. The HMBP would also provide local agencies with the information they need to plan appropriately for a chemical release, fire, or other incident. In addition, the SFPUC would implement Action haz1 of the Alameda WMP, which requires the development of hazardous chemical management procedures addressing the type, use, storage, transport, and disposal of hazardous chemicals and pesticides used in watershed activities. With compliance with legal requirements for the transport of hazardous materials, implementation of the design features described above for the new chemical facility, revision of the legally required HMBP, and implementation of Alameda WMP Action haz1, impacts related to the transport, storage, and use of hazardous materials during project operations would be less than significant.

Impact HZ-6: Project operations would not expose people or structures to a significant risk of property loss, injury, or death involving fires. (Less than Significant)

As discussed in Impact HZ-4, the new chemical facility, chemical injection station, Air Gaps Nos. 1 and 3, the southern terminus of the backup pipeline, water pipeline to the town of Sunol, and Staging Area A are located in a "High Fire Hazard Severity Zone" within a State Responsibility Area. Of these, the new chemical facility is the only permanent structure that could contribute to wildfire hazards during operation. Without proper vegetation maintenance, construction of this new facility within a high fire hazard area could put the facility at risk for damage, potentially resulting in a release of calcium thiosulfate, which could also contribute to the spread of a wildfire. However, regulations governing vegetation maintenance in the vicinity of structures in fire-prone areas (described in Section 5.17.2, above) are designed to minimize the risk of wildfires. In accordance with Title 24 of the CCR, Division 1.5, Chapter 7, Subchapter 2, Article 5, the SFPUC would be required to dispose of flammable vegetation and fuels resulting from site development and construction; maintain a 30-foot firebreak around structures that is cleared of all flammable vegetation and other combustible growth; and maintain a reduced fuel zone between 30 and 100 feet where the vertical and/or horizontal continuity of flammable and combustible vegetation is disrupted in order to reduce fire intensity, inhibit fire in the crown of the trees, slow the rate of fire spread, and create a safer environment for the firefighters suppressing a wildfire. Compliance with these legal requirements would serve to limit the risk of wildfires during project operations such that this impact would be less than significant.

5.17.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Under Pumping Variant 1, the proposed Alameda Creek Pump Station, wet well, control building, and transfer pipeline would not be constructed. These facilities are not located within areas of suspected soil or groundwater contamination. Since all other proposed project facilities and improvements would be constructed under Pumping Variant 1, including those components located in areas of suspected soil contamination, the impact related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials in soil would be potentially significant and would require the same mitigation as the proposed project; however, the magnitude of this impact under this variant could be slightly lower since less soil excavation would be required. All other hazards and hazardous materials impacts related to construction of Pumping Variant 1 would be the same as those described for the proposed project. Operation of the new chemical facility under Pumping Variant 1 would be the same as under the proposed project, and operation of this variant would result in the same less-than-significant impacts related to risk of wildfires because the same facilities would be constructed in high fire hazard areas. Thus, construction and operation of Pumping Variant 1 would not change the conclusions or mitigation measures presented in Sections 5.17.3.4 and 5.17.3.5, above.

Pumping Variant 2

Since Pumping Variant 2 would include construct of all of the facilities and involve all of the same construction activities and equipment as the proposed project, all of the hazards and hazardous materials impacts related to construction and operation of Pumping Variant 2 would be the same as those described for the proposed project. Thus, construction and operation of Pumping Variant 2 would not change the analysis, conclusions, or mitigation measures presented in Sections 5.17.3.4 and 5.17.3.5, above.

5.17.3.7 Cumulative Impacts and Mitigation Measures

Impact C-HZ: Construction of the proposed project would result in cumulatively considerable impacts related to hazards and hazardous materials. (Less than Significant with Mitigation)

The geographic scope for cumulative impacts associated with hazards and hazardous materials encompasses the project area and general vicinity. With respect to hazardous materials in the environment, effects are generally limited to site-specific conditions.

Hazardous Materials in Soil

Cumulative impacts related to the presence of hazardous materials in the soil could occur if the SABPL project and cumulative projects would be implemented in the same area at the same time. Of the projects listed in Table 5.1-6, the construction footprints of the Upper Alameda Creek Filter Gallery (Filter Gallery) project and New Irvington Tunnel (NIT) project would overlap geographically with the SABPL project area, and these projects could have overlapping construction schedules.

As discussed in Impact HZ-1, the SABPL project would be constructed in an area that was previously used for agricultural purposes and where pesticides were likely used historically; therefore, residual hazardous materials could be present in site soils. Construction of the Filter Gallery project and NIT project would also include excavation within areas that have been previously used for agricultural purposes. Therefore, cumulative impacts related to the exposure of workers and the public to hazardous materials in soil during construction of the SABPL project and these other cumulative projects are considered potentially significant, and the SABPL project's contribution would be cumulatively considerable.

Construction of the SABPL project, as well as construction of other cumulative projects in the Sunol Valley, could result in the accidental release of hazardous construction chemicals into the environment. Cumulative impacts related to the accidental release of hazardous construction chemicals into the environment during construction of the SABPL project and these other cumulative projects are considered potentially significant, and the SABPL project's contribution would be cumulatively considerable.

The SABPL project's contribution to these cumulative impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-HZ-1a (Evaluate Soil Quality)**, **M-HZ-1b (Implement a Construction Risk and Spoils Management Plan)** (see Impact HZ-1, above, for descriptions), and **M-HY-1a (Preparation and Implementation of a SWPPP)** (see Impact HY-1 in Section 5.16, Hydrology and Water Quality, for description). The measures would require the SFPUC to conduct soil testing and implement a CRSMP. The CRSMP would specify the procedures that would be implemented to ensure that excavated materials are stored, managed, and disposed of in a manner that is protective of human health and the environment, and in accordance with applicable laws and regulations. The SWPPP would specify the water quality BMPs that would be implemented during project construction to minimize the risk of hazardous materials releases and protect surface water bodies from contamination. With implementation of these measures, the SABPL project's residual contribution to cumulative impacts related to the exposure of workers and the public to hazardous materials in the soil would not be cumulatively considerable (less than significant). Similarly, the SABPL project's residual contribution to cumulative impacts related to the accidental release of hazardous construction chemicals into the environment during construction would not be cumulatively considerable (less than significant).

Hazardous Building Materials

As discussed above under Impact HZ-1, the SABPL project would involve demolition of two quarry buildings that could contain hazardous building materials. The Calaveras Dam Replacement project would also involve demolition of structures that could contain hazardous building materials. Therefore, cumulative impacts related to disposal of electrical equipment that could contain PCBs, fluorescent light ballasts that could contain DEHP or PCBs, and fluorescent light tubes that contain mercury would be potentially significant, and the SABPL project's contribution would be cumulatively considerable.

The SABPL project's contribution to this cumulative impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-HZ-1c (Hazardous Building Materials)**, which would require the SFPUC to ensure that a qualified environmental professional survey the buildings for electrical equipment containing PCBs, fluorescent lights containing mercury vapors, and fluorescent light ballasts containing PCBs or DEHP, and properly remove and dispose of these materials prior to demolition of the buildings. With implementation of this measure, the SABPL project's residual contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Risk of Wildland Fires during Construction

Cumulative impacts related to the risk of fire during construction would occur where projects with overlapping schedules would be implemented in the same fire hazard area. As discussed in Impact HZ-3, the southern portion of the SABPL project area would be located in an area mapped by CAL FIRE as a "High Fire Hazard Severity Zone" within a State Responsibility Area, including the southern terminus of the backup pipeline, the new chemical facility, and Staging Area A. Cumulative projects that would also be conducted within moderate or high fire hazard severity zones and that have potentially overlapping construction schedules include the Filter Gallery project, NIT project, Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir (SVWTP Expansion) project, Calaveras Dam Replacement project, Geary Road Bridge project, and SMP-30 Quarry Expansion and Cutoff Wall (SMP-30 Expansion) project. Overlap of cumulative project construction activity in moderate to high fire hazard areas could result in an increased wildland fire risk, which would be a significant cumulative impact.

However, construction in those portions of the SABPL project area located within the high fire hazard zone would be subject to compliance with the SFPUC's Alameda WMP requirements and/or CAL FIRE's regulations described above in Section 5.17.2. Compliance with these requirements during construction would ensure that the SABPL project's contribution to cumulative impacts related to increased wildland fire hazards during construction would not be cumulatively considerable (less than significant).

Increased Use of Hazardous Materials during Operation

Cumulative impacts related to the use of hazardous materials would occur where projects would increase the use of hazardous materials in the same general area. The SABPL project would include the new use of calcium thiosulfate during operation (Impact HZ-4). Operation of the Filter Gallery project and SMP-30 Expansion project, and possibly other SFPUC projects in the vicinity, could also increase the use of hazardous materials (such as fuels and maintenance chemicals) in the same general area and could result in accidental releases of hazardous materials into the environment, which would be a potentially significant cumulative impact. However, as described above under Impact HZ-4 and in Chapter 3, Section 3.5, Proposed Project Components, the SABPL project would use secondary containment and other design features to prevent and contain an accidental release of hazardous materials and to prevent contact with stormwater runoff. With incorporation of these features, compliance with hazardous materials regulations (including updating the HMBP for the chemical facility at the San Antonio Pump Station), and compliance with the SFPUC's Alameda WMP requirements, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

Risk of Wildland Fires during Operation

Cumulative impacts related to the risk of fire during operation would occur where projects with permanent structures would be constructed in the same fire hazard area. As discussed in Impact

HZ-6, the southern portion of the SABPL project area would be located in an area mapped by CAL FIRE as a "High Fire Hazard Severity Zone" within a State Responsibility Area, and the new chemical facility would also be constructed within this area. Cumulative projects that also propose new permanent structures within moderate or high fire hazard severity zones include the NIT project, Alameda Siphons Seismic Reliability Upgrade project, and Calaveras Dam Replacement project. Construction of permanent structures in moderate to high fire hazard areas under these projects could result in an increased wildland fire risk during project operations, which would be a potentially significant cumulative impact. However, the new chemical facility constructed under the SABPL project would conform to the SFPUC's Alameda WMP requirements and/or Title 24 regulations described in Section 5.17.2, above. Compliance with these requirements would ensure that the SABPL project's contribution to cumulative impacts related to increased wildland fire hazards during operation would not be cumulatively considerable (less than significant).

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are the same as or very similar to those of the proposed project (refer to Section 5.17.3.6, Impact Analysis for Pumping Variants), the cumulative impact analysis and related conclusions provided above apply to both project variants.

5.17.4 References

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5.18 Mineral and Energy Resources

Mineral resources in the Sunol Valley include sand, clay, gravel, and rock products. In general, energy resources include fuel, electricity, and water that would be used during construction and operation of the project. This analysis evaluates the potential for the proposed San Antonio Backup Pipeline (SABPL) project to result in adverse effects on these resources.

5.18.1 Setting

5.18.1.1 Mineral Resources

Sand, clay, gravel, and rock products are the most important mineral resources in California and are actively mined or quarried in the Sunol Valley. In accordance with the Surface Mining and Reclamation Act of 1975 (discussed below in Section 5.18.2.2), the California Department of Conservation, Division of Mines and Geology, currently known as the California Geological Survey (CGS), has mapped nonfuel mineral resources of the state to show where economically significant mineral deposits are either present or likely to occur based on the best available scientific data. These resources have been mapped using the California Mineral Land Classification System, which includes the following four Mineral Resource Zones (MRZs):

- *MRZ-1*. Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- *MRZ-2*. Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
- *MRZ-3*. Areas containing mineral deposits, the significance of which cannot be evaluated.
- *MRZ-4*. Areas where available information is inadequate for assignment to any other zone.

The SABPL project is located within Sector E of the Alameda Creek–Sunol Valley Resource Area. This sector constitutes a total of 693 acres of the two-square-mile resource area and is mapped as MRZ-2 (CGS, 1987, 1996). This extensive sand and gravel deposit extends along Alameda Creek, from approximately 1.5 miles south of the Hetch Hetchy Aqueduct to the north beyond Interstate 680 (I-680). The CGS has estimated that Sector E contains 153 million tons of aggregate resources. These resources have been mined and processed in the Sunol Valley since the 1970s. Two operators currently mine these resources—Hanson Aggregates under Surface Mining Permit 24 (SMP-24), SMP-32, and SMP-33, and to Oliver De Silva, Inc. under SMP-30.

5.18.1.2 California's Electricity Supply

California's electricity is supplied by several sources, including natural gas (45.2 percent), coal (16.6 percent), large hydroelectric plants (11.7 percent), and nuclear (14.8 percent) (CEC, 2008a). The remaining 11.7 percent is supplied from renewable resources such as wind, solar, geothermal, biomass, and small hydroelectric facilities. Despite California's policies aimed at diversifying the state's electrical supply, dependence on natural gas is continuing to grow, from

41.5 percent in 2006 to 45.2 percent in 2007 (CEC, 2008b). In 2002, California imposed a requirement that corporations providing electricity must increase their procurement of eligible renewable energy resources by at least 1 percent per year such that 20 percent of their retail sales would be obtained from renewable resources by 2010 (Public Utilities Code, Section 399.15). In addition, the California Public Utilities Commission (CPUC) has asked publicly owned utilities to consider establishing similar targets.

5.18.1.3 Current Energy Providers

SFPUC Power Enterprise

The SFPUC Power Enterprise provides a long-term annual average of 1.7 billion kilowatt-hours (kWh) of electrical power, which is generated by the SFPUC's hydroelectric facilities in the Hetch Hetchy system. The system includes 150 miles of high-voltage transmission lines that carry this power from the SFPUC power generation facilities on the Tuolumne River to Newark, where the Hetch Hetchy power system is linked to California's electricity grid. The SFPUC Power Enterprise provides electricity to its facilities in the Sunol Valley as well as to all City and County of San Francisco (CCSF) facilities, San Francisco International Airport, Norris Industries (a federal facility), and the Modesto and Turlock Irrigation Districts (for municipal and agricultural water supply pumping). While the quantity of power produced exceeds San Francisco's municipal power needs on an annual basis, the CCSF must supplement its power sources to meet municipal demand and its contractual obligations during the summer and fall months, when power generation is reduced so that water can be stored. The Hetch Hetchy Water & Power (HHWP) Calaveras Substation provides electrical power to several SFPUC facilities in the Sunol Valley and owns several overhead electrical transmission and distribution lines in the project vicinity.

Pacific Gas and Electric Company

Pacific Gas and Electric Company (PG&E) provides natural gas and electricity to most of Northern California. PG&E produces and purchases electricity from both renewable and nonrenewable resources, with power derived from fossil fuels, nuclear, and hydroelectric sources. PG&E has an electricity generation portfolio that totals 6,000 megawatts. In 2006, this power consisted of 44 percent from hydroelectric sources, 54 percent from the Diablo Canyon nuclear plant, and 2 percent from fossil fuels. This portfolio supplied about 40 percent of the power provided by PG&E, with the remainder procured from outside sources or transmitted on behalf of the California Department of Water Resources (DWR). PG&E provides the SFPUC Power Enterprise with transmission and distribution services west of Newark, pursuant to an Interconnection Agreement regulated by the Federal Energy Regulatory Commission (PG&E, 2009).

5.18.1.4 Current Energy Use

The SFPUC's energy demand for operation of water facilities between Oakdale in the San Joaquin Valley and San Francisco is nearly 44 million kWh per year, which is less than 4 percent of the historical low production rate of the Hetch Hetchy system and less than 3 percent of the long-term annual average production rate (San Francisco Planning Department, 2008). The

SFPUC Power Enterprise provides power to SFPUC water supply facilities in the Sunol Valley from its hydroelectric facilities in the Hetch Hetchy system. The SFPUC's current power usage in the Sunol Valley region is 5,076,996.5 kWh per year, or less than 0.3 percent of the long-term annual average production rate of the Hetch Hetchy system. In 2007, the annual energy demand by PG&E customers in Alameda County was 11.9 billion kWh (CEC, 2009b).

5.18.2 Regulatory Framework

5.18.2.1 Federal Regulations

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards, and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the act, consumers and businesses can attain federal tax credits for: purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

5.18.2.2 State Regulations

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act (SMARA) of 1975 (found in Chapter 9, Division 2, Section 2710 et seq. of the Public Resources Code) requires the State Mining and Geology Board to adopt state policies for the reclamation of mined lands and the conservation of mineral resources. These policies are found in Title 24 of the California Code of Regulations, Division 2, Chapter 8, Subchapter 1.

In accordance with SMARA, the state has established the California Mineral Land Classification System to help identify and protect mineral resources in areas that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Protected mineral resources include construction materials, industrial and chemical mineral materials, metallic and rare minerals, and nonfluid mineral fuels.

2008 California Energy Action Plan Update

The *2008 Energy Action Plan Update* provides a status update to the *2005 Energy Action Plan II,* which is the State of California's principal energy planning and policy document (CPUC and CEC, 2008). The plan continues the goals of the original *Energy Action Plan*, describes a coordinated implementation plan for state energy policies, and identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. First-priority actions to address California's increasing energy demands are energy efficiency, demand response (i.e., reducing customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure), and the use of renewable sources of power. To the extent that these actions are unable to satisfy the increasing energy and capacity needs, the plan supports clean and efficient fossil-fired generation.

Building Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The current version of the standards was adopted in October 2005. The California Energy Commission (CEC) adopted an update in 2008, and the new standards became effective on January 1, 2010. California's building energy efficiency standards (along with those for energy-efficient appliances) have saved more than $56 billion in electricity and natural gas costs since 1978, and it is estimated that the standards will save an additional $23 billion by 2013 (CEC, 2009a).

5.18.2.3 Local Regulations

Alameda County General Code

The Alameda County General Code (Title 6, Health and Safety, Chapter 6.80, Surface Mining and Reclamation, Section 6.80.031, Mineral Resources Protection) encourages mining operators to extract minerals from compatible areas before encroaching into conflicting land uses. This section of the general code also protects mineral resource areas (classified by CGS or designated by the State Mining and Geology Board), as well as existing surface mining operations that remain in compliance with the provisions of this chapter, from intrusion by incompatible land uses that may impede or preclude mineral extraction or processing.

Section 6.80.031 of the Alameda County General Code also specifies that land use decisions within the county should be guided by information on the location of regionally significant mineral resources (as identified in the Alameda County General Plan, in accordance with the SMARA resource classification system). Section 6.80.031 requires decision-makers to consider and encourage conservation and potential development of the mineral resources within identified mineral resource areas. For development projects within an important mineral resource area, the County may require recordation of the presence of mineral resources on the property title. Prior to approving a land use that would otherwise be incompatible with mineral resource protection, conditions of approval may be applied to encroaching development projects to minimize potential conflicts.

San Francisco Plans

Sustainability Plan for San Francisco

The *Sustainability Plan for San Francisco* contains a set of general goals and specific objectives and actions for San Francisco to ensure that the city's current energy needs are met without sacrificing the ability of future generations to meet their own needs (SFDE, 1996). The major energy goals expressed in the plan are to reduce overall power use by maximizing energy efficiency; to maintain an energy supply based on renewable, environmentally sound resources; to eliminate climate-changing and ozone-depleting emissions and toxic contaminants associated with energy production and use; and to base energy decisions on the goal of creating a sustainable society.

Electricity Resource Plan

The *2002 Electricity Resource Plan* for San Francisco presented the initial action plan to meet the City's growth in demand for electricity using renewable energy resources. Goals included in the 2002 *Electricity Resource Plan* included the following: assure reliable power, maximize energy efficiency, develop renewable power, increase local control, affordable electric bills, improve air quality, support environmental justice and promote economic opportunities. One of the primary goals of the plan, to facilitate the shutdown of two of the City's older fossil-fueled power plants in Hunters Point and Potrero Hill, was achieved in 2006 and 2011, respectively (SFDE and SFPUC, 2002). The *2011 Updated Electricity Resource Plan* reaffirms the on-going goals of the 2002 *Electricity Resource Plan* and details the next steps to help San Francisco achieve its goal of generating all of its energy needs from renewable and zero-greenhouse gas (GHG) electric energy sources by 2030. The updated plan is designed to cover all electrical energy needs in San Francisco, not just the electrical energy needs provided by the SFPUC to serve municipal facilities. The updated plan proposes three broad strategies to reduce GHG emissions from electricity:

1. Empower San Francisco citizens and businesses to cost-effectively reduce GHG emissions associated with their own electric energy usage;

2. Increase the amount of zero-GHG electricity supplied to the City's customers from the wholesale energy market; and

3. Continue and expand SFPUC electric service to guarantee reliable, reasonably-priced, and environmentally sensitive service to its customers.

The 2011 *Updated Electricity Resource Plan* includes recommendations for implementation of each of these strategies.

5.18.3 Impacts and Mitigation Measures

5.18.3.1 Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to mineral and energy resources, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- 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;

- 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; or

- Encourage activities that resulted in the use of large amounts of fuel, water, or energy, or used these resources in a wasteful manner.

5.18.3.2 Approach to Analysis

This analysis evaluates the potential project-related loss of availability of locally or regionally important mineral resources based on mapping conducted under the CGS Mineral Land Classification System. Impacts related to the loss of mineral resources would be considered significant if construction activities would make known mineral resources temporarily unavailable, or if the construction of new facilities would make these resources permanently unavailable.

This analysis also considers the temporary use of energy resources (such as fuel, water, and electricity) during construction and the permanent use of energy resources during operation of the proposed project. The evaluation discusses how construction activities would be conducted to minimize the use of fuels, and estimates the amount of energy needed for operational purposes. Natural gas would not be required for project construction or operation and is therefore not discussed further in this section.

With respect to water usage, construction of the proposed facilities would require the use of some water for dust control and other purposes, but would not involve the wasteful use of water or encourage activities that use large amounts of water. Operation of the backup pipeline would not use water or encourage the wasteful use of water. Rather, the Alameda Creek Pump Station, transfer pipeline, and other related improvements would be used to conserve water that would otherwise be discharged to San Antonio Creek during planned (nonemergency) operations and certain emergency conditions. With implementation of the proposed project, water that is discharged out of the regional water system to Pit F3-East could be conserved by pumping the water to San Antonio Reservoir or to the Sunol Valley Water Treatment Plant (SVWTP) for subsequent treatment and delivery to customers. Because the SABPL project would not result in the wasteful use of water or encourage activities that use large amounts of water, water usage is not discussed further in this section.

5.18.3.3 Summary of Impacts

Table 5.18-1 lists the proposed project's mineral and energy resource impacts and significance determinations.

TABLE 5.18-1
SUMMARY OF IMPACTS – MINERAL AND ENERGY RESOURCES

Impacts	Significance Determinations
Impact ME-1: Project construction would not result in the temporary loss of availability of known mineral resources that would be of value to the region or residents of the state, or the temporary loss of availability of a locally important mineral resource recovery site.	LS
Impact ME-2: Project construction could result in substantial adverse effects related to the use of large amounts of fuel or energy, or the use of these resources in a wasteful manner.	LSM
Impact ME-3: Project implementation would not result in the permanent loss of availability of known mineral resources that would be of value to the region or residents of the state, or the permanent loss of availability of a locally important mineral resource recovery site.	LS

TABLE 5.18-1 (Continued)
SUMMARY OF IMPACTS – MINERAL AND ENERGY RESOURCES

Impacts	Significance Determinations
Impact ME-4: Project operations would not result in substantial adverse effects related to the long-term use of large amounts of fuel or energy, or the use of these resources in a wasteful manner.	LS
Impact C-ME: Project construction would result in a cumulatively considerable contribution to cumulative impacts related to mineral and energy resources.	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

5.18.3.4 Construction Impacts and Mitigation Measures

Impact ME-1: Project construction would not result in the temporary loss of availability of known mineral resources that would be of value to the region or residents of the state, or the temporary loss of availability of a locally important mineral resource recovery site. (Less than Significant)

Project construction activities would be conducted in an area mapped by the California Mineral Land Classification System as MRZ-2, which corresponds with areas where significant mineral deposits are believed to be present, as evidenced by the active quarries in the immediate project vicinity. Potential impacts associated with the temporary loss of known mineral resources could occur if the SABPL project impeded active mining operations such that mineral resources were temporarily unavailable.

Project construction activities would not impede or interfere with active mining operations. Construction in the SMP-30 area, including installation of the backup pipeline and water pipeline to the town of Sunol, would require the temporary placement of spoils in Pit F6 or at the SMP-30 aggregate processing facility until the spoils were sold by the quarry operators and reused. However, the SFPUC would coordinate with the quarry operators to ensure that spoils placement did not interfere with mining operations. In the SMP-24 area, construction activities associated with the proposed discharge facility at Pit F3-East, cutoff wall, Alameda Creek Pump Station, wet well, control building, and transfer pipeline would be conducted in an area where Hanson Aggregates has already completed active mining. Thus, project construction activities would not substantially interfere with active mining operations or result in the temporary or permanent loss of availability of mineral resources.

No new structures would be constructed within active mining areas. The proposed staging areas are not located within active mining areas and, with the exception of the former nursery site located within Staging Area C, all other staging areas would be returned to their original condition following construction; therefore, these areas could be accessed for mineral resource extraction in the future. As a result, impacts related to the temporary loss of availability of known mineral resources or a locally important mineral resource recovery site would be less than significant. Permanent impacts related to the placement of excess construction spoils in earthen berms at the North Spoils Site and at the former nursery site located within Staging Area C are analyzed below under Impact ME-3.

Impact ME-2: Project construction could result in substantial adverse effects related to the use of large amounts of fuel or energy, or the use these resources in a wasteful manner. (Less than Significant with Mitigation)

Construction of the SABPL project would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation, grading, demolition, and vehicle travel. Fuel for construction worker commute trips would be minor in comparison to the fuel used by construction equipment and for hauling. The precise amount of construction-related energy consumption is uncertain. Although fuels would only be used during construction of the SABPL project, excessive idling and other inefficient site operations could result in the wasteful use of fuels, which would constitute a potentially significant impact. However, implementation of SFPUC actions to reduce greenhouse gases (see Chapter 3, Section 3.6.7.2, SFPUC Standard Construction Measures and Greenhouse Gas Reduction Measures), as well as implementation of the mitigation measures described below, would reduce this impact to a less-than-significant level.

Mitigation Measure M-AQ-1a: BAAQMD Basic Construction Measures.

(See Impact AQ-1 in Section 5.8, Air Quality, for description.)

Mitigation Measure M-AQ-1b: BAAQMD Additional Construction Measures for NOx Reduction.

(See Impact AQ-1 in Section 5.8, Air Quality, for description.)

Mitigation Measure M-AQ-1a restricts idling of diesel-fueled commercial vehicles and requires that tune-ups be performed for all construction equipment, and Mitigation Measure M-AQ-1b encourages use of alternative fuels, engine retrofit technology, after-market products, add-on devices, and other devices to reduce NOx emissions, which in turn have the potential to reduce overall fuel consumption. Implementation of these measures would increase fuel efficiency and ensure that fuels would not be used in a wasteful manner. Therefore, this impact would be less than significant with mitigation.

5.18.3.5 Operational Impacts and Mitigation Measures

Impact ME-3: Project implementation would not result in the permanent loss of availability of known mineral resources that would be of value to the region or residents of the state, or the permanent loss of availability of a locally important mineral resource recovery site. (Less than Significant)

All of the proposed facilities would be constructed in an area mapped as MRZ-2, which corresponds with areas where significant mineral resources are believed to be present. The backup pipeline, water pipeline to the town of Sunol, and related pipeline improvements would generally be constructed along the same alignment as the existing San Antonio Pipeline along Calaveras Road. Mineral resources are already unavailable along this alignment due to the presence of the San Antonio Pipeline. Similarly, the new chemical facility would be constructed adjacent to the Alameda Siphons in an area where mineral resources are already unavailable due to the presence of SFPUC water supply facilities. The proposed facilities at SMP-24 quarry Pits F3-East and F3-West, including the Alameda Creek Pump Station, transfer pipeline, dewatering pipeline, cutoff wall, etc., would be located in an area where mineral extraction has been completed; thus, these facilities would not affect the availability of aggregate resources in this area. The proposed project would also not result in significant impacts related to the loss of availability of mineral resources in the two areas proposed a permanent spoils disposal areas: the North Spoils Site and the former nursery site located within Staging Area C. The proposed earthen berms at these two sites are not considered high-value improvements and could be relocated if marketable material was found to be located under these sites. Therefore, impacts related to a permanent loss of the availability of mineral resources or a locally important mineral resource recovery site would be less than significant.

Impact ME-4: Project operations would not result in substantial adverse effects related to the long-term use of large amounts of fuel or energy, or the use of these resources in a wasteful manner. (Less than Significant)

Discharges from the backup pipeline to Pit F3-East during planned maintenance activities would occur approximately two times per year and result in the discharge of up to 184 acre-feet of water to Pit F3-East. The frequency of emergency discharges from the backup pipeline to Pit F3-East is difficult to predict but is estimated at approximately once every two years. Up to 485 acre-feet of water would be discharged to Pit F3-East during emergency operations. The SABPL project would require an estimated total of 275,962 kWh of electrical power per year to operate the new chemical facility, discharge facility, dewatering facilities, and Alameda Creek Pump Station (SFPUC, 2011b), all of which would be provided by the HHWP Calaveras Substation. The greater portion of the SABPL project's electrical power consumption would be used to conserve water within the SFPUC regional water system that would otherwise be wasted. As described in Section 5.18.1.4, above, existing annual SFPUC energy usage in the Sunol Valley is 5,076,996.5 kWh, and the long-term annual average production of the Hetch Hetchy system is 1.7 billion kWh (San Francisco Planning

Department, 2008). Under the proposed project, the increased consumption of energy produced by the Hetch Hetchy system represents approximately 5 percent of the existing annual energy consumption in the Sunol Valley, and approximately 0.016 percent of the total energy produced by the Hetch Hetchy system. Increased energy consumption under the proposed project would constitute a very small portion of the total energy production for the Hetch Hetchy system. Further, the SFPUC has designed the proposed SABPL project facilities in accordance with the 2008 Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in the California Code of Regulations, Title 24, Part 6, as appropriate; compliance with these standards for the heating, ventilation, air conditioning, and lighting systems in the new chemical facility and the electrical control building for the discharge facility at Pit F3-East would help ensure that the energy needed to operate these systems would not be used in a wasteful manner. Because the design of SABPL project facilities would comply with the 2008 Energy Efficiency Standards, and because the total amount of energy used by the project would be 0.016 percent of the total energy produced by the Hetch Hetchy system and would be used to conserve water that would otherwise be wasted, the SABPL project would not use large amounts of energy or use the energy in a wasteful manner, and this impact would be less than significant.

5.18.3.6 Impact Analysis for Pumping Variants

Pumping Variant 1

Under Pumping Variant 1, the proposed Alameda Creek Pump Station, wet well, control building, transfer pipeline, electrical transformer, and new overhead powerline between the HHWP Calaveras Substation and the Alameda Creek Pump Station would not be constructed. Instead, two submersible high-pressure pumps would be installed adjacent to the proposed discharge facility at Pit F3-East. These pumps would be used to pump the discharged water from quarry Pit F3-East directly to San Antonio Reservoir or the SVWTP employing a one-step pumping process that relies on the proposed dewatering pipeline and other existing pipelines for conveyance. (The proposed project would use a two-step pumping process to first pump water from Pits F3-East and F3-West to the Alameda Creek Pump Station, and then pump the water to San Antonio Reservoir or the SVWTP.) Unlike the proposed project, Pit F3-West would not be dewatered under Pumping Variant 1.

Since Pumping Variant 1 would not construct the Alameda Creek Pump Station, wet well, control building, transfer pipeline, electrical transformer, and new overhead powerline, construction-related fuel consumption under this variant would be somewhat less but similar to that of the proposed project.

Unlike the proposed project, there would be no consumption of energy associated with operation of pumps on floating platforms to dewater Pit F3-West. Pumping Variant 1 would require an estimated 238,233 kWh per year to operate the new chemical facility, discharge facility, and submersible pumps, resulting in a lower operational energy demand when compared to the proposed project, which is estimated to require 275,962 kWh. As with the proposed project, the

HHWP Calaveras Substation would provide all of the electrical power for Pumping Variant 1. The increase in energy consumption associated with Pumping Variant 1 represents approximately 5 percent of the existing energy usage in the Sunol Valley, and approximately 0.014 percent of the total energy produced by the Hetch Hetchy system. Like the proposed project, this variant would not use a large amount of energy or use the energy in a wasteful manner because the total amount of energy used under this variant would represent approximately 0.014 percent of the total energy produced by the Hetch Hetchy system, the energy would be used to conserve water that would otherwise be wasted, and the proposed project facilities would be designed in accordance with the 2008 Energy Efficiency Standards. Therefore, impacts related to the use of large amounts of energy and the wasteful use of energy during project operations would be less than those described in Section 5.18.3.5 for the proposed project. This impact was determined to be less than significant for the proposed project, and the significance determination would not change with implementation of Pumping Variant 1.

Since neither the proposed project nor Pumping Variant 1 would involve the construction of facilities in active mining areas or in mineral resource areas that would otherwise be accessible for mining, all other mineral resources impacts would be the same as those described for the proposed project. Thus, overall, implementation of this variant would not change the analysis, conclusions, or mitigation measures identified in Sections 5.18.3.4 and 5.18.3.5, above.

Pumping Variant 2

Under Pumping Variant 2, one submersible high-pressure pump and one submersible low-pressure pump would be installed adjacent to the new discharge facility at Pit F3-East. Pumping Variant 2 would provide the SFPUC with the operational flexibility to recover the water that is discharged from the backup pipeline using either a one-step or two-step pumping process. The submersible high-pressure pump could be used to pump the discharged water directly out of Pit F3-East to San Antonio Reservoir or the SVWTP (one-step pumping). Alternately, as with the proposed project, the submersible low-pressure pump could be used to pump the discharged water from the quarry pits to the Alameda Creek Pump Station, where the water would then be pumped to San Antonio Reservoir or the SVWTP (two-step pumping). Like the proposed project, Pumping Variant 2 would also include flexible hoses and portable pumps mounted on floating platforms in Pit F3-West to enable the SFPUC to pump water from Pit F3-West (if water seeps from Pit F3-East to F3-West) to the Alameda Creek Pump Station after a discharge from the backup pipeline.

Since Pumping Variant 2 would construct nearly identical facilities as the proposed project, construction-related fuel consumption under this variant would be the same as that for the proposed project.

The energy requirements for Pumping Variant 2 were calculated based on the assumption that project operations would be split between one-step pumping and two-step pumping, which would result in an estimated average annual energy consumption of 257,098 kWh, compared to 275,962 kWh under the proposed project. Like the proposed project and Pumping Variant 1, Pumping Variant 2 would not use a large amount of energy or use the energy in a wasteful manner. The average annual energy consumption under this variant would represent

0.015 percent of the total energy produced by the Hetch Hetchy system and 5 percent of the total energy used by the SFPUC in the Sunol Valley. Because the energy would be used to conserve water that would otherwise be wasted, and project facilities would be designed in accordance with the 2008 Energy Efficiency Standards, impacts related to the use of large amounts of energy and the wasteful use of energy during operations would be the same as those described in Section 5.18.3.5 for the proposed project.

Since neither the proposed project nor Pumping Variant 2 would involve the construction of facilities in active mining areas or in mineral resource areas that would otherwise be accessible for mining, all mineral resources impacts would be the same as those described for the proposed project. Thus, overall, implementation of this variant would not change the analysis, conclusions, or mitigation measures identified in Sections 5.18.3.4 and 5.18.3.5, above.

5.18.3.7 Cumulative Impacts and Mitigation Measures

Impact C-ME: Project construction would result in a cumulatively considerable contribution to cumulative impacts related to mineral and energy resources. (Less than Significant with Mitigation)

The geographic scope for potential cumulative mineral and energy resources impacts consists of the project area and general vicinity (for mineral resources) and the broader region (for energy resources).

Loss of Availability of Known Mineral Resources

As described in Impacts ME-1 and ME-3, all of the proposed facilities and improvements would be constructed in an area mapped as MRZ-2 and could be underlain by aggregate resources. Several of the cumulative projects listed in Table 5.6-1 would also be located in areas designated as MRZ-2, including the SFPUC's Alameda Siphons Seismic Reliability Upgrade, New Irvington Tunnel, San Antonio Pump Station Upgrade, SVWTP Expansion and Treated Water Reservoir (SVWTP Expansion), and Upper Alameda Creek Filter Gallery (Filter Gallery) projects. All of these projects would include construction within an area that contains known aggregate resources, which could result in a significant cumulative impact. However, as described above in Impacts ME-1 and ME-3, the SABPL project would not result in the construction of new structures in active mining areas or in areas that would otherwise be available for mining. Therefore, the project's contribution to cumulative impacts related to the loss of availability of mineral resources would not be cumulatively considerable (less than significant).

Construction Use of Energy

The proposed project (see Impact ME-2) and all of the cumulative projects listed in Table 5.1.6 would use energy during construction, which could result in a significant cumulative impact. The SABPL project's contribution to this cumulative impact would be cumulatively considerable.

However, the SABPL project's contribution to this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures)** and **M-AQ-1b (BAAQMD Additional Construction Measures for NOx Reduction)** (see Impact AQ-1 in Section 5.8, Air Quality, for descriptions). These mitigation measures address the wasteful consumption of fuels during project construction and would limit the SABPL project's impacts related to energy use during construction. Therefore, the project's contribution would not be cumulatively considerable (less than significant).

Long-Term Energy Use during Operation

Operation of the SABPL project would require a total of 275,962 kWh of energy per year (see Impact ME-4). Many of the projects listed in Table 5.1-6, such as the SFPUC Expansion project and SFPUC Filter Gallery project, would also use energy for operations, which could result in a significant cumulative impact related to the use of large amounts of energy or wasteful use of this energy. However, the operational energy requirements for the SABPL project represent 0.016 percent of the total energy produced by the Hetch Hetchy system. This energy would be used to conserve water that would otherwise be wasted. Further, the SABPL project's facility improvements would comply with the 2008 Energy Efficiency Standards. Therefore, the SABPL project's residual contribution to cumulative impacts related to energy usage during operation would not be cumulatively considerable (less than significant).

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would result in impacts that are the same as or very similar to those of the proposed project (refer to Section 5.18.3.6, Impact Analysis for Pumping Variants), the cumulative impact analysis and related conclusions provided above apply to both project variants.

5.18.4 References

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5.19 Agriculture and Forest Resources

This section describes existing agricultural and forest resources in the vicinity of the proposed San Antonio Backup Pipeline (SABPL) project and analyzes the potential for project implementation to adversely affect such resources through displacement or conversion of these uses, or through project construction and operation.

5.19.1 Setting

The SABPL project is located entirely within SFPUC Alameda watershed lands in the Sunol Valley of unincorporated Alameda County. In the East County Area Plan of the Alameda County General Plan, SFPUC Alameda watershed lands are zoned as Resource Management, Water Management, and Parklands. The SABPL project area is designated as Water Management (Alameda County, 2002).

As described in Section 5.2, Land Use, existing land uses in the vicinity of the proposed project include gravel mining operations, commercial nurseries, grazing, regional open space, and SFPUC water supply facilities. Two former nursery sites are located in the project area: one is located between Pit F6 and Calaveras Road (this former nursery is visible on the aerial photo base map in Figure 3-3); and the other is located within Staging Area C and is also a proposed permanent spoils disposal site, meaning excess spoils generated during construction could be placed in a permanent earthen berm at this site (this former nursery is visible on the aerial photo base map in Figures 3-4 through 3-6). These nurseries were vacated in 2009 and 2010, respectively.

5.19.1.1 Agricultural Resources

Farmland Classifications

Farmland Mapping and Monitoring Program

The California Department of Conservation (CDC), Division of Land Resource Protection, maps important farmlands throughout California. Important farmlands are classified into the categories listed below on the basis of soil conditions (their suitability for agriculture) and current land use.

- *Prime Farmland*. This category represents farmland with the best combination of physical and chemical characteristics for long-term agricultural production. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed. In addition, the land must have been used for irrigated agricultural production in the last four years to qualify under this category.

- *Farmland of Statewide Importance*. Farmland of Statewide Importance is similar to Prime Farmland in that it has a good combination of physical and chemical characteristics for crop production, but with minor shortcomings, such as greater slopes and less ability to store moisture.

- *Unique Farmland*. This land does not meet the criteria for Prime Farmland or Farmland of Statewide Importance but is land that has been used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards, as found in some climatic zones of California. Unique Farmland must have been cropped at some time during the four years prior to the mapping date.

- Farmland of Local Importance. This category applies to land of importance to the local agricultural economy as determined by the county. This land is either currently producing crops or has the capability of production, but does not meet the criteria of the preceding categories.
- Grazing Land. Grazing Land is land on which the vegetation is suited to the grazing of livestock.
- Urban and Built-up Land. This land is occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures on a 10-acre parcel. This land generally provides unfavorable conditions for agricultural production.
- Other Land. This is land that is not included in any of the categories above and may include brush, timber, wetlands, confined livestock areas, strip mines, and gravel pits, among other land types.

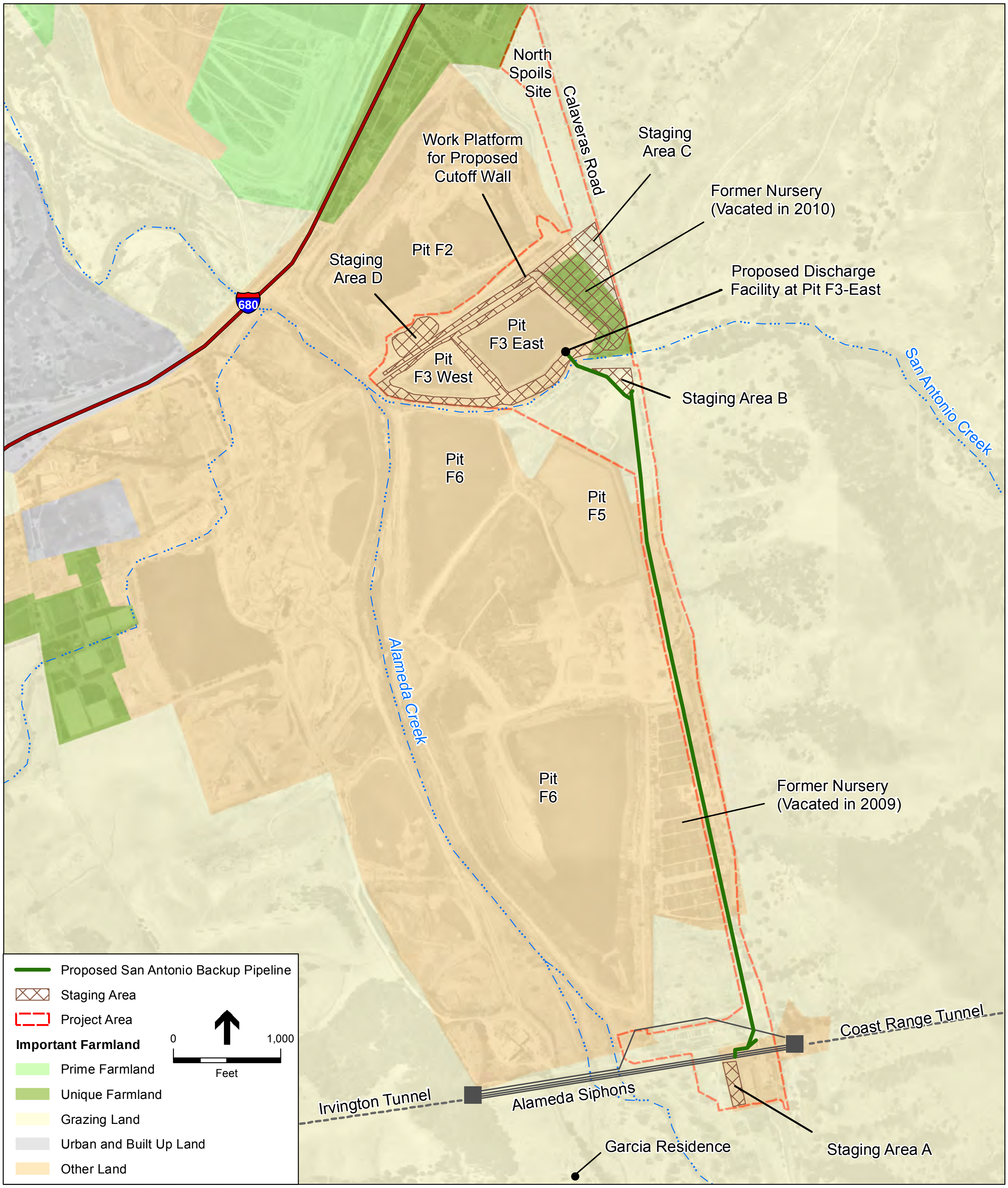
Farmland Designations in the Project Area

As shown in **Figure 5.19-1**, farmland mapping designations in the vicinity of the SABPL project consist of Grazing Land, Other Land, and Unique Farmland. The Grazing Land designation is based on the underlying soil types; the Other Land and Unique Farmland designations are based in part on historical and current land uses. The farmland mapping system designates the former nursery site located within Staging Area C as Unique Farmland, in part because this site has supported nursery operations within the last four years. The North Spoils Site and a portion of the project area located on the west side of Calaveras Road, just south of the San Antonio Creek crossing and encompassing the Hetch Hetchy Water & Power Calaveras Substation, are mapped as Grazing Land. The remainder of the project area is mapped as Other Land, including the former nursery site located between Pit F6 and Calaveras Road. The Other Land mapping coincides with the boundaries of the gravel quarries (CDC, 2011).

Williamson Act Program

As described below in Section 5.19.2.2, the California Land Conservation Act (commonly referred to as the Williamson Act) is the state's primary program for the conservation of private land for agricultural and open space uses. The CDC prepares countywide maps of lands enrolled in Williamson Act contracts and classifies them into the categories described below.

- Prime Agricultural Land. This category represents the state's highest quality agricultural land. Land under this category is typically used for the production of irrigated crops or to support livestock.
- Non-prime Agricultural Land. This category represents Open Space Land of Statewide Significance as defined under the California Open Space Subvention Act. Most land under this category is in agricultural uses such as grazing or non-irrigated crops, and may also include other open space uses that are compatible with agriculture and consistent with local general plans.
- Land in Non-renewal. This category represents land under contracts that are being terminated at the option of the landowner or local government.



SOURCE:CDC, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 5.19-1

Farmland Mapping Designations

Williamson Act Contracts in the Project Area

The grazing land on the private ranch parcel (referred to as the Garcia residence), located south of the Alameda West Portal and southwest of the project area, is under a Williamson Act contract and is designated as Non-prime Agricultural Land (APN 096-08080-004-00). No other lands in the immediate project vicinity are enrolled in the Williamson Act program (CDC, 2009).

5.19.1.2 Forest Resources

Section 12220(g) of the California Public Resources Code defines forest land as "land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." Timberland is land (other than land owned by the federal government and land designated by the California Board of Forestry and Fire Protection as experimental forest land) that is available for and capable of growing a crop of trees of any commercial species used to produce lumber and other forest products. There are no timber harvesting activities on SFPUC Alameda watershed lands. The former nursery sites adjacent to and within the project area are not used to grow trees that produce lumber or forest products. Although portions of the Alameda watershed meet the definition of forest land as provided above, the SABPL project is located in active quarry areas, and there is no forest land within the project area.

5.19.2 Regulatory Framework

5.19.2.1 Federal Regulations

The Farmland Protection and Policy Act requires an evaluation of the relative value of farmland that could be affected by decisions sponsored in whole or part by the federal government. The Farmland Protection and Policy Act does not apply to the proposed project since the project is not a federal government action or program.

5.19.2.2 State Regulations

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is the state's primary program aimed at conserving private land for agricultural and open space use. It is a voluntary, locally administered program that offers reduced property taxes on lands whose owners place enforceable restrictions on land use through contracts between the individual landowners and local governments.

As indicated above in Section 5.19.1.1, the closest land to the project area that is under a Williamson Act contract is the grazing land on the Garcia residence parcel, located south of the Alameda West Portal. As this parcel is outside of the project area, land use restrictions imposed by the Williamson Act are not applicable to the proposed project.

5.19.2.3 Local Regulations

Alameda County General Plan – East County Area Plan

The East County Area Plan of the Alameda County General Plan governs land use planning for eastern Alameda County. As discussed in Section 5.19.1, above, land use in the project area is designated as Water Management. Although the Water Management category allows for land uses that are compatible with this designation, the project area is not zoned for agricultural or forestry uses (Alameda County, 2002).

5.19.3 Impacts and Mitigation Measures

5.19.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to agriculture and forest resources, but generally considers that implementation of the proposed project would have a significant impact if it were to:

- 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;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]) or timberland (as defined by Public Resources Code Section 4526);
- Result in the loss of forest land or the conversion of forest land to non-forest use; or
- Involve other changes in the existing environment, which, due to their location or nature, could result in the conversion of farmland to non-agricultural use or forest land to non-forest use.

5.19.3.2 Approach to Analysis

Due to the nature of the proposed project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for these topics for the reasons described below:

> *Conflict with Zoning for Agricultural Use or with a Williamson Act Contract*. The proposed project is not located on land zoned for agricultural uses, and the project area is not subject to a Williamson Act contract. Therefore, the second significance criterion listed above is not applicable to the proposed project and is not discussed further in this EIR.
>
> *Conflict with Existing Zoning for Forest Land, or Result in the Loss of Forest Land or the Conversion of Forest Land to Non-forest Use*. There is no forest land in the project area; thus, implementation and operation of the SABPL project would not conflict with zoning regulations for forest land, result in the loss of forest land, or result in the conversion of

forest land to non-forest use. Therefore, the third and fourth significance criteria listed above are not applicable to the proposed project and are not discussed further in this EIR.

Involve Other Changes in the Existing Environment, which, due to their Location or Nature, Could Result in the Conversion of Farmland to Non-agricultural Use or Forest Land to Non-forest Use. The proposed project would not result in changes to the existing environment (for instance, by creating conflicting land uses or operational activities) that could indirectly cause the conversion of farmland to non-agricultural use or forest land to non-forest use. Thus, the fifth criterion listed above is not applicable to the proposed project and is not discussed further in this EIR.

To determine the potential for temporary and permanent impacts on agricultural resources, this evaluation compared the surface areas that would be disturbed during project construction and staging activities to the CDC's farmland mapping designations. Areas mapped as Grazing Land (i.e., the North Spoils Site) or Other Land (i.e., Pits F3-East and F3-West and a portion of the alignment for the backup pipeline and 12-inch-diameter water pipeline to the town of Sunol) are not addressed in this analysis because these designations do not relate to the significance criteria described above.

5.19.3.3 Summary of Impacts

Table 5.19-1 lists the proposed project's impacts and significance determinations related to agriculture and forest resources.

TABLE 5.19-1
SUMMARY OF IMPACTS – AGRICULTURE AND FOREST RESOURCES

Impacts	Significance Determinations
Impact AG-1: Implementation of the proposed project would result in the conversion of Unique Farmland, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.	LSM
Impact C-AG: Implementation of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to the conversion of Unique Farmland to non-agricultural uses.	LSM

LSM = Less than Significant impact with Mitigation

5.19.3.4 Impacts and Mitigation Measures

For the impacts addressed below, the factor determining significance is site selection rather than any specific construction or operational activities (i.e., whether the proposed project is sited on unique farmland determines impact significance); consequently, while other sections in Chapter 5 distinguish between construction and operational impacts, this section does not.

Impact AG-1: Implementation of the proposed project would result in the conversion of Unique Farmland, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. (Less than Significant with Mitigation)

The former nursery site located within Staging Area C is designated as Unique Farmland. This 5-acre site would be used for construction staging during the initial phases of construction; however, during the later phases of construction, the SFPUC also proposes to use this site for permanent spoils disposal by placing excess spoils generated during construction in an earthen berm at this site. Thus, project implementation would preclude future use of this site for nursery operations. Therefore, project construction would result in the permanent conversion of Unique Farmland to non-agricultural use, and impacts at this former nursery site would be significant. However, this impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-AG-1.

Mitigation Measure M-AG-1: Compensation for Loss of Unique Farmland.

The SFPUC shall compensate for the conversion of Unique Farmland to non-agricultural use as follows:

- As compensation for the permanent loss of Unique Farmland at the former nursery site, the SFPUC shall dedicate a permanent agricultural conservation easement equal in area to the Unique Farmland converted to non-agricultural use.
- As an alternative to the permanent agricultural easement described above, the SFPUC shall contribute funds to a local agricultural land conservancy to establish a conservation easement to protect an equivalent acreage of similarly valued land in the area.

Should the Farmland Mapping and Monitoring Program remove the Unique Farmland designation from the former nursery site before the earthen berm is constructed, this mitigation measure would no longer be warranted and would not be required.

Mitigation Measure M-AG-1 would address the impact on Unique Farmland by requiring the SFPUC to provide compensation for any Unique Farmland converted to non-agricultural uses, either by dedicating a permanent agricultural conservation easement equal in area to the Unique Farmland lost, or by contributing funds to a local agricultural land conservancy to establish a conservation easement to protect an equivalent acreage. Therefore, this impact would be less than significant with mitigation.

The Farmland Mapping and Monitoring Program has mapped the remainder of the project area as Other Land and Grazing Land. Nursery operations at the former nursery site located between Pit F6 and Calaveras Road ceased in 2009. This former nursery site is designated by the CDC as Other Land; thus, no impact would result.

5.19.3.5 Impact Analysis for Pumping Variants

Pumping Variants 1 and 2

Like the proposed project, under both Pumping Variants 1 and 2, construction contractors would utilize the former nursery site located within Staging Area C for staging during the earlier phases of construction; during the later phase of construction, excess spoils would be permanently placed in an earthen berm at this site. Thus, as with the proposed project, implementation of either Pumping Variant 1 or Pumping Variant 2 would preclude nursery operations at this former nursery site following construction, thereby resulting in the permanent conversion of Unique Farmland to non-agricultural use, a significant impact. Potential impacts on agriculture associated with Pumping Variants 1 and 2 would be the same as those described for the proposed project. Thus, implementation of either pumping variant would not change the analysis or conclusions presented in Section 5.19.3.4, above.

5.19.3.6 Cumulative Impacts and Mitigation Measures

Impact C-AG: Implementation of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to the conversion of Unique Farmland to non-agricultural uses. (Less than Significant with Mitigation)

The geographic scope for cumulative impacts on agricultural resources consists of areas of Unique Farmland within the Sunol Valley.

Cumulative impacts on agricultural resources could result if the SABPL project and other cumulative projects in the Sunol Valley caused the permanent conversion of Unique Farmland to non-agricultural use, either through direct changes in land use or through permanent changes from existing conditions. As discussed in Impact AG-1, excess spoils generated during construction of the SABPL project would be placed in a permanent earthen berm at the former nursery site located within Staging Area C. Thus, implementation of the SABPL project would result in the permanent conversion of Unique Farmland to non-agricultural uses at this site. This former nursery site is also located within the SFPUC Upper Alameda Creek Filter Gallery (Filter Gallery) project area, and the Filter Gallery project would also utilize this site for the permanent placement of spoils. Cumulative impacts related to the permanent conversion of Unique Farmland to non-agricultural use during construction of the SABPL project and Filter Gallery project would be significant, and the SABPL project's contribution to this cumulative impact would be cumulatively considerable.

As described in Impact AG-1, the SABPL project's impact related to the permanent conversion of Unique Farmland to non-agricultural use would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-AG-1 (Compensation for Loss of Unique Farmland)** (see Impact AG-1, above, for description). Therefore, with the implementation of mitigation, the SABPL project's contribution to this cumulative impact would not be cumulatively considerable (less than significant).

The SMP-30 Quarry Expansion and Cutoff Wall project would expand quarrying operations into a portion of the former nursery property located between Pit F6 and Calaveras Road; however, this area is designated as Other Land. Therefore, cumulative impacts related to the conversion of Unique Farmland to non-agricultural uses would be less than significant.

Implementation of the proposed project would not contribute to any cumulative impacts on forest resources because the project would not result in project-specific impacts on forest resources.

Cumulative Impacts of Pumping Variants

Because implementation of either Pumping Variant 1 or Pumping Variant 2 would have the same effects on agriculture as the proposed project, the cumulative impact analysis and associated conclusions provided above apply to both project variants.

5.19.4 References

Alameda County, *East County Area Plan, A Portion of the Alameda County General Plan, Volume I: Goals, Policies, and Programs*. May 2002.

California Department of Conservation (CDC), Division of Land Resource Protection, Alameda County Williamson Act Lands 2009 – Lands Enrolled in Williamson Act and Farmland Security Zone Contracts as of 01-01-2009 [Map], Williamson Act Program. 2009.

California Department of Conservation (CDC), Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Alameda County Important Farmland 2010 [vector digital data]. Published April 2011.

CHAPTER 6
Other CEQA Issues

6.1 Growth Inducement

6.1.1 Introduction and Overview

This chapter analyzes the growth inducement potential and associated secondary effects of growth impacts of the proposed project, as required by the California Environmental Quality Act (CEQA). CEQA requires that an Environmental Impact Report (EIR) evaluate the growth-inducing impacts of a proposed project.[1] A growth-inducing impact is defined as follows:

> [T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth…. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

As described in Chapter 2, Section 2.2, the San Francisco Planning Department prepared a Program Environmental Impact Report (PEIR) on the SFPUC's Water System Improvement Program (WSIP), which was certified in October 2008 (San Francisco Planning Department, 2008). The PEIR includes a detailed analysis of the growth inducement potential of the overall WSIP water supply strategy and concluded that "The WSIP would support planned growth in the existing SFPUC service area (WSIP PEIR, Vol. 4, Chapter 7, Impact 7-1)."

1 CEQA Guidelines Section 15126.2(d).

The proposed San Antonio Backup Pipeline (SABPL) project, as a facility improvement project of the WSIP, would be a contributing factor in that growth inducement potential and associated indirect effects of growth. By removing the lack of a reliable water supply and supply system as one potential obstacle to growth within the SFPUC service area, the WSIP, and thus the proposed project, would have an indirect growth-inducing effect according to the CEQA definition above.[2]

This EIR tiers from the WSIP PEIR, and the growth inducement analysis contained in PEIR Chapter 7 and associated Appendix E are incorporated by reference into this EIR. All impacts related to the WSIP water supply strategy to which this project contributes have been examined at a sufficient level of detail in the PEIR and no additional review is necessary in this EIR. The significant environmental effects have been adequately addressed in the PEIR, and the SFPUC has adopted the CEQA Findings on the PEIR related to the growth inducing impacts of the WSIP. A summary of the growth inducement analysis in the PEIR is provided below.

6.1.2 Summary of PEIR Growth Inducement Analysis

Implementation of the WSIP would achieve the WSIP goals and objectives, including the water supply goal through the year 2018. It would allow the SFPUC to: (1) meet its customer water needs in nondrought periods through the year 2018 and (2) limit rationing to a maximum of 20 percent systemwide reduction in water service during extended droughts. Achieving the WSIP water supply goal would increase the reliability of water service to existing customers as well as would water to serve planned growth of additional residential and business customers in the existing SFPUC service area.

A variety of factors influence new development or population growth in the area served by SFPUC water, including economic conditions of the region, adopted growth management policies in the affected communities, and the availability of adequate infrastructure (e.g., water service, sewer service, public schools, and roadways, etc.), with economic factors generally the lead driver. While water service is only one of many factors affecting the growth potential of a community, it is one of the chief public services needed to support urban development, and lack of a reliable water supply as well as a service capacity deficiency could constrain future development.

Pursuant to CEQA, growth *per se* is not assumed to be necessarily beneficial, detrimental, or of little significance to the environment; it is the secondary, or indirect, effects of growth that can cause adverse changes to the physical environment. The indirect effects of population and/or economic growth and accompanying development can include increased demand on community services and public service infrastructure; increased traffic and noise; degradation of air and water quality; and conversion of agricultural land and open space to urban uses. Local land use plans (e.g., general plans and specific plans) of the jurisdictions served by the SFPUC establish land use development patterns and growth policies that are intended to allow for the orderly

[2] The WSIP would not *directly* induce growth as it does not involve the development of new housing to attract additional population, nor would it indirectly induce growth by establishing substantial permanent or even short-term construction employment opportunities that could stimulate population growth. Construction of the WSIP projects is not expected to involve employment opportunities substantially beyond what would normally be available to construction workers in the area, and workers are expected to be drawn from the local labor pool.

expansion of urban development supported by adequate public services, including water supply, roadway infrastructure, sewer service, and solid waste service. Local jurisdictions conduct CEQA environmental review on their general and specific plans to assess the secondary effects of their planned growth and to identify feasible mitigation for significant, adverse effects. A project that would induce growth and is inconsistent with local land use plans and policies could indirectly cause adverse environmental impacts, as well as impacts on public services; this could occur if the local land use jurisdictions have not previously addressed these issues in the CEQA review of their land use plans and development proposals.

By removing the lack of a reliable water supply and water system (as one potential obstacle to growth within the SFPUC service area) and providing and assisting in the development of additional water supply sources (such as recycled water and groundwater projects) as well as promotion of more efficient use of water through conservation measures, the WSIP would have an indirect growth-inducing effect according to the CEQA definition. The WSIP would support growth in the SFPUC service area through 2018, although it appears that some growth would occur irrespective of the WSIP due to increased water delivery efficiencies (e.g., plumbing code changes), conservation, and other water supply sources. Growth would in turn result in indirect effects. In most cases, the effects of population and employment growth have been identified and addressed in the EIRs for the general plans and associated area plans and specific plans adopted by the jurisdictions in the service area. Some of the identified indirect effects of growth are significant and unavoidable; others are significant but can be mitigated.

Potentially significant and unavoidable impacts as a result of growth in the SFPUC service area have been identified by the local jurisdictions in the following areas: traffic congestion, air pollution, traffic noise, construction noise, increased demand for public schools and other public services, loss of recreational opportunities and impacts on visual quality resulting from the loss of open space, cumulative effects on over-utilized parks, loss of wildlife habitat and wetlands and impacts on other biological resources, cumulative impacts on cultural resources, increased flooding potential, increased urban runoff pollutants, seismic hazards, induced population growth, failure to meet housing demand for projected population growth, exposure of new development to contaminated soil or groundwater, insufficient water supply, insufficient wastewater disposal capacity, loss of agricultural resources, land use conflicts, conflicts with existing land use plans or policies, and changes in density, scale, and character of an area.

The adopted WSIP would have growth-inducement potential through 2018 because the SFPUC (with the cooperation of the wholesale customers) would provide the additional water supply to meet purchase requests through 2018. The WSIP would support much of the growth through 2018 in the jurisdictions served by the SFPUC regional water system. In general, development that was planned and approved through the general plan process in the SFPUC service area would have environmental impacts. The environmental consequences of this planned growth have been largely addressed in local plans and the associated CEQA review as well as in other, project-specific documentation. In a number of jurisdictions, negative declarations or mitigated negative declarations were prepared for general plans and related planning documents that were found not to have significant environmental effects.

The PEIR does not identify any mitigation measures for implementation by the SFPUC that could substantially decrease or eliminate growth-inducing impacts. This is because the SFPUC does not have control over the decisions that each local agency will make with respect to growth in their jurisdictions. Individual agencies' general plans and environmental documents contain actions, limitations, and mitigation measures that will be implemented in the individual jurisdictions with local development project or program approvals. These types of mitigation measures were identified in the PEIR (see PEIR Chapter 7 and PEIR Appendix E, which are incorporated by reference into this EIR).

To assess the growth inducement potential of the WSIP and characterize the secondary effects of growth, the PEIR investigates the following questions:

- *What assumptions did the SFPUC and its wholesale customers make regarding growth (population and employment) in projecting future (2030) total water demand and customer purchases from the SFPUC?*
- *Are these assumptions consistent with forecasts prepared and used by local and regional planning agencies (e.g., Association of Bay Area Governments [ABAG], counties and cities) within the service area? What are the growth trends in the Bay Area region?*
- *Are there any notable inconsistencies between the population and employment forecasts used by the SFPUC and the wholesale customers and those of the local and regional planning agencies that suggest that the water supply planning efforts are inconsistent with land use planning efforts?*
- *Is the level of growth projected for 2030 consistent with that identified and planned for in existing adopted general plans?*
- *What are the potential environmental impacts (secondary effects) associated with growth projected to occur in the service area? Have these impacts been evaluated in previous CEQA review documents on existing general and specific plans?*
- *What mitigation measures and findings have the local jurisdictions adopted as part of approving their future growth plans?*

The issues raised in these questions are summarized below and addressed in detail in PEIR Chapter 7 (Vol. 4) and supplemented by PEIR Appendix E (Vol. 5).

- *SFPUC Projections (PEIR Section 7.2)*. Accurate demand projections are important in ensuring that future water supplies will be adequate while not surpassing the needs of planned growth. SFPUC and its customers used computer models to forecast future water demand. Section 7.2 presents an overview of the SFPUC water service area, and describes key factors (assumptions, inputs, and methodologies) used in estimating future demand that relate to growth and inform comparisons between water demand and land use planning projections. These factors include baseline population, methodology used to determine existing water usage by land use/account type, the current water supply agreement between the SFPUC and its wholesale customers, and assumptions regarding future land use patterns, water conservation and recycling, and water from other (non-SFPUC) sources through 2030. The demand estimates, in conjunction with estimates of savings from conservation and use of other water sources, provide the basis for the 2030 purchase estimates.

- *Growth Inducement Potential (PEIR Section 7.3)*. This section analyzes the WSIP's growth inducement potential: whether the demand to be met by the WSIP would be consistent with local plans and policies or could contribute to growth in the service area beyond that called for in the existing general plan. To gauge the consistency of the WSIP with growth planned in the jurisdictions served by the SFPUC, the analysis compares the growth assumed in the SFPUC projections with growth forecasts (a) developed by ABAG and (b) reflected in adopted land use plans in the service area. With respect to ABAG, this section also describes ABAG's changing expectations about growth as reflected in its updated projections issued in 2002, 2003, and 2005.

- *Indirect Effects of Growth (PEIR Section 7.4)*. Growth (whether planned or unplanned) can cause environmental impacts. Section 7.4 describes the potential impacts of growth that could be supported, in part, by implementation of the WSIP. This section also identifies measures adopted to reduce, eliminate or otherwise mitigate the impacts of planned growth.

6.1.3 Summary of Conclusions

A review of historical growth trends of a selection of jurisdictions in the service area, based primarily on information in general plans and Bay Area Water Supply and Conservation Association profiles, shows that:

- Cities in the service area are largely urbanized, most having experienced their most rapid growth in the postwar decades through the 1970s.

- Milpitas and East Palo Alto have experienced high rates of growth more recently.

- San Francisco's population fluctuated somewhat but on average has been essentially stable over the past 50 years.

- Many jurisdictions cannot grow laterally and their general plans include policies to manage growth; many general plans identify strategies consistent with "smart growth" principles, such as encouraging infill development and the redevelopment of previously developed areas, as means to accommodate future growth.

- The SFPUC's wholesale customers vary widely, in a variety of ways: by size, overall demand projected for 2030, the change that the 2030 demand represents in absolute terms and as a percentage of 2001 demand, and the degree to which the customers depend on the SFPUC for their water supply. As such, the WSIP would remove growth obstacles to varying degrees within the service area.

As stated above, the complete growth inducement analysis is included in PEIR Chapter 7 and PEIR Appendix E, which are incorporated into this EIR by reference.

6.1.4 Indirect Effects of Growth

The indirect effects of growth expected in the general plans of jurisdictions in the service area have been identified in the EIRs prepared for those plans. Impacts commonly identified as significant and unavoidable and those commonly identified as significant but mitigable are presented in PEIR Section 7.4 and summarized briefly below.

- The most commonly identified significant and unavoidable impacts of growth are:
  - Increased traffic congestion
  - Deterioration of air quality
  - Cumulative effects of increased air pollutant emissions and noise
- Mitigation measures have been adopted by local jurisdictions as part of their general plan approval processes to address the secondary effects of planned growth. These measures are summarized in PEIR Appendix E.
- Two cities identified increased demand for potable water supply as a significant and unavoidable effect of growth; the WSIP would address this issue in those two cities.
- Overriding considerations commonly adopted by the decision-making bodies in adopting their general plans include the following:
  - Accommodation of growth in an orderly, fiscally sound manner
  - Economic diversification and job generation
  - Creation of housing, furtherance of regional housing share objectives, and provision of affordable housing
  - Improvements of the local jobs/housing balance
  - Increased sales revenue and positive fiscal impact
  - Promotion of alternative modes of travel to reduce reliance on private vehicles
  - Establishment of policies to preserve natural areas and open space lands
- For many cities that receive water from the SFPUC regional system, the supply to be provided under the WSIP supports and is consistent with the planned growth reflected in their existing adopted general plans. For other communities, it appears that the WSIP supply (in combination with other supply sources available to those communities), could serve a level of growth beyond that identified in the existing general plans. In those cases, secondary effects of such growth could include impacts related to increased density and impacts related to development of new land areas.
  - Density related impacts could include, e.g., increased traffic congestion, air pollution, traffic noise, construction noise, and demand on public services.
  - Land area related impacts could include, e.g., loss of open space and agricultural land, loss of and degradation of water quality due to increases in impervious surface area.

The proposed SABPL project would not directly induce population or economic growth, nor would it tax existing community service facilities or encourage other activities that could significantly affect the environment. However, as described above, the SABPL project is one of the facility improvement projects that comprise the WSIP and therefore, its implementation would contribute to the growth inducement potential of the WSIP and the associated indirect effects of growth. Implementation of the SABPL project would thus contribute to an incremental portion of the growth inducement impacts and associated indirect impacts of growth of the WSIP. See Chapter 7 of the PEIR for a detailed analysis of the WSIP's growth inducement effects (San Francisco Planning Department, 2008).

6.2 Summary of Cumulative Impacts

As described in Chapter 5, Section 5.1.4, Cumulative Impacts, cumulative impacts result from two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts (CEQA Guidelines, Section 15355). The cumulative impacts from several projects are the change in the environment that results from the incremental impact of the project when added to other closely related past, present, or reasonably foreseeable future projects. The cumulative analysis in this EIR identifies project impacts that would be individually limited, but when viewed in connection with the effects of other past, present, and probable future projects, could be "cumulatively considerable" (i.e., significant) with regard to the project's contribution to a cumulative impact.

In Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, cumulative impacts are discussed and analyzed under each resource area immediately following the description of the direct impacts of the proposed project and the identified mitigation measures for that resource area. The analyses of cumulative impacts are based on the same setting, regulatory framework, and significance criteria as the direct impacts, and it applies the results of the project-level, direct impact analysis within the context of the identified geographic scope of area affected by the cumulative effect. Table 5.1-6 lists the relevant past, present, or reasonably foreseeable future projects proposed by the SFPUC and other jurisdictions that are considered in the cumulative impact analysis. Figure 5.1-1 shows the cumulative project locations.

Table 6-1, below, provides a summary of all of the cumulative impacts associated with the SABPL project. With the exception of construction-related emissions of criteria pollutants (Impact C-AQ), all other significant cumulative impacts could be reduced to a less-than-significant level with implementation of mitigation measures identified in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures. See Chapter 5 for the detailed discussion of cumulative impacts by resource topic, and where appropriate, a description of the mitigation measures that would avoid or lessen the cumulative impacts.

As discussed in Chapter 5, since Pumping Variant 1 would not construct the Alameda Creek Pump Station, wet well, control building for the pump station, electrical transformer, or retaining wall along the access road at the southern boundary of the Alameda Creek Pump Station, this variant's contribution to construction-related cumulative impacts (i.e., cumulative construction impacts related to soil erosion, water quality, air emissions, traffic, etc.) would be slightly less than the proposed project. In addition, Pumping Variant 1's contribution to energy consumption during operations would be less than that of the proposed project due to the lower energy demand associated with one-step pumping. However, overall, Pumping Variant 1 would result in similar contributions to cumulative impacts as the proposed project.

TABLE 6-1
SUMMARY OF CUMULATIVE IMPACTS

Impact	Significance Determination
Impact C-LU: Project construction would result in a cumulatively considerable contribution to cumulative impacts on existing land uses.	LSM
Impact C-AE: Implementation of the proposed project could result in a cumulatively considerable contribution related to cumulative impacts on scenic vistas, scenic resources, and visual character.	LSM
Impact C-PH: No cumulative impacts related to population and housing.	NI
Impact C-CP: Construction of the proposed project could result in a cumulatively considerable contribution related to cumulative impacts on historical, archaeological, or paleontological resources, or human remains.	LSM
Impact C-TR: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative traffic increases and safety hazards on local and regional roads.	LSM
Impact C-NO: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative noise impacts.	LSM
Impact C-AQ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative air quality impacts associated with criteria pollutant emissions and health risks.	SUM
Impact C-GG: The proposed project would not result in a cumulatively considerable contribution to cumulative GHG emissions.	LS
Impact C-WS: No cumulative impacts related to wind and shadow.	NI
Impact C-RE: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on recreational resources and uses.	LSM
Impact C-UT: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts related to disruption or relocation of utilities.	LSM
Impact C-PS: No cumulative impacts related to public services.	NI
Impact C-BI: Project implementation could result in a cumulatively considerable contribution to cumulative impacts on biological resources during project construction and operation.	LSM
Impact C-GE: Project construction could result in a cumulatively considerable contribution to cumulative impacts related to the loss of topsoil.	LSM
Impact C-HY: Project construction could result in a cumulatively considerable contribution to cumulative impacts on hydrology and water quality.	LSM
Impact C-HZ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to hazards and hazardous materials.	LSM
Impact C-ME: Project construction would result in a cumulatively considerable contribution to cumulative impacts related to mineral and energy resources.	LSM
Impact C-AG: Implementation of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to the conversion of Unique Farmland to non-agricultural uses.	LSM

NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation
SUM = Significant and Unavoidable impact with implementation of feasible Mitigation

Since Pumping Variant 2 would construct all of the same facilities and improvements as the proposed project, this variant's contribution to cumulative construction impacts would be the same as the proposed project. Operational energy demand would be lower than the proposed project but higher than Pumping Variant 1 due to the option for both one-step and two-step pumping under this variant. Therefore, this variant's contribution to cumulative impacts related to operational energy demand would be slightly lower than the proposed project. All other operational aspects of Pumping Variant 2 would be the same as the proposed project and would result in the same cumulative impacts. Overall, Pumping Variant 2's contribution to cumulative impacts would be very similar to, or the same as, the proposed project.

6.3 Significant Environmental Effects That Cannot Be Avoided if the Proposed Project Is Implemented

In accordance with Section 21100(b)(2)(A) of CEQA and with Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify project-related environmental impacts that could not be eliminated or reduced to a less-than-significant level with implementation of all mitigation measures identified in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures. The findings in this chapter are subject to final determination by the San Francisco Planning Commission as part of its certification of the EIR.

6.3.1 Significant and Unavoidable, and Potentially Significant and Unavoidable Effects of the Proposed Project

This section identifies project impacts that, even with the implementation of all identified mitigation measures, would remain significant, and are therefore considered *unavoidable*. With the exceptions described below, all SABPL project impacts would either be less than significant, or reduced to less-than-significant levels with implementation of the identified mitigation measures. The analyses presented in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures of this EIR indicate implementation of the proposed project would result in two significant unavoidable impacts:

- Even with implementation of mitigation measures, project construction would result in significant and unavoidable impacts associated with daily emissions of criteria air pollutants. There is no feasible mitigation measure that could reduce the impact to a less-than-significant level (see Section 5.8, Impact AQ-1).

- Similarly, the SABPL project's contribution to cumulative emissions of criteria pollutants and health risks during construction would remain significant and unavoidable after implementation of mitigation measures (see Section 5.8, Impact C-AQ).

6.3.2 Significant and Unavoidable Effects of the WSIP

The proposed project is one of the facility improvement projects that comprise the SFPUC's WSIP. Insofar as the proposed project is a component of the WSIP, it would contribute to the WSIP's significant and unavoidable, and potentially significant and unavoidable water supply and growth-inducement impacts, as identified in the WSIP PEIR (San Francisco Planning Department, 2008) and summarized below:

- By providing water to support planned growth in the SFPUC service area, the WSIP will result in significant and unavoidable growth inducement effects that are primarily related to secondary effects such as air quality, traffic congestion, and water quality. These impacts were adequately addressed in the PEIR at a sufficient level of detail such that no further analysis is required in this EIR. The analysis contained in the PEIR is incorporated into this EIR by this reference (see PEIR Chapter 7).

- Based on the best available information at that time, the PEIR made the conservative determination that the WSIP could result in a significant and unavoidable impact on fishery resources in Crystal Springs Reservoir related to inundation of spawning habitat upstream of the reservoir (see PEIR Chapter 5, Section 5.5.5, Impact 5.5.5-1). The project-level fisheries analysis in the Lower Crystal Springs Dam Improvements Project EIR modifies certain PEIR impact determinations based upon more detailed site-specific data and analysis. These project-level conclusions supersede any contrary impact conclusions in the PEIR. Project-level review of updated, site-specific information that was developed following certification of the PEIR was incorporated into the project-level EIR for the Lower Crystal Springs Dam Improvements Project, and the project-level analysis determined that impacts on fishery resources due to inundation effects would be less than significant (San Francisco Planning Department, 2010).

- Based on the best available information at that time, the PEIR made the conservative determination that the WSIP would result in a significant and unavoidable impact related to flow along Alameda Creek below the Alameda Creek Diversion Dam ("Alameda Creek Hydrologic Impact") (see PEIR Chapter 4, Section 5.4.1, Impact 5.4.1-2). The project-level analysis in the Calaveras Dam Replacement Project EIR modifies this PEIR impact determination to be less than significant based upon more detailed site-specific data and analysis (San Francisco Planning Department, 2011). These project-level conclusions supersede the contrary impact conclusions in the PEIR.

6.4 Significant Irreversible Environmental Changes

In accordance with CEQA Section 21100(b)(2)(B) and CEQA Guidelines Sections 15126(c) and 15126.2(c), the purpose of this section is to identify significant irreversible environmental changes that would be caused by the proposed project. Construction activities associated with the SABPL project would result in an irretrievable and irreversible commitment of natural resources through the use of power supply and construction materials. In addition, the construction of new facilities (e.g., SABPL, new chemical facility, water pipeline to the town of Sunol, discharge facility at Pit F3-East, Alameda Creek Pump Station) would result in an irretrievable or irreversible commitment of land to water supply uses. However, these uses would take up limited land area and are compatible with the adjacent land uses.

The proposed SABPL project would require the commitment of energy resources to fuel and maintain construction equipment (such as gasoline, diesel, and oil) during the construction period. Project construction would commit resources, such as concrete and steel, to be used for the proposed facilities and related improvements. Implementation of the SABPL project would also result in irreversible changes associated with increased energy demand and energy use for operation of the new chemical facility, discharge facility at quarry Pit F3-East, and Alameda Creek Pump Station.

6.5 References

San Francisco Planning Department, *Final Program Environmental Impact Report for the San Francisco Public Utility Commission's Water System Improvement Program*, File No. 2005.0159E, State Clearinghouse No. 2005092026. Certified October 30, 2008.

San Francisco Planning Department, *Final Environmental Impact Report for the San Francisco Public Utilities Commission Calaveras Dam Replacement Project*, San Francisco Planning Department File No. 2005.0161E, State Clearinghouse No. 2005102102. Certified January 27, 2011.

San Francisco Planning Department, *Final Environmental Impact Report for the San Francisco Public Utilities Commission's Lower Crystal Springs Dam Improvements Project*, San Francisco Planning Department File No. 2005.0161E, State Clearinghouse No. 2007012002. Certified October 7, 2010.

CHAPTER 7
Alternatives

7.1 Introduction

This chapter presents the California Environmental Quality Act (CEQA) alternatives analysis for the San Antonio Backup Pipeline (SABPL) project. The CEQA Guidelines, Section 15126.6(a), state that an Environmental Impact Report (EIR) must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the project. Specifically, the CEQA Guidelines (Section 15126.6) set forth the following criteria for selecting and evaluating alternatives:

- ***Identifying Alternatives.*** The selection of alternatives is limited to those that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of "no project" must also be evaluated.

- ***Range of Alternatives.*** An EIR need not consider every conceivable alternative, but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency (the City and County of San Francisco) is responsible for selecting a range of project alternatives to be examined and for disclosing its reasons for the selection of the alternatives.

- ***Evaluation of Alternatives.*** EIRs are required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Matrices may be used to display the major characteristics and the environmental effects of each alternative. If an alternative would cause one or more significant effects that would not result from the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project.

Section 7.2 summarizes the systemwide, programmatic alternatives that were analyzed for the San Francisco Public Utilities Commission's (SFPUC) Water System Improvement Program (WSIP) in order to provide context for the alternatives to the SABPL project, which is one of the key regional facility improvement projects under the WSIP. Section 7.3 describes the alternatives selection process and the objectives of the project; summarizes the significant impacts of the project; describes the alternatives selected for detailed analysis; and compares the environmental impacts of each alternative to those of the proposed project. Section 7.4 identifies the environmentally superior alternative. Section 7.5 discusses the preliminary alternatives that were considered but rejected from further consideration.

Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, evaluates two variants of the proposed project: Pumping Variant 1 and Pumping Variant 2. The environmental analysis indicates that these two variants would result in impacts that are similar to or the same as those of the proposed project; would not result in a substantial increase in the severity of environmental impacts; and would not require any additional mitigation measures other than those identified for the proposed project. Thus, this alternatives analysis also applies to Pumping Variants 1 and 2.

7.2 WSIP Alternatives

As discussed in Chapter 2, Introduction and Background, of this EIR, the SFPUC approved implementation of the Phased WSIP in October 2008. The WSIP is a comprehensive program to improve the reliability of the SFPUC regional water system with respect to water quality, seismic response, and water delivery based on a planning horizon through the year 2030, and to improve the system with respect to water supply to meet water delivery needs in the service area through the year 2018. It includes a series of key regional facility improvement projects, including the SABPL project.[1] To the extent that the SABPL project would contribute to achieving the goals and objectives of the WSIP, the analysis of the WSIP alternatives applies to the alternatives analysis of the SABPL project.

1 The WSIP PEIR's description of the SABPL project (which was referred to as the San Antonio Backup Pipeline project [SABUP or SV-6] in the PEIR) included an approximately 2-mile-long pipeline extending between the San Antonio Pump Station and San Antonio Reservoir, new discharge facilities at San Antonio Creek at the base of Turner Dam, and improvements at the Alameda East Portal. Subsequently, the improvements to the Alameda East Portal were undertaken as part of the Alameda Siphons Seismic Reliability Upgrade project and, as described in Section 7.3.3, the SFPUC revised the SABPL project so that the backup pipeline would be routed to discharge into Pit F3-East instead of into San Antonio Creek at the base of Turner Dam.

The San Francisco Planning Department, Environmental Planning Division (formerly the Major Environmental Analysis Division) considered systemwide alternatives to the WSIP in the Program Environmental Impact Report (PEIR), which the San Francisco Planning Commission certified on October 30, 2008. The PEIR evaluated seven alternatives to the WSIP because of their apparent ability to meet most of the WSIP's goals, their ability to reduce one or more of the significant impacts associated with program implementation, their potential feasibility, and their collective ability to provide a reasonable range of alternatives to foster informed decision-making and public participation. Analysis of the No Program Alternative was included in the PEIR as required by CEQA.

Prior to approving the Phased WSIP, the SFPUC approved the PEIR and adopted the CEQA Findings on the WSIP (SFPUC Resolution 08-0200). The Phased WSIP incorporates elements of three alternatives analyzed in the PEIR: the No Purchase Request Alternative, the Aggressive Conservation/Water Recycling and Groundwater Alternative, and the Modified WSIP Alternative. Chapters 9 and 14 of the PEIR include more detailed descriptions of these WSIP alternatives, and also present the associated program-level environmental analysis of these alternatives. Chapter 13 of the PEIR includes additional information about the adopted Phased WSIP. All three of these chapters are incorporated into this EIR by reference. For informational purposes, the proposed program and the alternatives examined in the PEIR are summarized below.

- ***WSIP Proposed Program.*** The proposed program described and analyzed in the PEIR would establish program goals and system performance objectives in the areas of water quality, seismic reliability, delivery reliability, and water supply. The WSIP would provide for water supplies to serve customer purchase requests during nondrought and drought periods through 2030, including increased average annual diversions from the Tuolumne River, and would implement all key regional facility improvement projects.

- ***No Program Alternative.*** Under the No Program Alternative, the SFPUC would implement only those facility improvement projects driven by regulatory requirements or existing agreements with regulatory agencies. It would meet only the water quality goals of the WSIP and would fail to meet the other goals and objectives. It would endeavor to meet increasing customer purchase requests through the year 2030 by diverting additional Tuolumne River water only when available under City and County of San Francisco's (CCSF) existing water rights.

- ***No Purchase Request Increase Alternative.*** The No Purchase Request Increase Alternative is designed to serve the wholesale customers the amount of water required under the existing Master Water Sales Agreement between the CCSF and each of the wholesale customers. It would thereby limit the ability of the system to meet customer purchase requests through 2030, but would include implementation of all key regional facility improvement projects.

- ***Aggressive Conservation/Water Recycling and Local Groundwater Alternative.*** Under the Aggressive Conservation/Water Recycling and Local Groundwater Alternative, the SFPUC would implement all of the key regional facility improvement projects, but would endeavor to serve the projected increase in customer purchase requests through 2030 only through additional conservation, water recycling, and local groundwater projects.

- ***Lower Tuolumne River Diversion Alternative.*** Under the Lower Tuolumne River Diversion Alternative, the SFPUC would implement all of the key regional facility improvement projects and would serve the projected increase in customer purchase requests through 2030 through diversions from the lower Tuolumne River near its confluence with the San Joaquin River. This alternative would include construction and operation of additional conveyance and treatment facilities to divert, transport, treat, and blend the new supply into the regional water system.

- ***Year-round Desalination at Oceanside Alternative.*** Under the Year-round Desalination at Oceanside Alternative, the SFPUC would implement all of the key regional facility improvement projects and would construct a 25-million-gallon-per-day (mgd) desalination plant in San Francisco to serve the projected increase in customer purchase requests through 2030.

- ***Regional Desalination for Drought Alternative.*** Under the Regional Desalination for Drought Alternative, the SFPUC would implement all of the key regional facility improvement projects and would partner with other Bay Area water agencies to construct and operate a regional desalination plant that would provide the SFPUC with supplemental supply during drought years.

- ***Modified WSIP Alternative.*** Under the Modified WSIP Alternative, the SFPUC would implement all of the key regional facility improvement projects, but would modify proposed system operations to minimize environmental effects. This alternative would include the implementation of key mitigation measures identified in the PEIR.

7.3 SABPL Alternatives Analysis

7.3.1 Approach to Alternatives Selection

Consistent with CEQA, the approach to alternatives selection for the SABPL project focused on identifying alternatives that: (1) could meet most of the basic objectives of the project while reducing one or more of its significant impacts, (2) could foster informed decision-making and public participation, and (3) were feasible. The planning effort for the SABPL project entailed consideration of multiple alternatives by the SFPUC and Environmental Planning. Certain alternatives were eliminated from consideration based on their inability to meet most of the project's basic objectives, their lack of feasibility, or their inability to reduce the project's environmental impacts. Those alternatives retained for consideration are presented in Section 7.3.3. The alternatives eliminated and the reasons for their elimination are discussed in Section 7.5.

As discussed in Chapter 3, Section 3.3, Project Goals and Objectives, the objectives of the SABPL project are to:

- Provide reliable conveyance capacity for emergency discharges of Hetch Hetchy water supplies during events that impair water quality or during facility outages

- Increase operational flexibility and delivery reliability during emergencies and planned maintenance

These objectives support the goals and objectives of the WSIP (SFPUC Resolution No. 08-200). The SABPL project is a fundamental component of the WSIP; implementation of the proposed project is one element of an overall program designed to achieve the established WSIP system performance objectives for delivery reliability and water quality.

After the Notice of Preparation (NOP) for the SABPL project was published in 2007 (see discussion in Chapter 2, Section 2.5, Project Changes Subsequent to NOP Publication), the SFPUC modified the project following the development of more detailed information regarding project impacts. The changes included: (1) relocation of discharges and associated facilities from the base of Turner Dam to quarry Pit F3-East; (2) installation of a cutoff wall around the quarry pit; and (3) construction and operation of pumping and pipeline facilities to provide the SFPUC with the operational flexibility to convey the discharged water to either San Antonio Reservoir or the Sunol Valley Water Treatment Plant (SVWTP). With relocation of the discharge facilities to Pit F3-East, the length of the proposed backup pipeline was changed to 1.3 miles instead of 2 miles. The project modifications resulted in the following:

- ***Reduction in Magnitude of Impacts on Biological and Cultural Resources.*** The project changes would reduce (and in some cases eliminate) some impacts associated with the SABPL project as described in the 2007 NOP. Specifically, the relocation of discharges and discharge facilities eliminates potentially significant long-term impacts on: sensitive sycamore alluvial habitat along the San Antonio Creek channel between Calaveras Road and the base of Turner Dam; habitat for special-status aquatic species (including California red-legged frog and western pond turtle) in the San Antonio Creek channel just downstream of Turner Dam; and direct impacts on prehistoric archaeological site SA-1 (see Section 5.5, Cultural and Paleontological Resources, for a discussion of this site).

- ***Improved Recovery of Discharged Water.*** The proposed facilities and improvements would better enable the SFPUC to recover and conserve future discharges from the backup pipeline for subsequent delivery to customers. With the originally proposed SABPL project, capacity limitations associated with the San Antonio Pump Station as well as the lead time necessary to change operations at the SVWTP would have limited the SFPUC's ability to conserve the discharged water.

- ***Greater Energy and Slope Stability Impacts.*** The project changes would increase energy consumption relative to the project described in the 2007 NOP due to pumping associated with recovering the discharged water. Under the proposed project, water would be discharged to Pit F3-East via gravity flow and, if the discharges raised water elevations in the quarry pits above 195 feet mean sea level (msl), the SFPUC would recover the water by pumping it out of Pits F3-East and F3-West to either San Antonio Reservoir or to the SVWTP. The project as described in the 2007 NOP would discharge the water directly to San Antonio Creek by gravity flow, but the water would not be recovered so there would be no increase in energy demand associated with water recovery. In addition, the project modifications involve constructing facilities in an area of potentially unstable slopes: the area surrounding Pits F3-East and F3-West (unlike the project as described in the 2007 NOP, which does not propose construction in this area).

- ***Addressed Public Comments Regarding Alternatives.*** The project modifications also addressed comments received during the EIR scoping period requesting that the EIR evaluate alternatives that could reduce impacts on waters of the United States and conserve future discharges (refer to end of Table 2-2, Summary of Scoping Comments, in Chapter 2, Introduction and Background).

- ***Reduction of Benefit to Long-Term Operations and Maintenance.*** The proposed project would achieve the objectives of providing reliable conveyance capacity for discharges of Hetch Hetchy water supplies while allowing for the simultaneous transfer of water from San Antonio Reservoir to the SVWTP. However, a benefit of the original project—allowing the full length of the existing San Antonio Pipeline to be taken off line for repairs without a reduction in system operations and attendant risk of disruption in water service—would be reduced. As described in Chapter 3, Section 3.2.1.3, Constraints to San Antonio Pipeline Operations, the aging San Antonio Pipeline is susceptible to failure due to corrosion and breakage. As a result, in the future the SFPUC will periodically need to take the existing San Antonio Pipeline out of service for maintenance and repairs to help prevent unexpected breakage, and may need to eventually replace the San Antonio Pipeline. The SABPL project as currently proposed would allow a portion of the existing San Antonio Pipeline (the segment parallel to the proposed backup pipeline alignment) to be taken off line for repairs without the risk of service disruption; the original project would have provided the same benefit for this pipeline segment as well as for the segment of the existing San Antonio Pipeline extending to the base of Turner Dam.

For the most part, the proposed project modifications summarized above advance the intent of CEQA and the CEQA Guidelines with respect to examining ways of addressing project impacts on the environment; that is, the project modifications reduce some significant environmental impacts relative to the originally proposed project and address concerns expressed by the public during the EIR scoping process. However, the modifications result in new impacts on resources in the vicinity of Pits F3-East and F3-West. As part of the alternatives screening process presented in this chapter, the project described in the 2007 NOP was revisited to determine whether it could feasibly be modified to reduce some of the adverse impacts on biological and cultural resources noted above while meeting most of the basic objectives of the project. The result of this reevaluation has been carried forward in this alternatives analysis as Alternative 2 (see Section 7.3.3.2).

7.3.2 Summary of Significant Environmental Impacts

As described in the preceding section, project modifications subsequent to publication of the NOP reduced certain environmental impacts relative to the originally proposed project; this section summarizes the impacts of the currently proposed SABPL project that were considered during the alternatives identification process. With the exception of criteria pollutant emissions during project construction, all direct project impacts[2] were determined to be less than significant with mitigation (LSM), meaning that all significant project impacts could be reduced to a less-than-significant level through the implementation of mitigation measures identified in this EIR. The SABPL project's estimated construction-related nitrogen oxide (NO_X) emissions were determined to be significant and unavoidable even with implementation of mitigation (SUM), meaning that even with

[2] As discussed in Chapter 6, Section 6.1, Growth-Inducing Impacts, the SABPL project, as a facility improvement project in the WSIP, would contribute to the WSIP's growth-inducement potential and associated significant and unavoidable *indirect* effects of growth. Alternatives that would reduce or avoid indirect effects of growth were evaluated in the WSIP PEIR (including the No Program and No Purchase Request Increase Alternatives described in Section 7.2).

implementation of basic construction measures and NO_X reduction measures recommended by the Bay Area Air Quality Management District (BAAQMD), criteria pollutant emissions during construction would remain significant and unavoidable. In addition, the SABPL project's contribution to cumulative impacts related to criteria pollutant emissions during construction was also determined to be significant and unavoidable because no feasible mitigation is available to reduce the impact to a less-than-significant level. All other significant cumulative impacts were determined to be less than significant with mitigation (LSM). As summarized below, the proposed project would result in few long-term impacts; the majority of impacts would be short term in nature and associated with project construction activities.

7.3.2.1 Long-Term Impacts

Project implementation would result in the following significant long-term impacts, all of which could be mitigated to a less-than-significant level with the implementation of mitigation measures identified in Chapter 5:

- ***Aesthetics.*** Tree removal along the Calaveras Road right-of-way could make existing water infrastructure facilities more visible and adversely affect views from Calaveras Road, a designated scenic route (Impact AE-3, LSM). Cumulative long-term effects on scenic vistas and scenic resources were also determined to be potentially significant (Impact C-AE, LSM).

- ***Cultural and Paleontological Resources.*** Construction activities could damage Alameda Siphons Nos. 1 and 2, which are eligible for listing in the National Register of Historic Places and the California Register of Historical Resources (Impact CP-1, LSM). Project construction activities could potentially result in disturbance to a known archaeological site and previously unrecorded prehistoric sites, paleontological resources, and human remains in the construction zone (Impacts CP-2 through CP-4, LSM). The proposed project's contribution to cumulative impacts on historical, archaeological, or paleontological resources or on human remains was also determined to be significant (Impact C-CP, LSM).

- ***Biological Resources***. Removal of mature native trees is considered a long-term impact given the length of time for replacement trees to reach maturity (Impact BI-2, LSM). The potential for injury to, or mortality of, California red-legged frogs during project operations associated with entrainment of the frog in the pump intakes for dewatering facilities was determined to be significant (Impact BI-7, LSM). The proposed project's contribution to cumulative operational impacts to California red-legged frog was also determined to be significant (Impact C-BI, LSM).

- ***Geology and Soils.*** Construction-related soil erosion could result in the loss of topsoil, which typically takes several years to develop (Impact GE-2, LSM). The SABPL project's contribution to cumulative impacts related to the loss of topsoil was also determined to be significant (Impact C-GE, LSM).

- ***Agricultural Resources.*** Due to the permanent placement of spoils at the former nursery site located east of Pit F3-East, project implementation would result in the conversion of Unique Farmland to non-agricultural use (Impact AG-1, LSM). The SABPL project's contribution to cumulative impacts related to the conversion of Unique Farmland to non-agricultural use was also determined to be significant (Impact C-AG, LSM).

7.3.2.2 Short-Term Impacts

Project implementation would result in the following significant short-term impacts; all but two of these impacts could be mitigated to a less-than-significant level with the implementation of mitigation measures identified in Chapter 5:

- ***Land Use.*** Project construction could substantially disrupt or displace existing land uses or land use activities (Impact LU-2, LSM). Cumulative impacts related to land use disruption were also determined to be potentially significant (Impact C-LU, LSM).

- ***Aesthetics.*** Construction activities would include excavation, trenching, and construction staging in close proximity to Calaveras Road, a designated scenic route, adversely affecting views from the road (Impact AE-1, LSM). Cumulative impacts related to adverse effects on scenic routes during construction were also determined to be potentially significant (Impact C-AE, LSM).

- ***Transportation and Circulation.*** Project construction would temporarily increase safety hazards for vehicles, bicyclists, and pedestrians on Calaveras Road (Impact TR-3, LSM). Although cumulative impacts related to increases in traffic would be less than significant, cumulative impacts related to increased safety hazards for vehicles, bicyclists, and pedestrians were determined to be potentially significant (Impact C-TR, LSM).

- ***Noise and Vibration.*** Temporary, construction-related nighttime noise could cause substantial annoyance at the SFPUC watershed keeper's residence located east of Calaveras Road (Impact NO-1, LSM). During periods of extended construction hours, construction activities during the nighttime hours and on Saturdays would extend beyond the Alameda County Noise Ordinance time limits. During these periods, noise from backup beepers could exceed the sleep interference criterion at the SFPUC watershed keeper's residence located east of Calaveras Road (Impact NO-2, LSM). Cumulative nighttime noise impacts at the Garcia residence and the SFPUC watershed keeper's residence were determined to be cumulatively considerable, but could be reduced to a less-than-significant level with implementation of mitigation (Impact C-NO, LSM).

- ***Air Quality.*** Even with mitigation, average daily emissions of criteria pollutants during project construction would still exceed the BAAQMD threshold of 54 pounds per day (lbs/day) for NOx (Impact AQ-1, SUM). The proposed project's average daily emissions of NOx after implementation of mitigation were estimated at 114.2 lbs/day in 2013 (when most construction activities would occur) and 77.5 lbs/day in 2014. The emissions of NOx during construction would also result in a cumulatively considerably contribution to cumulative emissions of criteria pollutants, which would remain significant, even after implementation of mitigation measures; similarly, the cumulative health risk during construction would be a significant and unavoidable impact (Impact C-AQ, SUM).

- ***Recreation.*** Construction-related noise, air quality, and traffic safety effects along Calaveras Road would combine to increase the overall impact on the recreational experience of bicyclists (Impact RE-1, LSM). Similarly, the SABPL project's contribution to cumulative impacts on recreational bicyclists during construction was determined to be potentially significant (Impact C-RE, LSM).

- ***Utilities and Service Systems.*** The backup pipeline and the pipeline to the town of Sunol would be constructed near a number of underground and aboveground utility lines that could be damaged during construction, including Alameda Siphons Nos. 1, 2, and 3, the South Bay

Aqueduct, a 36-inch-diameter Pacific Gas and Electric Company (PG&E) high-pressure natural gas pipeline, and a 25-inch-diameter PG&E high-pressure natural gas pipeline (Impact UT-1, LSM). In addition, some utilities could require relocation (Impact UT-2, LSM). Cumulative impacts related to utility service disruption and relocation of utility lines during project construction activities were also determined to be potentially significant (Impact C-UT, LSM).

- ***Biological Resources.*** Project construction could adversely affect several special-status species, including California red-legged frog, California tiger salamander, and Alameda whipsnake, and could also result in habitat loss and disruption of breeding and foraging habitat for nesting birds, raptors, and bats (Impact BI-1, LSM). Construction activities could have a substantial adverse effect on riparian habitat and other sensitive habitats (Impact BI-2, LSM). Jurisdictional waters (San Antonio Creek and an ephemeral stream that crosses the proposed alignments of the backup pipeline and the pipeline to the town of Sunol) as well as a small freshwater marsh at Staging Area A would be adversely affected by project construction (Impact BI-3, LSM). Project construction could also adversely affect aquatic habitat due to degradation of water quality (Impact BI-4, LSM). Dozens of small ornamental trees along the Calaveras Road right-of-way that are protected by the Alameda County Tree Ordinance could be removed during project construction (Impact BI-6, LSM). The SABPL project's contribution to cumulative impacts on biological resources during construction was also determined to be significant (Impact C-BI, LSM).

- ***Geology and Soils.*** Construction of the new outfall and splash pad at Pit F3-East could cause unstable slopes (Impact GE-1, LSM). Excavation and grading activities could result in soil erosion (Impact GE-2, LSM).

- ***Hydrology and Water Quality.*** Construction of the project could cause degradation of water quality as a result of erosion and sedimentation or an accidental release of construction-related hazardous materials (Impact HY-1, LSM). Water quality impacts could also result from discharges of groundwater produced during construction dewatering (Impact HY-3, LSM). The SABPL project's contribution to cumulative water quality impacts during construction was also determined to be significant (Impact C-HY, LSM).

- ***Hazards and Hazardous Materials.*** During excavation for the project, the contractor could encounter pesticides, herbicides, fungicides, diesel, and/or waste oil in soil, resulting in the release of these hazardous materials into the environment. Demolition of the two quarry buildings could also result in impacts related to hazardous building materials (Impact HZ-1, LSM). Project construction could also result in accidental releases of hazardous construction chemicals into the environment (Impact HZ-2, LSM). The SABPL project's contribution to cumulative impacts associated with releases of hazardous materials into the environment during construction was also determined to be significant (Impact C-HZ, LSM).

- ***Mineral and Energy Resources.*** Project construction activities could result in the wasteful use of fuels (Impact ME-2, LSM), and the SABPL project's contribution to cumulative impacts related to the wasteful use of fuels during construction would be cumulatively considerable (Impact C-ME, LSM).

Significant impacts were addressed during the alternatives selection process by developing alternatives that would:

- Lower emissions of construction-related air pollutants contributing to criteria pollutant and health risk impacts through an alternative that requires less construction

- Minimize excavation to reduce multiple impacts, including the likelihood of encountering archaeological resources
- Reduce operations-phase energy consumption associated with pumping through an alternative that relies more heavily on gravity than on pumping

7.3.3 Selected CEQA Alternatives

This section describes the project alternatives that were selected and analyzed in accordance with CEQA Guidelines Section 15126.6(a). The three alternatives to the proposed project selected for detailed analysis in this EIR are:

- Alternative 1: No Project Alternative
- Alternative 2: SABPL Discharges to Base of Turner Dam
- Alternative 3: Aboveground SABPL

Table 7-1 provides a brief description of these alternatives and highlights how they differ from the proposed project. **Figure 7-1** shows the backup pipeline alignment under Alternatives 2 and 3. This section also evaluates the impacts of the selected alternatives relative to those of the proposed project. Since the alternatives are conceptual, the evaluation is based on the available information and reasonable assumptions about how each alternative would be implemented. For each alternative, this section presents the following:

- A description of the alternative, including the rationale for its selection and associated facility improvements and auxiliary components. Each description discusses feasibility issues as well as assumptions regarding the construction methods likely to be used.
- An evaluation of the alternative's ability to meet project goals and objectives.
- Analysis of the environmental impacts of each alternative compared to those of the proposed project.

Table 7-2 summarizes the environmental impacts of the selected alternatives compared to those of the proposed project. This table presents the significant impacts of the proposed project as well as less-than-significant impacts whose severity would be different under the project alternatives than under the proposed project. Table 7-2 does not include less-than-significant impacts of the proposed project that would have the same significance determination and/or impact severity as the project alternatives.

7.3.3.1 Alternative 1: No Project Alternative

CEQA Guidelines Section 15126.6(e) requires that EIRs include an evaluation of the No Project Alternative to provide decision-makers the information necessary to compare the relative impacts of approving the project and not approving the project. The No Project Alternative is defined as a continuation of existing conditions, as well as conditions that are reasonably expected to occur in the event that the proposed project is not implemented.

TABLE 7-1
SELECTED CEQA ALTERNATIVES

Alternative	How Does the Alternative Differ from the Proposed Project?
Alternative 1: No Project – The SFPUC would not make improvements, and the San Antonio Pipeline would continue to operate as it does under existing conditions.	• The new backup pipeline would not be constructed. • A new chemical facility would not be constructed, and the SFPUC would not have the ability to dechlorinate the future maximum flow of 315 mgd. • The ability to achieve WSIP level of service goals would be impaired because the SFPUC would not have the ability to simultaneously conduct planned or emergency discharges while also conveying 160 mgd of water from San Antonio Reservoir to the SVWTP. • The SFPUC would not be able to conserve water discharged to San Antonio Creek for future use.
Alternative 2: SABPL Discharges to Base of Turner Dam – The SFPUC would install a new 2-mile-long backup pipeline between the San Antonio Pump Station and San Antonio Creek at the base of Turner Dam. Improvements would be made to the existing discharge facility at the base of Turner Dam. A new chemical facility would be constructed. Like the proposed project, excess spoils generated during construction could be permanently placed in an earthen berm at the North Spoils Site or former nursery site located east of Pit F3-East.	• A pipeline would be installed between the San Antonio Pump Station and the base of Turner Dam; the pipeline would be 0.7 mile longer than proposed project pipeline. • A new outfall would be constructed in San Antonio Creek at the base of Turner Dam. A control building would be constructed on the south side of San Antonio Creek adjacent to the new outfall. • The existing stilling basin would be replaced with a larger stilling basin to handle the future maximum flow of 315 mgd. • The banks of San Antonio Creek in the immediate vicinity of the discharge facility in San Antonio Creek would be reinforced to prevent erosion. • Construction in the vicinity of Pit F3-East would be avoided, including construction of the new discharge facility at Pit F3-East, cutoff wall around Pits F3-East and F3-West, Alameda Creek Pump Station, wet well, transfer pipeline, and dewatering pipeline. • The future maximum flow from emergency and planned discharges could be made to San Antonio Creek; however, the SFPUC would not have the ability to conserve the future maximum flow of 315 mgd. • Discharges to San Antonio Creek would be by gravity.
Alternative 3: Aboveground SABPL – The SFPUC would install a new 1.3-mile-long aboveground backup pipeline between the San Antonio Pump Station and Pit F3-East. Like the proposed project, this alternative would also construct a new discharge facility at Pit F3-East, cutoff wall around Pits F3-East and F3-West, new chemical facility, and a new overhead powerline and electrical transformer. The Alameda Creek Pump Station, wet well, transfer pipeline, and dewatering facilities would also be constructed, the same as the proposed project. Excess spoils generated during construction could be permanently placed in an earthen berm at the North Spoils Site or former nursery site located east of Pit F3-East.	• The backup pipeline would be constructed along the same alignment, but the entire length of the pipeline would be above ground on pipe supports. • This alternative assumes the 12-inch-diameter water pipeline to the town of Sunol would not be constructed.

In the event that the SFPUC does not implement the SABPL project, no facility improvements would be constructed. Under the No Project Alternative, the San Antonio Pipeline would remain in operation and no improvements would be made to the pipeline. The SFPUC would have sufficient capacity to discharge the future maximum Hetch Hetchy flow of 315 mgd. As with existing operations, the SFPUC's preferred option would be to pump up to 160 mgd to San Antonio Reservoir or the SVWTP via the existing San Antonio Pipeline in order to conserve the water for future treatment and delivery to customers.[3] However, as occurs under the existing condition, the SFPUC's ability to conserve the water would be limited by the capacity of the San Antonio Pump Station (160 mgd); when the discharge exceeded the pumping capacity and could not be pumped to the reservoir, flows of up to 230 mgd would instead be discharged by gravity flow to San Antonio Creek via the existing San Antonio Pipeline.[4] At the future maximum flow of 315 mgd, the remaining 85 mgd would be discharged to quarry Pit F6 via the Alameda East Overflow Pipeline constructed as a component of the Alameda Siphons Seismic Reliability Upgrade project. The Alameda East Portal Overflow Pipeline has a capacity of 180 mgd and could accommodate the increased flows; however, since flows in excess of the 240-mgd capacity of the existing chemical facility could not be dechlorinated, up to 75 mgd of chlorinated water would be discharged out of the Alameda East Portal Overflow Pipeline to Pit F6. Together, the existing San Antonio Pipeline and Alameda East Portal Overflow Pipeline would have the capacity to accommodate planned and emergency discharges of up to 340 mgd. Thus, the facilities would be capable of accepting the future maximum Hetch Hetchy flow of 315 mgd.

Without construction of the backup pipeline, the SFPUC would rely on the existing San Antonio Pipeline for both emergency and planned discharges, and the SFPUC would not have the ability to simultaneously discharge Hetch Hetchy water while also conveying 160 mgd of water from the San Antonio Reservoir to the SVWTP, thereby inhibiting the SFPUC's ability to achieve the WSIP level of service goals. Further, while emergency and planned discharges of up to 160 mgd could be pumped to San Antonio Reservoir via the existing San Antonio Pipeline for future treatment and distribution to customers, the SFPUC would not have the ability to conserve the future maximum flow of 315 mgd.

The treatment capacity of the existing chemical facility is 240 mgd, and the maximum capacity of the San Antonio Pipeline is 230 mgd. The existing chemical facility does not have sufficient treatment capacity to allow system operators to dechlorinate and pH-adjust the future maximum Hetch Hetchy flow of 315 mgd prior to discharge. Thus, when flows are greater than the 230-mgd capacity of the San Antonio Pipeline, the SFPUC would discharge up to 85 mgd of chlorinated water to quarry Pit F6, which would subsequently infiltrate to the groundwater.

[3] If there is sufficient lead time to adjust treatment plant operations before the quality-impaired water reaches the Sunol Valley, SFPUC system operators also have the option to divert the water to the SVWTP using the Calaveras Pipeline.

[4] The maximum capacity of the San Antonio Pump Station is 160 mgd, which limits discharges to San Antonio Reservoir because the discharges must be pumped to the reservoir. Discharges to San Antonio Creek flow via gravity and are limited to 230 mgd, the maximum capacity of the San Antonio Pipeline.

SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 7-1
SABPL Alignments for CEQA Alternatives

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TABLE 7-2
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Land Use				
Impact LU-2: Project construction could substantially disrupt or displace existing land uses or land use activities. (Less than Significant with Mitigation)	Construction-related noise, air quality, and traffic safety effects along Calaveras Road could combine to substantially disrupt existing land uses.	**No Impact** There would be no construction activities.	**Similar** Construction activities along Calaveras Road would have similar effects on existing land uses.	**Similar** Construction of the aboveground backup pipeline and associated facilities would have similar effects on existing land uses.
Impact LU-3: Project operations would not result in substantial long-term or permanent impacts on the existing character of the vicinity. (Less than Significant)	Permanent aboveground components would not substantially affect the existing character of the project vicinity.	**No Impact** No facilities would be constructed.	**Similar** The permanent aboveground components along Calaveras Road would have similar effects on the existing character of the project vicinity.	**Increased** The aboveground backup pipeline would be constructed parallel to Calaveras Road and would adversely affect the character of the project vicinity.
Impact C-LU: Project construction could make a cumulatively considerable contribution to cumulative impacts on existing land uses. (Less than Significant with Mitigation)	Construction-related noise, air quality, and traffic safety effects along Calaveras Road would contribute to cumulative impacts related to the disruption of existing land uses.	**No Impact** No facilities would be constructed.	**Similar** Although this alternative's contribution to traffic safety hazards during construction is assumed to be greater due to the construction of the backup pipeline across Calaveras Road, this alternative's overall contribution to cumulative land use disruption impacts would be similar to those of the proposed project.	**Similar** This alternative's contribution to cumulative land use disruption impacts would be similar to those of the proposed project.
Aesthetics				
Impact AE-1: Project construction could result in substantial adverse effects on scenic vistas and temporarily degrade the visual character of the site and its surroundings. (Less than Significant with Mitigation)	Construction activities along a portion of the pipeline alignment and at the staging areas would be visible from Calaveras Road.	**No Impact** There would be no construction activities.	**Similar** Construction activities between the San Antonio Pump Station and the Turner Dam access road would be visible from Calaveras Road and nearby residences.	**Similar** Construction activities would be visible from Calaveras Road and nearby residences.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Aesthetics (cont.)				
Impact AE-3: Implementation of the proposed project could result in long-term adverse effects on scenic vistas and scenic resources, and degradation of the visual character of the site and its surroundings. (Less than Significant with Mitigation)	Removal of trees within the Calaveras Road right-of-way could adversely affect views from Calaveras Road, a designated scenic roadway.	**No Impact** There would be no tree removal.	**Similar** Construction activities along Calaveras Road would likely require removal of the same mature trees as the proposed project. Although installation of the pipeline between Calaveras Road and the base of Turner Dam could require tree removal, much of this area is not visible from Calaveras Road or nearby residences.	**Increased** Like the proposed project, construction of the new aboveground backup pipeline would require tree removal within the Calaveras Road right-of-way. The approximately 7,000-foot-long (1.3-mile-long), 66-inch-diameter aboveground backup pipeline from the San Antonio Pump Station along the west side of Calaveras Road to Pit F3-East would be clearly visible from Calaveras Road, a designated scenic roadway.
Impact C-AE: Implementation of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on scenic vistas, scenic resources, and visual character. (Less than Significant with Mitigation)	Cumulative impacts on the visual character of the area during project construction. Long-term cumulative impacts on the visual character of the area due to tree removal.	**No Impact** There would be no construction or tree removal.	**Similar** Construction activities along Calaveras Road would result in similar cumulative impacts on the visual character of the area as the proposed project. Tree removal along Calaveras Road would result in the same long-term cumulative impacts on the visual character of the area.	**Increased** Construction activities would result in the same cumulative impacts on the visual character of the area as the proposed project. Long-term cumulative impacts on the visual character and scenic resources would be greater due to the combination of tree removal along the Calaveras Road right-of-way and installation of the approximately 7,000-foot-long (1.3-mile-long), 66-inch-diameter aboveground backup pipeline along the west side of Calaveras Road that would be clearly visible from Calaveras Road, a designated scenic roadway.
Cultural Resources and Paleontological Resources				
Impact CP-1: Project construction could cause a substantial adverse change in the significance of a historical resource. (Less than Significant with Mitigation)	Construction of the connection between the backup pipeline and Alameda Siphon No. 3 could damage the adjacent Alameda Siphons Nos. 1 and 2, which are historic resources.	**No Impact** A new pipeline would not be constructed.	**Same** The new backup pipeline would require connection to Alameda Siphon No. 3 at the same location.	**Same** The new backup pipeline would require connection to Alameda Siphon No. 3 at the same location.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Cultural Resources and Paleontological Resources (cont.)				
Impact CP-2: Project construction could cause a substantial adverse change in the significance of a historical or unique archaeological resource. (Less than Significant with Mitigation) Impact CP-3: Project construction could result in a substantial adverse effect by directly or indirectly destroying a unique paleontological resource or site. (Less than Significant with Mitigation) Impact CP-4: Project construction could result in a substantial adverse effect related to the disturbance of human remains. (Less than Significant with Mitigation)	Potential adverse effects on the recorded prehistoric archaeological site SA-1 and previously unidentified archaeological and paleontological resources and human remains during construction.	**No Impact** There would be no construction activities.	**Increased** Under this alternative, there would be a greater potential to encounter archaeological and paleontological resources and human remains due to the potential for subsurface resources to be encountered along the San Antonio Creek corridor, and the greater extent of excavation resulting from the longer backup pipeline alignment. The potential for adverse effects to prehistoric archaeological site SA-1 would be the same as the proposed project.	**Decreased** Because there would be less ground disturbance and excavation for construction of the aboveground backup pipeline, there would be less potential to encounter archaeological and paleontological resources and human remains. The potential for adverse effects on prehistoric archaeological site SA-1 would be the same as the proposed project.
Impact C-CP: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on historical, archaeological, or paleontological resources, or human remains. (Less than Significant with Mitigation)	Potential for cumulative impacts on previously unidentified archaeological and paleontological resources and human remains during construction.	**No Impact** There would be no construction activities.	**Increased** This alternative would result in a greater contribution to cumulative impacts on previously unidentified archaeological and paleontological resources and human remains during construction due to the greater potential to encounter these resources during construction.	**Decreased** This alternative's contribution to cumulative impacts on previously unidentified archaeological and paleontological resources and human remains during construction would be decreased relative to the proposed project due to the reduced potential to encounter these resources during construction.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Transportation and Circulation				
Impact TR-2: Project construction activities would not result in inadequate emergency access. (Less than Significant)	Project construction would not be conducted within the travel lanes of Calaveras Road, and all access roads would remain open at all times.	**No Impact** There would be no construction activities that would restrict emergency access.	**Increased** The new backup pipeline would cross Calaveras Road and be routed beneath the access road to Turner Dam. Even with the use of steel plates to maintain roadway access on Calaveras Road, construction activities within Calaveras Road and the Turner Dam access road could impair access for emergency response vehicles.	**Same** As with the proposed project, construction would not be conducted within the travel lanes of Calaveras Road, and all access roads would remain open at all times.
Impact TR-3: Project construction activities could decrease the safety of public roadways for vehicles, bicyclists, and pedestrians. (Less than Significant with Mitigation)	Safety hazards for automobiles, bicyclists, and pedestrians due to increased construction-related traffic.	**No Impact** There would be no construction activities or construction-related traffic.	**Increased** This alternative would eliminate construction vehicles associated with new facilities in the vicinity of Pits F3-East and F3-West. Overall, the level of construction-related traffic would likely be similar because of the longer pipeline and modifications to the existing discharge facilities at San Antonio Creek. However, traffic safety hazards during construction would be greater due to the construction of the backup pipeline across Calaveras Road.	**Decreased** The level of construction-related traffic would be the less than the proposed project because there would be substantially less excavation and spoils hauling, incrementally reducing safety hazards for automobiles, bicyclists, and pedestrians. However, the level of significance for this impact would be the same as for the proposed project.
Impact C-TR: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative traffic increases and safety hazards on local and regional roads. (Less than Significant with Mitigation)	Cumulative impacts associated with increased traffic and safety hazards for vehicles, bicycles, and pedestrians.	**No Impact** There would be no construction activities or construction-related traffic that would contribute to this cumulative impact.	**Increased** This alternative's contribution to traffic safety hazards during construction would be greater due to the construction of the backup pipeline across Calaveras Road.	**Decreased** This alternative's contribution to construction-related traffic safety hazards would be incrementally less than the proposed project. However, the level of significance for this impact would be the same as for the proposed project.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Noise and Vibration				
Impact NO-1: Construction activities would result in substantial temporary increases in ambient noise levels that could interfere with nearby land uses. (Less than Significant with Mitigation)	Nighttime construction during phases of extended construction hours would result in noise levels above the sleep interference threshold at the SFPUC watershed keeper's residence.	**No Impact** There would be no construction activities or construction-related noise.	**Similar** Construction noise near the Garcia residence and SFPUC watershed keeper's residence, located east of Calaveras Road, would be similar to the proposed project. There are no sensitive receptors that would be affected by construction activities between Calaveras Road and the base of Turner Dam.	**Similar** The level of construction-related noise would be similar to the proposed project.
Impact NO-2: Construction activities would expose people to noise levels in excess of the standards established by the Alameda County Noise Ordinance. (Less than Significant with Mitigation)	During phases of extended construction hours, construction equipment with backup alarms used beyond the noise ordinance time limits could exceed ordinance noise limits.	**No Impact** There would be no construction activities or construction-related noise.	**Same** This alternative would require the same six weeks of nighttime construction and at the same locations as the proposed project.	**Same** This alternative would require the same six weeks of nighttime construction and at the same locations as the proposed project.
Impact C-NO: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative noise impacts. (Less than Significant with Mitigation)	Cumulative nighttime noise increases could occur at the SFPUC watershed keeper's residence and Garcia residence during the six weeks of extended construction hours.	**No Impact** There would be no construction activities or construction-related noise that would contribute to this cumulative impact.	**Same** Construction hours would be similar to the proposed project; this alternative would require the same six weeks of nighttime construction at the same locations relative to sensitive receptors as the proposed project.	**Same** Construction hours would be similar to the proposed project; this alternative would require the same six weeks of nighttime construction at the same locations relative to sensitive receptors as the proposed project.
Air Quality				
Impact AQ-1: Emissions generated during project construction activities would violate air quality standards and would contribute substantially to an existing air quality violation. (Significant and Unavoidable with implementation of feasible Mitigation)	Even with implementation of mitigation, average daily NO_X emissions generated during construction would exceed the BAAQMD CEQA significance thresholds.	**No Impact** There would be no construction activities or construction-related NO_X emissions.	**Decreased** With the proposed project, construction-phase NOx emissions exceed the significance threshold during construction phases when construction of the facilities associated with discharge to the quarry pit occur concurrent with backup pipeline construction. Overall, there would be less construction occurring concurrently with this alternative. Consequently, daily NOx	**Decreased** Assuming elimination of backup pipeline trench excavation and related on-site transport and off-site disposal of spoils could reduce related equipment and vehicle operations by approximately half, construction-related NOx emissions would be less than the proposed project. Mitigated emissions in 2013 likely would still exceed the significance threshold of 54 lbs/day

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Air Quality (cont.)				
Impact AQ-1 (cont.)			emissions associated with Alternative 2 would be less than the proposed project, but would likely still exceed the significance threshold. The level of significance would be the same as for the proposed project.	during some months; however, it is likely that mitigated emissions in 2014 could be reduced to below the significance threshold.
Impact C-AQ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative air quality impacts associated with criteria pollutant emissions and health risks. (Significant and Unavoidable with implementation of feasible Mitigation)	Even with implementation of mitigation, the project's contribution to cumulative NO_X emissions during construction would exceed the BAAQMD CEQA significance thresholds.	**No Impact** There would be no construction activities or construction-related NO_X emissions that would contribute to this cumulative impact.	**Decreased** This alternative's contribution to cumulative NO_X emissions during construction could be less than that of the proposed project because there would be less construction occurring concurrently. The contribution to cumulative health risk impacts would be similar to the proposed project. Overall, this alternative's contribution to cumulative impacts associated with emissions of air pollutants during construction would be less than the proposed project.	**Decreased** This alternative's contribution to cumulative NO_X emissions during construction would be less than the proposed project because the aboveground pipeline would require less excavation and as a result, NO_X emissions generated during excavation and earthwork activities would be reduced when compared to the proposed project. For similar reasons, the contribution to cumulative health risk impacts may be less than under the proposed project.
Recreation				
Impact RE-1: The proposed project could temporarily degrade existing recreational uses during construction. (Less than Significant with Mitigation)	Construction activities could cause safety hazards for bicyclists and pedestrians due to increased construction-related traffic and nuisances due to noise as well as dust and exhaust emissions. Temporary traffic delays could also affect access to nearby recreational facilities.	**No Impact** There would be no construction activities or construction-related traffic, noise, or air emissions.	**Similar** The level of construction-related noise, dust and exhaust emissions, and traffic would be similar to the proposed project.	**Similar** The level of construction-related noise, dust and exhaust emissions, and traffic would be similar to the proposed project.
Impact C-RE: Construction of the proposed project could result in a cumulatively considerable contribution to cumulative impacts on recreational resources and uses. (Less than Significant with Mitigation)	Safety hazards for bicyclists and pedestrians due to increased construction-related traffic in combination with traffic from other projects.	**No Impact** There would be no construction activities or construction-related traffic.	**Similar** The level of construction-related noise, dust and exhaust emissions, and traffic would be similar to the proposed project.	**Similar** The level of construction-related noise, dust and exhaust emissions, and traffic would be similar to the proposed project.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Utilities and Service Systems				
Impact UT-1: Project construction could result in a substantial adverse effect related to disruption of utility operations or accidental damage to existing utilities. (Less than Significant with Mitigation)	Construction activities could conflict with a 36-inch-diameter PG&E high-pressure natural gas pipeline, overhead electrical distribution lines, the South Bay Aqueduct, the Sunol Pump Station Pipeline, the Alameda East Overflow Pipeline, and Alameda Siphons Nos. 1 and 2.	**No Impact** There would be no construction activities or potential to damage existing utilities.	**Decreased** Under this alternative, the backup pipeline alignment would cross the Chevron crude oil pipeline that runs along the east side of Calaveras Road. The proposed pipeline alignment would not cross this road or intersect this pipeline. The backup pipeline alignment under this alternative would entirely avoid construction near Pits F3-East and F3-West and any associated potential conflicts with underground utilities in this area, including the South Bay Aqueduct and PG&E high-pressure natural gas pipeline. Like the proposed project, this alternative would also require connection to Alameda Siphon No. 3 and could affect the same underground and overhead utilities in this area.	**Decreased** The aboveground backup pipeline would follow the same alignment as the proposed project alignment, but potential conflicts with the PG&E high-pressure natural gas pipeline and Sunol Pump Station Pipeline would be reduced because pipeline supports could be placed to avoid conflicts with these underground utilities. Like the proposed project, this alternative would construct the same facilities at Pits F3-East and F3-West and therefore could affect the same underground utilities in this area. Like the proposed project, this alternative would also require connection to Alameda Siphon No. 3 and could affect the same underground and overhead utilities in this area.
Impact UT-2: Project construction could result in a substantial adverse effect related to the relocation of regional or local utilities. (Less than Significant with Mitigation)	Although utility relocation is not currently believed to be necessary, relocation of utilities could be necessary once the locations and characteristics of conflicting utilities are confirmed.	**No Impact** There would be no construction activities or any need to relocate utilities.	**Similar** Similar to the proposed project, relocation of utilities could be required.	**Similar** Similar to the proposed project, relocation of utilities could be required.
Impact C-UT: Construction of the proposed project could result in cumulatively considerable impacts related to disruption or relocation of utilities. (Less than Significant with Mitigation)	Cumulative impacts related to disruption of utility operations or accidental damage to existing utilities and relocation of regional or local utilities.	**No Impact** There would be no construction activities or any need to relocate utilities.	**Decreased** This alternative would have a lower potential for cumulative impacts on existing utilities because it would avoid potential conflicts with underground utilities near Pits F3-East and F3-West, including the South Bay Aqueduct and PG&E high-pressure natural gas pipeline.	**Decreased** This alternative would have a lower potential for cumulative impacts on existing utilities because pipeline supports could be placed to avoid conflicts with underground utilities.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Biological Resources				
Impact BI-1: The proposed project could have a substantial adverse effect on special-status animal species during construction. (Less than Significant with Mitigation)	Construction could affect several special-status species including: California red-legged frog; California tiger salamander; Alameda whipsnake; and nesting white-tailed kite, Cooper's hawk, tricolored blackbird, horned lark, golden eagle, short-eared owl, and loggerhead shrike.	**No Impact** There would be no construction activities or impacts on special-status species.	**Increased** This alternative would require construction activities in sensitive riparian habitat and extensive construction within the San Antonio Creek channel, which would have a greater potential to adversely affect special-status species. Compared to the proposed project, this alternative would involve more construction closer to higher quality habitat for sensitive species (i.e., the San Antonio Creek corridor and sycamore alluvial habitat).	**Decreased** Under this alternative, the aboveground backup pipeline would be constructed on pipeline supports, which would require less excavation than the underground backup pipeline under the proposed project. Therefore, the potential to adversely affect habitat for special-status species would be reduced.
Impact BI-2: The proposed project could have a substantial adverse effect on riparian habitat and other sensitive habitats during construction. (Less than Significant with Mitigation)	Construction activities at the San Antonio Creek crossing could affect mule fat scrub riparian habitat, a sensitive habitat under the Fish and Game Code, and require removal of some moderately sized native trees and mature native trees. In addition, the permanent placement of spoils at the North Spoils Site could result in soil disturbance within the dripline of protected oak trees, potentially resulting in increased pathology and death of the oak trees.	**No Impact** There would be no construction activities or any impact on sensitive habitats and mature native trees.	**Increased** Extensive construction within the San Antonio Creek channel would increase the potential for impacts on sensitive habitats. In addition, although the backup pipeline would be routed beneath the Turner Dam access road to minimize impacts on sensitive riparian habitat and mature trees, due to the proximity of pipeline construction activities to the creek, there would still be a greater potential for impacts. The North Spoils Site would also be used for spoils disposal under this alternative, potentially affecting the same trees at that site.	**Decreased** Under this alternative, the aboveground backup pipeline would be constructed on pipeline supports that could be spaced to avoid impacts on mule fat scrub riparian habitat at the San Antonio Creek crossing. Construction of the aboveground pipeline under this alternative is expected to require removal of the same mature trees as the proposed project. The North Spoils Site would also be used for spoils disposal under this alternative, potentially affecting the same trees at that site.
Impact BI-3: The proposed project could have a substantial adverse effect on jurisdictional waters during construction. (Less than Significant with Mitigation)	Jurisdictional waters within and adjacent to San Antonio Creek, a small segment of an ephemeral tributary that crosses the project area, and a small freshwater marsh at Staging Area A would be adversely affected by	**No Impact** There would be no construction activities or any impact to wetlands or aquatic resources.	**Increased** This alternative would result in permanent impacts on wetlands and aquatic resources due to modifications to the existing discharge facility, including replacement and enlargement of the stilling basin within	**Decreased** Under this alternative, the aboveground backup pipeline would be constructed on pipeline supports that could be spaced to avoid impacts on San Antonio Creek and the ephemeral tributary. There would be

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Biological Resources (cont.)				
Impact BI-3 (cont.)	construction activities. Earthwork adjacent to Alameda and San Antonio Creeks could result in sedimentation or a release of hazardous materials to these creeks, adversely affecting aquatic resources in the creeks.		the San Antonio Creek channel and stabilization of the creek banks. In addition, installation of the backup pipeline between Calaveras Road and Turner Dam would require extensive construction near San Antonio Creek, which could result in greater impacts on wetlands and aquatic resources due to an increased potential for sedimentation and releases of hazardous materials. Because this alternative would also be expected to use Staging Area A and cross the ephemeral tributary located at the southern backup pipeline alignment during construction, it would result in the same impacts on freshwater marsh at Staging Area A and the ephemeral tributary.	less soil disturbance because the backup pipeline would be constructed on pipeline supports, and therefore impacts related to erosion and sedimentation of water bodies would be decreased. Because this alternative would also be expected to use Staging Area A during construction, it would result in the same impacts on freshwater marsh at Staging Area A.
Impact BI-4: The proposed project could have a substantial adverse effect on resident trout and other native fishes during construction, either by impeding movement or adversely affecting aquatic habitat. (Less than Significant with Mitigation)	Construction activities adjacent to Alameda and San Antonio Creeks could result in sedimentation or a release of hazardous materials to these creeks, potentially affecting resident trout if there is flow and trout are present in the creeks.	**No Impact** There would be no construction activities or any impact on resident trout or other native fish.	**Increased** Extensive construction within the San Antonio Creek channel related to the improvements to the existing discharge facility, including replacement and enlargement of the stilling basin and construction of riprap on the creek banks, would result in an increased potential for sedimentation and releases of hazardous materials that could adversely affect resident trout or other native fish.	**Decreased** This alternative would decrease this impact when compared to the proposed project because the aboveground backup pipeline would result in less soil disturbance (the backup pipeline would be constructed on pipeline supports), and there would be less potential for impacts related to erosion and sedimentation that could affect resident trout or other native fish.
Impact BI-6: Construction activities associated with the proposed project could conflict with local policies or ordinances protecting biological resources. (Less than Significant with Mitigation)	Dozens of native and non-native trees located along the Calaveras Road right-of-way that are protected by the Alameda County Tree Ordinance could be removed during project construction.	**No Impact** There would be no construction activities or any impact on protected trees.	**Same** The portion of the backup pipeline alignment along the Calaveras Road right-of-way would be the same as under the proposed project and would require removal of the same trees that are protected by the local tree ordinance.	**Same** The portion of the aboveground pipeline along the Calaveras Road right-of-way would be the same as under the proposed project and would require removal of the same trees that are protected by the local tree ordinance.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Biological Resources (cont.)				
Impact BI-7: Project operations could have a substantial adverse effect on special-status animal species. (Less than Significant with Mitigation)	The pump intakes for the dewatering facilities in Pits F3-East and F3-West could cause injury to, or mortality of, California red-legged frog due to entrainment.	**No Impact** If the proposed project is not implemented, the SFPUC would retain the ability to discharge up to 230 mgd of system water to San Antonio Creek, the same as existing conditions.	**Increased** Discharges of the future maximum Hetch Hetchy flow to San Antonio Creek via the backup pipeline would adversely affect special-status species, such as California red-legged frog and western pond turtle, in the creek channel just downstream of Turner Dam.	**Same** Discharges to Pit F3-East via the aboveground pipeline would have the same operational impacts on special-status species as the proposed project.
Impact BI-8: Project operations would not have a substantial adverse effect on jurisdictional waters, riparian habitat, or aquatic resources. (Less than Significant)	Operational impacts on jurisdictional waters, riparian habitat, or aquatic resources would be less than significant since discharges would be routed to Pit F3-East, which is part of active mining facilities.	**No Impact** If the proposed project is not implemented, the SFPUC would retain the ability to discharge up to 230 mgd of system water to San Antonio Creek, the same as existing conditions.	**Increased** Discharges of up to 315 mgd to San Antonio Creek would adversely affect aquatic habitat and jurisdictional waters within the creek channel just downstream of Turner Dam.	**Same** Operational impacts on jurisdictional waters, riparian habitat, or aquatic resources would be the same as the proposed project.
Impact BI-10: The proposed project would not have a substantial adverse effect on resident trout and other native fishes during project operations. (Less than Significant)	Emergency and planned discharges under the proposed project would not affect resident trout or other native fish because the discharged water would be transferred to San Antonio Reservoir or the SVWTP.	**No Impact** If the proposed project is not implemented, the SFPUC would retain the ability to discharge up to 230 mgd of system water to San Antonio Creek, the same as existing conditions.	**Increased** Under this alternative, in the event of an emergency or planned discharge exceeding 160 mgd, the SFPUC would discharge up to 315 mgd of water to San Antonio Creek. These heavy flows could adversely affect resident trout and other native fish in San Antonio or Alameda Creeks (if fish are present).	**Same** Under this alternative, emergency and planned discharges would be made to Pit F-3 East and pumped from Pits F3-East and F3-West to the San Antonio Reservoir or the SVWTP, the same as the proposed project.
Impact C-BI: Project implementation could result in a cumulatively considerable contribution to cumulative impacts on biological resources. (Less than Significant with Mitigation)	Cumulatively considerable impacts on special-status species, mature native trees, riparian and sensitive habitats, jurisdictional waters, and resident fishes during construction. Cumulatively considerable impacts on protected trees.	**No Impact** There would be no construction activities with the potential to contribute to cumulative impacts on special-status species, riparian and sensitive habitats, jurisdictional waters, resident fishes, or protected trees.	**Increased** The longer backup pipeline under this alternative (2 miles vs. 1.3 miles) would be routed in close proximity to sensitive riparian habitat along San Antonio Creek, thereby increasing the SABPL project's contribution to cumulative impacts on special-status species, riparian habitats,	**Decreased** This alternative would decrease the project's contribution to cumulative impacts on special-status species, riparian habitats, and jurisdictional waters because the aboveground backup pipeline would result in less soil disturbance, and therefore the project's contribution to cumulative soil

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Biological Resources (cont.)				
Impact C-BI (cont.)			and jurisdictional waters. This alternative would require removal of the same trees along the Calaveras Road right-of-way and would result in the same contribution to cumulative impacts on protected trees as the proposed project.	erosion and sedimentation of water bodies would be reduced. This alternative would require removal of the same trees along the Calaveras Road right-of-way and would result in the same contribution to cumulative impacts on protected trees as the proposed project.
Geology and Soils				
Impact GE-1: The project is located on a geologic unit that could become unstable as a result of project construction. (Less than Significant with Mitigation)	Construction of the new outfall and splash pad could cause unstable slopes in Pit F3-East during construction.	**No Impact** There would be no construction activities and therefore no potential for creating unstable slopes during construction.	**Decreased** This alternative would not involve construction of the outfall and splash pad in Pit F-3 East and would not be constructed in an area susceptible to slope instability.	**Same** This alternative would involve construction of the same outfall and splash pad in Pit F-3 East as the proposed project.
Impact GE-2: The project could result in substantial soil erosion or loss of topsoil during construction. (Less than Significant with Mitigation)	Construction activities would cause soil disturbance along a 1.3-mile pipeline alignment and associated staging areas and other work areas.	**No Impact** There would be no construction activities or related soil erosion.	**Similar** Although the pipeline constructed under this alternative would be longer (2 miles vs. 1.3 miles), the amount of soil disturbance would be similar to the proposed project because no construction would be required in the vicinity of Pits F3-East and F3-West.	**Decreased** Under this alternative, the aboveground backup pipeline would be constructed on pipeline supports that would require less excavation than the trench called for to construct an underground pipeline for the proposed project, therefore resulting in less potential for soil erosion.
Impact GE-5: The project would not expose people or structures to substantial adverse effects related to the risk of property loss, injury, or death due to seismically induced ground failure, including liquefaction, lateral spreading, or settlement. (Less than Significant)	The backup pipeline would be constructed in an area with low potential for liquefaction, lateral spreading, and settlement.	**No Impact** There would be no pipeline constructed under this scenario.	**Increased** The portion of the pipeline alignment to the east of Calaveras Road traverses an area with a liquefiable layer and an area adjacent to San Antonio Creek where lateral displacement could result in ground displacement of up to several feet, and construction of a retaining wall could be required.	**Similar** Under this alternative, the aboveground backup pipeline would be constructed along the same alignment as the proposed project and would be subject to the same seismic hazards.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Geology and Soils (cont.)				
Impact C-GE: Project construction could result in a cumulatively considerable contribution to cumulative impacts related to the loss of topsoil. (Less than Significant with Mitigation)	Cumulative impacts related to loss of topsoil during construction.	**No Impact** There would be no construction activities.	**Increased** This alternative's contribution to cumulative impacts related to loss of topsoil would be greater due to the longer backup pipeline alignment (0.7 mile longer than under the proposed project) and associated increase in soil excavation.	**Decreased** This alternative's contribution to cumulative impacts related to loss of topsoil would be less than under the proposed project because construction of the aboveground backup pipeline would require less soil excavation than an underground pipeline.
Hydrology and Water Quality				
Impact HY-1: Project construction could substantially degrade water quality as a result of erosion and sedimentation or an accidental release of hazardous chemicals. (Less than Significant with Mitigation)	The project could cause degradation of water quality in Alameda Creek, San Antonio Creek, and Pit F3-East as a result of soil erosion and sedimentation or an accidental release of hazardous materials during construction.	**No Impact** There would be no construction activities or related soil erosion and sedimentation or releases of hazardous materials.	**Increased** Increased construction activities in close proximity to San Antonio Creek could result in greater water quality impacts from soil erosion and sedimentation and accidental releases of hazardous materials.	**Decreased** Under this alternative, the aboveground backup pipeline would be constructed on pipeline supports and would require less excavation than the proposed project, resulting in a reduced potential for soil erosion, sedimentation, and accidental releases of hazardous materials.
Impact HY-3: Discharges of dewatering effluent from excavated areas during project construction could substantially degrade water quality. (Less than Significant with Mitigation)	The project could cause water quality impacts from discharges of groundwater produced during construction dewatering.	**No Impact** There would be no construction activities or need for groundwater dewatering.	**Similar** Excavation along the 2-mile-long backup pipeline alignment could require more groundwater dewatering than would occur along the 1.3-mile-long backup pipeline alignment under the proposed project, particularly where the alignment parallels San Antonio Creek. However, the level of dewatering would be similar to the proposed project because no construction activities requiring excavations would be conducted in the vicinity of Pits F3-East and F3-West under this alternative.	**Decreased** Under this alternative, the aboveground backup pipeline would be constructed on pipeline supports, which would require less excavation than the trench called for to construct an underground pipeline for the proposed project, and this excavation might not require groundwater dewatering.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Hydrology and Water Quality (cont.)				
Impact HY-8: Future discharges from the backup pipeline would not substantially degrade water quality or create runoff that would exceed the capacity of Pit F3-East. (Less than Significant)	Emergency and planned discharges under the proposed project would not affect water quality or flows in Alameda and San Antonio Creeks because the discharged water would be transferred from Pit F3-East to either San Antonio Reservoir or the SVWTP. Any increases in the frequency, timing, or rate of discharges to Alameda Creek by Hanson Aggregates would be covered under the quarry company's National Pollutant Discharge Elimination permit.	**No Impact** As under existing conditions, if the proposed project is not implemented the SFPUC would retain the ability to discharge up to 230 mgd of dechlorinated Hetch Hetchy water to San Antonio Creek.	**Increased** Under this alternative, the SFPUC would convey emergency or planned discharges of up to 315 mgd of dechlorinated Hetch Hetchy water to San Antonio Creek. Despite the improvements to the existing discharge facility (enlarged stilling basin and riprap along the creek banks), these higher flows could increase channel erosion and adversely affect water quality in the creek.	**Same** Same as the proposed project, emergency and planned discharges of up to 315 mgd of Hetch Hetchy water would be conveyed to Pit F3-East and subsequently pumped to San Antonio Reservoir or the SVWTP.
Impact C-HY: Project implementation could result in a cumulatively considerable contribution to cumulative impacts on hydrology and water quality. (Less than Significant with Mitigation)	Cumulative water quality impacts during construction related to soil erosion, accidental releases of hazardous construction chemicals, and dewatering discharges.	**No Impact** There would be no construction activities.	**Increased** This alternative's contribution to cumulative water quality impacts would be greater due to the longer backup pipeline alignment (0.7 mile longer than under the proposed project) and associated increases in soil excavation, as well as to the proximity of the construction activities east of Calaveras Road to San Antonio Creek.	**Decreased** This alternative's contribution to cumulative water quality impacts would be decreased when compared to the proposed project because construction of the aboveground backup pipeline would require less soil excavation than an underground pipeline, resulting in a reduced potential for erosion.
Hazards and Hazardous Materials				
Impact HZ-1: Project construction could result in a substantial adverse effect related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less than Significant with Mitigation)	Diesel and waste oil could potentially be present in the soil in the vicinity of the San Antonio Pump Station, and diesel has affected soil quality in the Surface Mining Permit 30 (SMP-30) area. Electrical equipment that could contain PCBs, fluorescent light ballasts that could contain di	**No Impact** There would be no construction activities or related potential to encounter hazardous materials in soil, groundwater, or building materials.	**Similar** Like the proposed project, this alternative could include soil excavation near the San Antonio Pump Station and in the SMP-30 area. Although this alternative would not require demolition of the two quarry buildings located east of Pit F3-East, overall, the potential to encounter	**Similar** Like the proposed project, this alternative could include soil excavation near the San Antonio Pump Station and in the SMP-30 area as well as demolition of the residential style building and shed in the vicinity of Pit F3-East for construction of the cutoff wall. Therefore, the potential to

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Hazards and Hazardous Materials (cont.)				
Impact HZ-1 (cont.)	(2-ethylhexyl) phthalate (DEHP) or PCBs, and fluorescent light tubes that contain mercury could also be encountered during demolition of the two quarry buildings.		hazardous materials during construction is similar to the proposed project.	encounter hazardous materials in the soil and building materials during construction is similar to the proposed project.
Impact HZ-2: Project construction could result in a substantial adverse effect related to accident conditions involving the release of hazardous construction chemicals into the environment. (Less than Significant with Mitigation)	Project construction activities could result in accidental releases of hazardous construction chemicals into the environment.	**No Impact** There would be no construction activities or related potential for accidental releases of hazardous construction chemicals into the environment.	**Same** Like the proposed project, construction activities associated with this alternative could result in the accidental release of hazardous construction chemicals into the environment.	**Same** Like the proposed project, construction activities associated with this alternative could result in the accidental release of hazardous construction chemicals into the environment.
Impact C-HZ: Construction of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to hazards and hazardous materials. (Less than Significant with Mitigation)	Cumulatively considerable construction impacts related to accidental upset and release of contaminated soil or groundwater or hazardous building materials into the environment, and accidental releases of hazardous construction chemicals into the environment.	**No Impact** There would be no construction activities or related potential for accidental releases of contaminated soil or groundwater, hazardous building materials, or hazardous construction chemicals into the environment that could contribute to this cumulative impact.	**Increased** Due to the longer backup pipeline that would be constructed under this alternative, construction activities would make a slightly greater contribution to cumulative impacts related to the release of contaminated soil and groundwater into the environment, and the accidental release of hazardous construction chemicals into the environment.	**Decreased** Due to the reduced excavation and earthwork that would be required to install the aboveground backup pipeline and the associated decrease in the intensity of construction activities, this alternative's contribution to cumulative impacts associated with contaminated soil and groundwater, and the accidental release of hazardous construction chemicals into the environment, would be less than that of the proposed project.
Mineral and Energy Resources				
Impact ME-2: Project construction could result in substantial adverse effects related to the use of large amounts of fuel or energy, or the use of these resources in a wasteful manner. (Less than Significant with Mitigation)	Construction activities could result in the wasteful use of fuels.	**No Impact** There would be no construction activities or construction-related use of fuels.	**Similar** Although the pipeline constructed under this alternative would be longer (2 miles vs. 1.3 miles), the level of construction activities and associated construction-related energy use would be similar to the proposed project.	**Decreased** Because the aboveground backup pipeline that would be constructed under this alternative would require less excavation than the underground backup pipeline under the proposed project, construction activities for this alternative would require less energy during construction.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Mineral and Energy Resources (cont.)				
Impact ME-4: Project operations would not result in substantial adverse effects related to the long-term use of large amounts of fuel or energy, or the use of these resources in a wasteful manner. (Less than Significant)	Without energy efficiency measures, the proposed project could result in the inefficient use of energy during operation.	**Decreased** Without implementation of the proposed project, operations would continue as they are today; some emergency and planned discharges would be released to San Antonio Creek under gravity flow, and therefore less energy would be required to manage the discharges.	**Decreased** Under this alternative, when Hetch Hetchy flows are greater than 160 mgd, the water would be discharged to San Antonio Creek by gravity. Flows of 160 mgd or less would be pumped to San Antonio Reservoir or to the SVWTP. Because this alternative would not provide the SFPUC with the flexibility to recover water that is discharged to San Antonio Creek, there are no energy requirements associated with water recovery. As a result, this alternative would use less energy during operation.	**Same** Under this alternative, emergency and planned discharges would be made to Pit F3-East. Depending on the water elevation in Pit F3-East after a discharge, the SFPUC would recover a portion or all of the discharged water by pumping the water out of the quarry pit to San Antonio Reservoir or the SVWTP, the same as the proposed project. Therefore, energy requirements for managing discharges during operation would be the same as the proposed project.
Impact C-ME: Project construction would result in a cumulatively considerable contribution to cumulative impacts related to mineral and energy resources. (Less than Significant with Mitigation)	Cumulative impacts related to energy consumption during construction.	**No Impact** There would be no construction activities or construction-related use of fuels that could contribute to this cumulative impact.	**Similar** Although the backup pipeline constructed under this alternative would be longer (2 miles vs. 1.3 miles), the level of construction activities and associated construction-related energy use would be similar to the proposed project. Thus, this alternative's contribution to cumulative impacts associated with energy use during construction would be the same as the proposed project.	**Decreased** This alternative would use less energy during construction activities; therefore, this alternative's contribution to cumulative impacts related to energy use during construction would be less than that of the proposed project.
Agriculture and Forest Resources				
Impact AG-1: Implementation of the proposed project would result in the conversion of Unique Farmland, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. (Less than Significant with Mitigation)	Impacts related to the permanent conversion of Unique Farmland to non-agricultural uses as a result of the permanent placement of spoils in an earthen berm at the former nursery site.	**No Impact** There would be no construction activities requiring the management of excess spoils.	**Similar** Although this alternative would generate less excess spoils than the proposed project, a portion of the excess spoils generated during construction could still require disposal in an earthen berm at the former nursery site.	**Similar** Although this alternative would generate less excess spoils than the proposed project, a portion of the excess spoils generated during construction could still require disposal in an earthen berm at the former nursery site.

TABLE 7-2 (Continued)
COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE CEQA ALTERNATIVES

Impact	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: SABPL Discharges to Base of Turner Dam	Alternative 3: Aboveground SABPL
Agriculture and Forest Resources (cont.)				
Impact C-AG: Implementation of the proposed project would result in a cumulatively considerable contribution to cumulative impacts related to the conversion of Unique Farmland to non-agricultural uses. (Less than Significant with Mitigation)	Cumulative impacts related to the permanent conversion of Unique Farmland to non-agricultural uses.	**No Impact** There would be no construction activities requiring the management of excess spoils that could contribute to this cumulative impact.	**Similar** Although this alternative would generate less excess spoils than the proposed project, a portion of the excess spoils generated during construction could be permanently placed in an earthen berm at the former nursery site. Thus, this alternative's contribution to cumulative impacts associated with the conversion of Unique Farmland to non-agricultural uses would be the same as the proposed project.	**Similar** Although this alternative would generate less excess spoils than the proposed project, a portion of the excess spoils generated during construction could be permanently placed in an earthen berm at the former nursery site. Thus, this alternative's contribution to cumulative impacts associated with the conversion of Unique Farmland to non-agricultural uses would be the same as the proposed project.

Ability to Meet Project Objectives

The No Project Alternative would not meet either of the project objectives: to provide reliable conveyance capacity for emergency discharges of Hetch Hetchy water during water quality events or facility outages, and to increase the operational flexibility and delivery reliability during emergencies and planned maintenance.

Although SFPUC system operators would have sufficient capacity to convey the maximum future Hetch Hetchy flow of 315 mgd out of the regional system by utilizing the Alameda East Portal Overflow Pipeline, flows exceeding the 230-mgd capacity of the San Antonio Pipeline and 240-mgd capacity of the existing chemical facility would be discharged to Pit F6 without first being dechlorinated or pH-adjusted (up to 75 mgd).

The No Project Alternative would also not provide the operational flexibility and delivery reliability afforded by the proposed project. Without implementation of the proposed project, water service to downstream customers could potentially be disrupted, because SFPUC facility operators would not have the ability to simultaneously divert quality-impaired Hetch Hetchy water out of the regional water system while accessing water stored in San Antonio Reservoir to meet customer demand. Further, as discussed in Chapter 3, Project Description, the San Antonio Pipeline is susceptible to damage due to corrosion and breakage. If the San Antonio Pipeline failed, there would be no backup pipeline. In the event of failure of the San Antonio Pipeline, the Alameda East Portal Overflow Pipeline (with a capacity of 180 mgd) would be the only pipeline available to convey emergency discharges, and this pipeline alone could not accommodate the future maximum Hetch Hetchy flow of up to 315 mgd. Overall, the No Project Alternative would jeopardize the SFPUC’s ability to meet the adopted WSIP goals and objectives, which would be counter to SFPUC Resolution 08-0200. (See Chapter 2, Introduction and Background, for a description of SFPUC Resolution 08-0200.)

Environmental Impacts of the No Project Alternative

As summarized in Table 7-2, the No Project Alternative would avoid all construction-related impacts of the proposed project, including the two significant unavoidable air quality impacts associated with NOx emissions and health risks (Impacts AQ-1 and C-AQ). This is because the new backup pipeline, chemical facility, Alameda Creek Pump Station, transfer pipeline, cutoff wall along the perimeter of Pits F3-East and F3-West, and ancillary features would not be constructed under the No Project Alternative. The two quarry buildings located east of Pit F3-East would not be demolished, thereby eliminating impacts related to hazardous building materials (Impact HZ-1 and HZ-C). Similarly, since this alternative would not generate excess spoils, the No Project Alternative would also avoid impacts related the permanent conversion of Unique Farmland to non-agricultural uses (Impacts AG-1 and C-AG).

Consistent with existing conditions, in the event of an emergency or planned discharge, the SFPUC would retain the ability to discharge up to 230 mgd of dechlorinated system water to San Antonio Creek via the San Antonio Pipeline. By utilizing the Alameda East Overflow Pipeline, the SFPUC would have the capacity to convey the entire future maximum Hetch Hetchy flow of 315 mgd out of the system. However, the existing San Antonio Pipeline and existing chemical facility do not have sufficient capacity to accommodate the future maximum Hetch Hetchy flow; therefore, up to 75 mgd of system water (flows in excess of 230 mgd) would be discharged to quarry Pit F6 via the Alameda East Portal Overflow Pipeline without being dechlorinated.

Energy use during operation (Impact ME-3) would be less under the No Project Alternative because discharges exceeding the capacity of the San Antonio Pump Station would be made to San Antonio Creek via gravity. Under the proposed project, all discharges exceeding the capacity of the San Antonio Pump Station would be made to Pit F3-East and, if water elevations in Pit F3-East were to rise above 195 feet msl, such discharges would subsequently be pumped to San Antonio Reservoir or to the SVWTP.

7.3.3.2 Alternative 2: SABPL Discharges to Base of Turner Dam

Alternative 2 was selected for analysis because it could reduce certain impacts associated with the proposed project (e.g., energy consumption, slope stability), is feasible, and would meet the project's objectives. Alternative 2 includes all project components originally proposed in the NOP, but represents an environmentally preferable variation of the original project in that it routes the backup pipeline beneath the Turner Dam access road to avoid prehistoric archaeological site SA-1 and to reduce impacts on sensitive biological resources.

Under this alternative, the backup pipeline would follow the alignment shown on Figure 7-1. It would be 2 miles long (0.7 mile longer than under the proposed project) and extend between the San Antonio Pump Station and the existing discharge facility at San Antonio Creek at the base of Turner Dam. The new backup pipeline would be constructed generally parallel to the existing San Antonio Pipeline between the San Antonio Pump Station and pipeline station 62+00. This pipeline section would be the same as under the proposed project. At pipeline station 62+00, the backup pipeline would turn east, cross Calaveras Road and pass under the existing San Antonio Pipeline, and continue beneath the Turner Dam access road along the south side of San Antonio Creek to the existing discharge facility (see Figure 7-1). Construction of the backup pipeline beneath the existing San Antonio Pipeline could undermine the structural integrity of that pipe, necessitating replacement of a segment of the existing pipeline at that location. Installation of the backup pipeline beneath the Turner Dam access road would likely require that the SFPUC use an existing alternative access road located to the north of San Antonio Creek to access the dam and/or to facilitate construction traffic routing. The need for improvements to the alternative access road (and any associated impacts of such improvements) is not known. The backup pipeline would terminate at the existing discharge facility via a new cone valve and outfall to San Antonio Creek. A new electrical control building would be constructed on the south bank of San Antonio Creek. The existing stilling basin within the San Antonio Creek channel would be replaced with a larger stilling basin designed to handle the future maximum Hetch Hetchy flow, and the creek banks immediately downstream of the new and existing cone valves would be reinforced with riprap, or with an environmentally engineered bank stabilization alternative, to protect against bank erosion.

As with the proposed project, a new chemical facility would be constructed near the San Antonio Pump Station to dechlorinate and pH-adjust the Hetch Hetchy water prior to discharge. The backup pipeline alignment, the modifications to the existing discharge facility, and the new chemical facility would be designed to accommodate the future maximum Hetch Hetchy flow of 315 mgd. In addition, this alternative would replace a segment of 12-inch-diameter water pipeline to the town of Sunol, the same as under the proposed project. Unlike the proposed project, this alternative would not construct the new discharge facility at Pit F3-East, cutoff wall around Pits F3-East and F3-West, Alameda Creek Pump Station, wet well, transfer pipeline, dewatering pipeline, or new electrical transformer. No construction requiring excavations would be necessary in the vicinity of Pits F3-East and F3-West. Since the cutoff wall would not be constructed, demolition of the two quarry buildings just east of Pit F3-East would not be required. However, like the proposed project, excess spoils generated during construction could be permanently placed in an earthen berm at the North Spoils Site or former nursery site located east of Pit F3-East.

Although the removal of riparian trees along the San Antonio Creek corridor would be avoided to the extent possible, it is likely that some mature riparian trees could be damaged or would require removal during construction due to their proximity to the access road. Like the proposed project, the pipeline would be installed using open-trench construction methods. Where the alternative alignment crosses Calaveras Road, steel plates would be placed over the trench to maintain traffic flow, and at least one lane would remain open at all times. The improvements to the existing discharge facility, including the new outfall, stilling basin, and riprap, would involve extensive construction within a reach of San Antonio Creek known to provide habitat for special-status aquatic species, including California red-legged frog and western pond turtle.

Under planned and emergency conditions requiring discharges of quality-impaired Hetch Hetchy water, the SFPUC's preferred operation would be to pump the water to San Antonio Reservoir or the SVWTP so that it could be conserved for future treatment and distribution to customers. However, as occurs under the existing condition, the SFPUC's ability to conserve the water under this alternative would be limited by the capacity of the San Antonio Pump Station (160 mgd). When the Hetch Hetchy flow exceeded 160 mgd, the SFPUC would discharge the entire flow to San Antonio Creek, and the water would not be conserved for future use. When compared to the proposed project, opportunities to conserve the discharged water for future delivery to customers would be greatly reduced.

Ability to Meet Project Objectives

Alternative 2 would fully meet both project objectives. The facility improvements that would be implemented under this alternative would provide reliable conveyance capacity for emergency discharges of Hetch Hetchy water supplies during water quality events or during facility outages because the new facilities would have sufficient capacity to accommodate the maximum future flow of 315 mgd. This alternative would also meet the goal of increasing operational flexibility and delivery reliability during emergencies and planned maintenance because the new backup pipeline could be used for emergency discharges while the existing San Antonio Pipeline was simultaneously being used to convey water stored in San Antonio Reservoir to the SVWTP to meet water demand. Alternative 2 would be consistent with the adopted WSIP goals and objectives prescribed in SFPUC Resolution 08-0200.

Environmental Impacts of Alternative 2

Compared to the proposed project, this alternative would have less substantial impacts related to slope instability during construction (Impact GE-1) because construction activities would not be conducted within the walls of Pit F3-East or any other slope that could become unstable. This alternative would also result in less use of energy during operation (Impact ME-4) compared to the project because all flows exceeding 160 mgd would be discharged via gravity (under the proposed project, all discharges would require pumping from Pit F3-East to San Antonio Reservoir or to the SVWTP). Despite the longer pipeline alignment, this alternative likely would require less excavation than the proposed project because none of the facilities associated with operational discharges to Pit F3-East would be built (i.e., new discharge facility on the southern slope of Pit F3-East, cutoff wall, transfer pipeline, dewatering pipeline, Alameda Creek Pump Station, and wet well, which together would generate spoils totaling 86,050 cubic yards). For the proposed project, construction-phase NOx emissions exceed the daily threshold of 54 lbs/day during phases when construction of the facilities associated with operational discharges to Pit F3-East would be concurrent with construction of the backup pipeline. With Alternative 2, daily NOx emissions would be less than under the proposed project, thereby reducing the severity of the two significant and unavoidable impacts of the proposed project: construction-related NOx emissions (Impact AQ-1) and the project's contribution to cumulative construction-related NOx emissions (Impact C-AQ). Nonetheless, these impacts likely would remain significant and unavoidable. Further, the contribution of Alternative 2 to the significant and unavoidable cumulative health risk would be similar to the proposed project.

As summarized in Table 7-2, implementation of Alternative 2 would result in greater construction-related impacts in many areas relative to the proposed project. Construction-related impacts on archaeological site SA-1 (Impact CP-2) would be the same as with the proposed project. However, there could be a greater potential to encounter previously unidentified archaeological and paleontological resources and human remains, given the increased excavation associated with the longer pipeline alignment (2 miles versus 1.3 miles; Impacts CP-2, CP-3, and CP-4). Although the backup pipeline would be routed beneath the existing access road to Turner Dam in an effort to minimize impacts on riparian habitat, construction-related impacts on biological resources, including mature native trees, special-status species, riparian habitats, and other sensitive habitats (Impacts BI-1 and BI-2), would be greater than under the proposed project due to the extensive construction within the San Antonio Creek channel associated with improvements to the existing discharge facility, as well as the proximity of pipeline construction to riparian and sycamore alluvial habitat. This alternative would result in the same impacts on the freshwater marsh at Staging Area A and the ephemeral stream along the southern portion of the backup pipeline alignment (Impact BI-3), but would increase the severity of this impact because of the permanent impacts on wetlands and aquatic resources caused by modifying the existing San Antonio Creek discharge facility. This alternative would result in substantially greater construction-related impacts on water quality (Impact HY-1) and resident trout and other native fish species (Impact BI-4) along San Antonio Creek because of the extensive construction within the creek channel and proximity of pipeline construction activities to the creek. In addition, it is possible that some mature riparian trees along the alignment would require removal (Impact BI-2).

The backup pipeline alignment under Alternative 2 would cross a Chevron crude oil pipeline that runs along the east side of Calaveras Road, resulting in an increased potential for conflicts with this pipeline. (The crude oil pipeline would not be affected by the proposed project as the alignments do not intersect). Because this alternative would avoid construction near Pits F3-East and F3-West, it would avoid potential conflicts with the South Bay Aqueduct along the northern boundary of the quarry pits. This alternative would also avoid conflicts with the 36-inch-diameter PG&E high-pressure natural gas pipeline near pipeline station 64+00 because the backup pipeline alignment at pipeline station 62+00 would veer east across Calaveras Road (Impact UT-1). The need for groundwater dewatering would be reduced because excavation associated with the cutoff wall around Pits F3-East and F3-West would not occur, resulting in less substantial water quality impacts related to the discharge of groundwater from construction dewatering (Impact HY-3). However, even with the use of steel plates across open trenches to maintain traffic flow on Calaveras Road, construction across Calaveras Road and within the access road to Turner Dam could impede access for emergency response vehicles (Impact TR-2) and increase traffic safety hazards (Impact TR-3). In addition, in the event of an earthquake, lateral spreading (the horizontal movement of soil due to liquefaction of underlying sediments) could occur along the portion of the pipeline alignment closest to San Antonio Creek, potentially requiring a retaining wall. The backup pipeline alignment under the proposed project would not cross this area (Impact GE-5) (URS, 2009). This alternative would not require demolition of the two quarry buildings located just east of Pit F3-East, and therefore would avoid impacts associated with a release of hazardous building materials. Like the proposed project, the permanent placement of spoils in an earthen berm at the former nursery site located east of Pit F3-East would result in the permanent conversion of Unique Farmland to non-agricultural uses (Impacts AG-1 and C-AG).

Since the future maximum Hetch Hetchy flow of 315 mgd could be discharged to San Antonio Creek, there would be an increased potential for Alternative 2 to adversely affect water quality and aquatic resources in San Antonio and Alameda Creeks during project operations. The increased flows under this alternative could cause erosion, disrupt aquatic habitat, and adversely affect special-status species such as California red-legged frog and western pond turtle, since these special-status species are known to inhabit the San Antonio Creek corridor just downstream of Turner Dam (Impacts BI-7, BI-10, and HY-8).

7.3.3.3 Alternative 3: Aboveground SABPL

Alternative 3, Aboveground SABPL, was selected as a project alternative because it could reduce impacts associated with the proposed project (construction of the aboveground pipeline would minimize ground disturbance and the associated construction-related impacts), is feasible, and could meet the project objectives.

Under this alternative, the new backup pipeline would be constructed along the same alignment as the proposed project, but it would be constructed entirely aboveground instead of belowground. The aboveground backup pipeline would be constructed on pipe supports approximately 2 to 3 feet in height, and the total height of the 66-inch-diameter pipeline would be approximately 7 to 8 feet above ground surface. The vaults and manhole risers along the backup pipeline alignment would also be constructed above ground. The 12-inch-diameter water pipeline to the town of Sunol would not be constructed under this alternative, but could require replacement at a later date under a separate project. With the exception of the water pipeline to the town of Sunol, this alternative includes all of the same facility components as the proposed project, including the new chemical facility, discharge facility at Pit F3-East, cutoff wall, Alameda Creek Pump Station, wet well, transfer pipeline, dewatering pipeline, etc. As with the proposed project, all project facilities would be designed with sufficient capacity to accommodate the future maximum Hetch Hetchy flow of 315 mgd.

This alternative would substantially reduce earthwork associated with pipeline installation and would reduce disturbance to vegetated areas along the backup pipeline alignment. Construction of this alternative probably would generate a smaller fraction of the 31,300 cubic yards of excess spoils associated with construction of the backup pipeline under the proposed project. All other construction activities would be the same as under the proposed project. Like the proposed project, excess spoils generated during construction could be permanently placed in an earthen berm at the North Spoils Site or former nursery site located east of Pit F3-East.

Project operations would be the same as those under the proposed project. Like the proposed project, this alternative would enable the SFPUC to conserve the future maximum Hetch Hetchy flow for treatment and distribution to customers.

Ability to Meet Project Objectives

Alternative 3 would meet both project objectives. The new aboveground backup pipeline and associated facilities would provide reliable conveyance capacity for planned and emergency discharges of Hetch Hetchy water because these facilities would be designed to accommodate the future maximum flow of 315 mgd. This alternative would also meet the goal of increasing operational flexibility and delivery reliability during emergencies and planned maintenance because the SFPUC would be able to convey discharges through the new backup pipeline while simultaneously using the existing San Antonio Pipeline to convey water stored in San Antonio Reservoir to the SVWTP to meet water demand. Alternative 3 would be consistent with the adopted WSIP goals and objectives prescribed in SFPUC Resolution 08-0200.

Environmental Impacts of Alternative 3

As summarized in Table 7-2, implementation of Alternative 3 would reduce construction-related impacts in some areas relative to the proposed project. Most importantly, this alternative would reduce the severity of the two significant and unavoidable impacts of the proposed project—construction-related NOx emissions (Impact AQ-1) and the project's contribution to cumulative construction-related NOx emissions and health risk impacts (Impact C-AQ)—because the aboveground pipeline would require much less excavation and earthwork and would result in a decrease in construction-related NOx emissions when compared to the proposed project. Assuming that the elimination of pipeline trench excavation and related on-site transport and off-site disposal of spoils could reduce related equipment and vehicle operations by approximately one-fifth, construction-related NOx emissions would be less than with the proposed project. However, mitigated emissions in 2013 likely would still exceed the significance threshold of 54 lbs/day assuming concurrent construction of the backup pipeline and facilities associated with operational discharges to Pit F3-East; however, mitigated emissions in 2014 could be reduced to below the significance threshold. The contribution of Alternative 3 to the significant and unavoidable cumulative health risk would also be reduced.

There also would be less potential to encounter previously unidentified archaeological and paleontological resources and human remains because of the reduced excavation associated with the backup pipeline and because the water pipeline to the town of Sunol would not be constructed (Impacts CP-2, CP-3, and CP-4). Similarly, construction-related impacts on biological resources, including special-status species and sensitive habitats (Impacts BI-1 and BI-2), as well as impacts related to soil erosion, sedimentation of San Antonio and Alameda Creeks (Impacts GE-2 and HY-1), and construction-related effects on resident trout and other native fish species (Impact BI-4), would be less substantial relative to the proposed project because of the reduced excavation. The need for groundwater dewatering could also be reduced as a result of the reduced amount of excavation, resulting in less substantial water quality impacts related to the discharge of groundwater from construction dewatering (Impact HY-3).

Impacts on aquatic resources due to construction disturbance across the ephemeral stream located along the southern portion of the backup pipeline alignment and across San Antonio Creek (Impact BI-3) could be avoided because the pipeline supports could be placed to avoid these features. Similarly, this alternative could avoid conflicts with the 36-inch-diameter and 22-inch-diameter PG&E high-pressure natural gas pipelines (Impact UT-1) because the pipeline supports could be placed to avoid these natural gas pipelines.

Like the proposed project, the future maximum Hetch Hetchy flow of 315 mgd would be discharged to Pit F3-East and subsequently pumped to San Antonio Reservoir or the SVWTP. Therefore, operational impacts would be similar to those of the proposed project: there would be no direct discharges to San Antonio or Alameda Creeks, and there would be no related significant adverse effects on resident trout and other native fish species or on water quality from direct discharges (Impacts BI-10 and HY-8). Energy use during operation under this alternative would be the same as under the proposed project (Impact ME-4). Like the proposed project, the permanent placement of spoils in an earthen berm at the former nursery site would result in the permanent conversion of Unique Farmland to non-agricultural uses (Impacts AG-1 and C-AG).

The SFPUC would need space to inspect and maintain the pipeline, and would not be able to fully screen the 7- to 8-foot-high aboveground backup pipeline from Calaveras Road using vegetation because of the limited space between the pipeline right-of-way and Calaveras Road, and due to restrictions outlined in the SFPUC's Right-of-Way Integrated Vegetation Management

Policy, which would prohibit trees from being planted within the right-of-way of the backup pipeline. Therefore, the aboveground pipeline would be visible from Calaveras Road, a designated scenic roadway, particularly along the 6,200 feet where the backup pipeline would parallel the road. Since the opportunities to screen the backup pipeline are limited, the visibility of the aboveground backup pipeline from Calaveras Road would result in a significant and unavoidable impact on scenic resources (Impact AE-3) and could also adversely affect the character of the project vicinity (Impact LU-2). In addition, the aboveground backup pipeline would be less secure than the belowground pipeline planned under the proposed project, making it more vulnerable to vandalism.

7.4 Comparison of Alternatives

The CEQA Guidelines require the identification of an environmentally superior alternative to the proposed project (Section 15126.6[e]). If it is determined that the "no project" alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (Section 15126.6[3]).

Table 7-2 compares the impacts associated with the CEQA alternatives to those of the proposed project. As discussed throughout Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, Pumping Variants 1 and 2 would result in impacts that are very similar to or the same as those of the proposed project. Thus, for the purpose of this alternatives analysis, the comparison of the project alternatives to the proposed project also applies to Pumping Variants 1 and 2, unless otherwise indicated.

The No Project Alternative would avoid all of the construction-related environmental impacts of the proposed project, including the two significant and unavoidable construction-related impacts associated with NO_X emissions and cumulative health risks (Impacts AQ-1 and C-AQ). This alternative would also avoid operational impacts on biological resources in Pit F3-East. However, this alternative would not achieve either of the project objectives and would be counter to the SFPUC's basic mission of providing a reliable water supply for its customers, because water service to downstream customers could potentially be disrupted in the event of a water quality emergency. In addition, SFPUC facility operators would not have the ability to simultaneously divert quality-impaired Hetch Hetchy water out of the regional water system while accessing water in San Antonio Reservoir for water supplies to meet the needs of downstream customers. Further, because the capacity of the existing chemical facility is limited to 240 mgd and the capacity of the San Antonio Pipeline is 230 mgd, when flows are pumped to San Antonio Reservoir, up to 75 mgd would be discharged to quarry Pit F6 via the Alameda East Portal Overflow Pipeline without being dechlorinated in the event of a planned or emergency discharge of Hetch Hetchy water supplies.

Alternative 2, SABPL Discharges to Base of Turner Dam, would achieve both of the project objectives and would support the SFPUC's basic mission of providing a reliable water supply for its customers by providing the ability to simultaneously divert quality-impaired Hetch Hetchy water out of the regional water system while accessing water stored in San Antonio Reservoir to meet customer demand. Alternative 2 would reduce the severity of Impacts AQ-1 and C-AQ, both of which were determined to be significant and unavoidable under the proposed project, but NOx emissions likely would still exceed the significance thresholds and the impacts would remain unavoidable even with mitigation. In addition, the significant cumulative health risk impact under this alternative would be similar to the proposed project. Overall, however, this alternative would result in greater magnitude long-term impacts when compared to the proposed project. That is, while the backup pipeline would be routed beneath the Turner Dam access road to minimize impacts on the riparian corridor of San Antonio Creek, excavation for the longer backup pipeline (2 miles long versus 1.3 miles long) would likely result in greater impacts on biological resources. Further, the proposed improvements to the existing discharge facility at San Antonio Creek would result in greater construction-related impacts related to erosion, water quality, aquatic habitat, and special-status species. Even with the improvements to the discharge facility, the increased volume and rate of future discharges could result in long-term impacts on these same resources. In addition, Alternative 2 would not provide the SFPUC with the ability to conserve the future maximum Hetch Hetchy flow of 315 mgd for future use.

Alternative 3, Aboveground SABPL, would achieve both of the project objectives and would support the SFPUC's basic mission. Under this alternative, less soil excavation would be required because the pipeline would be constructed on pipeline supports, resulting in reduced impacts with respect to certain environmental resources. When compared to the proposed project, this alternative would result in a decrease in construction-related NO_X emissions and would lessen the severity of Impacts AQ-1 and C-AQ, both of which were determined to be significant and unavoidable under the proposed project. With this alternative, Impact AQ-1 would still be considered significant and unavoidable (for emissions during 2013) but the emissions would exceed the significance thresholds for a shorter period of time. The significant cumulative health risk under this alternative would be similar to the proposed project. This alternative could avoid impacts on the ephemeral stream along the southern portion of the backup pipeline alignment and on San Antonio Creek (Impact BI-3) if the pipeline supports were placed to avoid these features. Similarly, this alternative could avoid conflicts with the 36-inch-diameter PG&E high-pressure natural gas pipeline (Impact UT-1) if the pipeline supports were placed to avoid the gas pipeline. Because the aboveground backup pipeline installed under this alternative would discharge to Pit F3-East and the discharged water would ultimately be pumped to San Antonio Reservoir or the SVWTP, the future maximum Hetch Hetchy flow of 315 mgd could be conserved in the system for future use, the same as under the proposed project. However, construction of the 7- to 8-foot-high aboveground pipeline would adversely affect the character of the project vicinity and result in a significant and unavoidable impact on scenic resources because the 1.3-mile-long aboveground pipeline would be visible from Calaveras Road, a designated scenic roadway, while under the proposed project the pipeline would be underground and would not be visible. Despite a reduction in temporary significant and unavoidable air quality impacts, this alternative would result in greater overall impacts when compared to the proposed project and Alternative 2 due to the permanent, unavoidable degradation of scenic views from Calaveras Road.

As assessed above, although none of the action alternatives would reduce all of the impacts of the proposed project (and all of the impacts of Pumping Variants 1 and 2), Alternative 2 is considered to be environmentally superior among the alternatives, in part because it could incrementally reduce significant and unavoidable impacts associated with the proposed project (Impacts AQ-1 and C-AQ). Relative to the proposed project, this alternative would result in reduced impacts related to slope instability during construction (Impact GE-1) and energy use during project operations (Impact ME-4), but would result in greater impacts on many resources, such as aquatic habitats and special-status species. These greater impacts are associated with the portion of the backup pipeline alignment east of Calaveras Road and parallel to the San Antonio Creek corridor, the modifications to the existing discharge facility at the base of Turner Dam, and the effects of future discharges on sensitive habitat and special-status species in this portion of the creek channel.

7.5 Alternatives Considered but Rejected from Further Analysis

The alternatives to the SABPL project that were considered during project development are presented in the *Sunol Valley Water Source Reliability Alternatives Analysis Report* (Task 10.4) (URS and CDM, 2006). The purpose of the Alternatives Analysis Report was to document the evaluation of conveyance alternatives to provide 160 mgd of supply to the SVWTP during an outage associated with the Hetch Hetchy system. The Alternatives Analysis Report considered two Hetch Hetchy outage scenarios: (1) a planned maintenance event that did not require the discharge of quality-impaired Hetch Hetchy supply, and (2) an emergency event necessitating the discharge of the entire Hetch Hetchy flow into the Alameda system. The proposed project falls under the second outage scenario. Five alternative concepts (called "options") were considered for the second outage scenario as part of the background and project development. Option 5 represents the proposed project as originally described in the 2007 NOP. Options 1 through 4 were considered but rejected for the reasons indicated below.

Table 7-3 summarizes the options that were considered in the Alternatives Analysis Report and indicates each option's ability to meet the project goals. As indicated in the table, Options 1, 2, and 4 would meet both of the project objectives. However, Options 1 and 2 would involve discharges to Alameda Creek and associated potential impacts related to sudden temperature and flow changes in the creek during a discharge event. Both of these options would result in greater environmental impacts on biological resources (including resident trout and other native fish species) and water quality. While Option 4 would meet both of the project objectives and would provide the SFPUC with the ability to conserve the quality-impaired Hetch Hetchy water for future use by conveying the water to San Antonio Reservoir, this option would also result in greater environmental impacts when compared to the proposed project, including impacts on biological resources due to construction within the riparian zone of San Antonio Creek and impacts on cultural resources because the pipeline alignment would traverse prehistoric archaeological site SA-1. Option 3, which would involve discharges to San Antonio Creek via the existing San Antonio Pipeline, was determined to be technically infeasible because the existing San Antonio Pipeline does not have the capacity to convey the future maximum Hetch Hetchy flow. Option 5 (Discharge to San Antonio Creek through a new valve in Alameda Siphon No. 3 and a new pipeline paralleling the existing San Antonio Pipeline) included construction of a new pipeline parallel to the existing San Antonio Pipeline and discharge to San Antonio Creek. This option is evaluated above as Alternative 2,

TABLE 7-3
ALTERNATIVES CONSIDERED BUT REJECTED FROM FURTHER CONSIDERATION

Potential Alternative Identified	Description	Ability to Meet Project Objectives and Constraints on Implementation
Option 1. Discharge to Alameda Creek through the existing Alameda East Portal vent.	Construction of a new approximately 1,100-foot-long, 84-inch-diameter discharge pipeline extending between the outlet of the Alameda East Portal Overflow Pipeline to a new outfall into the east channel of Alameda Creek. An energy dissipation structure and other improvements would be constructed at the new outfall in Alameda Creek to minimize erosion, and the existing chemical facility at the San Antonio Pump Station would be expanded. Quality-impaired Hetch Hetchy water would be dechlorinated and pH-adjusted at the existing chemical facility before being discharged to Alameda Creek.	• Meets All Project Objectives: – Provides sufficient capacity to discharge future maximum Hetch Hetchy flow. – SFPUC would have the operational flexibility to simultaneously discharge quality-impaired Hetch Hetchy water out of the regional water system while accessing water in San Antonio Reservoir. • Reasons for Rejection: – Includes discharges to Alameda Creek and could result in impacts related to sudden temperature and flow changes during discharge. – Would result in greater environmental impacts on biological resources (including resident trout and other native fish) and water quality due to construction within the Alameda Creek channel and discharges to the creek.
Option 2. Discharge to Alameda Creek through a new valve in Alameda Siphon No. 3.	Construction of a new valve in Alameda Siphon No. 3 and a new approximately 1,100-foot-long, 84-inch-diameter discharge pipeline extending between the new valve in Alameda Siphon No. 3 to the east channel of Alameda Creek. An energy dissipation structure and other improvements would be constructed at the new outfall in Alameda Creek to minimize erosion, and the existing chemical facility at the San Antonio Pump Station would be expanded. (This option is similar to Option 1 except that the quality-impaired water would exit the system via the new valve in Alameda Siphon No. 3 as opposed to the Alameda East Portal Overflow Pipeline.) Quality-impaired Hetch Hetchy water would be dechlorinated and pH-adjusted at the existing chemical facility before being discharged to Alameda Creek.	• Meets All Project Objectives: – Provides sufficient capacity to discharge future maximum Hetch Hetchy flow. – SFPUC would have the operational flexibility to simultaneously discharge quality-impaired Hetch Hetchy water out of the regional water system while accessing water in San Antonio Reservoir. • Reasons for Rejection: – Includes discharges to Alameda Creek and could result in impacts related to sudden temperature and flow changes during discharge. – Would result in greater environmental impacts on biological resources (including resident trout and other native fish) and water quality due to construction within the Alameda Creek channel and discharges to the creek.

TABLE 7-3 (Continued)
ALTERNATIVES CONSIDERED BUT REJECTED FROM FURTHER CONSIDERATION

Potential Alternative Identified	Description	Ability to Meet Project Objectives and Constraints on Implementation
Option 3. Discharge to San Antonio Creek through the existing 48-inch-diameter cone valve.	Construction of a new suction pipeline between Alameda Siphon No. 3 and the existing San Antonio Pipeline. Quality-impaired Hetch Hetchy water would be conveyed through Alameda Siphon No. 3 to the San Antonio Pump Station. The discharge would be conveyed to the existing discharge facility in San Antonio Creek via the San Antonio Pipeline.	• Fails to Meet All Project Objectives: – Fails to meet basic criterion of conveying future maximum Hetch Hetchy flow, because the existing San Antonio Pipeline does not have sufficient capacity. – SFPUC would not have the operational flexibility to simultaneously discharge quality-impaired Hetch Hetchy water out of the regional water system while accessing water in San Antonio Reservoir. • Reasons for Rejection: – This option is not technically feasible because the existing San Antonio Pipeline does not have the capacity to convey the future maximum Hetch Hetchy flow. – This option does not meet either of the project objectives.
Option 4. Discharge to San Antonio Reservoir via a new pump station and pipeline paralleling the existing San Antonio Pipeline.	Construction of a new 2.25-mile-long pipeline from the San Antonio Pump Station to San Antonio Reservoir, paralleling the existing San Antonio Pipeline between the pump station and Turner Dam. A new suction pipeline would be constructed between Alameda Siphon No. 3 and the San Antonio Pump Station to accommodate the future maximum Hetch Hetchy flow. A new pump station would be constructed near the San Antonio Pump Station, and the existing chemical facility would be expanded.	• Meets All Project Objectives: – Provides sufficient capacity to discharge future maximum Hetch Hetchy flow. – SFPUC would have the operational flexibility to simultaneously discharge quality-impaired Hetch Hetchy water out of the regional water system while accessing water in San Antonio Reservoir. • Benefits: – Future maximum Hetch Hetchy flow is retained in the water system for future use. • Constraints: – Easements could be required because the pipeline alignment traverses private property. • Reasons for Rejection: – Would result in greater environmental impacts on biological resources due to construction along the existing San Antonio Pipeline alignment, which encroaches on sensitive riparian habitat along San Antonio Creek. – Would result in greater environmental impacts on cultural resources because the pipeline alignment would traverse prehistoric archaeological site SA-1.

TABLE 7-3 (Continued)
ALTERNATIVES CONSIDERED BUT REJECTED FROM FURTHER CONSIDERATION

Potential Alternative Identified	Description	Ability to Meet Project Objectives and Constraints on Implementation
NOx Emissions Reduction Alternative	This alternative would involve staggering the construction schedule of facilities associated with operation discharges to Pit F3 East such that construction phasing did not overlap, thereby reducing NOx emissions to a significant, mitigable level.	• This alternative would meet the project objectives. • Although no specific constraints to implementation have been identified, staggering the construction phases would prolong the overall construction schedule and, consequently, prolong the duration of other construction-related environmental impacts. Therefore, this alternative was rejected.

SOURCES: URS and CDM, 2006.

SABPL Discharges to Base of Turner Dam, with the modifications noted. Thus, all engineering options presented in the Alternatives Analysis Report except for Option 5 were rejected, because they would not meet the goals of the project, would result in greater environmental impacts than the proposed project, or were determined to be infeasible. In addition to the options evaluated in the Alternatives Analysis Report, an alternative specifically directed at reducing NOx emissions during 2013 below the significance threshold was contemplated, as described in Table 7-3.

7.6 References

San Francisco Planning Department, *Initial Study/Mitigated Negative Declaration, SFPUC Alameda Siphons Seismic Reliability Upgrade Project*, San Francisco Planning Department File No. 2006.0776E. May 2008.

URS and Camp Dresser McKee (CDM), *Sunol Valley Water Source Reliability Alternative Analysis Report (Task 10.4), Calaveras Dam Conceptual Engineering.* April 14, 2006.

URS Corporation (URS), *Geotechnical Report for San Antonio Backup Pipeline Replacement Project.* August 18, 2009.

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For the
San Francisco Public Utilities Commission's

SAN ANTONIO BACKUP PIPELINE PROJECT




Appendices

San Francisco Planning Department Case No. 2007.0039E
State Clearinghouse No. 2007102030

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APPENDIX A

Notice of Preparation

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San Antonio Backup Pipeline Project

Case No. 2007.0039E

1.0 OVERVIEW AND BACKGROUND

The San Francisco Public Utilities Commission (SFPUC) is proposing to construct and operate the San Antonio Backup Pipeline (SABPL) Project. To meet California Environmental Quality Act (CEQA) requirements, the San Francisco Planning Department will prepare and distribute an Environmental Impact Report (EIR) describing and analyzing the environmental effects of the proposed project. This Notice of Preparation (NOP) provides a brief description of proposed project, and identifies some of the project's key potential environmental effects.

1.1 San Francisco Water System and the San Antonio Backup Pipeline System

The City and County of San Francisco, through the SFPUC, owns and operates a regional water system that extends from the Sierra Nevada mountain range to the San Francisco Bay Area (see Figure 1 at the end of this document). This regional water system serves 2.4 million people in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. The basic network of major facilities in the regional system was built from the late 1880s through the 1930s. Expansion and improvements of the major facilities continued through the 1970s. The current San Antonio Pipeline, which transmits water in an emergency water outage event to maintain water delivery to the San Francisco Bay Area and transmits water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant, was built in 1967 and is a part of the SFPUC's water system.

Aging facilities within the water system are in need of major repair, rehabilitation, upgrade, and/or replacement. Currently, whenever there are unexpected water quality problems in the upper Hetch Hetchy system near Yosemite National Park, such as turbidity spikes, water is diverted to the existing San Antonio Pipeline in the Sunol Valley. The existing 60-inch diameter San Antonio Pipeline is a pre-stressed concrete cylinder pipe and is therefore susceptible to failure when the pre-stressing wires corrode and break, thereby preventing the emergency discharge of water out of the water system.

In February 2005, the SFPUC developed a regional Water System Improvement Program (WSIP). The basic goals of the WSIP are to increase the reliability of the regional water system with respect to water quality, seismic response, water delivery, and water supply to meet water delivery needs in the service area through the year 2030. To accomplish these goals, the SFPUC proposes 22 facility improvement projects throughout the regional water system under the WSIP. The SABPL Project is one of the proposed WSIP facility improvement projects. In June 2007, the San Francisco Planning Department published a Draft Program EIR (PEIR) to address the potential environmental impacts of the WSIP on a programmatic level and evaluate regional water supply alternatives. The Draft PEIR is available on the San Francisco Planning Department website at www.sfgov.org/planning/mea.

1.2 Environmental Review Process

The San Francisco Planning Department will prepare a project-specific EIR to evaluate the environmental effects of the proposed SABPL Project. The EIR will be prepared in compliance with the CEQA Guidelines Section 15161 and will address project-specific construction and operational impacts.

The first step in the environmental review process is the formal public scoping process, for which this NOP has been prepared. Following the public scoping meeting, a Draft EIR will be prepared and circulated for a 45-day public review period. Public comments on the Draft EIR will be accepted in writing during the review period or orally at formal public hearings to be held by the San Francisco Planning Commission. The San Francisco Planning Department then will prepare written responses to comments on environmental issues raised during the public review period, and a Response to Comments document will be prepared. This document will be considered by the San Francisco Planning Commission, along with the Draft EIR and any revisions to the draft based on the responses to comments, for certification as a Final EIR.

1.3 Public Scoping Meeting

The San Francisco Planning Department will hold a public scoping meeting at the following location, date, and time:

Date:	**Thursday, October 25, 2007** **6:30 PM to 8:30 PM** **Sunol, CA 94586**	**Location:**	**Sunol Glen School** **11601 Main St**

The purpose of this meeting is to assist the San Francisco Planning Department with its review of the proposed scope and content of the EIR as summarized in this NOP. The public will have the opportunity to comment and offer testimony for consideration. The San Francisco Planning Department will also accept written comments at the meetings or by mail, e-mail, or fax until the close of business on **November 5, 2007**. Written comments should be sent to the San Francisco Planning Department, Attn: Bill Wycko, Acting Environmental Review Officer, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479, or be emailed to chris.kern@sfgov.org.

2.0 PROJECT DESCRIPTION

2.1 Existing Facilities and Proposed Project Components

The proposed project would be located between the San Antonio Pump Station and San Antonio Reservoir in the Sunol Valley in Alameda County, California. This project area lies just south of the intersection of Highways 680 and 84 along Calaveras Road (see Figure 2). There are four primary locations at which new construction and/or facility upgrades would occur, including: (1) along the alignment of the existing San Antonio Pipeline, which runs about two miles from the San Antonio Pump Station to the James Turner Dam, (2) the San Antonio Creek Discharge facilities at the base of the James Turner Dam at the San Antonio Reservoir, (3) the San Antonio Pump Station, and (4) the Alameda East Portal. The existing facilities and the proposed construction and/or facility upgrade activities at these locations are described below.

(1) ***San Antonio Backup Pipeline (SABPL).*** The existing San Antonio Pipeline is a 60-inch pre-stressed concrete cylinder pipe that runs 11,300 feet from the San Antonio Pump Station (SAPS) adjacent to Calaveras Road to the base of James Turner Dam at the San Antonio Reservoir. The route of this pipeline is west along the access road from the dam to Calaveras Road. It cuts the corner at the intersection of the access road and Calaveras Road, and then proceeds south along the west side of Calaveras Road until tying into the SAPS. The existing pipeline is a two-way conduit. It may be used to transfer up to 160 million gallons per day (MGD) of stored water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant or it can be used to move 160 MGD of Hetch Hetchy water into San Antonio Reservoir under controlled release scenarios. The 160 MGD flow rate is controlled by the pumping capacity of SAPS. The existing San Antonio Pipeline is also used as an emergency discharge pipeline capable of diverting up to 230 MGD of Hetch Hetchy water out of the system and into San Antonio Creek when water quality parameters are exceeded. The 230 MGD flow rate is controlled by the size of SAPL and requires no pump assist. Failure of the San Antonio Pipeline, without the availability of the proposed SABPL, would limit water transmission and management options, and the reliability of these options in this area of the water system. The San Antonio Pipeline has failed before due to wire corrosion and breakage in the Pre-stressed Concrete Cylinder Pipe (PCCP).

The proposed SABPL would be a 66-inch pipe (material to be determined) installed alongside the existing San Antonio Pipeline. It would be designed to transfer up to 315 MGD of Hetch Hetchy water from Alameda Siphon No. 3 to the base of James Turner Dam at San Antonio Reservoir. This design capacity is based on planned future Hetch Hetchy flow capacity when another proposed WSIP project, the San Joaquin Pipeline System, is completed. This water would be de-chlorinated and pH adjusted at the SAPS before entering the pipeline. Additional chemical storage and distribution facilities would be located adjacent to the existing SAPS (see description # 3, below). The 315 MGD discharge would occur through a new cone valve structure and then into San Antonio Creek. The creek banks in the immediate vicinity of the new and existing cone valves would be reinforced with riprap to protect against bank erosion (see description #2, below).

As the backup water pipeline to the existing San Antonio Pipeline, the SABPL would be configured with three air gap connections between the new and the existing pipeline. These air gaps would allow the existing San Antonio Pipeline to be taken off-line for repairs and still allow water to be transferred as needed to and from the SAPS and the San Antonio Reservoir.

(2) San Antonio Creek Discharge Facility: The existing San Antonio Creek discharge facility is located at the end of the existing San Antonio Pipeline at the base of the James Turner Dam at the San Antonio Reservoir. It is the junction point for San Antonio Reservoir and Hetch Hetchy discharges.

This facility is used as necessary to allow for an emergency draw down of the San Antonio Reservoir by discharging the reservoir water into San Antonio Creek. It is also the San Antonio Pipeline discharge point for quality impaired water diverted from the water delivery system. Water is discharged into San Antonio Creek through a flow control cone valve.

The existing discharge facility includes a 48-inch cone valve housed in a 20-foot long, 14-foot wide trapezoidal outlet structure. However, the existing structure is not adequate to prevent downstream erosion of the San Antonio Creek channel. The water jet discharging from the existing cone valve has damaged the banks of the creek immediately outside the structure and undermined a retaining wall along the south side of the creek.

The proposed action would include construction of a second discharge structure at the end of the SABPL and just west of the existing facility. The new discharge facility would include a 54-inch cone valve housed in a concrete outlet structure similar to the existing facility, and the creek bed in the immediate vicinity of the discharge points of both the new and old discharge facilities would be armored with riprap to protect against scouring during discharge events. The new cone valve is designed to substantially reduce creek bank erosion.

(3) ***San Antonio Pump Station Chemical Facility Upgrades:*** The existing chemical facility is located on the north side of the SAPS compound. It houses the chemicals and feed system used to dechlorinate treated water before it is discharged either back to the San Antonio Reservoir or into San Antonio Creek. The equipment used for this includes two 2,000-gallon sodium bisulfite chemical storage tanks, four chemical feed pumps; and other auxiliary components. These facilities have been used successfully when the existing 48-inch cone valve at the base of Turner Dam is tested annually. The estimated flow and treatment capacity during these annual tests is about 240 MGD.

The current facility would have to be expanded by approximately 50% to provide treatment for a full diversion of the 315 MGD of Hetch Hetchy water supply. The additional facilities that would be required to meet this demand include another chemical storage tank, two new chemical feed pumps, and the piping, valves, and controls required to convey the sodium bisulfite to the injection point on the proposed SABPL. This additional equipment would be housed in a new structure to be built just north of the existing chemical facility.

(4) ***Alameda East Portal Improvements:*** The proposed project includes several security improvements at the Alameda East Portal site. All the improvements except the new fence would occur within the existing site footprint and would include the following actions:

(a) Replace the existing perimeter fence and access gates with new chain-link fence. Access gates would be relocated into the new fence line where it would cross the existing access road;

(b) Construct new steel, concrete, and soil backfill enclosures around the portal structures and a moveable concrete wall in front of the portal access manifold; and

(c) Relocate the existing overhead crane to allow it to reach both the new moveable concrete wall and the portal access manifold when access to the latter is required.

These improvements would involve grading and removal of trees and other vegetation.

The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras fault, which is part of the Hayward Fault complex (see Figure 4). All project components would be designed to accommodate seismic activity associated with this fault area.

2.2 Project Goals and Objectives

The overall objectives of the proposed project are to provide a more efficient and reliable conveyance option for emergency water diversion when Hetch Hetchy water cannot be conveyed through the Alameda West Portal and Irvington Tunnel, and to provide a redundant water transmission pipeline from San Antonio Reservoir to the Hetch Hetchy system if needed.

For the specific project components, the SABPL improvements are designed to meet the following goals and objectives:

(1) ***San Antonio Backup Pipeline:*** The SABPL would give SFPUC greater flexibility in managing a potential emergency situation along the Hetch Hetchy system when water cannot be conveyed through the Alameda West Portal and on to water customers in the San Francisco Bay area. This could occur as a result of high turbidity in the Hetch Hetchy supply caused by erosion and ashes from a fire. This kind of event is unpredictable and rare, but serious when it occurs. The existing San Antonio Pipeline has limited conveyance capacity and has a history of failure due to wire corrosion and breakage in the Pre-stressed Concrete Cylinder Pipe (PCCP).

The SABPL also would serve as a backup water supply conveyance alternative from San Antonio Reservoir to the Hetch Hetchy system in the event the existing, aging, San Antonio Pipeline is out of service due to maintenance or failure.

(2) San Antonio Creek Discharge Facility: Construction of the new discharge facility would be necessary to provide a safe and adequate method for discharging the emergency release of water from the SABPL. There are two reasons for this. First, the current discharge facility would not be able to handle the full 315 MGD flow capability of the proposed SABPL, necessitating the construction of an additional, larger capacity discharge facility. And second, due to the current alignment of the existing discharge facility and the proposed alignment of the SABPL, it is not possible to use the existing facility as a discharge point for the SABPL (the angle of the pipeline bend that would be necessary to match alignments between the SABPL and the existing discharge facility would exceed engineering parameters for the pressure and volume of flow in the pipe). Thus, a second discharge facility is proposed.

(3) San Antonio Pump Station Chemical Facility Upgrades: As noted in Section 2.1, the upgrades to the chemical facility are proposed in order to allow for dechlorination of the full 315 MGD of treated water from the Hetch Hetchy supply should it need to be diverted to San Antonio Creek due to water quality issues.

(4) Alameda East Portal Improvements: The proposed project includes several security improvements at the Alameda East Portal site. All the improvements except the new fence would occur within the existing site footprint and would include the following actions:

(a) Replace the existing perimeter fence and access gates with new chain-link fence. Access gates would be relocated into the new fence line where it would cross the existing access road;

(b) Construct new steel, concrete, and soil backfill enclosures around the portal structures and a moveable concrete wall in front of the portal access manifold; and

(c) Relocate the existing overhead crane to allow it to reach both the new moveable concrete wall and the portal access manifold when access to the latter is required.

These improvements would involve grading and removal of trees and other vegetation.

The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras Fault, which is part of the Hayward Fault complex. All project components would be designed to accommodate seismic activity associated with this fault area

2.3 Schedule

Depending on the environmental review and permitting processes for the proposed project construction of the SABPL could begin as early as Fall 2009 and would be completed around Spring 2012.

3.0 ENVIRONMENTAL ANALYSIS

3.1 Key Environmental Issues to be Addressed in the EIR

The following paragraphs describe the key environmental issues that the EIR will address. The EIR will address both construction and operation activities, and will propose mitigation measures for impacts considered to be potentially significant.

Biological Resources – The proposed project would have potential temporary and long-term impacts on sensitive species, including California red-legged frog, California tiger salamander, Alameda whipsnake, and raptors. Construction of the proposed San Antonio Creek Discharge Facility would involve destruction of wetlands and riparian habitat at the base of the James Turner Dam. Operation of the SABPL for emergency discharges would impact riparian habitat along San Antonio Creek. Trees and other vegetation would be removed at the Alameda East Portal site, and oak woodlands and grasslands may be affected within the proposed alignment of the SABPL.

Cultural Resources – Sensitive cultural resources that could be affected by the proposed project include historical and prehistoric features. Resources, including archaeological sites and historical structures, have been documented in the proposed project area and impacts on these resources will be addressed in the EIR. Identified resources will be evaluated for their significance according to CEQA, the National Register of Historic Places and the California Register of Historic Resources. A cultural resources impact could occur during excavation if unidentified cultural resources are disturbed or if the value of a historic building is adversely affected. Impacts on paleontological resources could occur during excavation if unanticipated resources are uncovered and damaged.

Hydrology and Water Quality – Construction of the proposed backup pipeline could result in discharges of contaminants to receiving waters (either surface or groundwater). Dewatering of the pipeline trench may be required during construction, and the water would need to be discharged in accordance with regulatory standards. Erosion could occur during construction as a result of grading and other activities. Once the project is operational, managing an emergency along the regional water system may require that water be discharged from the proposed pipeline into San Antonio Creek. This could result in habitat destruction along the creek due to higher flows and degradation of the creek's water quality.

Geology, Soils, and Seismology – The proposed SABPL would cross active and potentially active faults that have potential to rupture the pipeline. Other potential geologic hazards to which the proposed project could be exposed include settlement, liquefaction, and landslides. Geologic hazards that the proposed project could potentially cause, including landslides, will also be evaluated in the EIR.

Traffic and Transportation - Construction of the facilities would generate additional vehicle traffic above baseline levels. Traffic would be generated by construction vehicles traveling to and from the work site and trucks transporting supplies and equipment. Pipeline installation could temporarily disrupt traffic at the road crossings. Upgrades to existing access roads off the SFPUC's right-of-way could potentially cause minor localized traffic disruption.

Other Environmental Issues

Other topics that will be addressed in detail in the EIR include potential impacts related to:

- **Mineral Resources**
- **Air Quality**
- **Land Use**
- **Agricultural Resources**
- **Recreation**
- **Noise**
- **Utilities and Public Service Systems**
- **Hazards/Hazardous Materials**
- **Growth-inducing Impacts**
- **Cumulative Impacts**

3.2 Project Alternatives

As required by CEQA, the EIR will describe and evaluate a reasonable range of alternatives to the proposed SABPL project. The alternatives would feasibly attain most of the proposed SABPL project's basic objectives while avoiding or substantially lessening any significant effects of the project. CEQA also requires evaluation of the 'No Project' alternative. The No Project Alternative will compare the potential impacts of the proposed project with the impacts that would be expected to occur if the SABPL project is not implemented.

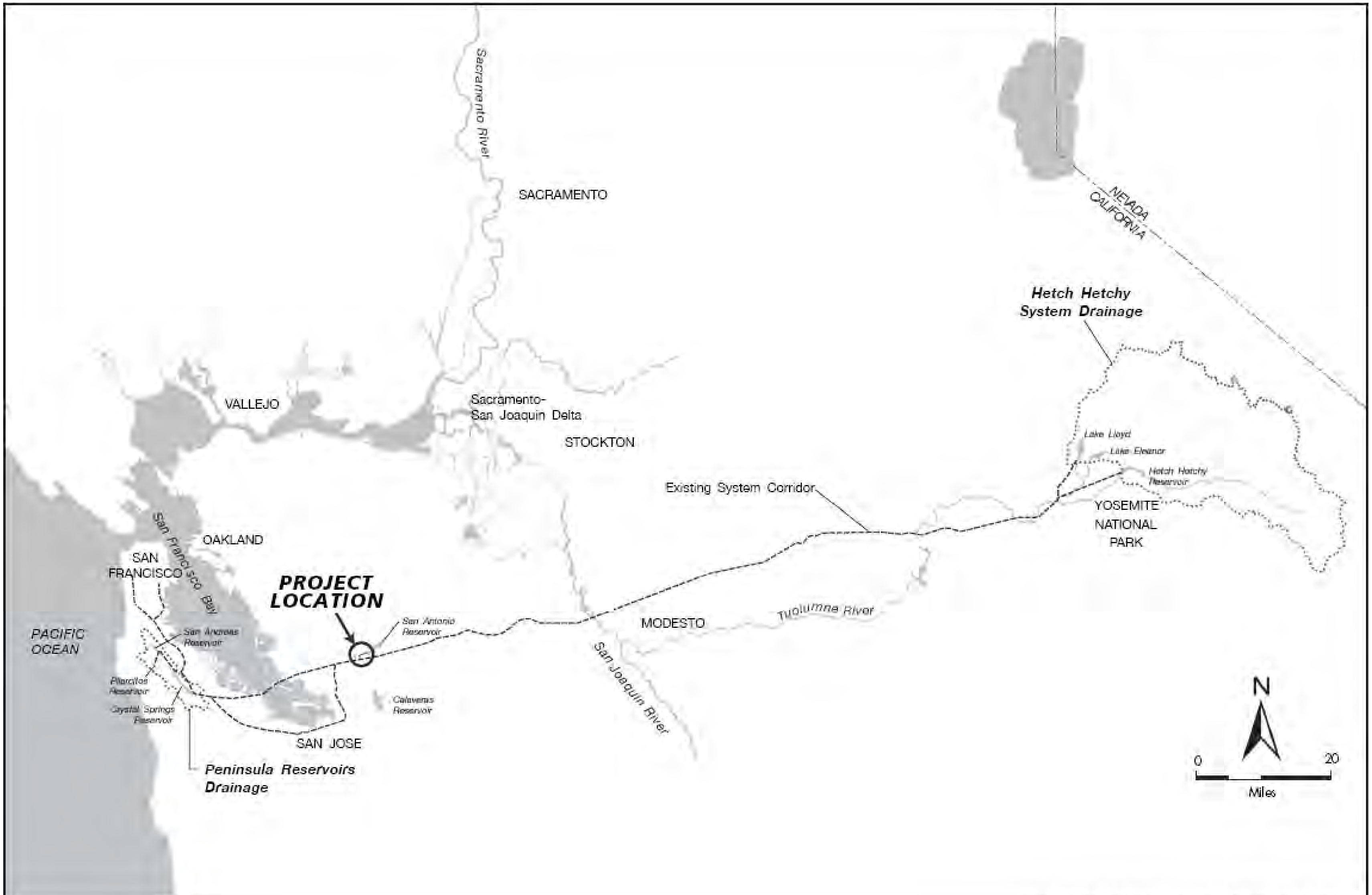
Attachments:

Figure 1: SFPUC Regional Water System

Figure 2: SFPUC SABPL Project Area

Figure 3: SABPL Project Site

Figure 4: Proposed San Antonio Creek Discharge Facility

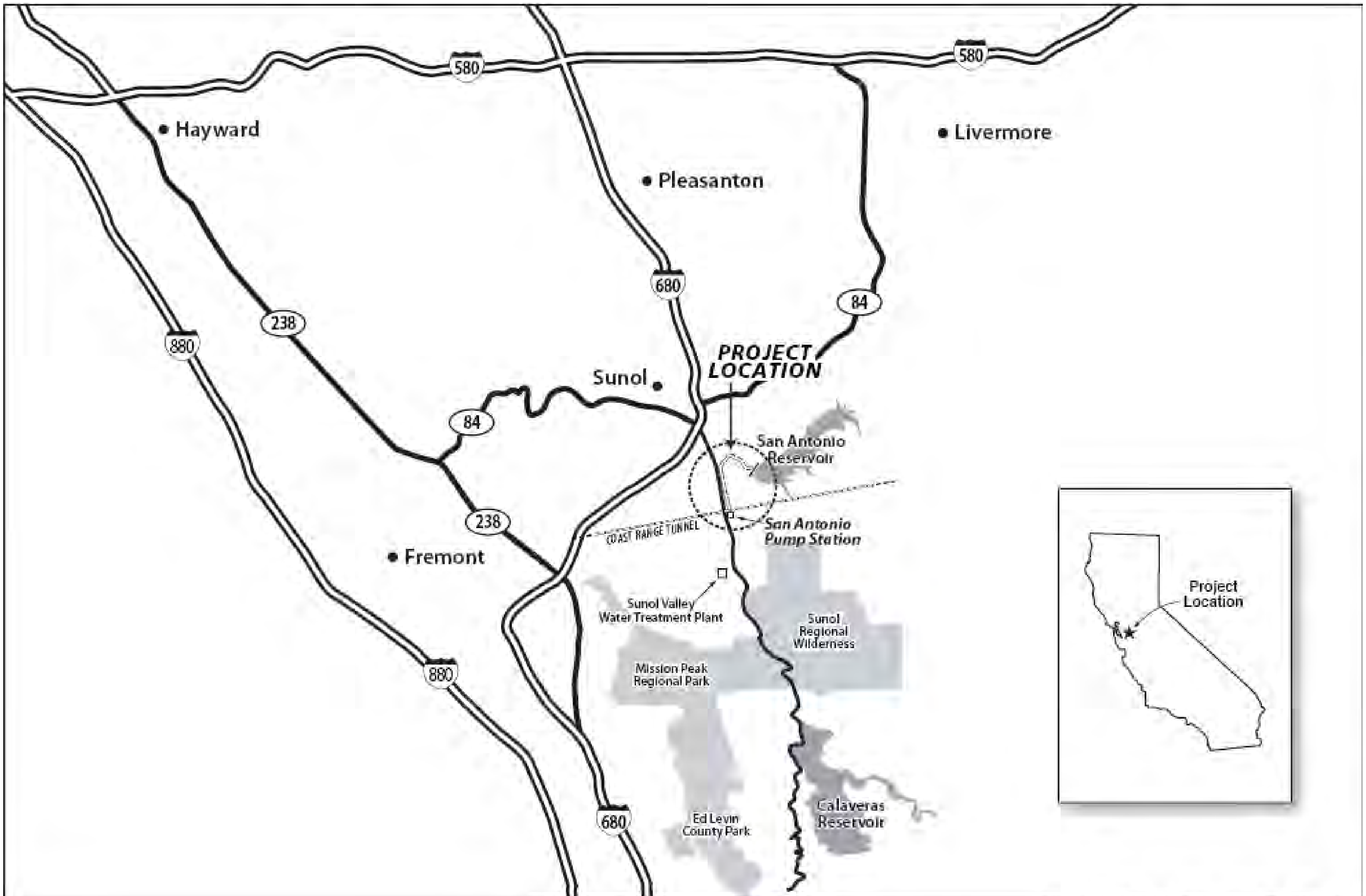


002475.SP11.01.d (2007 Corp Archives – CD02) 10/01/2007

Figure 1

SFPUC Regional Water System

San Antonio Backup Pipeline Project

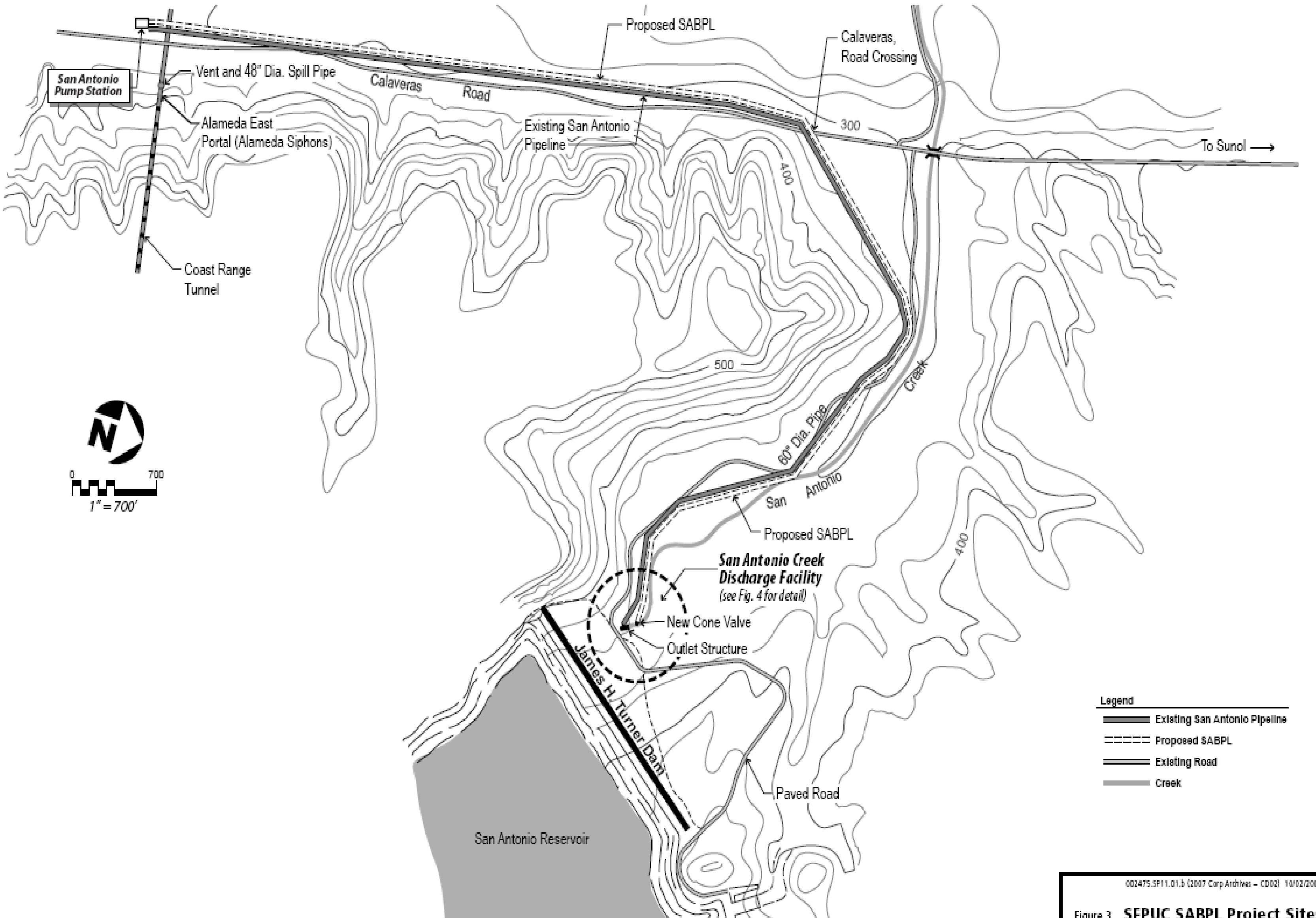


002475.SP11.01.e (2007 Corp Archives – CD02) 10/01/2007

Figure 2

SFPUC SABPL Project Area

San Antonio Backup Pipeline Project



002475.SP11.01.b (2007 Corp Archives – CD02) 10/02/2007

Figure 3 **SFPUC SABPL Project Sites**
San Antonio Backup Pipeline Project

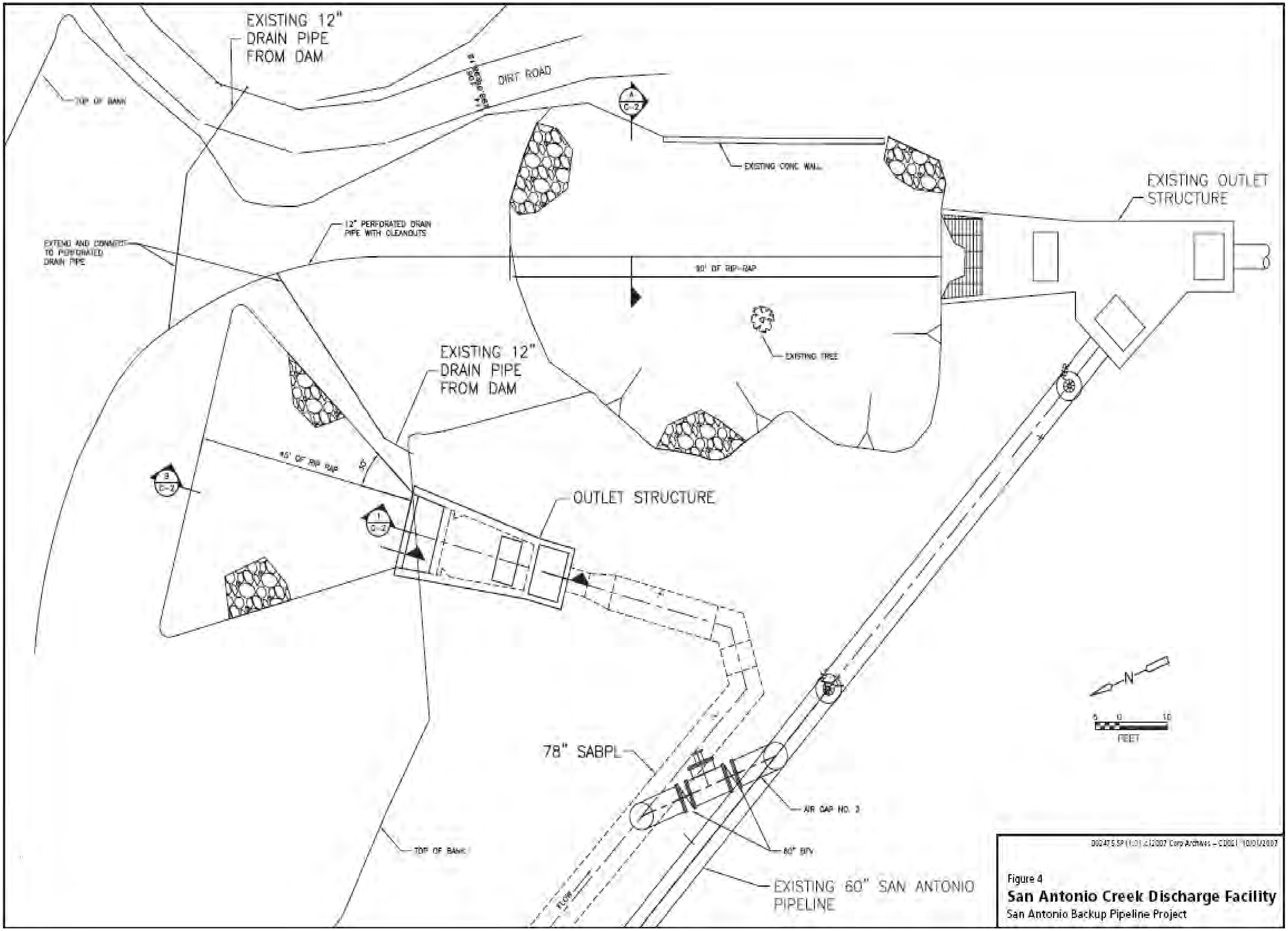


Figure 4
San Antonio Creek Discharge Facility
San Antonio Backup Pipeline Project

APPENDIX B

Public Scoping Process Summary Report

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San Antonio Backup Pipeline Project
Environmental Impact Report

(CS-834A7)

PUBLIC SCOPING PROCESS
SUMMARY REPORT

December 5, 2007

<u>Prepared For:</u>

San Francisco Planning
Major Environmental Analysis

San Francisco Public Utilities Commission
Bureau of Environmental Management

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ACRONYMS AND ABBREVIATIONS

ACA	Alameda Creek Alliance
BAWSCA	Bay Area Water Supply & Conservation Agency
CA	California
CAC	Citizen's Advisory Committee
CalTrans	California Department of Transportation
CCSF	City and County of San Francisco
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
EBRPD	East Bay Regional Park District
EIR (or DEIR)	Environmental Impact Report (Draft EIR) (under CEQA)
NOP	Notice of Preparation
PEIR	Program Environmental Impact Report
RWQCB	Regional Water Quality Control Board
SABPL	San Antonio Backup Pipeline
SFPUC	San Francisco Public Utilities Commission
WSIP	Water System Improvement Program

1.0 INTRODUCTION

The San Francisco Planning Department is the lead agency for implementation of California Environmental Quality Act (CEQA) requirements for all projects sponsored by the City and County of San Francisco (CCSF) or conducted within San Francisco. The San Francisco Planning Department is preparing a Draft Environmental Impact Report (EIR) on the San Francisco Public Utilities Commission's (SFPUC's) proposed San Antonio Backup Pipeline (SABPL) Project. This Draft EIR, which will assess the potential impacts of the SABPL on the physical environment of the project area, is being prepared in accordance with CEQA. CEQA requires the preparation of an EIR when a proposed project could significantly affect the physical environment.

As part of the Draft EIR process, the San Francisco Planning Department conducted a public scoping effort in October 2007 to solicit comments from regulatory agencies and the public to help determine the scope of the Draft EIR. This report describes that scoping process and summarizes the public and regulatory agencies' comments received during that process.

2.0 PURPOSE OF THE SCOPING PROCESS

The purpose of the scoping process is to solicit input from the public and agencies on the appropriate scope, focus, and content of the Draft EIR. The San Francisco Planning Department will consider all of the input received during this process in the preparation of the Draft EIR.

The Draft EIR will describe the existing environmental conditions of the area that could be affected by the proposed project and evaluate the potential effects of the SABPL in accordance with CEQA. The comments provided by the public and agencies during scoping will help the San Francisco Planning Department identify pertinent issues, methods of analyses, and the level of detail that should be addressed in the Draft EIR. The scoping comments also will be considered in developing a reasonable range of feasible alternatives that will be evaluated in the Draft EIR.

The scoping comments received will augment the information developed by the EIR team, which includes specialists in each of the environmental subject areas to be covered in the EIR. This combined input will result in an EIR scope of work that is both comprehensive and responsive to the issues raised by the public and agencies, and that meets CEQA requirements. The Draft EIR is scheduled to be available for public comment in 2008.

In addition to facilitating public and regulatory agency input on the scope and focus of the Draft EIR, scoping allows the San Francisco Planning Department to explain the EIR process to the public and to identify additional opportunities for public comment and public involvement during the EIR process. CEQA requires that the public be informed about the significant environmental effects of a proposed project or program, and the ways in which those environmental effects can be avoided or reduced before the project or program is approved.

3.0 SCOPING PROCESS FOR THE SABPL EIR

In general, the scoping process involves six basic requirements as defined by CEQA. These are:

1) Identify the potential area of impact and development of a mailing list of potentially affected persons and agencies that would have an interest in or jurisdiction over actions taken within that area.

2) Prepare and mail a Notice of Preparation (NOP).

3) Provide other notification of the upcoming scoping meeting for the proposed project. This takes several forms, including publication of legal notices in local papers and providing information on the San Francisco Planning Department web page.

4) Hold the public scoping meeting to solicit verbal comments from the public and agencies.

5) Receive written comments via mail and email.

6) Document the results of this process in a public scoping summary report (this document).

The actions taken by the San Francisco Planning Department to complete this process are described in the sections that follow.

3.1 NOP Mailing List

The San Francisco Planning Department maintains a list of agencies, organizations, and individuals that have requested to receive notices of all projects proposed by this department. This list was supplemented with the names of local and state elected officials, regional and local interest groups, and property owners within 300 feet of the project area. A total of 289 names and addresses were placed on the mailing list for this project. Table 1 describes the general characteristics of those on this mailing list.

Table 1 General Description of NOP Mailing List Contacts

Number on Mailing List	Type of Contact
1	Owners/Occupants of property within 300 feet of the defined project area
47	SFPUC Wholesale Water Customers (includes representatives of cities, towns, water districts, and the Bay Area Water Supply & Conservation Agency [BAWSCA])
15	SFPUC Citizen's Advisory Committee (CAC)
167	Other Interested Parties (includes residents and business in or near to Sunol, CA, state and federal elected officials, and state and local agencies, including the State Clearinghouse)
16	Federal and State Permitting Agencies
23	Local Jurisdictions
5	Bordering Jurisdictions
15	Libraries and Media Outlets
289	**Total**

3.2 Prepare and Mail NOP

The San Francisco Planning Department prepared the NOP (see Appendix A) and mailed it to the addressees on the mailing list on October 5, 2007, starting the thirty-day public scoping period. An additional 15 copies were provided to the State Clearinghouse on that date, as well. The NOP summarized the goals, objectives, and elements of the proposed SABPL projects and presented the San Francisco Planning Department's determination that the proposed projects may have a significant effect on the environment, requiring the preparation of an EIR on the SABPL projects under CEQA. Lastly, the NOP described the public scoping process and included information on the public scoping meeting and the methods by which interested parties could submit comments on the SABPL projects.

The NOP was mailed to 289 recipients (see Table 1). Of these, 18 were sent to state and federal agencies by certified mail. The remaining 271 were sent via regular first class mail. The copies of the NOP sent to the State Clearinghouse were delivered by courier on the morning of October 5, 2007.

3.3 Additional Scoping Process Notification

In addition to mailing the NOP, the San Francisco Planning Department also published meeting notices on October 6, 2007, in the *Examiner* (San Francisco, CA), *The Valley Times* (Pleasanton, CA), and *The Argus* (Fremont, CA). Copies of these notices are provided in Appendix B of this report. The NOP, the public scoping meeting notice, and project contact information also were posted on the San Francisco Planning Department website at http://www.sfgov.org/site/planning/mea.

3.4 Public Scoping Meeting

The San Francisco Planning Department and SFPUC held a public scoping meeting at the Sunol Glen School in Sunol, California, on Thursday October 25, 2007. This meeting began at 6:30 PM. Only one member of the general public attended and provided comment.

The scoping meeting was designed to follow an informal format to allow meeting participants to review displays, maps, and literature about the proposed project, and to meet members of the EIR project team and SFPUC personnel to discuss the project. SFPUC staff and members of the EIR project team were available throughout the meeting to answer questions and receive written comments. Project fact-sheets and copies of the NOP were made available to the public in English. These meeting materials are provided in Appendix C of this report.

The scoping meeting began with opening remarks by Mr. Chris Kern of the San Francisco Planning Department, introducing the key project contacts and providing an overview of the CEQA EIR process. Ms. Vivian Chow of the SFPUC then provided an overview of the proposed project, including illustrations of the proposed project locations. Mr. Kern then invited the public to make oral comments on the scope or content of the proposed EIR.

A court reporter recorded the public scoping meeting and provided a transcript of the comments, presentations, and the identifying information of the person who commented. The participant provided his oral comments, but also was advised he could submit additional written comments at a later date. The scoping meeting transcript is provided in Appendix D.

3.5 Scoping Comments Received

The public scoping period ran for thirty days from publication of the NOP on October 5, 2007, to its close on November 5, 2007. Comments were received by the San Francisco Planning Department throughout this period and at the public scoping meeting on October 25, 2007. A total of ten commenters submitted comments during the scoping period, submitting their comments via seven letters, two emails, and one verbal comment (provided at the scoping meeting). Of these, one letter and one email contained additional supplemental material entered into the comments database as separate comment documents from the respective agencies, bringing the total number of comments received to 13. An additional comment letter was received after the close of the comment period and has been included in the database of scoping comments. These 14 comment documents were further evaluated and divided into distinct subcomments based on the topic areas described, bringing to 98 the total number of comments identified from the scoping process.

Table 2 identifies the seven state and local public agencies, one non-governmental organization, one company, and one individual who submitted comments. Table 3 lists the document number assigned to each of the 14 comments and provides more information on the commenters. The actual comment documents are provided in Appendix E.

Table 2 Sources of Comments Received

Commenter Type	Commenter Name	# Documents Received
Public Agency (State or Local)	Alameda County Public Works Agency	1
	Alameda County Water District	1
	Bay Area Water Supply and Conservation Agency (BAWSCA)	1
	California Department of Fish and Game (CDFG)	1
	California Department of Transportation (CalTrans)	1
	California Regional Water Quality Control Board (RWQCB)	2
	East Bay Regional Park District (EBRPD)	4
Non-governmental Organization	Alameda Creek Alliance (ACA)	1
Company/Business	Chevron Pipe Line Company	1
Private Citizen	Mr. Stanley Garcia (local resident within the project area)	1
Total comment letters, emails and public statements received		**14**

Table 3 Persons or Agencies Providing Comment

Document Number	Date on Comment	Comment Source (Agency / Organization)	Comment Author	Commenter Address	Commenter Phone Number	Comment Type	Date Rec'd	Additional Information
CO001	10/18/07	Chevron Pipe Line Company	Jeremy Gross Contract ROW/Conflict Inquiry Specialist Los Medanos	2360 Buchanan Rd. Pittsburg, CA 94565	NA	Email	18-Oct-07	
LA001	11/5/2007	County of Alameda Public Works Agency	Arthur Valderrama, P.E. Supervising Civil Engineer	Development Services Department 951 Turner Court, Room 100 Hayward, CA 94545-2698	510-670-6601	Letter	6-Nov-07	
LA002	10/29/2007	Bay Area Water Supply & Conservation Agency	Nicole M. Sandkulla, P.E. Senior Water Resources Engineer	155 Bovet Road, Suite 302 San Mateo, CA 94402	650-349-3000	Letter	2-Nov-07	
LA003	10/25/200	Alameda County Water District	Paul Piraino General Manager	43885 South Grimmer Blvd. PO Box 5110 Fremont, CA 94537-5110	510-668-4200	Letter	13-Nov-07	
LA004a	10/30/2007	East Bay Regional Park District	Chris Barton Senior Planner	2950 Peralta Oaks Court PO Box 5381 Oakland, CA 94605	510-635-0135	Letter	31-Oct-07	Primary comment from EBRPD re: SABPL NOP
LA004b	10/12/2005	East Bay Regional Park District	Brad Olson Environmental Programs Manager	2950 Peralta Oaks Court PO Box 5381 Oakland, CA 94605	510-635-0135	Letter	31-Oct-07	Attachment to 10/30/07 EBRPD comments, re: EBRPD scoping comments on San Francisco WSIP DEIR, specifically impacts to the Sunol/Ohlone Regional Wilderness
LA004c	8/16/07	East Bay Regional Park District	Brad Olson Environmental Programs Manager	2950 Peralta Oaks Court PO Box 5381 Oakland, CA 94605	510-635-0135	Letter	31-Oct-07	Attachment to 10/30/07 EBRPD comments, re: EBRPD scoping comments on SFPUC Habitat Reserve Program (Case #2006.1505E)
LA004d	10/1/2007	East Bay Regional Park District	Chris Barton Senior Planner	2950 Peralta Oaks Court PO Box 5381 Oakland, CA 94605	510-635-0135	Letter	31-Oct-07	Attachment to 10/30/07 EBRPD scoping comments, re: EBRPD comments on SFPUC WSIP DPEIR
NP001	11/5/2007	Alameda Creek Alliance	Jeff Miller Executive Director	PO Box 192 Canyon, CA 94516	510-499-9185	Letter	5-Nov-07	
PC001	10/25/2007	Private Citizen	Mr. Stanley Garcia	6501 Calaveras Road Sunol, CA 94586		Verbal Comment	25-Oct-07	

Table 3 Persons or Agencies Providing Comment

Document Number	Date on Comment	Comment Source (Agency / Organization)	Comment Author	Commenter Address	Commenter Phone Number	Comment Type	Date Rec'd	Additional Information
SA001a	10/16/2007	California Regional Water Quality Control Board -- San Francisco Bay Region	Keith H. Lichten, P.E. Senior Engineer	1515 Clay Street, Suite 1400 Oakland, CA 94612	510-622-2300	Letter	18-Oct-07	
SA001b	11/9/2007	California Regional Water Quality Control Board -- San Francisco Bay Region	Xavier Fernandez Environmental Scientist	1515 Clay St, Suite 1400 Oakland, CA 94612	510-622-5685	Email with comment attached	8-Nov-07	Email sent by Mr. Fernandez added as a supplemental RWQCB comment an attached document dated 9 May 2006, prepared by Philip Williams & Associates (San Francisco, CA), regarding a "Draft approach for assessing erosion potential of reservoir releases."
SA002	10/19/2007	California Department of Fish and Game	Charles Armor Regional Manager Bay Delta Region	PO Box 47 Yountville, CA 94599	707-944-5500	Letter	24-Oct-07	
SA003	11/2/2007	California Department of Transportation	Timothy C. Sable District Branch Chief	111 Grand Avenue PO Box 23660 Oakland, CA 94623-0660	510-286-5505	Letter	5-Nov-07	

<u>**Notes:**</u>

The Document Number was created using a code for the commenter type (see below) followed by a unique sequential number. Comments from this commenter are then listed sequentially starting at “01,” as shown in the second column of Table 2. The commenter type codes are:

CO Private Company/Business

LA Local Agency

NP Non-profit Organization

PC Private Citizen

SA State Agency

Table 4 categorizes the 98 comments by general topic areas. However, individual comments may fall under other categories as well. For example a comment categorized under mitigation measures also may concern water quality, biological resources, land use, or traffic.

Table 4 General Comment Topic Areas

Topic Area Discussed	Number of Topic Comments
Alternatives	3
Biological Resources	9
Cultural Resources	2
Hazardous Materials	3
Hydrology & Water Quality	11
Land Use	1
Mailing List	6
Mitigation Measures	27
Noise	1
Permit Processes	3
Project Description	8
Project Design	4
Public Utilities and Services	1
Purpose and Need for the Project	1
Recreation	4
Regulatory Process / Public Involvement	5
Traffic	9
Total number of comments received	**98**

Table 5 summarizes the individual comments, sorted by the comment number. Table 6 lists the same comments as Table 5, but sorted by comment topic.

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Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
CO001 – Chevron Pipe Line Company			
CO001	CO001-01	Mailing List	Requests a copy of plans and drawings associated with the project.
CO001	CO001-02	Project Description	Chevron has an active petroleum projects pipeline in the project vicinity.
LA001 – County of Alameda Public Works Agency			
LA001	LA001-01	Traffic	Define how the project will impact traffic in the project area.
LA001	LA001-02	Biological Resources (Fish)	Potential impact from armoring creek bottoms -- may create barriers to fish passage.
LA001	LA001-03	Hydrology & Water Quality	Potential impacts on flood control channel/creek and road crossings.
LA001	LA001-04	Biological Resources (TES)	Effects on: red legged frog, San Joaquin kit fox, California tiger salamander, steelhead, Alameda whipsnakes, rare plants, and wetlands.
LA001	LA001-05	Hydrology & Water Quality	Potential impacts of flow diversions on downstream segment of Alameda Creek.
LA001	LA001-06	Cultural Resources	Potential impacts on cultural resources.
LA002 – Bay Area Water Supply & Conservation Agency			
LA002	LA002-01	Purpose and Need	A better description of the project need should be added to the DEIR.
LA002	LA002-02	Project Description / Alternatives	The EIR should describe the change in project scope to eliminate certain modifications at Alameda East Portal.
LA002	LA002-03	Project Description	The EIR should address that the project would assist in flushing the Coast Range Tunnel of sediment after a seismic event.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
LA002	LA002-04	Project Description	Provide further information on the operating limitations of the existing pipeline. Provide scenarios where the new pipeline would enhance operational flexibility.
LA002	LA002-05	Project Description (Hazmat)	Please describe the holding time for the de-chlorinating agent that will be stored in liquid form at the site.
LA002	LA002-06	Hazardous Materials	What measures will be employed for chemical spills at the chemical storage facility?
LA002	LA002-07	Project Description	Highlight the fact that a forest fire in the watershed caused the closure of the Hetch Hetchy delivery system for six weeks within the last 10 years.
LA003 – Alameda County Water District			
LA003	LA003-01	Hydrology & Water Quality	DEIR should fully evaluate all potential downstream impacts to water quality from site activites, including discharge of contaminants to receiving waters, dewatering of pipeline trench, and erosion as a result of grading and other activities.
LA003	LA003-02	Mitigation (Water Quality)	Provide complete mitigation to ensure there are no adverse impacts to ACWD's water supplies from the Alameda Creek Watershed, including providing a notification plan for events that could affect downstream water quality.
LA003	LA003-03	Hydrology & Water Quality	DEIR should evaluate potential impacts on water quality, hydrology, and water supplies during releases/discharges of high flows from the backup pipeline.
LA003	LA003-04	Mitigation (Water Quality)	Mitigation for the high flow discharges from the backup pipeline also should include a notification plan of these events.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
LA003	LA003-05	Hazardous Materials	DEIR also should evaluate potential impacts due to potential spills during chemical handling and storage.
LA003	LA003-06	Mitigation (Hazmat)	Provide for appropriate mitigation for potential chemical spills to prevent adverse impacts to downstream drinking water supplies, and that an appropriate notification plan is in place should such a spill occur.
LA004 – East Bay Regional Park District (includes supplemental comments LA004b, LA004c, and LA004d, attached to LA004a)			
LA004a	LA004a-01	Traffic	Identify road closures and provide methods to minimize effects.
LA004a	LA004a-02	Traffic	Account for increased use of Regional Parks during weekends and holidays in traffic impacts.
LA004a	LA004a-03	Recreation	Traffic analysis should include mitigation measures for loss of access to regional parks.
LA004a	LA004a-04	Traffic	Disclose details of traffic control plan in DEIR or incorporate measurable performance standards into mitigation measures that reference traffic control plan. Develop traffic control plan in coordination with EBRPD. Traffic control plan should recognize peak recreational demand periods.
LA004a	LA004a-05	Traffic	The EIR should address how traffic delays, road hazards, and detours would be communicated to the public, including signage, pamphlets, displays at park kiosks, and media outreach.
LA004a	LA004a-06	Traffic	Project should be designed or mitigation measures provided to avoid or minimize deterioration of affected roads.
LA004a	LA004a-07	Hydrology & Water Quality	The DEIR should address how the project would alter flows of San Antonio and Alameda Creeks.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
LA004a	LA004a-08	Biological Resources	The DEIR should evaluate how diminished water quality and habitat loss resulting from project construction and operations would affect the recovery of anadromous fish in Alameda Creek. Mitigation measures for impacts on biological resources should include measurable, performance-based standards.
LA004a	LA004a-09	Mitigation (Biology-TES)	The DEIR should address how the use of SFPUC watershed lands for mitigation of habitat impacts would not result in a net loss of habitat for special status species.
LA004a	LA004a-10	Mailing List	Request 1 hard copy and 1 CD copy of DEIR
LA004b	LA004b-01	Hydrology & Water Quality	The DEIR should evaluate surface water resource impacts from changes in water system operations, changes in primary versus secondary watershed status, changes in existing drainage patters, increased erosion or deposition of sediments, and impacts on riparian vegetation, fisheries, and wildlife habitat.
LA004b	LA004b-02	Recreation	SFPUC must fully assess and mitigate the potential impacts of the proposed pipeline construction on access to and use of existing and planned trails and recreation in watershed areas that may result due to trail closure or rerouting, dust, noise, visual impacts, and trail safety and convenience.
LA004c	LA004c-01	Mitigation (General)	Agreement that the HRP's coordinated and consolidated approach to mitigations is a better approach.
LA004c	LA004c-02	Mitigation (General)	Why are the proposed program and the HCP being prepared separately?
LA004c	LA004c-03	Reg. Process/Pub. Involvement	LA004c-2 could result in a segmentation violation under CEQA.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
LA004c	LA004c-04	Mitigation (Land Use)	The primary project impact would take place in watersheds that are already in conservancy. To mitigate the project would have to purchase additional lands in fee.
LA004c	LA004c-05	Mitigation (Land Use)	Fee purchase of lands for mitigation is preferred to purchasing conservation easements.
LA004c	LA004c-06	Mitigation (Land Use)	Acquisition of mitigation lands should be proximate to the project location.
LA004c	LA004c-07	Mitigation (Biological Resources-Vegetation)	The NOP state on page 5 that " habitat preservation would involve fencing, periodic weed control and managed grazing." Such measures would seen to be just good property management measures that SFWD has already implemented and not necessarily mitigation for impacts.
LA004c	LA004c-08	Mitigation (General)	It is unclear what would be the added value of preserving watershed lands that have already been acquired by SFWD to protect water quality and associated natural resources (see LA004c-4).
LA004c	LA004c-09	Mitigation (Biological Resources-Vegetation)	Provide management and monitoring provisions for the following: yellow starthistle, non-native animals, pond management, property management, public access, and habitat monitoring.
LA004d	LA004d-01	Recreation (Indirect Impacts)	Any disruption of parks users experience may result in a significant environmental impact under CEQA. The WSIP PEIR analysis of impacts on recreation did not fully account for impacts on recreation resources from resource categories other than construction impacts and aesthetics. Recreation impacts also may occur indirectly as a result of impacts from traffic, noise, air quality, and biological resources. Please account for these indirect impacts also.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
LA004d	LA004d-02	Recreation (Traffic)	Effects of road closures and increased vehicle trips (along Calaveras Road) should be evaluated in the project level analysis to determine potential impacts from increased traffic congestion and delays on access to recreational areas.
LA004d	LA004d-03	Mitigation (Recreation)	Traffic control plans should recognize peak demand hours for park use and minimize construction traffic volumes and road/lane closures to not overlap these hours. This may require that construction traffic is significantly restricted or prohibited during holidays and weekends.
LA004d	LA004d-04	Mitigation (Public Notification)	SFPUC should be the sole agency with responsibility to notify the public about any road closures from this project, including being responsible for providing proper signage, informational pamphlets and displays at nearby parks, and other needed outreach efforts.
LA004d	LA004d-05	Mailing List (Document Review Request)	Provide EBRPD with opportunity to review the proposed traffic control plans associated with this project.
LA004d	LA004d-06	Project Description (Traffic)	Add information in the project description to define the time over which any roads or driveways will be closed or the number of available lanes will be reduced due to construction activities.
LA004d	LA004d-07	Mitigation (Traffic)	Adopt a performance-based mitigation measure to determine/set deadlines for when affected roads are to re-open following construction of the proposed projects.
LA004d	LA004d-08	Traffic	Address how road surfaces will be maintained during and after construction of the SABPL projects.
LA004d	LA004d-09	Mitigation (Traffic)	The project traffic control plan should include mandatory language clarifying traffic restrictions, signage, and public outreach regarding possible road closure (comment originally addressed to Calaveras Dam EIR)

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Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
LA004d	LA004d-10	Mailing List (Document Review Request)	Please provide the EBRPD and the Alameda Creek Fisheries Restoration Workgroup opportunity to review the draft EIR and mitigation monitoring and reporting plans.
LA004d	LA004d-11	Mitigation (Biological Resources - Riparian Habitat)	Use of existing SFPUC watershed preserve land for mitigation of project impacts may be considered inadequate under CEQA unless the mitigation were to rehabilitate or enhance distrubed or marginal habitat areas with the watershed.
LA004d	LA004d-12	Mitigation (Biological Resources - Habitat Restoration)	Use fee purchase of mitigation lands instead of conservation easements to compensate for loss of habitat and to reduce problems associated with enforcement of land use restrictions, maintaining public access to areas, and assuring long-term management occurs.
LA004d	LA004d-13	Noise	When evaluating noise impacts on users at nearby recreation areas, consider that an increase in 5dB CNEL over noise levels is considered a significant noise impact.
LA004d	LA004d-14	Land Use	Refer to the existing recreation area management plans for additional guidance on land use in those areas.
LA004d	LA004d-15	Public Services / Utilities	Coordinate with EBRPD Fire Department re fire suppression planning and response, including traffic control plans.
NP001 – Alameda Creek Alliance			
NP001	NP001-01	Project Design	Design the new cone valve to release low and moderate flows to facilitate the return of native steelhead populations.
NP001	NP001-02	Biological Resources (Fish)	The EIR should address potential for restoration of steelhead and other native fishes below Turner Dam and the stream flows required to accomplish this. The proposed cone valve should be sized to allow future

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
			low-flow water releases to San Antonio Creek for this purpose.
NP001	NP001-03	Project Description	The EIR should quantify how much of the bank of San Antonio Creek would be armored with rip-rap to prevent erosion.
NP001	NP001-04	Mitigation (Water Quality)	Armoring San Antonio Creek with rip-rap will require mitigation in the form of creek restoration or habitat enhancement downstream.
NP001	NP001-05	Hazardous Materials	In May 2002 SFPUC had discharged contaminated water from the SVWTP. The SABPL project must include fail-safe measures to prevent any further chemical spills.
NP001	NP001-06	Mitigation (Hazmat)	The DEIR must outline containment, spill response, and mitigation measures in case a chemical spill does occur.
NP001	NP001-07	Biological Resources	The DEIR should discuss the potential for occurrence of special status species in the vicinity of the proposed project and potential impacts to species or their habitat.
NP001	NP001-08	Mitigation (Biological Resources-General)	The project should emphasize avoidance of sensitive habitats and fully mitigate for any direct or indirect impacts to native wildlife.
PC001 – Mr. Stanley Garcia			
PC001	PC001-01	Mailing List	Please delete Mr. Garcia's mother (Mrs. Rosie Garcia) from the SFPUC mail list as she has been deceased for about 14 years.
PC001	PC001-02	Traffic	Please make sure that Mr. Garcia has access to his driveway as the new pipeline is installed.
PC001	PC001-03	Traffic	Please make sure traffic flows along Calaveras Road are maintained as pipeline is installed where it crosses from the east to the west side of the road.

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Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
SA001 – California Regional Water Quality Control Board (includes comments received from SA001b, supplement to SA001a)			
SA001a	SA001a-01	Hydrology & Water Quality	Consideration must be given in the EIR to the Beneficial Uses of both Alameda Creek and of San Antonio Creek as a tributary to Alameda Creek.
SA001a	SA001a-02	Reg. Process/Pub. Involvement	EIR should discuss the Regional Water Quality Control Board's jurisdiction (in addition to the CDFG and USFWS) with regard to special-status species as it relates to the beneficial uses of Alameda Creek and San Antonio Creek.
SA001a	SA001a-03	Permit Process	Both CWA Section 401water quality certification and Section 404 permit from the USACE will be necessary for fill impacts to San Antonio Creek. In addition, A Report of Waste Discharge also may be needed if the project may impacts waters of the State, even if such waters have been excluded from federal jurisdiction. A Streambed Alteration Agreement from the CDFG also may be necessary since the proposed project involves stream channels and riparian habitats.
SA001a	SA001a-04	Hydrology & Water Quality	CWA Section 404 (b)(1) "…prohibit all discharge of fill material into regulated waters of the United States, unless a discharge, as proposed, constitutes the least environmentally damaging practicable alternative that will achieve the basic project purpose."
SA001a	SA001a-05	Mitigation (Water Quality)	Where impacts to water quality cannot be avoided the creation of adequate mitigation habitat to compensate for the loss of water body acreage, functions and values must be provided.
SA001a	SA001a-06	Alternatives	The LEDPA analysis in the EIR should evaluate alternatives that would (1) avoid impacts to waters, (2) modify project to minimize impacts to waters, and (3) mitigate, once impacts have been fully minimized, to compensate for unavoidable impacts.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
SA001a	SA001a-07	Hydrology & Water Quality	Potential impacts from discharging water into San Antonio and Alameda creeks must be identified. Include the potential cumulative and indirect impacts include deposition of sediments; erosion of substratum; additional water (flooding); and creating a condition of pollution.
SA001a	SA001a-08	Alternatives	Project also should evaluate alternatives that avoid discharges into San Antonio Creek by retaining water with SFPUC's water supply system.
SA001a	SA001a-09	Mitigation (Water Quality)	Treatment of discharges to San Antonio Creek should be considered as a mitigation measure. These discharges also must be evaluated for potential impacts related to changes in water temperature in this creek.
SA001a	SA001a-10	Hydrology & Water Quality / Geology	Potential impacts to San Antonio Creek from discharges include increases in erosion and sedimentation, with detrimental effects to riparian and aquatic habitats and to water column chemistry. EIR should include a geomorphic assessment using continuous flow modeling to assess these potential impacts.
SA001a	SA001a-11	Mitigation (Water Quality)	For site dewatering activities, water should be discharged first to a sanitary sewer if possible, or used for other onsite activities such as dust control (presuming minimal water contamination)
SA001a	SA001a-12	Permit Process	For dewatering discharges not able to be made to sanitary sewers, SFPUC should determine the appropriate permit to cover these discharges and file the requisite sampling, analysis, treatment plans, and Notices of Intent within the appropriate time frame (60 days for review and approval by RWQCB staff).
SA001a	SA001a-13	Mitigation (Water Quality)	If dewatering samples are tested and found to be clean (and there is no history of contamination on the site or adjacent sites, SFPUC should implement a sediment removal program as necessary to ensure the water is clean prior to discharge to storm drain or water body.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
SA001a	SA001a-14	Project Design	SFPUC should confirm that the discharge will not cause erosion, flooding, or other problems.
SA001a	SA001a-15	Permit Process	Project must be covered under the State NPDES General Permit for Discharges of Storm Water Associated with Construction Activities (General Construction Permit). This is done by filing an NOI with the State Water Resources Control Board (State Board) and completing the General Constuction Permit (website provided). This also requires development, review and approval by the State Board (60 days), and implementation of a Stormwater Pollution Prevention Plan.
SA001b	SA001b-01	Hydrology & Water Quality	Follow-up email providing a suggested method for assessing and mitigating potential hydromodification impacts on San Antonio Creek.
SA002 – California Department of Fish and Game			
SA002	SA002-01	Biological Resources	CDFG recommends a complete assessment of the flora and fauna within and adjacent to the project area, with emphasis on identifying endangered, threatened, and locally unique species and sensitive habitats. Rare and, threatened and endangered species should include those that meet the CEQA Guideline Section 15380 definition. Rare plants and rare natural communities should be identified pursuant to CDFG Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities.
SA002	SA002-02	Reg. Process/Pub. Involvement	The project may be required to obtain a California Endangered Species Act Permit, and Streambed Alteration Agreement. Early consultation is encouraged for CESA permit. The EIR should identify potential impacts to the stream or riparian resources and provide avoidance, mitigation, monitoring, and reporting commitments.

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
SA002	SA002-03	Biological Resources	Disclose impact to special status species such as, California tiger salamander (Ambystoma californiense), California red-legged frog (Rana draytonii), and Central Coast ESU steelhead (*Oncorhynchus mykiss iridieus*).
SA002	SA002-04	Biological Resources (Fish)	Consider the possible operational impact to steelhead as they will gain access to San Antonio Creek in the foreseeable future.
SA002	SA002-05	Biological Resources / Water Quality	The EIR should address potential effects of sudden changes to water quality in San Antonio Creek on fish and wildlife.
SA002	SA002-06	Mitigation (Biological Resources)	Propose mitigation measures that would avoid, minimize, or compensate for impacts and/or take of special status species due to construction of the project or its operation.
SA002	SA002-07	Project Design	Substitute bioengineering techniques for rip-rap.
SA002	SA002-08	Project Design	Position cone valve parallel to San Antonio Creek to reduce erosion.
SA002	SA002-09	Alternatives	Include a discussion of potentially discharging water into San Antonio Reservoir, or other alternatives where water would be returned to the system.
SA003 – California Department of Transportation			
SA003	SA003-01	Mitigation (General)	The project's fair share contribution, financing, scheduling, implementation, and lead agency monitoring responsibilities for all mitigation measures should be fully dis-cussed in the DEIR.
SA003	SA003-02	Reg. Process/Pub. Involvement	An encroachment permit will be required for any work in the State right of way (ROW).

Table 5 Summary of Individual Comments, Sorted by Comment Source

Comment Document #	Comment #	Topic / Resource Area	Comment Received
SA003	SA003-03	Cultural Resources	The project's environmental analysis section must include documentation of a current archaeological records search from the Northwest Information Center (NIC) of the California Historic Resources Information System (CHRIS) for all work in the state ROW.
SA003	SA003-04	Mailing List	Send a copy of the DEIR to: Lisa Carboni, Mail Stop #10D, PO Box 23660, Oakland, CA 94623-0660
SA003	SA003-05	Reg. Process/Pub. Involvement	To apply for an encroachment permit submit a permit application, environmental documentation, and five (5) sets of plans to Michael Condie, Mail Stop #5E, PO Box 23660, Oakland, CA 94623-0660

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Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
Alternatives			
SA001a	SA001a-06	Alternatives	The LEDPA analysis in the EIR should evaluate alternatives that would (1) avoid impacts to waters, (2) modify project to minimize impacts to waters, and (3) mitigate, once impacts have been fully minimized, to compensate for unavoidable impacts.
SA001a	SA001a-08	Alternatives	Project also should evaluate alternatives that avoid discharges into San Antonio Creek by retaining water with SFPUC's water supply system.
SA002	SA002-09	Alternatives	Include a discussion of potentially discharging water into San Antonio Reservoir, or other alternatives where water would be returned to the system.
Biological Resources (combined)			
LA004a	LA004a-08	Biological Resources	The DEIR should evaluate how diminished water quality and habitat loss resulting from project construction and operations would affect the recovery of anadromous fish in Alameda Creek. Mitigation measures for impacts on biological resources should include measurable, performance-based standards.
NP001	NP001-07	Biological Resources	The DEIR should discuss the potential for occurrence of special status species in the vicinity of the proposed project and potential impacts to species or their habitat.
SA002	SA002-01	Biological Resources	CDFG recommends a complete assessment of the flora and fauna within and adjacent to the project area, with emphasis on identifying endangered, threatened, and locally unique species and sensitive habitats. Rare and, threatened and endangered species should include those that meet the CEQA Guideline Section 15380 definition. Rare plants and rare natural communities should be identified pursuant to CDFG Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities.
SA002	SA002-03	Biological Resources	Disclose impact to special status species such as, California tiger salamander (Ambystoma californiense), California red-legged frog (Rana draytonii), and Central Coast ESU steelhead (*Oncorhynchus mykiss iridieus*).
LA001	LA001-02	Biological Resources (Fish)	Potential impact from armoring creek bottoms -- may create barriers to fish passage.

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Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
NP001	NP001-02	Biological Resources (Fish)	The EIR should address potential for restoration of steelhead and other native fishes below Turner Dam and the stream flows required to accomplish this. The proposed cone valve should be sized to allow future low-flow water releases to San Antonio Creek for this purpose.
SA002	SA002-04	Biological Resources (Fish)	Consider the possible operational impact to steelhead as they will gain access to San Antonio Creek in the foreseeable future.
LA001	LA001-04	Biological Resources (TES)	Effects on: red legged frog, San Joaquin kit fox, California tiger salamander, steelhead, Alameda whipsnakes, rare plants, and wetlands.
SA002	SA002-05	Biological Resources / Water Quality	The EIR should address potential effects of sudden changes to water quality in San Antonio Creek on fish and wildlife.
Cultural Resources			
LA001	LA001-06	Cultural Resources	Potential impacts on cultural resources.
SA003	SA003-03	Cultural Resources	The project's environmental analysis section must include documentation of a current archaeological records search from the Northwest Information Center (NIC) of the California Historic Resources Information System (CHRIS) for all work in the state ROW.
Hazardous Materials			
NP001	NP001-05	Hazardous Materials	In May 2002 SFPUC had discharged contaminated water from the SVWTP. The SABPL project must include fail-safe measures to prevent any further chemical spills.
LA002	LA002-06	Hazardous Materials	What measures will be employed for chemical spills at the chemical storage facility?
LA003	LA003-05	Hazardous Materials	DEIR also should evaluate potential impacts due to potential spills during chemical handling and storage.
Hydrology & Water Quality (combined)			
LA001	LA001-03	Hydrology & Water Quality	Potential impacts on flood control channel/creek and road crossings.
LA001	LA001-05	Hydrology & Water Quality	Potential impacts of flow diversions on downstream segment of Alameda Creek.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
LA004b	LA004b-01	Hydrology & Water Quality	The DEIR should evaluate surface water resource impacts from changes in water system operations, changes in primary versus secondary watershed status, changes in existing drainage patters, increased erosion or deposition of sediments, and impacts on riparian vegetation, fisheries, and wildlife habitat.
LA003	LA003-01	Hydrology & Water Quality	DEIR should fully evaluate all potential downstream impacts to water quality from site activites, including discharge of contaminants to receiving waters, dewatering of pipeline trench, and erosion as a result of grading and other activities.
SA001a	SA001a-07	Hydrology & Water Quality	Potential impacts from discharging water into San Antonio and Alameda creeks must be identified. Include the potential cumulative and indirect impacts include deposition of sediments; erosion of substratum; additional water (flooding); and creating a condition of pollution.
LA003	LA003-03	Hydrology & Water Quality	DEIR should evaluate potential impacts on water quality, hydrology, and water supplies during releases/discharges of high flows from the backup pipeline.
LA004a	LA004a-07	Hydrology & Water Quality	The DEIR should address how the project would alter flows of San Antonio and Alameda Creeks.
SA001a	SA001a-01	Hydrology & Water Quality	Consideration must be given in the EIR to the Beneficial Uses of both Alameda Creek and of San Antonio Creek as a tributary to Alameda Creek.
SA001a	SA001a-04	Hydrology & Water Quality	CWA Section 404 (b)(1) "…prohibit all discharge of fill material into regulated waters of the United States, unless a discharge, as proposed, constitutes the least environmentally damaging practicable alternative that will achieve the basic project purpose."
SA001b	SA001b-01	Hydrology & Water Quality	Follow-up email providing a suggested method for assessing and mitigating potential hydromodification impacts on San Antonio Creek.
SA001a	SA001a-10	Hydrology & Water Quality / Geology	Potential impacts to San Antonio Creek from discharges include increases in erosion and sedimentation, with detrimental effects to riparian and aquatic habitats and to water column chemistry. EIR should include a geomorphic assessment using continuous flow modeling to assess these potential impacts.
Land Use			
LA004d	LA004d-14	Land Use	Refer to the existing recreation area management plans for additional guidance on land use in those areas.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
Mailing List			
CO001	CO001-01	Mailing List	Requests a copy of plans and drawings associated with the project.
LA004a	LA004a-10	Mailing List	Request 1 hard copy and 1 CD copy of DEIR
PC001	PC001-01	Mailing List	Please delete Mr. Garcia's mother (Mrs. Rosie Garcia) from the SFPUC mail list as she has been deceased for about 14 years.
SA003	SA003-04	Mailing List	Send a copy of the DEIR to: Lisa Carboni, Mail Stop #10D, PO Box 23660, Oakland, CA 94623-0660
LA004d	LA004d-05	Mailing List (Document Review Request)	Provide EBRPD with opportunity to review the proposed traffic control plans associated with this project.
LA004d	LA004d-10	Mailing List (Document Review Request)	Please provide the EBRPD and the Alameda Creek Fisheries Restoration Workgroup opportunity to review the draft EIR and mitigation monitoring and reporting plans.
Mitigation Measures (combined)			
LA004d	LA004d-12	Mitigation (Biological Resources - Habitat Restoration)	Use fee purchase of mitigation lands instead of conservation easements to compensate for loss of habitat and to reduce problems associated with enforcement of land use restrictions, maintaining public access to areas, and assuring long-term management occurs.
LA004d	LA004d-11	Mitigation (Biological Resources - Riparian Habitat)	Use of existing SFPUC watershed preserve land for mitigation of project impacts may be considered inadequate under CEQA unless the mitigation were to rehabilitate or enhance distrubed or marginal habitat areas with the watershed.
SA002	SA002-06	Mitigation (Biological Resources)	Propose mitigation measures that would avoid, minimize, or compensate for impacts and/or take of special status species due to construction of the project or its operation.
NP001	NP001-08	Mitigation (Biological Resources-General)	The project should emphasize avoidance of sensitive habitats and fully mitigate for any direct or indirect impacts to native wildlife.
LA004c	LA004c-07	Mitigation (Biological Resources-Vegetation)	The NOP state on page 5 that " habitat preservation would involve fencing, periodic weed control and managed grazing." Such measures would seen to be just good property management measures that SFWD has already implemented and not necessarily mitigation for impacts.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
LA004c	LA004c-09	Mitigation (Biological Resources-Vegetation)	Provide management and monitoring provisions for the following: yellow starthistle, non-native animals, pond management, property management, public access, and habitat monitoring.
LA004a	LA004a-09	Mitigation (Biology-TES)	The DEIR should address how the use of SFPUC watershed lands for mitigation of habitat impacts would not result in a net loss of habitat for special status species.
LA004c	LA004c-01	Mitigation (General)	Agreement that the HRP's coordinated and consolidated approach to mitigations is a better approach.
LA004c	LA004c-02	Mitigation (General)	Why are the proposed program and the HCP being prepared separately?
LA004c	LA004c-08	Mitigation (General)	It is unclear what would be the added value of preserving watershed lands that have already been acquired by SFWD to protect water quality and associated natural resources (see LA004c-4).
SA003	SA003-01	Mitigation (General)	The project's fair share contribution, financing, scheduling, implementation, and lead agency monitoring responsibilities for all mitigation measures should be fully dis-cussed in the DEIR.
LA003	LA003-06	Mitigation (Hazmat)	Provide for appropriate mitigation for potential chemical spills to prevent adverse impacts to downstream drinking water supplies, and that an appropriate notification plan is in place should such a spill occur.
NP001	NP001-06	Mitigation (Hazmat)	The DEIR must outline containment, spill response, and mitigation measures in case a chemical spill does occur.
LA004c	LA004c-04	Mitigation (Land Use)	The primary project impact would take place in watersheds that are already in conservancy. To mitigate the project would have to purchase additional lands in fee.
LA004c	LA004c-05	Mitigation (Land Use)	Fee purchase of lands for mitigation is preferred to purchasing conservation easements.
LA004c	LA004c-06	Mitigation (Land Use)	Acquisition of mitigation lands should be proximate to the project location.
LA004d	LA004d-04	Mitigation (Public Notification)	SFPUC should be the sole agency with responsibility to notify the public about any road closures from this project, including being responsible for providing proper signage, informational pamphlets and displays at nearby parks, and other needed outreach efforts.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
LA004d	LA004d-03	Mitigation (Recreation)	Traffic control plans should recognize peak demand hours for park use and minimize construction traffic volumes and road/lane closures to not overlap these hours. This may require that construction traffic is significantly restricted or prohibited during holidays and weekends.
LA004d	LA004d-07	Mitigation (Traffic)	Adopt a performance-based mitigation measure to determine/set deadlines for when affected roads are to re-open following construction of the proposed projects.
LA004d	LA004d-09	Mitigation (Traffic)	The project traffic control plan should include mandatory language clarifying traffic restrictions, signage, and public outreach regarding possible road closure (comment originally addressed to Calaveras Dam EIR)
LA003	LA003-02	Mitigation (Water Quality)	Provide complete mitigation to ensure there are no adverse impacts to ACWD's water supplies from the Alameda Creek Watershed, including providing a notification plan for events that could affect downstream water quality.
LA003	LA003-04	Mitigation (Water Quality)	Mitigation for the high flow discharges from the backup pipeline also should include a notification plan of these events.
NP001	NP001-04	Mitigation (Water Quality)	Armoring San Antonio Creek with rip-rap will require mitigation in the form of creek restoration or habitat enhancement downstream.
SA001a	SA001a-05	Mitigation (Water Quality)	Where impacts to water quality cannot be avoided the creation of adequate mitigation habitat to compensate for the loss of water body acreage, functions and values must be provided.
SA001a	SA001a-09	Mitigation (Water Quality)	Treatment of discharges to San Antonio Creek should be considered as a mitigation measure. These discharges also must be evaluated for potential impacts related to changes in water temperature in this creek.
SA001a	SA001a-11	Mitigation (Water Quality)	For site dewatering activities, water should be discharged first to a sanitary sewer if possible, or used for other onsite activities such as dust control (presuming minimal water contamination)
SA001a	SA001a-13	Mitigation (Water Quality)	If dewatering samples are tested and found to be clean (and there is no history of contamination on the site or adjacent sites, SFPUC should implement a sediment removal program as necessary to ensure the water is clean prior to discharge to storm drain or water body.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
Noise			
LA004d	LA004d-13	Noise	When evaluating noise impacts on users at nearby recreation areas, consider that an increase in 5dB CNEL over noise levels is considered a significant noise impact.
Permit Process			
SA001a	SA001a-03	Permit Process	Both CWA Section 401water quality certification and Section 404 permit from the USACE will be necessary for fill impacts to San Antonio Creek. In addition, A Report of Waste Discharge also may be needed if the project may impacts waters of the State, even if such waters have been excluded from federal jurisdiction. A Streambed Alteration Agreement from the CDFG also may be necessary since the proposed project involves stream channels and riparian habitats.
SA001a	SA001a-12	Permit Process	For dewatering discharges not able to be made to sanitary sewers, SFPUC should determine the appropriate permit to cover these discharges and file the requisite sampling, analysis, treatment plans, and Notices of Intent within the appropriate time frame (60 days for review and approval by RWQCB staff).
SA001a	SA001a-15	Permit Process	Project must be covered under the State NPDES General Permit for Discharges of Storm Water Associated with Construction Activities (General Construction Permit). This is done by filing an NOI with the State Water Resources Control Board (State Board) and completing the General Constuction Permit (website provided). This also requires development, review and approval by the State Board (60 days), and implementation of a Stormwater Pollution Prevention Plan.
Project Description			
CO001	CO001-02	Project Description	Chevron has an active petroleum projects pipeline in the project vicinity.
LA002	LA002-03	Project Description	The EIR should address that the project would assist in flushing the Coast Range Tunnel of sediment after a seismic event.
LA002	LA002-04	Project Description	Provide further information on the operating limitations of the existing pipeline. Provide scenarios where the new pipeline would enhance operational flexibility.
NP001	NP001-03	Project Description	The EIR should quantify how much of the bank of San Antonio Creek would be armored with rip-rap to prevent erosion.
LA002	LA002-07	Project Description	Highlight the fact that a forest fire in the watershed caused the closure of the Hetch Hetchy delivery system for six weeks within the last 10 years.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
LA002	LA002-05	Project Description (Hazmat)	Please describe the holding time for the de-chlorinating agent that will be stored in liquid form at the site.
LA004d	LA004d-06	Project Description (Traffic)	Add information in the project description to define the time over which any roads or driveways will be closed or the number of available lanes will be reduced due to construction activities.
LA002	LA002-02	Project Description / Alternatives	The EIR should describe the change in project scope to eliminate certain modifications at Alameda East Portal.
Project Design			
NP001	NP001-01	Project Design	Design the new cone valve to release low and moderate flows to facilitate the return of native steelhead populations.
SA001a	SA001a-14	Project Design	SFPUC should confirm that the discharge will not cause erosion, flooding, or other problems.
SA002	SA002-07	Project Design	Substitute bioengineering techniques for rip-rap.
SA002	SA002-08	Project Design	Position cone valve parallel to San Antonio Creek to reduce erosion.
Public Services / Utilities			
LA004d	LA004d-15	Public Services / Utilities	Coordinate with EBRPD Fire Department re fire suppression planning and response, including traffic control plans.
Purpose and Need			
LA002	LA002-01	Purpose and Need	A better description of the project need should be added to the DEIR.
Recreation			
LA004a	LA004a-03	Recreation	Traffic analysis should include mitigation measures for loss of access to regional parks.
LA004b	LA004b-02	Recreation	SFPUC must fully assess and mitigate the potential impacts of the proposed pipeline construction on access to and use of existing and planned trails and recreation in watershed areas that may result due to trail closure or rerouting, dust, noise, visual impacts, and trail safety and convenience.

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Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
LA004d	LA004d-01	Recreation (Indirect Impacts)	Any disruption of parks users experience may result in a significant environmental impact under CEQA. The WSIP PEIR analysis of impacts on recreation did not fully account for impacts on recreation resources from resource categories other than construction impacts and aesthetics. Recreation impacts also may occur indirectly as a result of impacts from traffic, noise, air quality, and biological resources. Please account for these indirect impacts also.
LA004d	LA004d-02	Recreation (Traffic)	Effects of road closures and increased vehicle trips (along Calaveras Road) should be evaluated in the project level analysis to determine potential impacts from increased traffic congestion and delays on access to recreational areas.
Regulatory Process / Public Involvement			
LA004c	LA004c-03	Reg. Process/Pub. Involvement	LA004c-2 could result in a segmentation violation under CEQA.
SA001a	SA001a-02	Reg. Process/Pub. Involvement	EIR should discuss the Regional Water Quality Control Board's jurisdiction (in addition to the CDFG and USFWS) with regard to special-status species as it relates to the beneficial uses of Alameda Creek and San Antonio Creek.
SA002	SA002-02	Reg. Process/Pub. Involvement	The project may be required to obtain a California Endangered Species Act Permit, and Streambed Alteration Agreement. Early consultation is encouraged for CESA permit. The EIR should identify potential impacts to the stream or riparian resources and provide avoidance, mitigation, monitoring, and reporting commitments.
SA003	SA003-02	Reg. Process/Pub. Involvement	An encroachment permit will be required for any work in the State right of way (ROW).
SA003	SA003-05	Reg. Process/Pub. Involvement	To apply for an encroachment permit submit a permit application, environmental documentation, and five (5) sets of plans to Michael Condie, Mail Stop #5E, PO Box 23660, Oakland, CA 94623-0660
Traffic			
LA001	LA001-01	Traffic	Define how the project will impact traffic in the project area.
LA004a	LA004a-01	Traffic	Identify road closures and provide methods to minimize effects.
LA004a	LA004a-02	Traffic	Account for increased use of Regional Parks during weekends and holidays in traffic impacts.

Table 6 Summary of Individual Comments, Sorted by Comment Topic

Document #	Comment #	Topic / Resource Area	Comment Received
LA004a	LA004a-04	Traffic	Disclose details of traffic control plan in DEIR or incorporate measurable performance standards into mitigation measures that reference traffic control plan. Develop traffic control plan in coordination with EBRPD. Traffic control plan should recognize peak recreational demand periods.
LA004a	LA004a-05	Traffic	The EIR should address how traffic delays, road hazards, and detours would be communicated to the public, including signage, pamphlets, displays at park kiosks, and media outreach.
LA004a	LA004a-06	Traffic	Project should be designed or mitigation measures provided to avoid or minimize deterioration of affected roads.
LA004d	LA004d-08	Traffic	Address how road surfaces will be maintained during and after construction of the SABPL projects.
PC001	PC001-02	Traffic	Please make sure that Mr. Garcia has access to his driveway as the new pipeline is installed.
PC001	PC001-03	Traffic	Please make sure traffic flows along Calaveras Road are maintained as pipeline is installed where it crosses from the east to the west side of the road.

APPENDIX A: NOTICE OF PREPARATION DOCUMENTS

The three documents included in this Appendix are:

- Notice of Preparation Cover Letter
- Notice of Preparation Notice (includes State Clearinghouse stamp showing date of receipt)
- Notice of Preparation Report

SAN FRANCISCO
PLANNING DEPARTMENT

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

October 5, 2007

TO: Responsible Agencies, Trustee Agencies, and Interested Parties:

RE: CASE NO. 2007.0039E – SAN ANTONIO BACKUP PIPELINE PROJECT, NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETING

A Notice of Preparation (NOP) of an environmental impact report (EIR) pursuant to the California Environmental Quality Act (CEQA) and a Notice of Public Scoping Meeting for the above referenced project (described below) has been issued by the San Francisco Planning Department. The NOP and Notice of Public Scoping Meeting is either attached or is available upon request from Chris Kern, whom you may reach by phone at (415) 575-9037, by fax at (415) 558-6409, by email at chris.kern@sfgov.org, or by mail at 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479. The combined NOP/Notice of Public Scoping Meeting also is available online at: http://www.sfgov.org/site/planning/mea.

Project Description: The San Francisco Public Utilities Commission (SFPUC) proposes to implement four related upgrades to the water management system between the San Antonio Pump Station and the San Antonio Reservoir. The proposed project would be located between the Hetch Hetchy Alameda Siphons and San Antonio Reservoir in the Sunol Valley. This project area lies just south of the intersection of Highways 680 and 84 along Calaveras Road in Alameda County, California. The proposed project would include four components to upgrade this portion of the water supply system. The primary project would be the installation of a backup pipeline along the same route as the existing San Antonio pipeline that runs about two miles from the San Antonio Pump Station to the James Turner Dam. To accommodate the increased flows this backup pipeline would be able to handle, upgrades would be necessary at the San Antonio Creek Discharge Facilities at the base of the James Turner Dam at the San Antonio Reservoir, and at the San Antonio Pump Station dechlorination and pH adjustment facility. The last component would be to improve the security around the Alameda East Portal. The proposed construction or renovation activities at these locations are described in more detail below. The proposed project would perform two functions: 1) provide more reliable and efficient conveyance of emergency discharges from the Hetch Hetchy system when water quality parameters are exceeded, and 2) act as a backup pipeline for moving San Antonio Reservoir water into the Hetch Hetchy system when San Antonio Pipeline is out of service for maintenance or repair.

(1) ***San Antonio Backup Pipeline (SABPL).*** The existing San Antonio Pipeline is a 60-inch pre-stressed concrete cylinder pipe that runs 11,300 feet from the San Antonio Pump Station (SAPS) adjacent to Calaveras Road to the base of James Turner Dam at the San Antonio Reservoir. The route of this pipeline is west along the access road from the dam to Calaveras Road. It cuts the corner at the intersection of the access road and Calaveras Road, and then proceeds south along the west side of Calaveras Road until tying into the SAPS. The existing pipeline is a two-way conduit. It may be used to transfer up to 160 million gallons per day (MGD) of stored water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant or it can be used to move 160 MGD of Hetch Hetchy water into San Antonio Reservoir under controlled release scenarios. The 160 MGD flow rate is controlled by the pumping capacity of SAPS. The existing San Antonio Pipeline is also used as an emergency discharge pipeline capable of diverting up to 230 MGD of Hetch Hetchy water out of the system and into San Antonio Creek when water quality parameters are exceeded. The 230 MGD flow rate is controlled by the size of SAPL and requires no pump assist. Failure of the San Antonio Pipeline, without the availability of the proposed SABPL, would limit water transmission and management options, and the reliability of these options in this area of the water system. The San Antonio Pipeline has failed before due to wire corrosion and breakage in the Pre-stressed Concrete Cylinder Pipe (PCCP).

The proposed SABPL would be a 66-inch pipe (material to be determined) installed alongside the existing San Antonio Pipeline. It would be designed to transfer up to 315 MGD of Hetch Hetchy water from Alameda Siphon No. 3 to the base of James Turner Dam at San Antonio Reservoir. This design capacity is based on anticipated future emergency discharge requirements. This water would be de-chlorinated and pH adjusted at the SAPS before entering the pipeline. Additional chemical storage and distribution facilities would be located adjacent to the existing SAPS (see description # 3, below). The 315 MGD discharge would occur through a new cone valve structure and then into San Antonio Creek. The creek banks in the immediate vicinity of the new and existing cone valves would be reinforced with riprap to protect against bank erosion (see description #2, below).

As the backup water pipeline to the existing San Antonio Pipeline, the SABPL would be configured with three air gap connections between the new and the existing pipeline. These air gaps would allow the existing San Antonio Pipeline to be taken off-line for repairs and still allow water to be transferred as needed to and from the SAPS and the San Antonio Reservoir.

(2) ***San Antonio Creek Discharge Facility:*** The existing San Antonio Creek discharge facility is located at the end of the existing San Antonio Pipeline at the base of the James Turner Dam at the San Antonio Reservoir. It is the junction point for San Antonio Reservoir and Hetch Hetchy discharges.

This facility is used as necessary to allow for an emergency draw down of the San Antonio Reservoir by discharging the reservoir water into San Antonio Creek. It is also the existing San Antonio pipeline discharge point for quality impaired water diverted from the Alameda Siphon East Portal. Water is discharged to the creek through a flow control cone valve.

The existing discharge facility, which includes a 48-inch cone valve, is housed in a 20-foot long, 14-foot wide trapezoidal outlet structure. However, the existing structure is not adequate to prevent downstream erosion of the San Antonio Creek channel. The water jet discharging from the existing cone valve has damaged the banks of the creek immediately outside the structure and undermined a retaining wall along the south side of the creek.

The proposed project would include construction of a second discharge structure at the end of the SABPL and just west of the existing facility consisting of a 54-inch cone valve housed in a concrete outlet structure similar to the existing facility. The creek bed in the immediate vicinity of the discharge points of both the new and existing discharge facilities would be armored with riprap to protect against scouring during discharge events.

(3) ***San Antonio Pump Station Chemical Facility Upgrades:*** The existing chemical facility is located on the north side of the SAPS compound. It houses the chemicals and feed system used to dechlorinate treated water before it is discharged either back to the San Antonio Reservoir or into San Antonio Creek. The equipment used for this includes two 2,000-gallon sodium bisulfite chemical storage tanks, four chemical feed pumps; and other auxiliary components. This facility has been used successfully when the existing 48-inch cone valve at the base of Turner Dam is tested annually. The estimated flow and treatment capacity during these annual tests is about 240 MGD.

The current facility would have to be expanded by approximately 50% to provide treatment for a full diversion of the 315 MGD of Hetch Hetchy water supply. The additional facilities that would be required to meet this demand include another chemical storage tank, two new chemical feed pumps, and the piping, valves, and controls required to convey the sodium bisulfite to the injection point on the proposed SABPL. This additional equipment would be housed in a new structure to be built just north of the existing dechlorination and pH adjustment facility.

(4) ***Alameda East Portal Improvements:*** The proposed project includes several security improvements at the Alameda East Portal site. All the improvements except the new fence would occur within the existing site footprint and would include the following actions:

(a) Replace the existing perimeter fence and access gates with new chain-link fence. Access gates would be relocated into the new fence line where it would cross the existing access road;

(b) Construct new steel, concrete, and soil backfill enclosures around the portal structures and a moveable concrete wall in front of the portal access manifold; and

(c) Relocate the existing overhead crane to allow it to reach both the new moveable concrete wall and the portal access manifold when access to the latter is required.

These improvements would involve grading and removal of trees and other vegetation.

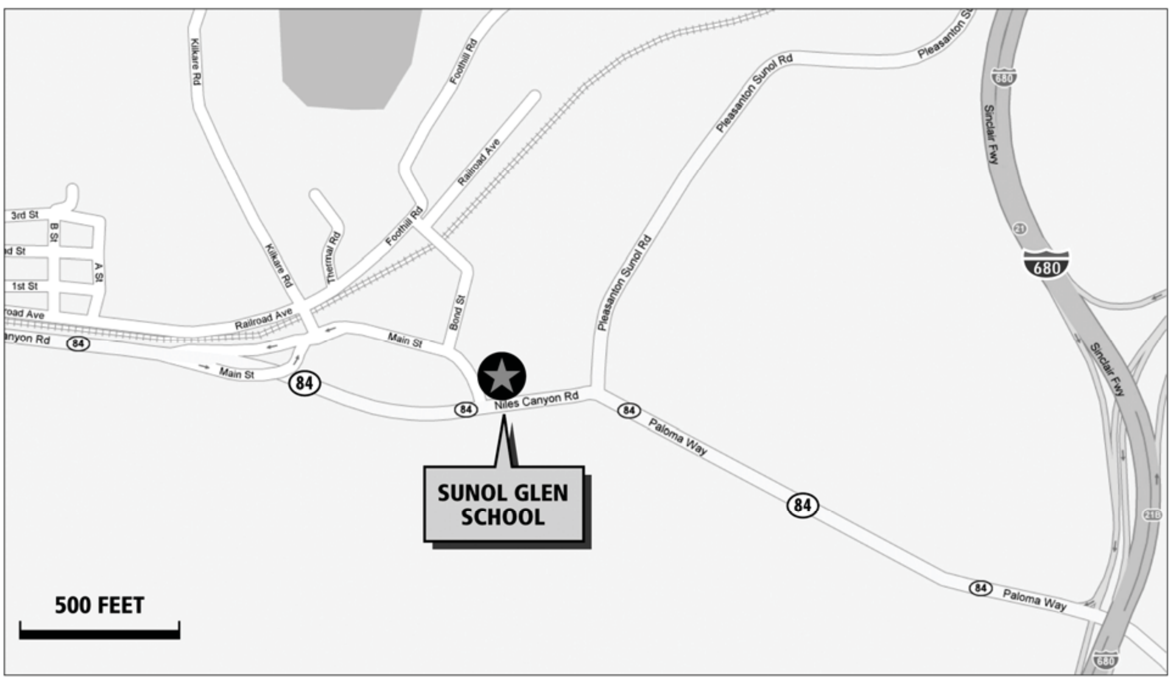
The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras Fault, which is part of the Hayward Fault complex (see Figure 4). All project components would be designed to accommodate seismic activity associated with this fault area.

Preparation of the EIR: The San Francisco Planning Department's Major Environmental Analysis Division (MEA) is preparing an EIR for consideration by decision makers prior to a final decision by the SFPUC regarding whether to approve and implement the project. The purpose of the EIR is to provide information about potentially significant adverse environmental effects of the proposed project, to identify possible ways to minimize those potentially significant adverse effects, and to describe and evaluate feasible alternatives to the proposed project. Preparation of an NOP or EIR does not indicate a decision by the City to approve or to disapprove the proposed project. However, prior to making any such decision, the decision makers must review and consider the information contained in the EIR.

Public Scoping Meeting: The San Francisco Planning Department will hold a PUBLIC SCOPING MEETING at the location, date, and time shown below. The purpose of this meeting will be to receive oral comments that will assist the San Francisco Planning Department in reviewing the scope and focus of the project's environmental impact analysis and information to be contained in the EIR. The public will have the opportunity to comment and offer testimony for consideration. The San Francisco Planning Department also will accept written comments at the meeting or by mail, email, or fax until the close of business on **November 5, 2007**. Written comments should be sent to the San Francisco Planning Department, Attn: Bill Wycko, Acting Environmental Review Officer, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479. Comments also may be sent by fax to (415) 558-6409, or by email to chris.kern@sfgov.org.

Public Scoping Meeting Location, Date, and Time:

<u>Date:</u>	**Thursday, October 25, 2007** **6:30 PM to 8:30 PM**	**<u>Location:</u>**	**Sunol Glen School** **11601 Main St** **Sunol, CA 94586**



Responsible or Trustee Agency Responses: If you work for an agency that is a Responsible or Trustee Agency, we need to know the views of your agency as to the scope and content of the environmental information that is relevant to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR when considering a permit or other approval for this project. We also will need the name of the contact person for your agency. If you have any questions concerning environmental review of the proposed project under CEQA, please contact Chris Kern at (415) 575-9037.

RECEIVED
OCT 0 5 2007
STATE CLEARING HOUSE

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETING

Date of this Notice:	**October 5, 2007**	
Lead Agency:	San Francisco Planning Department	
Contact Person:	Chris Kern	**Telephone:** (415) 575-9037
Email:	chris.kern@sfgov.org	**Facsimile:** (415) 558-6409
Project Title:	San Antonio Backup Pipeline Projects	
Project Sponsor:	San Francisco Public Utilities Commission	
Contact Person:	Kent Nelson	**Telephone:** (415) 554-2473
Email:	KNelson@sfwater.org	**Facsimile:** (415) 934-5750
Project Location:	The project is located in Sunol Valley just south of the intersection of Highways 680 and 84 along Calaveras Road.	
County:	Alameda County	
Assessor's Parcel Number:	Various	

Project Description: The San Francisco Public Utilities Commission (SFPUC) proposes to upgrade its water system between the San Antonio Reservoir and the San Antonio Pump Station in the Sunol Valley. This area lies just south of the intersection of Highways 680 and 84 along Calaveras Road in Alameda County, California. The proposed project includes four components. The primary component is the installation of a backup pipeline along the same route as the existing San Antonio Pipeline, which runs about two miles from the James Turner Dam at the San Antonio Reservoir to the San Antonio Pump Station. To accommodate increased flows through the proposed backup pipeline, the second and third project components include upgrades to the San Antonio Creek Discharge Facility at the base of the James Turner Dam and upgrades to the San Antonio Pump Station dechlorination and pH adjustment facility. The fourth component includes improvements to the security around the Alameda East Portal. The proposed construction and/or facility upgrade activities at these locations are described in more detail below.

(1) ***San Antonio Backup Pipeline (SABPL):*** The existing San Antonio Pipeline is a 60-inch pre-stressed concrete cylinder pipe that runs 11,300 feet from the San Antonio Pump Station (SAPS) adjacent to Calaveras Road to the base of James Turner Dam at the San Antonio Reservoir. The route of this pipeline is west along the access road from the dam to Calaveras Road. It cuts the corner at the intersection of the access road and Calaveras Road, and then proceeds south along the west side of Calaveras Road until tying into the SAPS. The existing pipeline is a two-way conduit. It may be used to transfer up to 160 million gallons per day (MGD) of stored water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant or it can be used to move 160 MGD of Hetch Hetchy water into San Antonio Reservoir under controlled release scenarios. The 160 MGD flow rate is controlled by the pumping capacity of SAPS. The existing San Antonio Pipeline is also used as an emergency discharge pipeline capable of diverting up to 230 MGD of Hetch Hetchy water out of the system and into San Antonio Creek when water quality parameters are exceeded. The 230 MGD flow rate is controlled by the size of SAPL and requires no pump assist. Failure of the San Antonio Pipeline, without the availability of the proposed SABPL, would limit water transmission and management options, and the reliability of these options in this area of the water system. The San Antonio Pipeline has failed before due to wire corrosion and breakage in the Pre-stressed Concrete Cylinder Pipe (PCCP).

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Three air gap connections would connect the proposed SABPL to the existing pipeline. These air gaps would allow the existing San Antonio Pipeline to be taken off-line for repairs and still allow water to be transferred as needed to and from the SAPS and the San Antonio Reservoir.

(2) ***San Antonio Creek Discharge Facility:*** The existing San Antonio Creek Discharge Facility is located at the end of the existing San Antonio Pipeline at the base of the James Turner Dam at the San Antonio Reservoir. It is the junction point for San Antonio Reservoir and Hetch Hetchy discharges.

This facility is used as necessary to allow for an emergency draw down of the San Antonio Reservoir by discharging the reservoir water into San Antonio Creek. It is also the San Antonio Pipeline discharge point for quality impaired water diverted from the Alameda Siphon East Portal. Water is discharged to the creek through a flow control cone valve.

The existing discharge facility, which includes a 48-inch cone valve, is housed in a 20-foot long, 14-foot wide trapezoidal outlet structure. However, the existing structure is not adequate to prevent downstream erosion of the San Antonio Creek channel. The water jet discharging from the existing cone valve has damaged the banks of the creek immediately outside the structure and undermined a retaining wall along the south side of the creek.

The proposed project would include construction of a second discharge structure at the end of the SABPL and just west of the existing facility consisting of a 54-inch cone valve housed in a concrete outlet structure similar to the existing facility. The creek bed in the immediate vicinity of the discharge points of both the new and old discharge facilities would be armored with riprap to protect against scouring during discharge events.

(3) ***San Antonio Pump Station Chemical Facility Upgrades:*** The existing chemical facility is located on the north side of the SAPS compound. It houses the chemicals and feed system used to dechlorinate treated water before it is discharged either back to the San Antonio Reservoir or into San Antonio Creek. The equipment used for this includes two 2,000-gallon sodium bisulfite chemical storage tanks, four chemical feed pumps; and other auxiliary components. This facility has been used successfully when the existing 48-inch cone valve at the base of James Turner Dam is tested annually. The estimated flow and treatment capacity during these annual tests is about 240 MGD.

The current facility would be expanded under the proposed project by approximately 50 percent to provide treatment for a full diversion of the 315 MGD of Hetch Hetchy water supply. The additional facilities that would be required to meet this project need include another chemical storage tank, two new chemical feed pumps, and the piping, valves, and controls required to convey the sodium bisulfite to the injection point on the proposed SABPL. This additional equipment would be housed in a new structure to be built just north of the existing dechlorination and pH adjustment facility.

(4) ***Alameda East Portal Improvements:*** The proposed project includes several security improvements at the Alameda East Portal site. All the improvements except the new fence would occur within the existing site footprint and would include the following actions:

(a) Replace the existing perimeter fence and access gates with new chain-link fence. Access gates would be relocated into the new fence line where it would cross the existing access road;

(b) Construct new steel, concrete, and soil backfill enclosures around the portal structures and a moveable concrete wall in front of the portal access manifold; and

(c) Relocate the existing overhead crane to allow it to reach both the new moveable concrete wall and the portal access manifold when access to the latter is required.

These improvements would involve grading and removal of trees and other vegetation.

The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras Fault, which is part of the Hayward Fault complex. All project components would be designed to accommodate seismic activity associated with this fault area.

Please see the attached report for more information about the proposed SABPL Project, the scope of the EIR, and the anticipated environmental issues.

THIS PROJECT MAY HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT. AN ENVIRONMENTAL IMPACT REPORT IS REQUIRED. This determination is based upon the criteria of the Guidelines of the State Secretary for Resources, Sections 15063 (Initial Study), 15064 (Determining Significant Effect), and 15065 (Mandatory Findings of Significance).

The San Francisco Planning Department will hold a **PUBLIC SCOPING MEETING** pursuant to the State of California Public Resources Code Section 21083.9 and California Environmental Quality Act Guidelines Section 15206 to receive oral comments concerning the scope of the EIR at the following location, date, and time:

Date:	**Thursday, October 25, 2007** **6:30 PM to 8:30 PM**	**Location:**	**Sunol Glen School** **11601 Main St** **Sunol, CA 94586**

The purpose of this meeting is to receive oral comments that will assist the San Francisco Planning Department in reviewing the scope and focus of the project's environmental impact analysis and information to be contained in the EIR. The public will have the opportunity to comment and offer testimony for consideration. The San Francisco Planning Department also will accept written comments on the scope of the EIR at the meeting or by mail, email, or fax until the close of business on November 5, 2007. Written comments may be submitted by mail to the San Francisco Planning Department, Attn:

Bill Wycko, Acting Environmental Review Officer, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479. They also may be submitted by fax to (415) 558-6409, or sent by email to chris.kern@sfgov.org.

Documents relating to the proposed project are available for review, by appointment, at the San Francisco Planning Department's Major Environmental Analysis (MEA) office at 1650 Mission Street, Suite 400. Please call Chris Kern at (415) 575-9037 to make an appointment. These documents also are available online at: http://www.sfgov.org/planning.

10/2/07
Date

Bill Wycko, Acting Environmental Review Officer

中文資料請電：558-6282
Para sa impormasyon sa Tagalog tumawag sa: 558-6251
Para información en Español llamar al: 558-6307

San Antonio Backup Pipeline Project

Case No. 2007.0039E

1.0 OVERVIEW AND BACKGROUND

The San Francisco Public Utilities Commission (SFPUC) is proposing to construct and operate the San Antonio Backup Pipeline (SABPL) Project. To meet California Environmental Quality Act (CEQA) requirements, the San Francisco Planning Department will prepare and distribute an Environmental Impact Report (EIR) describing and analyzing the environmental effects of the proposed project. This Notice of Preparation (NOP) provides a brief description of proposed project, and identifies some of the project's key potential environmental effects.

1.1 San Francisco Water System and the San Antonio Backup Pipeline System

The City and County of San Francisco, through the SFPUC, owns and operates a regional water system that extends from the Sierra Nevada mountain range to the San Francisco Bay Area (see Figure 1 at the end of this document). This regional water system serves 2.4 million people in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. The basic network of major facilities in the regional system was built from the late 1880s through the 1930s. Expansion and improvements of the major facilities continued through the 1970s. The current San Antonio Pipeline, which transmits water in an emergency water outage event to maintain water delivery to the San Francisco Bay Area and transmits water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant, was built in 1967 and is a part of the SFPUC's water system.

Aging facilities within the water system are in need of major repair, rehabilitation, upgrade, and/or replacement. Currently, whenever there are unexpected water quality problems in the upper Hetch Hetchy system near Yosemite National Park, such as turbidity spikes, water is diverted to the existing San Antonio Pipeline in the Sunol Valley. The existing 60-inch diameter San Antonio Pipeline is a pre-stressed concrete cylinder pipe and is therefore susceptible to failure when the pre-stressing wires corrode and break, thereby preventing the emergency discharge of water out of the water system.

In February 2005, the SFPUC developed a regional Water System Improvement Program (WSIP). The basic goals of the WSIP are to increase the reliability of the regional water system with respect to water quality, seismic response, water delivery, and water supply to meet water delivery needs in the service area through the year 2030. To accomplish these goals, the SFPUC proposes 22 facility improvement projects throughout the regional water system under the WSIP. The SABPL Project is one of the proposed WSIP facility improvement projects. In June 2007, the San Francisco Planning Department published a Draft Program EIR (PEIR) to address the potential environmental impacts of the WSIP on a programmatic level and evaluate regional water supply alternatives. The Draft PEIR is available on the San Francisco Planning Department website at www.sfgov.org/planning/mea.

1.2 Environmental Review Process

The San Francisco Planning Department will prepare a project-specific EIR to evaluate the environmental effects of the proposed SABPL Project. The EIR will be prepared in compliance with the CEQA Guidelines Section 15161 and will address project-specific construction and operational impacts.

The first step in the environmental review process is the formal public scoping process, for which this NOP has been prepared. Following the public scoping meeting, a Draft EIR will be prepared and circulated for a 45-day public review period. Public comments on the Draft EIR will be accepted in writing during the review period or orally at formal public hearings to be held by the San Francisco Planning Commission. The San Francisco Planning Department then will prepare written responses to comments on environmental issues raised during the public review period, and a Response to Comments document will be prepared. This document will be considered by the San Francisco Planning Commission, along with the Draft EIR and any revisions to the draft based on the responses to comments, for certification as a Final EIR.

1.3 Public Scoping Meeting

The San Francisco Planning Department will hold a public scoping meeting at the following location, date, and time:

Date:	**Thursday, October 25, 2007** **6:30 PM to 8:30 PM**	**Location:**	**Sunol Glen School** **11601 Main St** **Sunol, CA 94586**

The purpose of this meeting is to assist the San Francisco Planning Department with its review of the proposed scope and content of the EIR as summarized in this NOP. The public will have the opportunity to comment and offer testimony for consideration. The San Francisco Planning Department will also accept written comments at the meetings or by mail, e-mail, or fax until the close of business on **November 5, 2007**. Written comments should be sent to the San Francisco Planning Department, Attn: Bill Wycko, Acting Environmental Review Officer, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479, or be emailed to chris.kern@sfgov.org.

2.0 PROJECT DESCRIPTION

2.1 Existing Facilities and Proposed Project Components

The proposed project would be located between the San Antonio Pump Station and San Antonio Reservoir in the Sunol Valley in Alameda County, California. This project area lies just south of the intersection of Highways 680 and 84 along Calaveras Road (see Figure 2). There are four primary locations at which new construction and/or facility upgrades would occur, including: (1) along the alignment of the existing San Antonio Pipeline, which runs about two miles from the San Antonio Pump Station to the James Turner Dam, (2) the San Antonio Creek Discharge facilities at the base of the James Turner Dam at the San Antonio Reservoir, (3) the San Antonio Pump Station, and (4) the Alameda East Portal. The existing facilities and the proposed construction and/or facility upgrade activities at these locations are described below.

(1) ***San Antonio Backup Pipeline (SABPL).*** The existing San Antonio Pipeline is a 60-inch pre-stressed concrete cylinder pipe that runs 11,300 feet from the San Antonio Pump Station (SAPS) adjacent to Calaveras Road to the base of James Turner Dam at the San Antonio Reservoir. The route of this pipeline is west along the access road from the dam to Calaveras Road. It cuts the corner at the intersection of the access road and Calaveras Road, and then proceeds south along the west side of Calaveras Road until tying into the SAPS. The existing pipeline is a two-way conduit. It may be used to transfer up to 160 million gallons per day (MGD) of stored water from San Antonio Reservoir to the Sunol Valley Water Treatment Plant or it can be used to move 160 MGD of Hetch Hetchy water into San Antonio Reservoir under controlled release scenarios. The 160 MGD flow rate is controlled by the pumping capacity of SAPS. The existing San Antonio Pipeline is also used as an emergency discharge pipeline capable of diverting up to 230 MGD of Hetch Hetchy water out of the system and into San Antonio Creek when water quality parameters are exceeded. The 230 MGD flow rate is controlled by the size of SAPL and requires no pump assist. Failure of the San Antonio Pipeline, without the availability of the proposed SABPL, would limit water transmission and management options, and the reliability of these options in this area of the water system. The San Antonio Pipeline has failed before due to wire corrosion and breakage in the Pre-stressed Concrete Cylinder Pipe (PCCP).

The proposed SABPL would be a 66-inch pipe (material to be determined) installed alongside the existing San Antonio Pipeline. It would be designed to transfer up to 315 MGD of Hetch Hetchy water from Alameda Siphon No. 3 to the base of James Turner Dam at San Antonio Reservoir. This design capacity is based on anticipated future emergency discharge requirements. This water would be de-chlorinated and pH adjusted at the SAPS before entering the pipeline. Additional chemical storage and distribution facilities would be located adjacent to the existing SAPS (see description # 3, below). The 315 MGD discharge would occur through a new cone valve structure and then into San Antonio Creek. The creek banks in the immediate vicinity of the new and existing cone valves would be reinforced with riprap to protect against bank erosion (see description #2, below).

As the backup water pipeline to the existing San Antonio Pipeline, the SABPL would be configured with three air gap connections between the new and the existing pipeline. These air gaps would allow the existing San Antonio Pipeline to be taken off-line for repairs and still allow water to be transferred as needed to and from the SAPS and the San Antonio Reservoir.

(2) San Antonio Creek Discharge Facility: The existing San Antonio Creek discharge facility is located at the end of the existing San Antonio Pipeline at the base of the James Turner Dam at the San Antonio Reservoir. It is the junction point for San Antonio Reservoir and Hetch Hetchy discharges.

This facility is used as necessary to allow for an emergency draw down of the San Antonio Reservoir by discharging the reservoir water into San Antonio Creek. It is also the San Antonio Pipeline discharge point for quality impaired water diverted from the water delivery system. Water is discharged into San Antonio Creek through a flow control cone valve.

The existing discharge facility includes a 48-inch cone valve housed in a 20-foot long, 14-foot wide trapezoidal outlet structure. However, the existing structure is not adequate to prevent downstream erosion of the San Antonio Creek channel. The water jet discharging from the existing cone valve has damaged the banks of the creek immediately outside the structure and undermined a retaining wall along the south side of the creek.

The proposed action would include construction of a second discharge structure at the end of the SABPL and just west of the existing facility. The new discharge facility would include a 54-inch cone valve housed in a concrete outlet structure similar to the existing facility, and the creek bed in the immediate vicinity of the discharge points of both the new and old discharge facilities would be armored with riprap to protect against scouring during discharge events. The new cone valve is designed to substantially reduce creek bank erosion.

(3) ***San Antonio Pump Station Chemical Facility Upgrades:*** The existing chemical facility is located on the north side of the SAPS compound. It houses the chemicals and feed system used to dechlorinate treated water before it is discharged either back to the San Antonio Reservoir or into San Antonio Creek. The equipment used for this includes two 2,000-gallon sodium bisulfite chemical storage tanks, four chemical feed pumps; and other auxiliary components. These facilities have been used successfully when the existing 48-inch cone valve at the base of Turner Dam is tested annually. The estimated flow and treatment capacity during these annual tests is about 240 MGD.

The current facility would have to be expanded by approximately 50% to provide treatment for a full diversion of the 315 MGD of Hetch Hetchy water supply. The additional facilities that would be required to meet this demand include another chemical storage tank, two new chemical feed pumps, and the piping, valves, and controls required to convey the sodium bisulfite to the injection point on the proposed SABPL. This additional equipment would be housed in a new structure to be built just north of the existing chemical facility.

(4) ***Alameda East Portal Improvements:*** The proposed project includes several security improvements at the Alameda East Portal site. All the improvements except the new fence would occur within the existing site footprint and would include the following actions:

(a) Replace the existing perimeter fence and access gates with new chain-link fence. Access gates would be relocated into the new fence line where it would cross the existing access road;

(b) Construct new steel, concrete, and soil backfill enclosures around the portal structures and a moveable concrete wall in front of the portal access manifold; and

(c) Relocate the existing overhead crane to allow it to reach both the new moveable concrete wall and the portal access manifold when access to the latter is required.

These improvements would involve grading and removal of trees and other vegetation.

The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras fault, which is part of the Hayward Fault complex (see Figure 4). All project components would be designed to accommodate seismic activity associated with this fault area.

2.2 Project Goals and Objectives

The overall objectives of the proposed project are to provide a more efficient and reliable conveyance option for emergency water diversion when Hetch Hetchy water cannot be conveyed through the Alameda West Portal and Irvington Tunnel, and to provide a redundant water transmission pipeline from San Antonio Reservoir to the Hetch Hetchy system if needed.

For the specific project components, the SABPL improvements are designed to meet the following goals and objectives:

(1) San Antonio Backup Pipeline: The SABPL would give SFPUC greater flexibility in managing a potential emergency situation along the Hetch Hetchy system when water cannot be conveyed through the Alameda West Portal and on to water customers in the San Francisco Bay area. This could occur as a result of high turbidity in the Hetch Hetchy supply caused by erosion and ashes from a fire. This kind of event is unpredictable and rare, but serious when it occurs. The existing San Antonio Pipeline has limited conveyance capacity and has a history of failure due to wire corrosion and breakage in the Pre-stressed Concrete Cylinder Pipe (PCCP).

The SABPL also would serve as a backup water supply conveyance alternative from San Antonio Reservoir to the Hetch Hetchy system in the event the existing, aging, San Antonio Pipeline is out of service due to maintenance or failure.

(2) San Antonio Creek Discharge Facility: Construction of the new discharge facility would be necessary to provide a safe and adequate method for discharging the emergency release of water from the SABPL. There are two reasons for this. First, the current discharge facility would not be able to handle the full 315 MGD flow capability of the proposed SABPL, necessitating the construction of an additional, larger capacity discharge facility. And second, due to the current alignment of the existing discharge facility and the proposed alignment of the SABPL, it is not possible to use the existing facility as a discharge point for the SABPL (the angle of the pipeline bend that would be necessary to match alignments between the SABPL and the existing discharge facility would exceed engineering parameters for the pressure and volume of flow in the pipe). Thus, a second discharge facility is proposed.

(3) San Antonio Pump Station Chemical Facility Upgrades: As noted in Section 2.1, the upgrades to the chemical facility are proposed in order to allow for dechlorination of the full 315 MGD of treated water from the Hetch Hetchy supply should it need to be diverted to San Antonio Creek due to water quality issues.

(4) Alameda East Portal Improvements: The purpose of the proposed improvements at the Alameda East Portal would be to improve the structural integrity and security of the portal facilities.

2.3 Schedule

Depending on the environmental review and permitting processes for the proposed project construction of the SABPL could begin as early as Fall 2009 and would be completed around Spring 2012.

3.0 ENVIRONMENTAL ANALYSIS

3.1 Key Environmental Issues to be Addressed in the EIR

The following paragraphs describe the key environmental issues that the EIR will address. The EIR will address both construction and operation activities, and will propose mitigation measures for impacts considered to be potentially significant.

Biological Resources – The proposed project would have potential temporary and long-term impacts on sensitive species, including California red-legged frog, California tiger salamander, Alameda whipsnake, and raptors. Construction of the proposed San Antonio Creek Discharge Facility would involve destruction of wetlands and riparian habitat at the base of the James Turner Dam. Operation of the SABPL for emergency discharges would impact riparian habitat along San Antonio Creek. Trees and other vegetation would be removed at the Alameda East Portal site, and oak woodlands and grasslands may be affected within the proposed alignment of the SABPL.

Cultural Resources – Sensitive cultural resources that could be affected by the proposed project include historical and prehistoric features. Resources, including archaeological sites and historical structures, have been documented in the proposed project area and impacts on these resources will be addressed in the EIR. Identified resources will be evaluated for their significance according to CEQA, the National Register of Historic Places and the California Register of Historic Resources. A cultural resources impact could occur during excavation if unidentified cultural resources are disturbed or if the value of a historic building is adversely affected. Impacts on paleontological resources could occur during excavation if unanticipated resources are uncovered and damaged.

Hydrology and Water Quality – Construction of the proposed backup pipeline could result in discharges of contaminants to receiving waters (either surface or groundwater). Dewatering of the pipeline trench may be required during construction, and the water would need to be discharged in accordance with regulatory standards. Erosion could occur during construction as a result of grading and other activities. Once the project is operational, managing an emergency along the regional water system may require that water be discharged from the proposed pipeline into San Antonio Creek. This could result in habitat destruction along the creek due to higher flows and degradation of the creek's water quality.

Geology, Soils, and Seismology – The proposed SABPL would cross active and potentially active faults that have potential to rupture the pipeline. Other potential geologic hazards to which the proposed project could be exposed include settlement, liquefaction, and landslides. Geologic hazards that the proposed project could potentially cause, including landslides, will also be evaluated in the EIR.

Traffic and Transportation - Construction of the facilities would generate additional vehicle traffic above baseline levels. Traffic would be generated by construction vehicles traveling to and from the work site and trucks transporting supplies and equipment. Pipeline installation could temporarily disrupt traffic at the road crossings. Upgrades to existing access roads off the SFPUC's right-of-way could potentially cause minor localized traffic disruption.

Other Environmental Issues

Other topics that will be addressed in detail in the EIR include potential impacts related to:

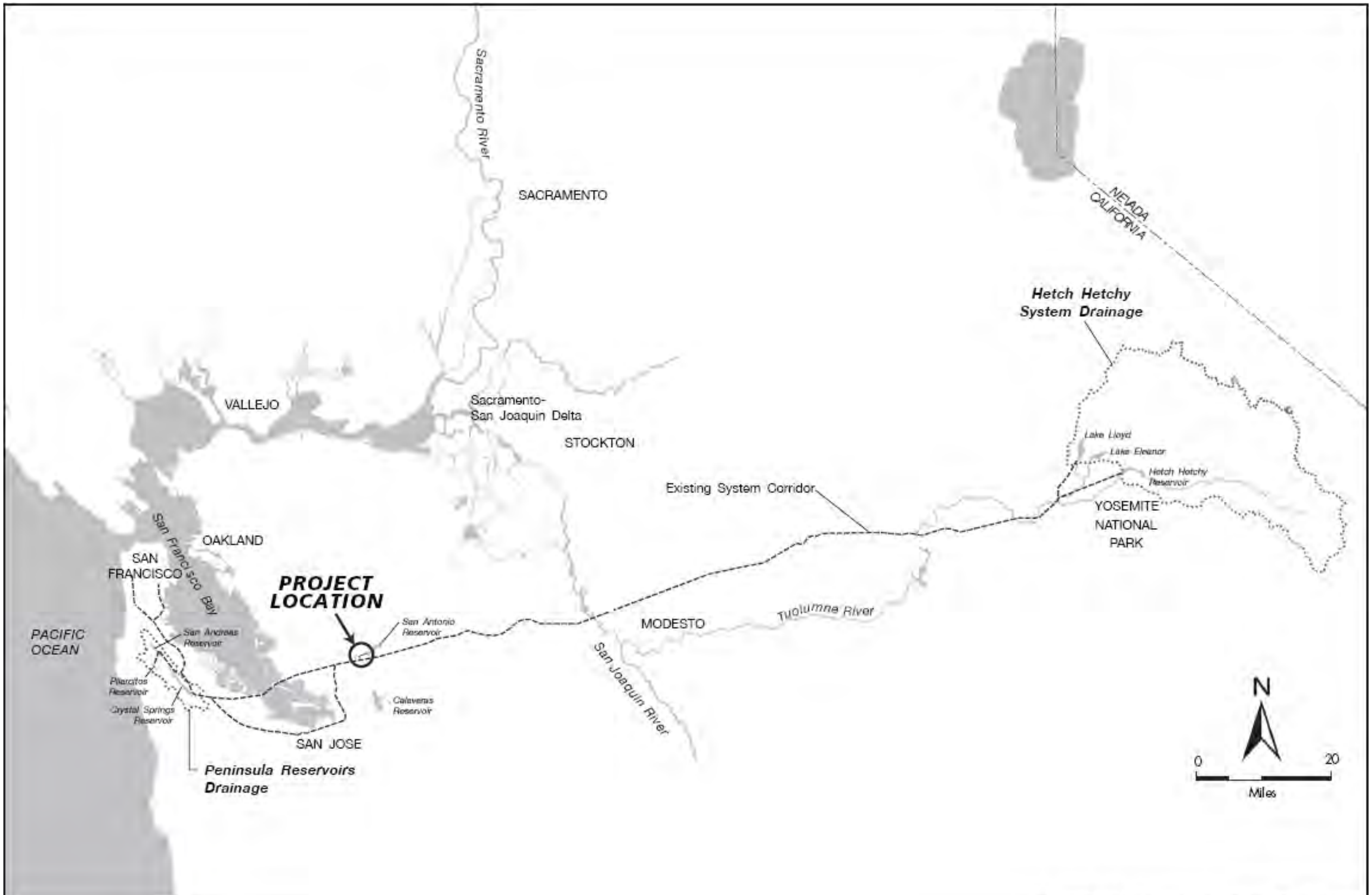
- **Mineral Resources**
- **Air Quality**
- **Land Use**
- **Agricultural Resources**
- **Recreation**
- **Noise**
- **Utilities and Public Service Systems**
- **Hazards/Hazardous Materials**
- **Growth-inducing Impacts**
- **Cumulative Impacts**

3.2 Project Alternatives

As required by CEQA, the EIR will describe and evaluate a reasonable range of alternatives to the proposed SABPL project. The alternatives would feasibly attain most of the proposed SABPL project's basic objectives while avoiding or substantially lessening any significant effects of the project. CEQA also requires evaluation of the 'No Project' alternative. The No Project Alternative will compare the potential impacts of the proposed project with the impacts that would be expected to occur if the SABPL project is not implemented.

Attachments:

Figure 1: SFPUC Regional Water System
Figure 2: SFPUC SABPL Project Area
Figure 3: SABPL Project Site
Figure 4: Proposed San Antonio Creek Discharge Facility



002475.SP11.01.d (2007 Corp Archives – CD02) 10/01/2007

Figure 1

SFPUC Regional Water System

San Antonio Backup Pipeline Project

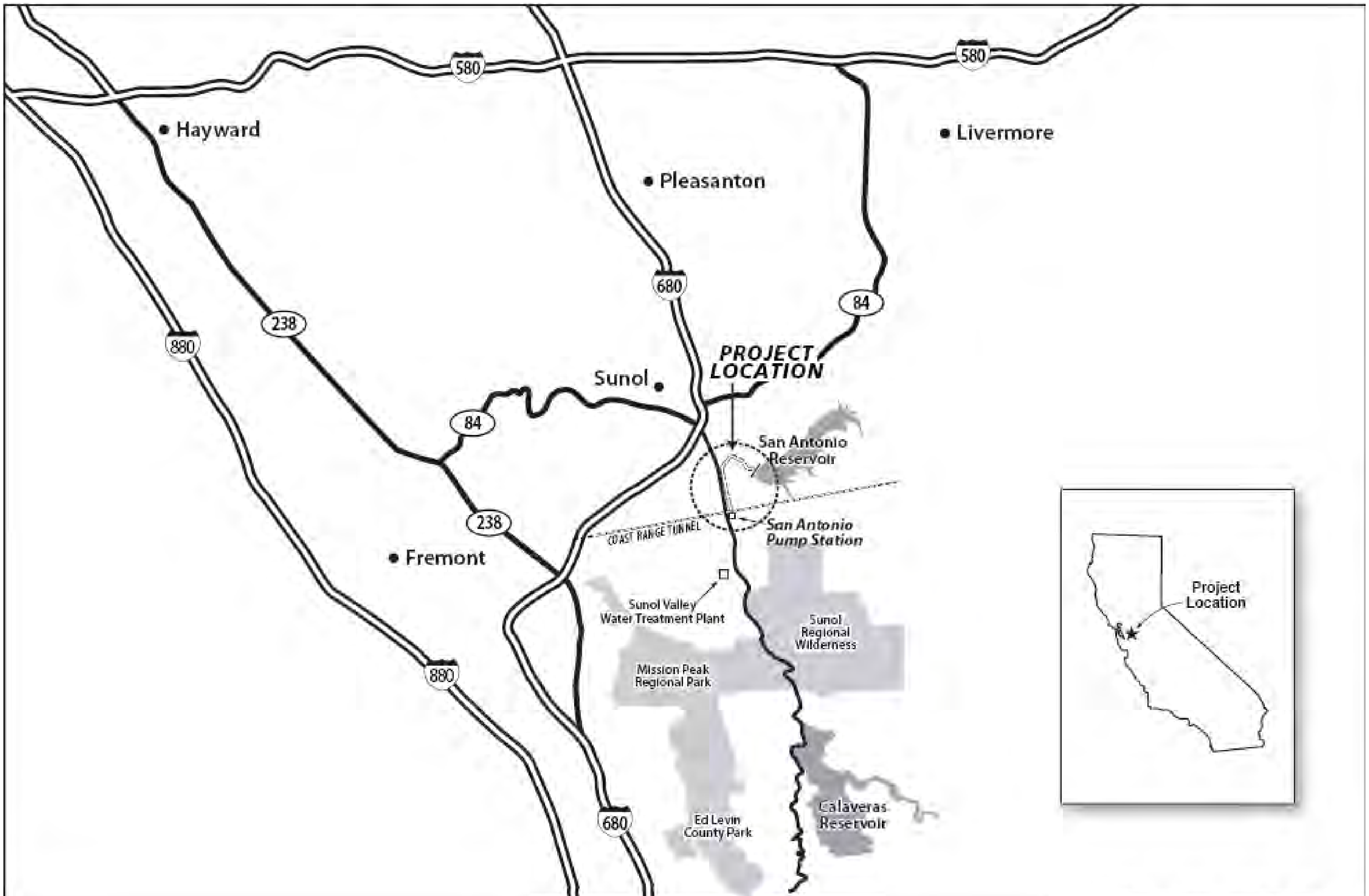


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Figure 2

SFPUC SABPL Project Area

San Antonio Backup Pipeline Project

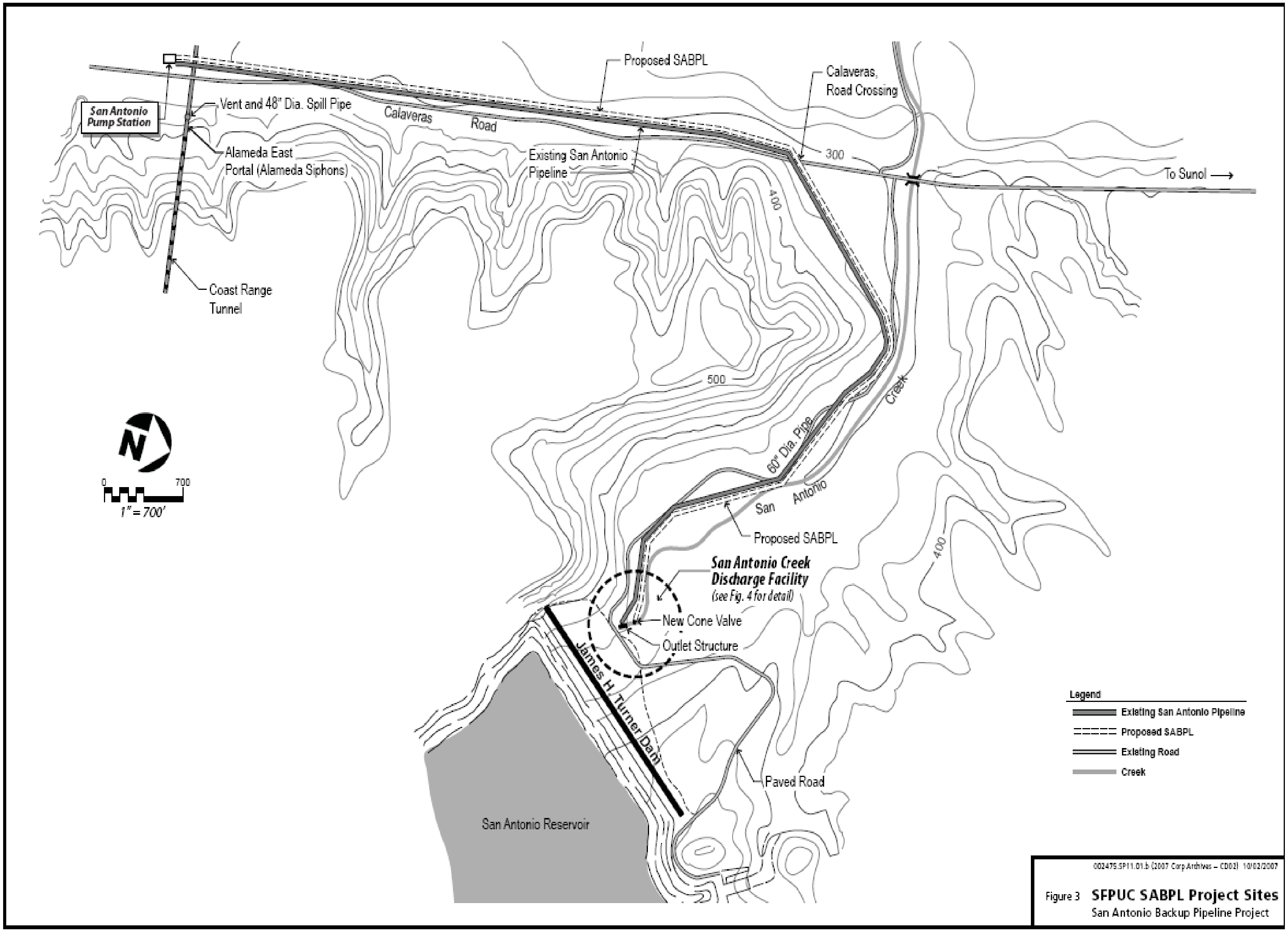
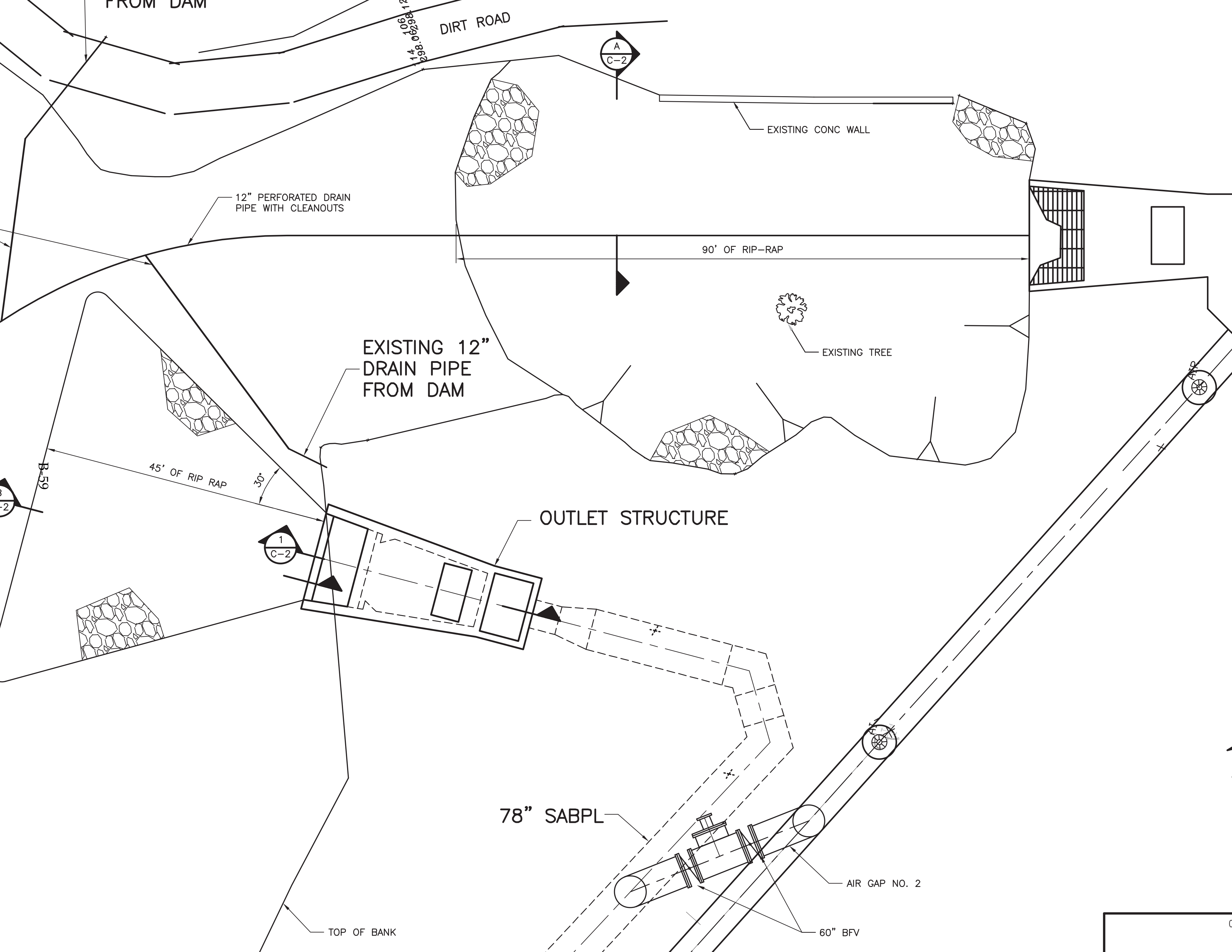


Figure 3 **SFPUC SABPL Project Sites**
San Antonio Backup Pipeline Project


FROM DAM
DIRT ROAD
A
C-2
EXISTING CONC WALL
12" PERFORATED DRAIN
PIPE WITH CLEANOUTS
90' OF RIP-RAP
EXISTING TREE
EXISTING 12"
DRAIN PIPE
FROM DAM
B-59
45' OF RIP RAP
30°
OUTLET STRUCTURE
1
C-2
78" SABPL
AIR GAP NO. 2
60" BFV
TOP OF BANK

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APPENDIX B: NEWSPAPER LISTINGS

Includes the following proofs of publication:

- *Argus* (Fremont, CA)
- *The Examiner* (San Francisco, CA)
- *The Valley Times* (Pleasanton, CA)

Argus

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San Francisco CA 94111

PROOF OF PUBLICATION

FILE NO. SABPL NOP 100207

In the matter of

San Antonio Backup Pipeline Project

The Argus

I am a citizen of the United States; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the Legal Advertising Clerk of the printer and publisher of The Argus, a newspaper published in the English language in the County of Alameda, State of California.

I declare that the Argus is a newspaper of general circulation as defined by the laws of the State of California as determined by this court's order, dated June 12, 1961, in the action entitled In the Matter of the Ascertainment and Establishment of the Standing of The Argus as a Newspaper of General Circulation, Case Number 314854, and as amended, April 25, 1967. Said order, as amended, states "'The Argus' has been established, printed and published in the County of Alameda, State of California; [] That it is a newspaper published daily for the dissemination of local and telegraphic news and intelligence of a general character and has a bona fide subscription list of paying subscribers; and ... THEREFORE, IT IS ORDERED, ADJUDGED AND DECREED: ... That 'The Argus' is a newspaper of general circulation for the County of Alameda, California." Said order as amended, has not been revoked.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

10/6/2007

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Public Notice Advertising Clerk

Legal No. **0000815054**

SAN FRANCISCO PLANNING DEPARTMENT NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETING FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT.

Initial evaluation conducted by the San Francisco Planning Department determined that the San Francisco Public Utilities Commission's proposed San Antonio Backup Pipeline Project may have a significant effect on the environment. The San Francisco Planning Department will prepare an Environmental Impact Report (EIR) to assess the project's environmental effects. The San Francisco Planning Department issued a Notice of Preparation for the EIR on October 5, 2007.

Project Description (Case No. 2007.0039E)

The proposed project would be located between the San Antonio Pump Station and San Antonio Reservoir in the Sunol Valley in Alameda County, California. This project area lies just south of the intersection of Highways 680 and 84 along Calaveras Road. The proposed project includes four components. The primary component is the installation of a backup pipeline along the same route as the existing San Antonio Pipeline, which runs about two miles from the James Turner Dam at the San Antonio Reservoir to the San Antonio Pump Station. To accommodate increased flows through the proposed backup pipeline, the second and third project components include upgrades to the San Antonio Creek Discharge Facility at the base of the James Turner Dam and upgrades to the San Antonio Pump Station dechlorination and pH adjustment facility. The fourth component includes improvements to the security around the Alameda East Portal. The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras Fault, which is part of the Hayward Fault complex. All project components would be designed to accommodate seismic activity associated with this fault area. In February 2005, the SFPUC developed a regional Water System Improvement Program (WSIP). The basic goals of the WSIP are to increase the reliability of the regional water system with respect to water quality, seismic response, water delivery, and water supply to meet water delivery needs in the service area through the year 2030. To accomplish these goals, the SFPUC proposes 22 facility improvement projects throughout the regional water system under the WSIP. The SABPL Project is one of the proposed WSIP facility improvement projects.

Public Scoping Meeting and Public Comments

The purpose of the EIR is to provide information about potentially significant adverse effects of the project. The public is invited to attend an upcoming scoping meeting to help identify the range of issues and the type of information that should be considered by the San Francisco Planning Department in the EIR. The public scoping meeting is scheduled as follows:

Sunol: Thursday, October 25, 2007
6:30 p.m. - 8:30 p.m.
Sunol Glen School
11601 Main Street
Sunol, CA 94586

How to Comment During Scoping

The public will have the opportunity to comment on the scope and focus of the EIR at the scoping meeting. The San Francisco Planning Department will also accept written public comments on the scope and focus of the EIR through the close of business on September 5, 2007. Written comments should be sent to the San Francisco Planning Department, Attn: Bill Wycko, Acting Environmental Review Officer, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479, by fax to (415) 558-6409, or by email to **chris.kern@sfgov.org**.

The Argus, #815054
October 6, 2007

PROOF OF PUBLICATION

(2015.5 C.C.P.)

THE EXAMINER

1224 Fairfax Avenue, San Francisco, CA 94124
Phone 415-359-2723; Fax 415-359-2659

STATE OF CALIFORNIA
County of San Francisco

SAN FRANCISCO PLANNING DEPARTMENT
San Antonio Backup Pipeline Project

Walter Weinthal

deposes and says that all times herein mentioned he was and is a citizen of the United States, and a resident of the County aforesaid, over the age of eighteen years, and not a party to or interested in the above-entitled matter; and is and was during and at all said times, the Principal Clerk of the Printer and Publisher of THE EXAMINER, a newspaper of general circulation, printed and published in the County of San Francisco, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Francisco, State of California, under the date of October 18, 1951, Case Number 410667; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

October 6

all in the year(s) 2007

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at San Francisco, San Francisco County, California,

10/6/2007

Signature: Walter Weinthal

GOVERNMENT

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THE VALLEY TIMES

(Incorporating The Pleasanton Times)

P.O. Box 607 – Pleasanton, Calif. 94566

***

AFFIDAVIT OF PUBLICATION

The undersigned declares and says:

That he is and was during all the times herein mentioned a citizen of the United States, over the age of 21 years, and neither party to nor in any way interested in the matter of action herein set forth, and is and was competent to be a witness in said matter of action.

That he is now and was at all times mentioned the Publisher/Legal Clerk/Legal Coordinator of THE VALLEY TIMES, incorporating the Pleasanton Times and is now, and was all the times therein mentioned a newspaper of general circulation printed and published in the City of Pleasanton, Township of Pleasanton, County of Alameda, State of California, and as such has now at at all times had charge of all legal notices and advertisements in said newspaper; and that said THE VALLEY TIMES, incorporating The Pleasanton Times is now and was at all times herein mentioned a newspaper of general circulation as that term is defined by Section 6040.5 of the Government code, and as provided by said Section is published for dissemination of local and telegraphic news and intelligence of general character, having a bonafide subscription list of paying subscribers, and is not devoted to the interests or published for the entertainment or instruction of a particular class, profession, trade, calling, race or denomination, or for any number of such classes, professions, trades, callings races, or denominations; that all of said times said newspaper has been established, printed, and published at regular intervals in said township, county, and state, for more than a year preceding the date of the first publication of the notice mentioned; the said notice was set in type not smaller than nonpariel, and was preceded with words in blackface type not smaller than nonpariel, describing or expressing in general terms the purport and character of the notice intended to be given.

That the Public Notice a copy of which is attached hereto, was published in said newspaper, The Valley Times (incorporating The Pleasanton Times) on the

October 6,

all in the year of 2007

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

....

Signature

Executed at Walnut Creek, California.
Date: October 9, 2007

San Antonio Backup Pipeline Project
Legal Ad
To Run on Saturday 6, 2007

SAN FRANCISCO PLANNING DEPARTMENT NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETING FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT.

Initial evaluation conducted by the San Francisco Planning Department determined that the San Francisco Public Utilities Commission's proposed San Antonio Backup Pipeline Project may have a significant effect on the environment. The San Francisco Planning Department will prepare an Environmental Impact Report (EIR) to assess the project's environmental effects. The San Francisco Planning Department issued a Notice of Preparation for the EIR on October 5, 2007.

Project Description (Case No. 2007.0039E)
The proposed project would be located between the San Antonio Pump Station and San Antonio Reservoir in the Sunol Valley in Alameda County, California. This project area lies just south of the intersection of Highways 680 and 84 along Calaveras Road. The proposed project includes four components. The primary component is the installation of a backup pipeline along the same route as the existing San Antonio Pipeline, which runs about two miles from the James Turner Dam at the San Antonio Reservoir to the San Antonio Pump Station. To accommodate increased flows through the proposed backup pipeline, the second and third project components include upgrades to the San Antonio Creek Discharge Facility at the base of the James Turner Dam and upgrades to the San Antonio Pump Station dechlorination and pH adjustment facility. The fourth component includes improvements to the security around the Alameda East Portal. The existing San Antonio Pipeline and the related existing and proposed facilities run along the active Calaveras Fault, which is part of the Hayward Fault complex. All project components would be designed to accommodate seismic activity associated with this fault area. In February 2005, the SFPUC developed a regional Water System Improvement Program (WSIP). The basic goals of the WSIP are to increase the reliability of the regional water system with respect to water quality, seismic response, water delivery, and water supply to meet water delivery needs in the service area through the year 2030. To accomplish these goals, the SFPUC proposes 22 facility improvement projects throughout the regional water system under the WSIP. The SABPL Project is one of the proposed WSIP facility improvement projects.

Public Scoping Meeting and Public Comments
The purpose of the EIR is to provide information about potentially significant adverse effects of the project. The public is invited to attend an upcoming scoping meeting to help identify the range of issues and the type of information that should be considered by the San Francisco Planning Department in the EIR. The public scoping meeting is scheduled as follows:

Sunol: Thursday, October 25, 2007
6:30 p.m. - 8:30 p.m.
Sunol Glen School
11601 Main Street
Sunol, CA 94586

How to Comment During Scoping
The public will have the opportunity to comment on the scope and focus of the EIR at the scoping meeting. The San Francisco Planning Department will also accept written public comments on the scope and focus of the EIR through the close of business on September 5, 2007. Written comments should be sent to the San Francisco Planning Department, Attn: Bill Wycko, Acting Environmental Review Officer, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479, by fax to (415) 558-6409, or by email to chris.kern@sfgov.org.
Legal PT/VT#2543923
Publish October 6, 2007

APPENDIX C: SCOPING MEETING MATERIALS

Includes the following items:

- Meeting Agenda
- Scoping Meeting Sign-in Sheet (copy of actual sign-in sheet)
- SABPL Project Fact Sheet
- Scoping Meeting Presentation
- Speaker Registration Cards (blank)
- Comments Form (blank)

SAN FRANCISCO PLANNING DEPARTMENT

Public Scoping Meeting

San Antonio Backup Pipeline Project

Sunol, CA – October 25, 2007

AGENDA

Starting promptly at 6:30 PM

Introductions – Michele Liapes, San Francisco Public Utilities Commission

Presentation:

- Environmental Review Process Overview – Chris Kern, San Francisco Planning Department
- Project Overview – Vivian Chow, San Francisco Public Utilities Commission

Public Comment

Closing Remarks

Glossary		SFPUC: San Francisco Public Utilities Commission
		MEA: Major Environmental Analysis Division, San Francisco Planning Department
		CEQA: California Environmental Quality Act
		WSIP: Water System Improvement Program
		EIR: Environmental Impact Report
		SABPL: San Antonio Backup Pipeline
		SVWTPIP: Sunol Valley Water Treatment Plant Improvement Project
Documents Currently Available		All documents available at www.sfwater.org or by calling (415) 554-3237
		- Project Notice of Preparation
		- SVWTP Improvement Project Fact Sheet
		- SFPUC Water System Improvement Program Description
		- SFPUC Wholesale Customer Water Demand Projections, November 2004
		- SFPUC Wholesale Customer Conservation Potential, December 2004
		- SFPUC 2030 Purchase Estimates, December 2004
		- San Francisco Retail Water Demands and Conservation Potential, November 2004
		- SFPUC Water Supply Master Plan, April 2000
For More Information		SFPUC Web Site: www.sfwater.org
		For Project: Michele Liapes at SFPUC, (415) 554-3211 or mliapes@sfwater.org
		For EIR: Chris Kern at SF Planning, (415) 575-9037 or chris.kern@sfgov.org

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SAN FRANCISCO PLANNING DEPARTMENT

Public Scoping Meeting

San Antonio Backup Pipeline Project

Sunol, CA – October 25, 2007

SIGN-IN SHEET

(PLEASE PRINT)

NAME	AFFILIATION	ADDRESS	PHONE	EMAIL
STAN GARCIA	S-G RANCHES	PO BOX 43	925 5960252	

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San Francisco Public Utilities Commission

water system improvements

1155 Market Street, Eleventh Floor :: San Francisco CA 94103 :: Ph: 415.554.3289 Fax 415.554.3282 :: www.sfwater.org

San Antonio Backup Pipeline Project

The San Francisco Public Utilities Commission (SFPUC) proposes the construction of a new San Antonio Backup Pipeline inside the SFPUC-owned Alameda Watershed in the Sunol Valley, between the San Antonio Pump Station off Calaveras Road and the San Antonio Reservoir, which stores local runoff as well as Hetch Hetchy water. The new 66-inch-diameter pipeline would extend approximately 2 miles, parallel to the existing 60-inch-diameter San Antonio Pipeline between the two sites.

The existing San Antonio Pipeline is able to perform three functions: 1) convey surplus Hetch Hetchy water from the Alameda Siphons to San Antonio Reservoir under controlled release conditions; 2) convey water stored in San Antonio Reservoir to San Antonio Pump Station where it is then pushed through Sunol Valley Water Treatment Plant and into the Hetchy system; and 3) convey the full Hetch Hetchy flow into San Antonio Creek when emergency conditions, such as sudden water quality problems, occur. The existing prestressed concrete cylinder San Antonio Pipeline, built in 1967, is susceptible to failures whenever the prestressing wires corrode and break.

The proposed project would transfer the full Hetch Hetchy flow more reliably and efficiently. It would also serve as backup to the existing pipeline whenever it needed to be taken out of service for maintenance or repairs.

Proposed Project Elements

San Antonio Backup Pipeline. This 66-inch-diameter water pipeline would extend approximately 2 miles parallel to the existing San Antonio Pipeline between the San Antonio Pump Station and Turner Dam at San Antonio Reservoir. The backup pipeline would be equipped with three air gap systems connecting to the existing pipeline. These would allow water transfer between the pump station and the reservoir whenever the existing pipeline had to be taken out of service for repairs or maintenance.

The proposed project also calls for the following additional elements:

Discharge Facilities. An existing discharge facility, a 48-inch cone valve at the end of the current San Antonio Pipeline at the base of Turner Dam, allows for the discharge of reservoir water into San Antonio Creek. It also allows Hetch Hetchy water to be diverted to San Antonio Creek if the water supply cannot be conveyed through the Irvington Tunnel because of inadequate water quality. The proposed new discharge facility would be a 54-inch cone valve housed in a concrete outlet structure, similar to the one housing the cone valve of the existing discharge facility. Since the operation of the existing cone valve has damaged creek banks and undermined a retaining wall along the creek's south side, the scope of work also calls for repair of the retaining wall and erosion control of the creek bank.

Upgrades to the San Antonio Pump Station Chemical System. The current system, located on the north side of the San Antonio Pump Station, consists of chemical storage and feed facilities used for dechlorination and pH adjustment before the water is conveyed to the San Antonio Reservoir or to San Antonio Creek. This system would be replaced with new equipment and a new building in order to provide the necessary treatment for a full diversion of Hetch Hetchy water.

Alameda East Portal Improvements: A recent site review showed the need to improve the structural integrity of some of the structures at this site. Work would include upgrading the perimeter fence and access gates, reinforcing the portal, the portal head wall and support structures, and moving the overhead crane. All these improvements would occur within the existing footprint of the facilities on this site.

Proposed Construction Activities

San Antonio Back-Up Pipeline. Construction of the San Antonio Backup Pipeline would occur along the alignment paralleling the present pipeline between the San Antonio Pump Station and Turner Dam, which impounds the San Antonio Reservoir. The project calls for one crossing of Calaveras Road. Activity would also take place at the current San Antonio Creek discharge facilities at Turner Dam, and the San Antonio Pump Station.

Installation would be in a trench on the west side of Calaveras Road. Thirty to fifty feet on either side of the trench would be temporarily used for construction equipment, materials and temporary spoils piles.

Spoils from the trenching would amount to approximately 15,000 cubic yards, and would be removed to a long-term spoils management site within the SFPUC-owned watershed along the west side of Calaveras Road near San Antonio Creek Road.

Work would normally be limited to daylight hours, Monday through Friday, though occasional situations could arise that would require work outside those times. Minor traffic delays can be expected during construction of the segment across Calaveras Road.

San Antonio Creek Discharge Facility. The construction site for this facility would be at the base of the dam and would include fortifying the stream banks with rip rap immediately downstream of the existing facility, and 80 to 100 feet north-northwest of that facility. Construction staging would be along the existing road and parking area just west of the existing discharge facility.

San Antonio Pump Station Chemical System. The new system would extend just north of the existing one. All construction would occur on previously disturbed areas.

Environmental Review

The San Francisco Planning Department's Major Environmental Analysis (MEA) Division is conducting the environmental review of the project in accordance with the California Environmental Quality Act (CEQA). CEQA requires that the SFPUC and the public be informed about the significant environmental effects of a project and ways to avoid or reduce these effects before a project is approved. MEA has decided that an Environmental Impact Report (EIR) is the appropriate level of environmental review for the San Antonio Backup Pipeline Project.

Anticipated Project Schedule

Environmental Review process began: July 2007
Anticipated construction period: March 2010 through June 2012

The SFPUC Water System Improvement Program

The San Antonio Backup Pipeline Project is part of the SFPUC's comprehensive $4.3 billion SFPUC Water System Improvement Program (WSIP) to repair, replace, and seismically upgrade the Hetch Hetchy system's aging pipelines, tunnels, reservoirs and dams.

Other proposed projects in the Sunol Valley region include the New Irvington Tunnel, Alameda Siphon 4, the Calaveras Dam Replacement, the San Antonio Pump Station Upgrade, the Sunol Valley Water Treatment Plant Improvement Project, and the installation of two portable generators for standby power. Also a selection of pipe sections and fittings are now stored at Sunol Yard as part of the regional Pipeline Repair and Readiness Improvement Project. For further information on these and other WSIP projects, please see sfwater.org/Water/System Improvements.

Questions? Comments?

For questions on the environmental review process, contact Chris Kern, San Francisco Department of Planning, Major Environmental Analysis Division, 415-575-9037, chris.kern@sfgov.org

For questions about the San Antonio Backup Pipeline Project, contact Michele Liapes, SFPUC Communications, 415-554-3211, mliapes@sfwater.org.

San Francisco Planning Department
Major Environmental Analysis Division

SCOPING MEETING

SAN ANTONIO BACKUP PIPELINE PROJECT
Environmental Impact Report

October 25, 2007

Tonight's San Antonio Backup Pipeline Project Scoping Meeting

Please:

- Sign in at the table near the entrance.
- Pick up copies of meeting materials.
- Fill out a speaker card if you would like to provide a comment tonight.
- Pick up comment cards to make written comments.
  - ***Drop off at the end of the meeting***
  - ***Mail or fax later***
- Hold all comments until the end of the presentation.

Project Team Introductions

San Francisco Planning Department

Chris Kern, EIR Coordinator

San Francisco Public Utilities Commission (SFPUC)

Vivian Chow, Project Manager
Kent Nelson, Environmental Project Manager
Michele Liapes, Communications

Meeting Agenda

- Presentation

  Overview of Environmental Review Process
  Overview of San Antonio Backup Pipeline Project

- Public Comments
- Closing Remarks

California Environmental Quality Act

Projects require environmental review under the California Environmental Quality Act (CEQA) before they can be considered for approval

For SFPUC projects, CEQA is implemented by the San Francisco Planning Department, the CEQA Lead Agency.

CEQA Objectives

- Present environmental impacts of proposed projects
- Identify ways to avoid or reduce environmental impacts
- Inform the agency decision-making process
- Encourage public participation
- Enhance interagency coordination

CEQA: Program and Project EIRs

- A Program EIR has been developed for the SFPUC WSIP.
- The proposed SABPL is one of the 22 Projects analyzed as part of the WSIP Program EIR.
- This effort is a more detailed, project-specific CEQA review compared to that presented in the WSIP Program EIR.

What will the EIR do?

- Provide a detailed description of the project and the existing environment
- Identify potential environmental effects
- Identify ways to avoid or reduce significant environmental effects through mitigation or alternatives to the proposed project

Environmental Review Schedule

- Scoping Period Ends – November 5, 2007
- Public Review of Draft EIR – Fall 2008
- Release of Final EIR – Spring 2009
- Certification of Final EIR – Spring 2009

PROPOSED SAN ANTONIO BACKUP PIPELINE PROJECT (SABPL)

SABPL: Project Goals and Objectives

The purpose of the San Antonio Backup Pipeline project is twofold:

- To discharge the full HH flow into San Antonio Creek during an emergency outage scenario
- To replace the existing San Antonio Pipeline if the existing pipeline is out of service due to planned or emergency event
- To improve the structural integrity and security of the Alameda East Portal.

SABPL: Project Location

SABPL: Project Timeline

Public Comment

- Hear your comments on the proposed scope of environmental review of the San Antonio Backup Pipeline Project
- Help identify the following to be analyzed in depth:

  Range of alternatives
  Environmental effects
  Methods of assessment
  Mitigation measures

Comment Session Ground Rules

Please:

- Submit speaker cards to speak
- Wait until your name is called
- State your name & speak clearly
- Limit comments to 3 minutes
- Use comment forms for more extensive input

Where to Send Comments

- Scoping comments accepted through:
  November 5, 2007
- Send by email to: chris.kern@sfgov.org
- Send by fax to: (415) 558-6409
- Send by U.S. mail to:
  San Francisco Planning Department
  Attn: Environmental Review Officer
  1650 Mission Street, Suite 400
  San Francisco, Ca 94103-2479
- CEQA Information is available online at:
  www.sfgov.org/planning/mea
- For Project information, contact:
  Michele Liapes (415) 554-3211, mliapes@sfwater.org

SABPL: Project Location

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SAN FRANCISCO PLANNING DEPARTMENT

Public Scoping Meeting

San Antonio Backup Pipeline Project

Sunol, CA – October 25, 2007

SPEAKER CARD

CONTACT INFORMATION

Name:

Affiliation:

Street Address:

City, State, Zip:

Phone:

Email:

SAN FRANCISCO PLANNING DEPARTMENT

Public Scoping Meeting

San Antonio Backup Pipeline Project

Sunol, CA – October 25, 2007

SPEAKER CARD

CONTACT INFORMATION

Name:

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City, State, Zip:

Phone:

Email:

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SAN FRANCISCO PLANNING DEPARTMENT

Public Scoping Meeting

San Antonio Backup Pipeline Project

Sunol, CA – October 25, 2007

COMMENTS

Thank you for participating in tonight's Public Scoping Meeting on the SFPUC's San Antonio Backup Pipeline Project.

Your comments on the scope and focus of the environmental review are encouraged.

Name (please print): ____________________

Affiliation (if applicable): ____________________

Phone: ____________________ Email: ____________________

Address: ____________________

City, State, Zip: ____________________

COMMENTS

Mail comments to: Chris Kern, San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103-2479
Fax: (415) 558-6409 Email: chris.kern@sfgov.org
For more information on the SFPUC's San Antonio Backup Pipeline Project, Contact:
Michele Liapes, SFPUC Communications Division
Phone: (415) 554-3211 Email: mliapes@sfwater.org

COMMENTS *(Continued)*

APPENDIX D: SCOPING MEETING TRANSCRIPT

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PUBLIC SCOPING MEETING

CITY AND COUNTY OF SAN FRANCISCO

SAN FRANCISCO PLANNING DEPARTMENT

In the Matter of:)
)
San Antonio Backup Pipeline)
Project)
)
________________________________)

SUNOL GLEN SCHOOL

11601 MAIN STREET

SUNOL, CALIFORNIA

THURSDAY, OCTOBER 25, 2007

6:30 P.M.

Reporter by:
Richard Friant

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

APPEARANCES

Chris Kern, San Francisco Planning Department

Vivian Chow, San Francisco Public Utilities Commission

Michele Liapes, San Francisco Public Utilities Commission

Steve Shaw, San Francisco Public Utilities Commission

Cheryl Karpowicz, Ecology & Environment, Inc.

Erec DeVest, Ecology & Environment, Inc.

I N D E X

PROCEEDINGS

MR. KERN: Let's get started. I hope you appreciate all the effort that we've made for you, Mr. Garcia. I know that you're veteran of these meetings so we're probably -- I'm going to alter our presentation a little bit and focus more on, I think, making sure that you have information about the project at this point and that we hear from you what your comments are on the scoping of this EIR, because I know that you understand the process pretty well, but with that said, I'm going to run through our slide presentation.

So as you know, tonight we're here to talk about the scoping for the environmental review for the San Antonio Backup Pipeline Project, which is part of the San Francisco PUC's Water System Improvement Program.

Next slide, please.

You've already signed in, and if you would like to speak, we won't make you fill out a speaker card. And if you have other comments that you want to offer or more detailed comments after tonight, you can do that in writing by mail, by fax, by email. We've got comment cards here that you can use.

My name is Chris Kern, and I am with the Planning Department, and I'm coordinating the environmental review for this project and a few other of the projects here in the Sunol Valley.

And Vivian Chow is the project manager for this project with the San Francisco PUC. And I think you've met Michele Liapes before, who is with PUC Communications. Steve Shaw I've just met tonight. I think you two know each other. And so that's the group -- oh, Kent Nelson is the PUC environmental project manager, but he's not here with us tonight, he's on vacation, but he's another contact on this project.

MR. GARCIA: I met him at the last meeting, I think.

MR. KERN: Right, yes. Okay. So tonight, like all these scoping meetings, we're going to do a brief review, even briefer maybe than normal, of the environmental review process, then Vivian's going to present some information about the project. And then we'd like to hear any comments that you might have on the scope and content of the environmental review for this project.

Next, please.

So projects in California are required to -- under the California Environmental Quality Act, or CEQA, to go through an environmental review process, which the purpose of which is really to provide information to the public and to decision-makers, permitting agencies, on the environmental effects of the project. And the lead agency responsible for implementing these requirements for the San Francisco PUC's project is my department, the San Francisco Planning Department.

Next, please.

So as I said, the purpose and objectives of CEQA are to disclose the potential environmental effects of a project on the environment, to identify project alternatives and mitigation measures that could lessen or avoid significant environmental effects, to provide that information to the public and decision-makers to aid the decision-making process and permitting processes and to encourage public participation in those processes and improve and enhance agency coordination.

As I believe you're aware, there is a program, Environmental Impact Report, that has been out for review since June of this year on the overall Water System Improvement Program, and this Environmental Impact Report that we're preparing for the San Antonio Backup Pipeline Project is going to be a project-specific EIR. So it will go into greater detail about this particular project.

MR. GARCIA: That's the one I didn't make, I missed that.

MR. KERN: The big one.

MR. GARCIA: Yeah.

MR. KERN: Well, there's going to be 22 more, so you'll have your chance.

Next, please.

So as I said, this is going to a project EIR, so it's going to provide more specific information, more detailed information about this specific project and more information about the potential environmental effects of this specific project than the programatic document was able to do.

Next, please.

And this is our schedule for the environmental review at this point. We are in the third week now of our public scoping period. We mailed out a Notice of Preparation at the beginning of October. There will be a public review of the Draft EIR -- well, the Draft EIR we anticipate releasing next fall, and then that will be out for public review. Then you'll have another opportunity to provide comments on the Draft Environmental Impact Report. We will then prepare a formal and written response to those comments, and all of that will then go to the San Francisco Planning Commission and it will be up to them to decide whether or not to certify the EIR as, you know, sufficient to meet the requirements of the CEQA.

So now I'd like to hand the presentation over to Vivian, and she can tell us more about the project.

MS. CHOW: Okay. I'm Vivian Chow, San Francisco

PUC project manager for this project. Tonight I'm happy to be here to briefing the project objective and goals and the components of the project.

The project mainly is can fully discharge the Hetcy flow if the water quality does not meet the standard. And another purpose is to replace the existing 60-inch San Antonio pipe. If the pipe has the emergency take out for the surfaces or is emergency, cannot be used, so you can move the water back and forth --

MR. GARCIA: They've had a couple of leaks in the last few years.

MS. CHOW: That's right.

And also we have another goal, is at the Alameda East Portal area we are going to be improving the structural integrity there and doing the security fence around the area. So in this slide we're showing the four major components of the project. The upper portion is the pipe, the new San Antonio Backup Pipeline is along with the existing, so the red one is the new pipe, the yellow is existing. The existing is 60 inches, and the new pipe is 66 inches. The pipe is running about two miles, the same alignment. And the lower left-hand side, the box is showing the San Antonio Pump Station area. That is the area we tie the new pipe to the existing pipe and the discharge from the siphon free; that's the location we tie the project. And also in that location we will build a new chemical treat system because we cannot just directly discharge the water, we need to treat the water, chemical treat the water for dechlorination and also pH adjustment.

MR. GARCIA: That's at the trailer and that little building is near my driveway?

MS. CHOW: No, just the little one just for this discharge, not the chlorination new building, it's the new facility.

MR. GARCIA: No, no, the little -- when you go in my driveway, there's a little building and a trailer alongside of it.

MS. CHOW: No, no.

MR. GARCIA: I think that's --

MS. CHOW: No, we have existing -- just north side of the pump station.

MR. GARCIA: Yeah. That's my driveway.

MS. CHOW: That's your driveway?

MR. GARCIA: The driveway that goes down, then there's a gate there to go into that.

MR. SHAW: Next to where you see the trailer, you're right, there is a little building there, yeah, that's no longer to be. We're going to build a new --

MS. CHOW: But next to the new one.

MR. SHAW: That's existing, yes, we're going to replace that.

MR. GARCIA: And it's going to be right in the same place.

MR. SHAW: Not quite the same place. Close. Close.

MS. CHOW: It's very close, just north side of that building. The north side of that building. So we'll build a new one and then T off -- demolate (sic) the old one.

So the middle part is the Alameda East Portal, the lower middle slide is the area we need to build the new fence around the facility and do the portal possession there. That is the middle part. That slide.

MR. GARCIA: You're going to do something with a crane, that overhead crane --

MS. CHOW: Yeah.

MR. GARCIA: -- and takes the end of the pipe off.

MS. CHOW: Yes. And then the right-hand side, the little slide is the discharge point. At that place we have existing cone valve house, we're going to be building a new discharge cone valve there and restore the area and do the creek bed protection, riprap the creek bed, whatever the corroded area, we're going to be -- improve the area, discharge area.

So this is the four major component of the project.

This slide tells you the whole project timeframe. Right now, we're in the beginning of the environmental and design. The project going to be finished in about middle of 2009. From there we're going to be -- take a -- put a big package together and award a contract, the construction going to be projected to start our construction in spring of 2010. Takes about 22 months to finish the project and close up. The project will be done by June 2012.

MR. KERN: Okay. So now is it's your turn to provide us any comments that you might have at this point on the scope or content of the EIR.

MR. GARCIA: Environmentally, all you're going to have is a little bit of dust, and that's taken care of with a little water wagon. And no matter what your fine residents say, you're going to dig a ditch, put a pipe in it, probably put sand under it, put a pipe in it, you'll have native soil back on top. Within a year you're going to have the same bugs, the same grass, everything's going to be the same as it was before you started.

MR. SHAW: Pretty much got it there, Stan.

MR. GARCIA: That's just how it is. You listen to the environmentalists, no, you're going to wipe everything out.

MR. SHAW: Yeah, it will come back.

MR. GARCIA: Everything will come back. I watch the other two, the last two run across when I was a kid. Everything is back just like it was. And it's -- any pipe you put in, it's going to be like that as long as you put native soil back on top. The first year you're going to have grasses, weeds and bugs, snakes. As far as your whip snake and stuff like that, even if they're around, it's not going to bother them, they're going to get out of the way. When you're done, they'll come back.

MR. KERN: Okay.

MR. GARCIA: Plain and simple. What areyou going to do with my driveway? Going to put a bridge over the pipe when they come back and forth?

MR. SHAW: That's another project, but it is being looked at, that's being addressed. Just to let you know.

MR. GARCIA: How about the driveway while they're building the pipe?

MR. SHAW: Oh, that's another issue, yeah, and I think that's something you would be concerned about when they cross a road --

MR. GARCIA: When they cross a road there might --

MR. SHAW: Is access.

MR. GARCIA: Just on the north side

MR. SHAW: That's right.

MS. CHOW: Yeah, we cross Calaveras Road

MR. SHAW: No, not Calaveras. The entrance road where he accesses his property.

MR. GARCIA: I access my property from that same one that goes into that new -- where you're going to put that new little building.

MS. CHOW: Yes.

MR. SHAW: In that area.

MR. GARCIA: Right there is where. But I'm not worried about it, because I know you're going to put some plates or something I'll be able to drive over. Got to be heavy enough to take a truck across it.

MR. SHAW: Well, not only that, but the Department needs to be able to access Alameda West and those areas as well. So it's not just you, but also the rest of us and the Hanson, or whoever it is, what's that company there?

MR. GARCIA: Gunite.

MR. SHAW: Gunite, yeah, whatever it is, I forget.

So that's going to have to be taken into consideration.

MR. GARCIA: They're supposed to have like 20 round trips, and you get about 50.

MR. SHAW: Is that right.

MR. KERN: Okay.

MR. GARCIA: Other than that, that's all well and good. I need to cross Calaveras Road.

MR. KERN: Proposing to go under it, right.

MS. CHOW: Yeah --

MR. GARCIA: You're going to bore under it?

MS. CHOW: Yeah.

MR. GARCIA: No disruption of traffic and all.

MS. CHOW: Yeah, we needed to design for that. Design for that, yeah, one crossing.

MR. GARCIA: That's easy enough right where that pipe crosses. You can go around it if you had to.

MR. KERN: And, you know, I forgot to ask you before you began your comments to state your name for the record.

MR. GARCIA: Stanley Garcia.

That's 6501 Calaveras Road

MR. KERN: Okay then. Well, then that concludes our scoping meeting.

Can we get the next slide?

MS. CHOW: That's the last one.

MR. KERN: You probably already have this, but in case not, here's our contact information, and I can give you a business card as well. You, I know, are on our mailing list already. And so you'll continue to receive notices.

MR. GARCIA: I wanted to make that one, that big environmental meeting. I got four notices.

MR. KERN: For the hearing?

MR. GARCIA: One to my mother; she's been dead for 14 years. Three to me under different names. One was a different address; one of them put my on Wells Creek Road.

Don't take them off, I may not get them, you take too many off --

MR. KERN: We'd like to get it right.

MR. GARCIA: My mother got one, and she's been gone for 14, 15 years now.

MS. LIAPES: What is the first name of your mother, Mr. Garcia?

MR. GARCIA: Rosie.

MS. LIAPES: okay. I'll look into that too.

MR. GARCIA: I still get her and wife's father, mother; they're all dead, and I still get mail for them.

MR. KERN: Is it because it's the same address, is that the reason you think?

MR. GARCIA: Well, they changed all their -- her folks ended up, when they went in a rest home, put their mail coming to our house.

MR. KERN: Oh, I see.

MR. GARCIA: So I get all their mail.

MR. KERN: That's interesting.

(Thereupon, the October 25, 2007,
San Antonio Backup Pipeline Project
Scoping Meeting
was adjourned at 6:35 p.m.)

--oOo--

****

CERTIFICATE OF REPORTER

I, RICHARD FRIANT, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing public scoping meeting; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said business meeting, nor in any way interested in outcome of said matter

IN WITNESS WHEREOF, I have hereunto set my hand this 30th day of October, 2007.

Richard Friant

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

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APPENDIX E: COMMENTS RECEIVED DURING SABPL SCOPING PROCESS

The Public Scoping comments presented in this appendix are listed below. The comment received from Mr. Stanley Garcia (# PC001) may be found in the public scoping meeting transcript in Appendix D.

Comment #:	**Source:**
CO001	Jeremy Gross, Chevron Corp. (copy of email)
LA001	Arthur Valderamma, P.E., County of Alameda Public Works Agency
LA002	Nicole Sandkulla, P.E., Bay Area Water Supply & Conservation Agency
LA003	Paul Piraino, Alameda County Water District
LA004a	Chris Barton, East Bay Regional Park District
LA004b	Brad Olson, East Bay Regional Park District
LA004c	Brad Olson, East Bay Regional Park District
LA004d	Chris Barton, East Bay Regional Park District
NP001	Jeff Miller, Alameda Creek Alliance
SA001a	Keith H. Lichten, P.E., California Regional Water Quality Control Board, San Francisco Bay Region
SA001b	Philip Williams & Associates, Ltd Technical Memo (received from Xavier Fernandez at California Regional Water Quality Control Board)
SA002	Charles Armor, California Department of Fish and Game, Bay Delta Region
SA003	Timothy C. Sable, California Department of Transportation

DOCUMENT #: CO 001

Corzilius, David

From: Chris Kern [Chris.Kern@sfgov.org]
Sent: Monday, October 22, 2007 1:31 PM
To: Corzilius, David
Cc: KNelson@sfwater.org
Subject: Fw: Case No. 2006-0137E

David,
I'll forward comments in response to the NOP for the SABPL project that I receive by email to you as they come in. I'll also scan and email to you letters that I receive. So far, I have only one letter (from the RWQCB).
Chris

Chris Kern, Environmental Planner
San Francisco Planning Department
Major Environmental Analysis Division
1650 Mission Street, Suite 400
San Francisco, CA 94103
ph: (415) 575-9037 fax: (415) 558-6409
chris.kern@sfgov.org

----- Forwarded by Chris Kern/CTYPLN/SFGOV on 10/22/2007 01:22 PM -----

"Jeremy Gross" <jgross.chevronpl@gmail.com>
10/18/2007 10:02 AM

To: "Chris Kern" <chris.kern@sfgov.org>
cc:
Subject: Case No. 2006-0137E

Hello Chris,

Chevron Pipe Line Company has received your letter regarding the Sunol Valley Water Treatment Plant Improvement Project. We would like to be placed on any mailing lists you have regarding this project. We do have an active Petroleum Products pipeline in the vicinity of your project. If you could forward us any plans or drawings you may have or come in contact with of the project, it would be greatly appreciated.

Regards, Jeremy

--
Jeremy Gross
Contract ROW/ Conflict Inquiry Specialist Chevron Pipe Line Company Los Medanos 2360 Buchanan Rd.
Pittsburg, CA 94565
jgross.chevronpl@gmail.com

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DOCUMENT #:
LA 001

COUNTY OF ALAMEDA
PUBLIC WORKS AGENCY
DEVELOPMENT SERVICES DEPARTMENT
951 Turner Court, Room 100
Hayward, CA 94545-2698
(510) 670-6601
FAX (510) 670-5269

November 5, 2007

San Francisco Planning Department
Attn: Bill Wycko, Acting Environmental Review Officer
1650 Mission Street Suite 400,
San Francisco Ca 94103-2479
Fax: 415:558-609
Email: Chris Kern: chris.kern@sfgov.org

Subject : Comments on Notice of Notice of an Environmental Impact Report and Notice of Public Scoping Meeting

Project Title: ***San Antonio Backup Pipeline Projects***

The Alameda County Public Works Agency has received and reviewed your *Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting* and offer the following potential impact areas within Alameda County have to be addressed in the draft EIR:

1. Potential traffic impacts
2. Potential impacts of armoring of creek bottoms – barriers to fish passage
3. Potential impacts on flood control channel/creek and road crossings
4. Project Potential effects on biological resources at various locations i.e.; red legged frog; San Joaquin kit fox; California tiger salamander; steelhead; Alameda whipsnakes; and several species of plants; wetlands etc.
5. Potential effects of flow diversions on downstream segment of Alameda Creek
6. Potential impacts on cultural resources

It is requested that you please include the Alameda County Public Works Agency on your mail list to receive copies of your draft EIR.

Should you have any questions, you may contact Fernando Gonzales of this office at (510) 670-5267.

Very truly yours,

A. Valderrama
Arthur Valderrama, P.E.
Supervising Civil Engineer
Development Services Department

TO SERVE AND PRESERVE OUR COMMUNITY

DOCUMENT #: LA002
Diana
11-2-07
Carol

BAWSCA

Bay Area Water Supply & Conservation Agency

October 29, 2007

RECEIVED

NOV 02 2007

CITY & COUNTY OF S.F.
PLANNING DEPARTMENT
MEA

Mr. Bill Wycko
Acting Environmental Review Officer
1650 Mission Blvd., Suite 400
San Francisco, CA 94103-2479

Subject: Case No. 2007.0039E-San Antonio Backup Pipeline, Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting

Dear Mr. Wycko,

Thank you for the opportunity to provide the following comments from the Bay Area Water Supply & Conservation Agency (BAWSCA). BAWSCA represents the interests the 25 cities and water districts and two private utilities that purchase water on a wholesale basis from the San Francisco Regional Water System. These entities in turn provide water to 1.7 million people, businesses and community organizations in Alameda, Santa Clara and San Mateo counties. BAWSCA member agencies are highly dependent on the SFPUC Regional Water System to provide potable drinking water critical to the health and safety of consumers in the region. All but one of BAWSCA's member agencies purchase more than 50% of their supply from the San Francisco Regional Water System.

These comments are in response to the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) dated March 28, 2007 for the San Antonio Backup Pipeline Project which is an individual project in the SFPUC's Water System Improvement Program.

Key Comments

1. **Overall, the need for the project should be better emphasized in the EIR.** The existing San Antonio Pipeline plays a critical role in the overall water supply operations in the Sunol Valley and it is subject to a high probability of failure during a seismic or other event. Reliability of the infrastructure in this location is critical to the overall supply reliability of the Regional Water System. For example, this facility is the final point where upstream water quality deviations can be rejected from the water system in order to prevent a boil water or other public notice to the Regional Water Customers, including City of San Francisco. The EIR should better explain the possible consequences of this type of event and how the proposed project would remove the potential for those situations to occur.

2. **The project description presented in the NOP does not include a project component -- modifications at Alameda East to upsize the capacity to spill to Alameda Creek during an emergency event -- that was part of the project description and scope in prior engineering reports.** The EIR should address this

scope change, the resulting impact to the neighboring environment during an emergency condition, and the overall impact on the project's ability to meet the reliability goals set forth for the project and the WSIP.

Specific Comments

Project Description

1. The EIR should add that the new pipeline will assist in clearing and flushing the Coast Range Tunnel after a seismic event which can stir up the sediment and cause water quality problems.
2. The description of the inter-connections between the existing and new pipelines should provide further information on the current operational limitations of the pipeline and how the addition of the backup pipeline will provide necessary operational flexibility. For example the existing pipeline will only allow water to flow in one direction while much greater operational flexibility is possible with the ability to flow water in two directions with the two pipelines. Scenarios regarding this important advantage should be provided in the EIR.
3. Please describe the holding time for the de-chlorinating agent that will be stored in liquid form at the site?
4. What measures will be employed for chemical spills at the chemical storage facility?

Section 2.2

1. The NOP states that fires in the watershed are rare occurrences with significant impacts. The EIR needs to highlight that while rare, this event did occur within the past 10 years, causing Hetch Hetchy to be shut down for six weeks with significant impacts to water supply reliability.

Thank you for the opportunity to review the NOP for the EIR for the San Antonio Backup Pipeline Project. If you have any questions, please call me at (650) 349-3000.

Sincerely,

Nicole M. Sandkulla

Nicole M. Sandkulla, P. E.
Senior Water Resources Engineer

cc: A. Jensen, BAWSCA
Deirdre Appel, SFPUC-Project Management Bureau
File
Chron

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DOCUMENT #: LA003

ACWD
ALAMEDA COUNTY WATER DISTRICT

rec'd via email 11/13/07

43885 SOUTH GRIMMER BOULEVARD • P.O. BOX 5110, FREMONT, CALIFORNIA 94537-5110
(510) 668-4200 • FAX (510) 770-1793 • www.acwd.org

October 25, 2007

Mr. Bill Wycko
Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103-2414

Dear Mr. Wycko:

Subject: Case No. 2007.00039E – San Antonio Backup Pipeline

The Alameda County Water District (ACWD) appreciates this opportunity to comment on the Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting for the San Antonio Backup Pipeline Project.

ACWD supplies water to a population of over 320,000 in the cities of Fremont, Newark and Union City. ACWD was formed in 1914 by an act of the California Legislature for the purpose of protecting the water in the Niles Cone Groundwater Basin and conserving the water of the Alameda Creek Watershed. Local runoff along with imported water is percolated into the Niles Cone Groundwater Basin through recharge in Alameda Creek itself and through recharge ponds within the Quarry Lakes Regional Recreational Area and adjacent areas. The water is subsequently recovered through groundwater production wells and provided as potable supply to ACWD's customers. A key objective for ACWD is to ensure the protection of the groundwater basin that constitutes this important source of water supply.

As one of the SFPUC's larger wholesale customers outside of the City of San Francisco, ACWD has a vested interest in seeing the SFPUC successfully execute its multi-billion dollar Water Supply Improvement Program (WSIP). We share in the same desire for high quality water supply and a reliable storage and conveyance system that will serve the present and future needs of the San Francisco Bay Area at a reasonable cost.

Comments for Notice of Preparation of an EIR and Notice of Public Scoping Meeting

ACWD has reviewed the Notice of Preparation of an EIR and Notice of Public Scoping Meeting and would appreciate SFPUC's consideration of the following comments:

1. Construction Impacts: As described in the NOP, construction of the backup pipeline may significantly impact surface water and groundwater quality in the vicinity of the project area, which may also impact water downstream in Alameda Creek. Specific impacts may occur as a result of:

   a. Discharges of contaminants to receiving waters;
   b. Dewatering of the pipeline trench; and
   c. Erosion as a result of grading and other activities

   The DEIR should fully evaluate all potential downstream impacts to water quality as a result of project construction, and provide complete mitigation to ensure that there are no adverse impacts to ACWD's water supplies from the Alameda Creek Watershed. A notification plan for events that could affect downstream water quality should be included in the planned mitigation.

2. Operational Impacts: The NOP also describes potential water quality and hydrology impacts as a result of the long-term operations of the project. Specifically, the NOP indicates that downstream water quality may be degraded as a result of the discharge of high flows from the backup pipeline. The DEIR should evaluate the potential impacts on water quality, hydrology and water supplies during these releases, and provide complete mitigation for any impacts. High flows released to San Antonio Creek have the potential to affect operation of ACWD's inflatable dams downstream in Alameda Creek, so notification of release events and spills are important to consider in planning mitigation. The DEIR should also evaluate the potential for adverse impacts due to potential spills during chemical handling and storage, and provide mitigation to ensure that: 1) there would be no adverse impacts to downstream drinking water supplies in the event of an accidental spill, and 2) an appropriate notification plan is put in place.

We look forward to responses to these comments and continuing to work with the SFPUC throughout the WSIP implementation process. If you have questions, please contact Laura Hidas, Water Supply Supervisor, at (510) 668-6516.

Sincerely,

Paul Piraino
General Manager

DOCUMENT #:
LA004a

East Bay Regional Park District

2950 PERALTA OAKS COURT PO BOX 5381 OAKLAND CALIFORNIA 94605 0381 T 510 635 0135 F 510 569 4319 TDD 510 633 0460 WWW.EBPARKS.ORG

RECEIVED

OCT 3 1 2007

CITY & COUNTY OF S.F.
PLANNING DEPARTMENT

Diana 11-2-07 Carol

October 30, 2007

San Francisco Planning Department
Attn: Bill Wycko, Acting Environmental Review Officer
1650 Mission Street, Suite 400
San Francisco, CA 94103-2479

RE: EAST BAY REGIONAL PARK DISTRICT (EBRPD) COMMENTS ON SFPUC's NOTICE OF PREPARATION (NOP) FOR THE PROPOSED SAN ANTONIO BACKUP PIPELINE PROJECT (SABPL)

Dear Mr. Wycko:

Thank you for providing East Bay Regional Park District (the "District") with a copy of San Francisco Public Utility Commission's (SFPUC) Notice of Preparation for the proposed San Antonio Backup Pipeline project. We own or manage several parks that abut San Francisco Water District (SFWD) watershed lands and lease 3,812 acres of land from SFPUC as part of the Sunol and Ohlone Regional Wilderness parks. Impacts associated with the proposed project may affect our ability to carry out our mission to provide parks and trails for public recreation and enjoyment.

Any aspect of the SABPL project that would impact the recovery of anadromous fish in Alameda Creek or impair safe, convenient public access to our parks particularly concern us – the project should be designed to avoid or minimize these potential impacts. The EIR should fully evaluate how these potential impacts will be avoided or minimized. Any proposed mitigation measures should have measurable performance-based standards incorporated into their design to ensure a predictable outcome will result when implemented.

Scoping comments were previously submitted to SFPUC by the District for the following projects that are directly or indirectly related to the SABPL Project:

- October 12, 2005 – Scoping comments for SFPUC Water System Improvement Program.
- August 16, 2007 - Scoping comments for SFPUC Habitat Reserve Program

We also provided comments on the Draft Program Environmental Impact Report (DPEIR) for SFPUC's Water System Improvement Project (WSIP) on October 1, 2007. These documents are incorporated herein by reference and are attached. The District's scoping comments under the California Environmental Quality Act for SFPUC's consideration in preparing the DEIR for the project are as follows:

1. Traffic - Analysis of traffic impacts associated with the proposed pipeline installation across Calaveras Road and increased truck traffic from construction activity should take into consideration the following:

    a. Road/Lane Closures – Provide details and analysis of any proposed partial or full road closures (such as when, where and anticipated time delays and reduction in speed) and how these disruptions will be avoided or minimized to eliminate or reduce travel delays.

    b. Impaired Access to Recreation - Peak park usage to Sunol and Ohlone Regional Parks is typically highest on weekends and holidays. The DEIR should analyze traffic impacts in the context of how traffic delays and hazards could discourage park users from accessing recreational opportunities at these parks. Mitigation measures should be developed to minimize these impacts.

    c. Traffic Control Plan – Details of any proposed traffic control plan should be disclosed in the DEIR. If sufficient information is not available to complete the traffic control plan, measurable performance standards should be incorporated into any mitigation measures that reference the traffic control plan as mitigation for impacts. We encourage SFPUC to consult with us to evaluate the vehicle/visitor demand to Sunol and Ohlone Regional Wilderness and incorporate these findings into the traffic control plan for this project. The traffic control plan should recognize peak demand hours for park use and minimize its traffic volumes to not overlap with these hours. This may require that construction traffic be significantly restricted or prohibited during holidays and weekends.

    d. Public Notification/Information – Confusion among motorists about altered traffic flows and detours may result in traffic and circulation hazards. The EIR should analyze how traffic delays, road hazards and alternate routes will be communicated to the public. This may include proper signage at appropriate locations, informational pamphlets and displays for park users at informational kiosks and other outreach efforts (newspaper, radio and television press releases).

    e. Roadway Deterioration/Hazards – Increased truck traffic volumes will accelerate the wear of roads which could cause roadway hazards from potholes, fallen debris, cracks, etc. The project should be designed and/or mitigation should be incorporated that eliminates or minimizes this potential impact.

2. Biological Resources – The DEIR should provide a clear understanding of how the proposed facility may alter flows to San Antonio Creek and its receiving waters (i.e. Alameda Creek). The impacts of diminished water quality and habitat loss associated with dewatering during construction and emergency discharges from operation of the facility should be evaluated in the DEIR for how the recovery of anadromous fish in Alameda Creek could be impaired by the project. Appropriate measurable, performance-based standards should be included with any proposed mitigation for impacts to biological resources.

   The DEIR should examine how project impacts resulting in a loss of habitat supporting special-status species will be mitigated to not result in a net loss of resources if SFPUC watershed lands that are not in need of rehabilitation or enhancement are proposed to be used as habitat mitigation lands. The DEIR should explain how the use of these lands to mitigate for project impacts on biological resources will not result in a net loss of resources given that these lands were already acquired for watershed protection.

We hope that these comments help SFPUC in its design and implementation of the project and provide guidance on the scope of the DEIR and ook forward to continuing our long established cooperative working relationship with the SFPUC in managing open space and watershed lands in the East Bay. We requests a copy of the DEIR when it becomes available (one hard copy and CD are preferred). Thank you for the opportunity to provide input on the scope and content of the information to be included in the DEIR and the SFPUC's consideration of our comments. If you have any questions or comments, please contact me at (510) 544-2627.

Sincerely,

Chris Barton
Senior Planner
Environmental Review Department

cc: Tim Ramirez

Attachments:

1. EBRPD scoping comments for SFPUC Water System Improvement Program, October 12, 2005
2. EBRPD scoping comments for SFPUC Habitat Reserve Program, August 16, 2007
3. EBRPD comments on WSIP Draft PEIR, October 1, 2007

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DOCUMENT #:

LA0046

EAST BAY REGIONAL PARKS PARK DISTRICT

October 12, 2005

Mr. Paul Maltzer
San Francisco Planning Department
30 Van Ness Suite 4150
San Francisco, CA 94103

Subject: Scoping Comments for SFPUC Water System Improvement Program
Sunol/Ohlone Regional Wilderness

Dear Mr. Maltzer,

Thank you for providing the East Bay Regional Park District ("District") with a copy of the Notice of Preparation (NOP) for a Draft Environmental Impact Report (DEIR) for SFPUC's Water System Improvement Program. The following are the District's scoping comments for your consideration in preparing the DEIR.

The District has a long established cooperative working relationship with the SFPUC on joint management of open space and watershed lands in the East Bay. We are also working with SFPUC and other agencies on watershed planning studies that include restoration of fisheries in Alameda Creek and public access in Niles Canyon.

The District leases 3812 acres of land from SFPUC as part of Sunol and Ohlone Regional Wilderness parks. There leases place a number of restrictions upon these lands, including no water-contact recreation, no bicycles and limitations on dogs and livestock grazing. The proposed project may create expand use restrictions on District-leased watershed lands. We are concerned about our ability to effectively implement such restrictions given current budget constraints and other competing interests. The proposed project description also includes replacement of the Calaveras Dam, which has the potential for significant effects to Sunol Regional Wilderness and other regional parks.

Regional Parks

The District owns or manages 31,462 acres of open space within the middle and upper portions of Alameda Creek Watershed. These include the following regional parks:

• Sunol Regional Wilderness	6858 acres
• Ohlone Regional Wilderness	9736 acres
• Camp Ohlone	(included above)
• Del Valle State Recreation Area	4315 acres
• Mission Peak Regional Preserve	2998 acres
• Vargas Plateau Regional Preserve	1030 acres
• Pleasanton Ridge Regional Park	4742 acres
• Brushy Peak Regional Preserve	1783 acres

2950 Peralta Oaks Court P.O. Box 5381 Oakland, CA 94605-0381
TEL 510 635-0135 FAX 510 569-4319 TDD 510 633-0460 www.ebparks.org

The DEIR should evaluate potential effects to all of these regional parks and provide appropriate mitigation for such effects. These effects could include:

1. ***Surface water resource impacts*** from changes in water system operations, changes in primary versus secondary watershed status, changes in existing drainage patterns, increased erosion or deposition of sediments, impacts to riparian vegetation, fisheries and wildlife habitats. The DEIR must identify and fully mitigate such significant effects.

2. ***Calaveras Dam replacement*** has the potential for a number of adverse effects to Sunol Regional Wilderness, including impacts to fisheries, plants and wildlife, special-status species, water and air quality, noise, esthetics, recreation, traffic and circulation, and public safety. Potential closure of Calaveras Road, Geary Road or other unpaved access roads or trails to Sunol Regional Wilderness may adversely affect park users and police and fire services. The DEIR must identify and fully mitigate such significant effects.

3. ***Water conveyance upgrades***, such as replacement or construction of new pipelines, maintenance facilities, treatment facilities, and collection and discharge facilities may adversely affect existing and planned trails and recreation in watershed areas. This would include the Ohlone Wilderness Trail, Bay Ridge Trail, Niles Canyon Trail and other regional and locally operated trails. Such impacts could include closure or rerouting of trails, noise, dust and visual impacts, and trail safety and convenience. The DEIR must identify and fully mitigate such significant effects.

4. ***Watershed protection*** measures currently prohibit water contact recreation and bicycle usage, and restrict dogs and livestock grazing in District-leased portions of Sunol Regional Wilderness. The DEIR must fully consider the effects of new watershed protection measures on these and other District land uses. It is the District's goal to maintain existing uses within these areas and to not have expanded or new use restrictions as a result of this project. We share SFPUC's goal to protect water quality and Alameda Creek Watershed. However, it is also important that SFPUC address the multiple uses for which District parklands have been acquired and to cooperatively work with the District is maintaining these uses within the Watershed.

Please call me if you have any questions regarding our scoping letter. I can be reached at (510) 544-2622. Please include my name on any future mailings regarding this project.

Sincerely,

Brad Olson
Environmental Programs Manager

East Bay Regional Park District
2950 PERALTA OAKS COURT · PO BOX 5381 · OAKLAND CALIFORNIA 94605 0381 · WWW.EBPARKS.ORG

2

DOCUMENT #:
LA004c

August 16, 2007

Paul Maltzer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 84193-2479

Subject: Scoping Comments for Habitat Reserve Program - Case #2006.1505E
Sunol Regional Wilderness

Dear Mr. Maltzer,

Thank you for providing the East Bay Regional Park District ("District") with a copy of the Notice of Preparation (NOP) for an Environmental Impact Report (EIR) for the proposed Habitat Reserve Program ("Program").

There are several District-operated regional parks that abut San Francisco Water District (SFWD) watershed lands. These include Sunol Regional Wilderness, Ohlone Regional Wilderness, Del Valle Regional Park and Vargas Plateau. Management changes and mitigation acquisitions adjacent to District parklands will affect our management of these lands. The following are the District's scoping comments for consideration in preparing the DEIR and Program.

Mitigation Goals

As described in the NOP, "a coordinated and consolidated approach" to natural resource impact mitigation can be effective in conserving and restoring large areas. The historic mitigation practice of many agencies has been a piece-meal approach where the long-term sustainability and real benefits of mitigation are not certain. As a result, many mitigation projects have failed and the resource impacts have effectively been unmitigated. A coordinated program is clearly a better approach to mitigation.

The NOP does not describe the relationship between the proposed Program and SFWD's Habitat Conservation Plan (HCP). The HCP is simultaneously being prepared by SFWD for maintenance and operational impacts to its watershed lands. The proposed Program and the HCP will likely be mitigating for impacts to the same special-status species, wetlands, riparian areas and other sensitive plant and animal habitats. It would follow that both of these projects will be considering the same areas to mitigate for impacts to special-status species. As described in the NOP, the goal of the Program is to establish a "coordinated and consolidated" approach to mitigation. Why then are the proposed Program and HCP being prepared separately? Under CEQA, this would also appear to be an improper segmentation of one project into two separate projects.

Mitigation Land Acquisition

The proposed impact mitigation in Alameda and Santa Clara Counties would "primarily" take place on existing watershed lands. We believe these watershed lands were already conserved when they were acquired. These same lands should not be counted twice as mitigation for new capital projects. Instead, we suggest that additional lands be acquired in fee where natural resource impact mitigation can occur.

The benefits of acquiring conservation easements over private land are not clear. SFWD and/or the conservation easement holder would have great difficulty enforcing land use restrictions and ensuring that the long-term management is properly implemented by the present and future private-property owners. By contrast, fee purchase of mitigation lands will ensure that there are no problems enforcing land use restrictions and assuring that long-term management will actually occur. Furthermore, purchase of conservation easements on private lands runs the risk of being a gift of public funds with no public benefit, such public access to protected lands.

Mitigation Land Management

Acquisition of mitigation land should occur adjacent to or nearby the impacted areas. This will assure that impacted species will have suitable replacement habitat in areas that are accessible to wildlife through linkages and migration corridors. There should also be provisions in the Program to conserve mitigation lands in perpetuity through conservation easements or deed restrictions. Non-wasting endowments should be established for the perpetual management and monitoring of mitigation lands.

In the Sunol Watershed, the NOP describes about 1,100 acres of existing SFWD lands that would be preserved as mitigation for development impacts. The NOP states on page 5 that "habitat preservation would involve fencing, periodic weed control and managed grazing". Such measures would seem to be just good property management measures that SFWD has already implemented and not necessarily mitigation for impacts. It is unclear what would be the added value of "preserving" watershed lands that have already been acquired by SFWD to protect water quality and associated natural resources.

Preserve lands that are acquired for mitigation need monitoring and management prescriptions set forth in a Long-term Management Plan (LTMP) which provides contingencies and dedicated funding for property management. The following are some example management and monitoring provisions that should be included in the LTMP:

- Non-native plants: Yellow starthistle is rapidly invading grasslands in California and displacing other native plants and animals. Prescribed fire, herbicides, such as Transline, and properly timed livestock grazing can be very effective in controlling this species. However, this requires a long-term commitment for successfully control. Grazing alone is typically insufficient to control this weed. Prescribed fire and/or herbicide may be necessary to make the control effective.

Fire and herbicides are considerably more expensive than grazing and will require substantial funding to implement in the mitigation areas.

- Non-native animals: Feral pigs root within wetlands, riparian and restoration areas. Extensive "hog" fencing and/or trapping may be required to control pigs and assure the long-term viability of mitigation lands, especially areas where restoration has occurred. Similar control measures will also need to be implemented for control of bullfrogs, bass, red fox, etc. Without management of such species, there is considerable doubt that mitigation would be successful in the long-term.
- Pond management: Existing and constructed stock ponds and other potential breeding areas for special-status amphibians, such a red-legged frog, will require long-term management within mitigation areas. For example, drainage of ponds may be periodically required to removed non-native animal species, such as bullfrogs and fish. Rehabilitation and maintenance of pond berms, spillways and drainage devices will be required to prevent pond failure and significant shoreline erosion during storm events or from wave fetch.
- Property management: Maintenance of site security, police and fire services, replacement of fences and gates, etc. should all be included in the LTMP. There should be funding provided for these purposes.
- Public access: The LTMP should provide for appropriate public access in areas where the public can enjoy passive recreational activities, such as hiking, equestrian access, wildlife and plant study, interpretive programs, views of scenic open space, etc.
- Habitat monitoring: While many mitigation lands may have relatively undisturbed habitats at the time of acquisition, many natural and human-induced factors may degrade habitat values over the long-term. These include spread of non-native species, changes in watershed hydrology and sedimentation, grazing management changes, etc. Monitoring should be conducted to determine the effects of these changes on the biological resources for which the property was initially conserved.

The District has considerable experience with developing, implementing and managing mitigation and restoration projects. We look forward to coordinating with SFWD as the Program and DEIR are developed. Please provide us with copies (CD preferred) of any technical studies, plans and the DEIR when available. Please call me should you have any questions regarding this letter. I can be reached at (510) 544-2622.

Sincerely,

Brad Olson

Brad Olson
Environmental Programs Manager

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DOCUMENT #:
LA004d

East Bay
Regional Park District

2950 PERALTA OAKS COURT PO BOX 5381 OAKLAND CALIFORNIA 94605 ... 569 4319 TDD 510 633 0460 WWW.EBPARKS.ORG

RECEIVED

OCT 03 2007

CITY & COUNTY OF S.F.
PLANNING DEPARTMENT
M E A

October 1, 2007

San Francisco Planning Department
Attn: Paul Maltzer, Environmental Review Officer
WSIP PEIR
1650 Mission Street, Suite 400
San Francisco, CA 94103

Sent Via E-Mail on 10.01.07
(wsip.peir.comments@gmail.com)

RE: EAST BAY REGIONAL PARK DISTRICT (EBRPD) COMMENTS ON SFPUC WATER SYSTEM IMPROVEMENT PROGRAM (WSIP) DRAFT PEIR

Dear Mr. Maltzer:

Thank you for providing East Bay Regional Park District ("District") with a copy of the Draft Program Environmental Impact Report (DPEIR) for San Francisco Public Utilities Commission's (SFPUC) WSIP Project. The District owns or manages several parks that abut San Francisco Water District (SFWD) watershed lands and leases 3,812 acres of land from SFPUC as part of the Sunol and Ohlone Regional Wilderness parks. Scoping comments were previously submitted to SFPUC by the District for the following projects that are directly or indirectly related to the WSIP Project:

- October 12, 2005 – Scoping comments for SFPUC Water System Improvement Program.

- November 9, 2005 – Scoping comments for SFPUC Calaveras Dam Replacement.

- August 16, 2007 - Scoping comments for SFPUC Habitat Reserve Program.

- September 4, 2007 – Scoping comments for Sunol valley Water Treatment Plant.

The District's Master Plan establishes its commitment to preserve natural and cultural resources, open space, parks and trails for enjoyment and recreation for generations to come. Changes to management practices or construction of new facilities within the watershed could affect the resources the District manages in and around SFWD's watershed lands. Based on the project description, analysis and maps provided in the DPEIR ("PEIR"), WSIP projects associated with the Sunol Valley Region and projects contributing to biological and water quality impacts to Alameda Creek are of particular concern to the District for managing resources in the following regional parks:

1.	Sunol Regional Wilderness	6,858 acres
2.	Ohlone Regional Wilderness (including camp Ohlone)	9,736 acres
3.	Mission Peak Regional Preserve	2,998 acres
4.	Vargas Plateau Regional Preserve	1,030 acres
5.	Quarry Lakes Regional Recreation Area	538 acres
6.	Coyote Hills Regional Park	978 acres
		(Total: 22,138)

The District has extensive experience in managing and enhancing natural and cultural resources and open space on more than 97,000 acres of land and 1,100 miles of trails in Alameda and Contra Costa County. We recognize the SFPUC's commitment to provide a reliable water supply to its customers and the challenges it faces in constructing and operating the infrastructure needed to meet this demand in a fashion that minimizes impacts on the environment. In continuing with its cooperative relationship with SFPUC in managing open space and watershed lands, we provide the following comments for consideration under the California Environmental Quality Act for the Water Supply Improvement Program:

I. <u>Recreation</u>:

The PEIR establishes significance standards related to recreation and considers that implementation of the proposed program would have a recreational impact if it were to cause environmental impacts (such as air quality or noise effects) that would indirectly result in deterioration in the quality of the recreational experience (PEIR, P. 4.12-17). In determining whether project impacts may deteriorate the quality of the recreational experience it is necessary to understand the types of activities that are associated with the "recreational experience". Our Master Plan describes recreational activities that its park users experience while enjoying the lands it manages - these activities include nature appreciation, hiking, biking, equestrian use, camping, picnicking, photography, painting, and birding. Any disruption or deterioration of park users experience while engaging in these activities is of concern to the District and may result in a significant environmental impact under CEQA.

The PEIR does not recognize that there are several impact categories, such as traffic, air quality, visual/aesthetics, biological resources and noise that could disrupt or deteriorate the experience of park users as a result of the project. Other than a brief discussion of construction impacts in Volume 2 (PEIR, p. 4.12-18) and combined recreational and visual/recreational impacts in Volume 3 (PEIR, PP. 5.4.7-1 and 5.4.7-5), in determining the potential effects on recreational resources, the PEIR relies on the conclusions of impact findings from sections of the report that do not specifically evaluate the project's impacts on recreational resources. The PEIR's analysis of recreational impacts could be improved to help the public better understand and evaluate potential indirect environmental impacts the project may have on recreational resources. The District offers the following comments regarding the projects potential impacts on recreational resources:

1. Traffic -

    a. Temporary closure of Calaveras Road between Geary Road and Felter Road to through traffic during construction of the Calaveras Dam project could impact recreational resources as follows:

        i. Park visitors currently enjoy a scenic drive when they come to visit Sunol Regional Wilderness with little or no congestion or delay. The proposed road closure would block access to the park from Santa Clara County and eliminate this secondary access route to the park. This alternate route is also a desirable route for nature viewing.

        ii. Closure of this secondary access route coupled with an increase in traffic volumes with up to 50 -190 worker vehicle trips (PEIR, P. 4.8-18) and up to 180 a.m. and p.m. peak hour truck trips would present a formidable obstacle to park users attempting to access the park. This considerable increase in traffic volume could discourage park users from visiting Sunol and Ohlone Regional Parks because of congestion, delay and associated road hazards. The impact of the road closure and increased vehicle trips on park users should be evaluated in the PEIR at a programmatic level for collective and cumulative impacts and at the project level in subsequent CEQA analysis.

        iii. The PEIR may not provide enough programmatic information to establish performance standards from which future project specific CEQA analysis can draw from. A range of mitigation measures should be identified at the program level to minimize these impacts to park visitors. Some of these measures should include:

            1. Consulting with EBRPD to evaluate the vehicle/visitor demand to Sunol Regional Wilderness and incorporate these findings into the traffic control plan for each project utilizing Calaveras Road for construction. The traffic control plan should recognize peak demand hours for park use and minimize its traffic volumes to not overlap with these hours. This may require that construction traffic be significantly restricted or prohibited during holidays and weekends.

            2. Prohibit or restrict construction traffic for the Calaveras Dam Replacement project (SV-2) from using Calaveras Road from the north.

            3. Requirement that SFPUC be the sole agency responsible for notifying the public of the proposed closure of Calaveras Road.

SFPUC should provide proper signage at appropriate locations, informational pamphlets and displays for park users at informational kiosks and other outreach efforts (newspaper, radio and television press releases).

4. SFPUC should provide us with an opportunity to review and comment on the traffic control plan for each project impacting this area and coordinate public outreach and information/ notification of road closures with us well in advance of closures. Public notification efforts should also identify the specific locations, durations and alternatives means of access to public trails.

iv. Most of the construction related traffic impacts related to this road closure are concluded to have a less than significant impact with mitigation because of the temporary nature of the impact. It is unclear from the PEIR if the closure will be for two to three (PEIR, P. 4.8-12; P. 4.3-15) years or two years (PEIR, P. 4.8-22). In order to ensure certainty as to the temporary nature of this closure, a performance based mitigation measure should be adopted for when the road must re-open. Without such standard, insufficient information is provided on the temporary nature of these impacts.

v. It is unclear which trails will be restricted due to the closure of Calaveras Road (PEIR, P. 4.8-22) – more information should be provided in the PEIR for trail users to better evaluate and understand how the project will restrict trail use and how this impact will be mitigated to a less than significant level.

b. The increase in traffic volumes from construction activities, especially truck trips on County roads and local streets, could rapidly accelerate the deterioration of roadway surfaces along haul routes. The PEIR should address how these roadway surfaces will be maintained in good condition during and after the project is completed.

c. Mitigation Measure 4.16-6c does not provide a level of certainty that traffic impacts could be mitigated with the implementation of a traffic control plan because it provides too much flexibility for whether or not identified standards for the plan are required or optional (PEIR, P. 6-33). The measure says that these standards "could" include. The words "shall include but not be limited to" would result in a more predictable outcome of successfully implementing this mitigation measure.

2. Air Quality – Levels of fugitive dust and criteria pollutants will drastically exceed BAAQMD significance thresholds (PEIR, P. 4.9-24) as a result of the project. The District recognizes that for the purpose of the PEIR sensitive receptors are generally associated with certain land uses (schools, day-care centers, hospitals & convalescent homes). However, because of the close proximity of the construction

and associated vehicle traffic to Sunol and Ohlone parks, sensitive receptor consideration should be given to park visitors such as children, the elderly and active persons engaged in strenuous exercise that use the parks. Poor air quality and associated health risks may diminish the recreational experience of park users. The PEIR should analyze this potential impact at a programmatic level and provide mitigation for this potential impact in order for park users (especially young families, the elderly and joggers/cyclists) to better understand and evaluate the air quality impacts of the WSIP.

3. Visual/Aesthetics - Park visitors are attracted to the natural beauty and views they enjoy and experience in the parks and surrounding areas. Any actions that may diminish this experience may have a significant impact on recreational resources. The PEIR recognizes that distant views of SFPUC facilities may be available from public trails in the Sunol Regional Wilderness (PEIR, 4.3-2). However, it does not recognize these views as visual resources in its impact analysis (PEIR, P 4.3-8). Given the broad range of projects that could alter views from the Sunol and Ohlone parks, the PEIR and subsequent project level CEQA review should recognize views from these parks as visual resources and minimize project impacts to these resources.

   Using the Alameda Watershed Management Plan (WMP) design guidelines may not sufficiently mitigate for visual/aesthetic impacts resulting from the WSIP because the WMP serves as guideline document without any clear substantive requirements for preserving visual resources – the goals and policies section of the WMP do not provide any guidance on how to apply its subjective design guidelines in a fashion that would result in the protection or preservation of visual/aesthetic resources. Where known visual impacts will occur but the exact location and design has not yet been established, such as with the Calaveras Dam Replacement project (including the borrow site & haul road), the PEIR should establish citing criteria or designate generally acceptable locations for siting/placement of these projects.

   Policy WA-9 of the WMP requires that if new facilities require additional new locations that view shed studies be conducted to minimize, eliminate or conceal the violation of scenic values. The PEIR evaluates the applicability of this policy on page 5.4.7-4 and concludes that since no new facilities are required for the project that view shed studies are not required. This conclusion may be true for most of the WSIP, however, for the Calaveras Dam replacement project, construction impacts will result in the permanent loss of riparian natural communities in the vicinity of the new dam and associated roads, staging areas and borrow site (PEIR, P. 4.6-55). Although not technically a new facility location, the impact area necessary for the construction of this project is well beyond the original facility location and should require a view shed study as called for by WMA, Policy WA-9. EBRPD should be consulted to assist in determining the locations from which this view shed analysis should be conducted for views from District managed lands.

4. Biological Resources – In its effort to maintain the recreational experience of its park users, we are actively involved in management activities aimed to preserve existing plant life and fish and wildlife habitat in the parks we manage and

surrounding watersheds. Reduced flows in Alameda Creek as a result of the project (PEIR, P. 5.4.7-5) is of particular concern to us because we operate and manage several parks that feature Alameda Creek as a focal recreational feature (Sunol, Coyote Hills, Quarry Lakes and Vargas Plateau). Maintaining flows in Alameda Creek to maximize benefits to amphibians and anadromous fish species in Alameda Creek is a priority for the District. The adopted Land Use Plan for Sunol and Ohlone Wilderness Regional Preserves calls for the District to coordinate the timing of water releases for the Calaveras Dam with the SFPUC to maximize the benefits to these species. In addition to considering the recommendations of the Alameda Creek Fisheries Restoration Workgroup, as part of mitigation measure 5.4.5-3a, the SFPUC should consider giving us an opportunity to review and comment on the operation plan for establishing minimum flows for resident trout in Alameda Creek. This cooperative effort will ensure that the resource management efforts of the District and SFPUC are coordinated in a fashion that best preserves and enhances these resources.

The PEIR concludes that the project would result in permanent loss of sensitive riparian natural communities (PEIR, P. 4.6-55) and that implementation of mitigation measures for these impacts would compensate for these impacts. The SFPUC's Habitat Reserve Program was identified as an option for implementing offsite habitat compensation (PEIR, P. 4.6-56). We would like to reiterate our concern over the use of lands already conserved and managed for watershed protection for use as habitat mitigation lands for new capital projects (also see the August 16, 2007 EBRPD Notice of Preparation comment letter for the Habitat Reserve Program). Preservation can be a feasible means for reducing the impact of lost habitat; however, using already protected watershed lands that are already effectively managed for habitat protection (as a result of watershed and water quality management objectives) would result in a net loss of the resource. Therefore, any proposed use of existing SFPUC watershed preserve land for mitigation for project impacts may be considered inadequate under CEQA unless the mitigation were to rehabilitate or enhance disturbed or marginal habitat areas within the watershed.

The effectiveness of conservation easements over private lands may be insufficient for ensuring long-term management and enhancement of habitat due to the difficulty associated with enforcing land use restrictions on present and future property owners. In addition, public access is generally not allowed on such lands, even when acquired with public funds. Fee purchase of mitigation lands will ensure that there are no problems enforcing land use restrictions and assuring that long-term management can occur.

5. Noise - An increase in 5dB CNEL over existing noise levels is generally considered a significant noise impact. The PEIR should evaluate noise impacts to park users in this context. Construction activities and increased traffic volumes should be evaluated for noise impacts to park users where haul roads or construction activities will be audible from parks.

II. General Comments:

1. The PEIR should recognize that regional parks have land use plans that guide the management of our parks.

2. The PEIR should address if some of the WSIP projects would need an encroachment permit from EBRPD where access is needed to District owned properties and trails (lands that are not leased by EBRPD from SFPUC) - it is unclear from the maps provided if any WSIP project will encroach onto District property (also see comment II.3 below).

3. The PEIR states that the Irvington Tunnel (SV-4) would tunnel below a portion of Mission Peak Regional Park (PEIR, P. 4.12-23), however, the maps provided indicate that this project is nearly a mile north of Mission Peak Regional Park. This statement should be clarified in the PEIR and sufficient mapping detail should be provided to show where the tunnel will cross under Mission Peak Regional Park. Providing this information will help the District evaluate the potential impacts of this crossing and determine the ownership of this portion of the park and types of approvals that may be needed.

4. Mitigation measure 4.5-4b is intended to prevent potential flooding impacts associated with the Alameda Creek Fishery Enhancement (SV-1). It is unclear from the project description what the project will actually involve or where it could be located. As a result, there is insufficient project detail in the PEIR to demonstrate that project impacts associated with SV-1 can be mitigated with the proposed mitigation measures. Construction of a diversion dam or concrete weir could alter the drainage of surface flows in Alameda Creek, causing flooding or siltation (PEIR, P. 4.5-39) – this impact cannot be evaluated without basic essential information such as the location of the proposed project. This deficiency may be augmented by including in the project description or as an additional mitigation measure siting criteria or generally acceptable sites that could accommodate the project without causing flooding or siltation.

5. Our public safety division provides fire and law enforcement/police services district wide - the Public Services and Utilities chapter of the PEIR should recognize this and include EBRPD Fire Department in the list of agencies SFPUC will coordinate with for fire suppression planning and response for construction activities, including the review and approval of traffic control plans (Mitigation Measure 4.8-1).

6. Based on the information provided in the PEIR, it appears that the borrow and spoils area will be located at the south end of the Calaveras Reservoir on north and east facing slopes. The PEIR should use this information to more accurately disclose the Calaveras Dam project's programmatic impacts to biological and visual/aesthetic resources. This conclusion is based on information provided in the PEIR where the location of the borrow area is identified as being at the south end of the Calaveras Reservoir (PEIR, P. 4.10-19) and north and east facing slopes in the immediate vicinity of the dam (PEIR, P4.3-38).

III. Clarifications/Corrections:

1. Reference to the WSIP Habitat Reserve Program (HRP) appears to be incorrect on page 6-55. Section 3.11 (Proposed Construction Schedule) is referenced for the WSIP – the correct reference is Section 3.12.3 (Page 3-84).

2. Page 5.4.7-1, "Alameda Creek Recreation and Visual Quality" – the PEIR does not disclose that Alameda Creek is adjacent to Vargas Plateau Regional Preserve, Quarry Lakes Regional Recreation Area and Coyote Hills Regional Park. These parks should be considered in the impact analysis.

We look forward to continuing our long established cooperative working relationship with the SFPUC in managing open space and watershed lands in the East Bay. We requests a copy of the FEIR when it becomes available (one hard copy and CD are preferred). Thank you for the opportunity to comment on the Water System Improvement Program Draft PEIR and the SFPUC's consideration of our comments. If you have any questions or comments, please contact me at (510) 544-2627.

Sincerely,

Chris Barton
Senior Planner
Environmental Review/GIS Department

DOCUMENT #:
NP.001

Alameda Creek Alliance

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November 5, 2007

Chris Kern or Bill Wycko
Acting Environmental Review Officer
SFPUC San Antonio Backup Pipeline Projects
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Re: Scoping Comments on the SFPUC San Antonio Backup Pipeline Projects

Dear Bill Wycko:

These are the scoping comments of the Alameda Creek Alliance on the San Francisco Public Utilities Commission's (SFPUC) proposed San Antonio Backup Pipeline Projects.

The Alameda Creek Alliance (ACA) is a community watershed group dedicated to the protection and restoration of the natural ecosystems of the Alameda Creek watershed. The ACA has over 1,450 members that live in or near the watershed. The ACA has been working to restore steelhead trout and protect endangered species in the Alameda Creek watershed, and specifically in the Sunol Valley, since 1997.

The Notice of Preparation for the project discusses the proposed route of the backup pipeline, the location of proposed additional chemical storage and treatment facilities, and installation of a new cone release valve for San Antonio Reservoir.

The new cone valve proposed for a second discharge structure at the base of Turner Dam should be sized to permit release of low and moderate flows to San Antonio Creek to allow for future restoration of steelhead trout and survival of other native fishes in San Antonio Creek and Alameda Creek below the dam.

The San Francisco Public Utilities Commission (SFPUC) currently operates San Antonio Reservoir and Turner Dam with no minimum bypass flows to keep native fish downstream in San Antonio Creek or in Alameda Creek in the reach below the confluence with San Antonio Creek in good condition, in violation of California Fish and Game Code §5937. California Fish and Game Code §5937 requires that the owner of a dam allow sufficient water to pass through a fishway or dam, to keep in "good condition" any fish that may be planted or exist below the dam. The law applies to any dam regardless of when it was built.

The Environmental Impact Report (EIR) for the project should discuss the potential for restoration of steelhead trout and other native fishes below Turner Dam, and the potential stream flows that could be required to maintain fish. The new cone valve must be sized to allow for future low-flow water releases to San Antonio Creek below the dam for this purpose.

Last winter, up to two dozen or more landlocked steelhead trout from San Antonio Reservoir spilled over Turner Dam and were trapped below the discharge facility for over 6 months. Most of these fish likely died, a significant loss of the San Antonio trout population, which was estimated at only 460 adult trout in 2003 (see SFPUC Technical Memorandum No. 2-04-006, 31 October 2005, Population Size Estimates for Adult Rainbow Trout (*Oncorhynchus mykiss*) in San Antonio and Calaveras Reservoirs). These trout represent the native steelhead gene pool for restoring steelhead below the dam. The EIR should discuss the potential for future spills of landlocked trout over the dam and should evaluate how to either ensure these trout can survive in San Antonio Creek below the dam, or include a plan to rescue trout and move them back up into the reservoir.

The pipeline project proposes armoring San Antonio Creek below the dam with rip-rap to protect against scouring due to discharges from the cone valve(s). The EIR should quantify how much of the creek bed will be armored. If armoring of the creek is necessary, the project should include full mitigation in the form of creek restoration or habitat enhancement downstream.

The EIR for the project should discuss the potential for chemical spills from the proposed chemical storage and treatment facilities and what fail-safe containment and spill response program will be used. The SFPUC had a disastrous chlorine spill at the Sunol Valley Water Treatment Plant (SVWTP) in April of 2002, which killed all fish and aquatic life in Alameda Creek within a reach extending downstream of the SVWTP about 1,000 yards, including an estimated 24-36 lampreys and several frogs of an undetermined species. In May 2002 the SFPUC had another discharge of chlorinated water from the SVWTP. No restoration or mitigation was ever done by the SFPUC to remediate the impacts of these chemical spills.

The San Antonio pipeline project includes installation of 2,000-gallon chemical storage tanks, chemical pump feeds and control valves. The environmental review for the project must discuss what fail-safe measures the SFPUC will implement at the San Antonio Pump Station to ensure there is never another chemical spill into Alameda Creek. The environmental review must also spell out what containment, spill response, and mitigation measures will be in place if a chemical spill does occur.

Special status species, such as the state and federally listed California tiger salamander, may occur in the vicinity of proposed construction for this project. The EIR should discuss the potential for occurrence of special status species and potential impacts to species or their habitat. The project should emphasize avoidance of sensitive habitats and should fully mitigate for any direct or indirect impacts to native wildlife.

Thank you for the opportunity to comment on this project.

Sincerely,

Jeff Miller, Executive Director

cc: Tim Ramirez, SFPUC
Josh Milstein, S.F. City Attorney
Suzanne Gautier, SFPUC
U.S. Fish and Wildlife Service
California Department of Fish and Game

DOCUMENT #: SA001a

California Regional Water Quality Control Board

San Francisco Bay Region

Linda S.Adams
Secretary for Environmental Protection

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Arnold Schwarzenegger
Governor

Date: OCT 16 2007
File No. 2198.09 (XF)

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OCT 18 2007

CITY & COUNTY OF S.F.
PLANNING DEPARTMENT
MEA

San Francisco Planning Department
Attn.: Mr. Wycko
Acting Environmental Review Officer
1650 Mission Street, Suite 400
San Francisco, CA 94103-2479

Subject: Comments on Notice of Preparation of an Environmental Impact Report for the San Antonio Backup Pipeline Project SCH No. 2007102030

Dear Mr. Wycko:

We have reviewed the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the San Antonio Backup Pipeline (SABPL) Project. The project consists of the following:

- Constructing and operating a backup pipeline about 2 miles in length along the alignment of the existing San Antonio Pipeline;
- Upgrading the San Antonio Creek Discharge Facility at the base of Turner Dam (San Antonio Reservoir) to allow for a discharge rate of 315 million gallons per day (MGD);
- Upgrading the dechlorination and pH treatment facility at the San Antonio Pump Station to allow for dechlorination and pH adjustment of 315 MGD; and,
- Improvements to security around the Alameda East Portal.

Based on the information provided in the NOP, we offer the following comments. These comments are intended to advise the San Francisco Planning Department and San Francisco Public Utilities Commission (SFPUC) of our concerns, so they may be incorporated into the planning and design process at an early date.

Comments on Beneficial Uses

The NOP discloses potential impacts to San Antonio Creek and provides information suggesting potential impacts to Alameda Creek. San Antonio Creek is a tributary to Alameda Creek, and both need to be protected for the Beneficial Uses they offer. Under the Basin Plan, Beneficial Uses of a significant water body, such as Alameda Creek, generally apply to its tributaries. As a result, Beneficial Uses of San Antonio Creek should be considered the same as Alameda Creek unless shown to be otherwise. These Beneficial Uses include agricultural supply, groundwater recharge, cold freshwater habitat, fish migration, fish spawning, warm freshwater habitat, wildlife habitat, water contact recreation, and non-contact water recreation.

Comments on Special Status Species

The NOP discloses potential impacts to special-status plant and animal species. Although the Water Board often defers to the U.S. Fish and Wildlife Service and California Department of Fish and Game when they are involved in the permitting, the EIR should include a discussion of the Water Board's jurisdiction in this area. The Water Board's jurisdiction in this area includes the beneficial uses of Alameda and San Antonio Creeks that relate to special-status species (e.g. cold freshwater habitat, fish migration, fish spawning, warm freshwater habitat, and wildlife habitat).

Comments on Aquatic Resources

The proposed project described in the NOP includes impacts to aquatic resources including wetlands, riparian habitat, streams or tributaries, or other waters of the State. Specifically, the project proposes to (1) fill riparian habitat adjacent to San Antonio Creek by building a new discharge facility in the riparian corridor with an outfall into San Antonio Creek; (2) fill the creek bed with rip rap in the vicinity of the new discharge facility; and (3) discharge potable water to San Antonio Creek as part of operations following project completion.

Fill Impacts

Both a Clean Water Act (CWA) Section 401 water quality certification and a CWA Section 404 Permit from the U.S. Army Corps of Engineers will be necessary for fill impacts to waters of the U.S. Additionally, the project proponent may need to file a Report of Waste Discharge if the project may impact waters of the State, even if such waters have been excluded from federal jurisdiction (e.g., isolated wetlands, ephemeral streams without a significant nexus, or stream banks above the ordinary high water mark). A Stream Bed Alteration Agreement from the California Department of Fish and Game may also be necessary since the proposed project involves stream channels and riparian habitat.

The Water Board adopted U.S. EPA's Section 404(b)(1), "Guidelines for Specification of Disposal Sites for Dredge or Fill Material," dated December 24, 1980, in its Basin Plan for

The Water Board adopted U.S. EPA's Section 404(b)(1), "Guidelines for Specification of Disposal Sites for Dredge or Fill Material," dated December 24, 1980, in its Basin Plan for determining the circumstance under which filling of wetlands, streams or other waters of the State may be permitted. Section 404(b)(1) Guidelines prohibit all discharges of fill material into regulated waters of the United States, unless a discharge, as proposed, constitutes the least environmentally damaging practicable alternative (LEDPA) that will achieve the basic project purpose.

The Guidelines sequence the order in which proposals should be approached: 1) Avoid - avoid impacts to waters; 2) Minimize - modify project to minimize impacts to waters; and, 3) Mitigate – once impacts have been fully minimized, compensate for unavoidable impacts to waters. When it is not possible to avoid impacts to water bodies, disturbance should be minimized. Mitigation for lost water body acreage and functions through restoration or creation should only be considered after disturbance has been minimized. Where impacts cannot be avoided, the creation of adequate mitigation habitat to compensate for the loss of water body acreage, functions and values must be provided.

The EIR should include an analysis that identifies the LEDPA by evaluating alternatives that first, avoid impacts; second, minimize impacts; and lastly, compensate for unavoidable impacts. This LEDPA analysis should include alternatives with measures or combinations of measures that prevent erosion without using rip rap or with minimal use of rip rap, such as controlling the discharge flow rates, bioengineering techniques to stabilize creek bed and banks, aligning the cone valve so that the water is discharged in the direction of stream flow, and retaining water within the SFPUC's transmission or storage systems. Retaining water within the SFPUC's transmission or storage systems has the added benefit of conserving water for municipal supply, and may include alternatives, such as diverting water to the Sunol Valley Water Treatment Facility for treatment and return to SFPUC's system, or discharging water into San Antonio Reservoir after dechlorination and pH adjustment.

Operational Discharges

The proposed project will also result in additional discharges of potable water to San Antonio Creek. Discharges of chlorinated water to a surface water are prohibited by the CWA, California Water Code, and Water Board's Basin Plan. Discharges of potable water may directly impact San Antonio and Alameda Creeks by altering pH, changing water temperature, and/or releasing toxic substances, such as chlorine/chloramine. Potential cumulative and indirect impacts may also occur as a result of potable water discharges to San Antonio Creek and the subsequent flows in Alameda Creek. Potential cumulative and indirect impacts include deposition of sediments; erosion of substratum; additional water (flooding); and creating a condition of pollution.

Water Board staff acknowledge and appreciate the inclusion of treatment to adjust pH and dechlorinate/dechloraminate water prior to discharge. However, the EIR should also evaluate alternatives that avoid discharges to San Antonio Creek by retaining water within SFPUC's water supply system. If discharges into the creek can not be avoided, the EIR should include treatment as mitigation measure. In addition, the EIR should evaluate whether discharges could result in changes in water temperature that lead to potentially significant impacts. If potentially significant impacts may occur as a result of changes in water temperature, the EIR should provide mitigation measures to prevent these impacts.

The EIR should also include an evaluation of potential impacts related to changes in stream flows (hydromodification) as a result of discharges from the new San Antonio Pipeline. Potential impacts from hydromodification include increases erosion and sedimentation that result in detrimental effects to riparian and aquatic habitat, and water column chemistry. The NOP indicates that bank erosion has occurred in the past as a result of discharges of 230 MGD, or about 356 cubic feet per second (cfs), to San Antonio Creek. The NOP also indicates that after construction of the new pipeline, the SFPUC will be able to discharge 315 MGD (487 cfs) to San Antonio Creek. Water Board staff are concerned that these discharges will not only increase erosion at the discharge location, but will also increase erosion and sedimentation downstream of the discharge. To address these concerns, the EIR should include a geomorphic assessment using continuous flow modeling to assess potential impacts to San Antonio and Alameda Creeks from increased erosion and sedimentation.

Comments on Groundwater Dewatering

For any site dewatering activity, whether or not there is known soil contamination at the site, dewatering discharges may be contaminated. As a first choice, water should be discharged to the sanitary sewer, assuming approval can be obtained from the sanitary sewer agency. If approval to discharge to the sanitary sewer cannot be obtained and the water cannot be otherwise disposed of (e.g., as dust control for water that has minimal contamination), then the SFPUC should determine whether the discharge can be covered under any of the Water Board's General National Pollutant Discharge Elimination System (NPDES) dewatering permits, and should prepare the requisite sampling, analysis, and treatment plans, file a Notice of Intent (NOI), etc. These general permits are available at http://www.waterboards.ca.gov/sanfranciscobay/npdes_gen__permit.htm. To be covered under any of these permits, the SFPUC will need to prepare the requisite monitoring and treatment plans, and file a Notice of Intent (NOI), and should allow 60 days for Water Board staff to review and accept these plans and the NOI before beginning a project.

If the water is tested and found to be clean, and if there is no history of contamination on the site or on adjacent sites, the SFPUC should implement a sediment removal program as necessary to ensure that the water is clean prior to discharge to a storm drain or water body. In addition, the SFPUC should confirm that the discharge will not cause erosion, flooding or other problems.

project must be covered under the State NPDES General Permit for Discharges of Storm Water Associated with Construction Activity (General Construction Permit). This can be accomplished by filing a NOI with the State Water Resources Control Board (State Board). The General Construction Permit is available at http://www.waterboards.ca.gov/stormwtr/construction.html. The General Construction Permit also requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to prevent impacts from storm water runoff. The SFPUC should allow the Water Board 60 days to review and accept the SWPPP.

Please note that General Construction Permit is currently being revised. Information on the status of the revised General Construction Permit can be obtained from the State Board's website at http://www.waterboards.ca.gov/stormwtr/constpermits.html.

Closing

Please contact Xavier Fernandez at 510-622-5685 or xafernandez@waterboards.ca.gov with any questions or comments.

Sincerely,

Keith H. Lichten, P.E.
Senior Engineer

cc: State Clearinghouse

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DOCUMENT #: SA 0016

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DRAFT TECHNICAL MEMORANDUM

Date:	May 9, 2006
To:	John Schroeter
Organization:	East Bay Municipal Utilities District
From:	PWA (Andrew Collison, Christie Beeman and Setenay Bozkurt Frucht)
PWA Project #:	P06-120
PWA Project Name:	EBMUD Reservoir Releases
Subject:	Draft approach for assessing erosion potential of reservoir releases
Copy(ies) To:	File

Based on our previous meeting and discussions we understand that EBMUD needs to develop a method of substantiating that proposed reservoir discharges will not cause erosion and bank destabilization of the receiving creek channels. This draft memo outlines our proposed methodology. We have slightly modified the approach based on additional analysis and thought since our last meeting.

Background

We envisage a phased approach with a graduated response so that straight forward cases where erosion is highly unlikely require little analysis while more complex or borderline cases are assessed in progressively greater detail. Our proposal is based on the geomorphic principal of 'dominant' or 'channel-forming' discharge. The concept of dominant discharge is based on the observation that over a long period of time (decades) most sediment is moved by events that occur approximately once every 1-2 years. In most stream channels the majority of flows are small, and do not exceed the particle entrainment threshold. As flows exceed this threshold, exponentially more sediment is eroded and transported, but these events become less frequent and thus cumulatively do less work. Thus, most sediment is moved by flows above the entrainment threshold that occur moderately frequently, and that carry moderately large amounts of sediment (Figure 1). We can calculate the effectiveness of flows by determining the flow frequency curve and combining this with a sediment rating curve (flow v. sediment load). Studies of the dominant discharge in different environments have frequently found it to coincide with flows around the 2 year recurrence interval, though ranges from 1.0 - 2.5 years are very common and wider ranges have been found in some environments.

Dominant discharge in East Bay creeks

We have performed a preliminary analysis of dominant discharge for creeks and rivers in the East Bay using suspended sediment records. This analysis requires a reasonably long flow record (minimum 10 years) and enough simultaneous measurements of sediment load and flow to develop a good rating curve. This analysis should be made using bedload as well as suspended load, though since bedload is measured much less frequently than suspended load studies often assume that bedload is a relatively fixed percentage of total load. There are only three East Bay creeks that meet the necessary data requirements for an analysis based on suspended sediment (Alameda Creek at Niles, San Lorenzo Creek above Don Castro Reservoir and Cull Creek above Cull Creek Reservoir). PWA carried out a dominant discharge analysis based on suspended sediment load for all three creeks to determine the range of flow during which most erosion occurs. The example from Alameda Creek is shown in Figure 2. We should note that a more comprehensive assessment using bedload would be necessary to confirm our initial findings, and we do not currently know whether such data are available for these three gages. For all three creeks the dominant discharge coincided with the flows close to the 2-year flood (plus or minus 0.5-year). Given the prevalence of 1.5 – 2 year flows as dominant discharges in other studies, and the consistency of the relationship for three creeks of greatly varying size (6, 18 and 229 square mile watersheds) it appears reasonable to assume that most East Bay creeks have similar dominant discharge characteristics.

Relationship between dominant discharge, erosion threshold and reservoir release criteria

The most conservative approach to reservoir releases would be to only release water so that total stream discharge was below the erosion threshold for the bed and bank materials. However, identifying the allowable release rate using this approach would be very costly to implement in every discharge scenario, since channel entrainment thresholds vary greatly along channels and calculating applied shear stress would require the development of a hydraulic model for every creek that EBMUD proposes to discharge to. In addition, measurement of entrainment threshold in cohesive sediments is very time consuming and subject to variability compared with measurements of non-cohesive sediment.

It appears from an initial review of EBMUD’s past and proposed releases that many releases are likely to be below the erosion threshold or at a level where the additional erosion is statistically insignificant. A practical approach is to ensure that flows remain below the level at which small increases in channel flow start to produce larger increases in erosion (inflection point in Figure 1). This can be estimated by calculating dominant discharge relationships for creeks in the EBMUD area and selecting a threshold based on the percentage of dominant discharge. Since the dominant discharge can be related to a flow recurrence interval (e.g. the two year flow, Q_2), the threshold could potentially be defined as a proportion of this flow.

Proposed methodology

As starting point for discussions and refinement we propose the following methodology to assess and prevent potential creek erosion impacts from flow releases:

Step 0 (Prior to assessment)

1. PWA will calculate dominant discharge for those East Bay creeks that have sufficient data to conduct the analysis.

2. PWA will work with EBMUD and the RWQCB to agree upon a threshold value (e.g. a proportion of Q_2 , tQ_2) below which erosion is likely to be insignificant.
3. For releases that exceed the threshold value we will work to develop an acceptable amount of sediment discharge as a proportion of the mean annual sediment load of the creek (e.g. discharge will contribute less than the equivalent of one week's average sediment load).
4. For releases that exceed the acceptable sediment load we will work to establish acceptable boundary shear stress tolerances.

Step 1. EBMUD staff locates reservoir discharge point in the natural creek system (e.g. culvert outfall) and provide GPS coordinates.

Step 2. Is flow discharging into a channel that is hardened on both banks and bed between the discharge point and the tidal limit of the San Francisco Bay? If yes, grant exemption from permit requirements.

Data availability: we have been informed by representatives from Contra Costa and Alameda Counties that this information is available for creeks in their county as a GIS layer. We propose that the GPS coordinates of the discharge point are overlaid onto the stream channel materials layer to allow an assessment of hardening to be made.

If flow discharges to a non hardened channel, go to Step 3.

Step 3. Calculate the proposed discharge as a percentage of the dominant discharge at the point where the reservoir discharges into the creek. Take dominant discharge from flow recurrence interval estimated in Step 0. Calculate the corresponding flow for the creek in question using either existing data where it exits or generate a new estimate of flow based on regional regressions (e.g. Waananen and Crippen, 1977). Compare the discharge with the threshold (tQ_2) agreed with RWQCB in Step 0.

If flow input < tQ_2 – grant exemption
If flow input > tQ_2 – go to Step 4.

Step 4. Conduct a brief geomorphic assessment of erosion vulnerability in the receiving channel and a basic hydraulic assessment (measure two cross sections, channel slope, Manning's n, calculate flow depth and shear stress at Q_2 and for proposed discharge level). Estimate the amount of sediment load associated with the proposed discharge by the following method:

1. Estimate mean annual sediment load for the watershed at the discharge point using regional sediment yield regression (PWA and SFEI, 2006).
2. Estimate sediment load associated with the proposed discharge by either use of a sediment transport model parameterized from data collected in geomorphic assessment, or by extrapolating a sediment rating curve from a similar creek for which data are available.

3. If increased sediment load is less than threshold agreed in Step 0, grant exemption.
4. If increased sediment load is more than threshold agreed in Step 0, go to Step 5.

Step 5. Calculate critical shear stress for receiving channel and banks and compare with boundary shear stress of applied flows, e.g. using methods outlined in Fishchenich, 2001. If shear stresses are significantly below critical shear stresses for bank materials (sediment and vegetation cover) then grant exemption ("significant" to be determined in this study and in collaboration with RWQCB, e.g. 50%). If shear stresses are not significantly below critical shear stresses either regulate flows to keep them below threshold or apply for permit.

Validation of approach
We anticipate than many discharges will fall under the exemption at Step 3. For those situations that require Steps 4 and 5 we recommend a validation exercise whereby in a subset of creeks we measure turbidity before, during and after stepped releases from reservoirs, to determine the thresholds at which erosion occurs. This may then allow us to refine the thresholds used at each step.

Next steps
We recommend that all the steps of the proposed methodology be applied in a test case on Baxter Creek, or another upcoming release. Although based on discussions with EBMUD it appears that the proposed flow releases for Baxter Creek will fall below the threshold of dominant discharge it would be a valuable exercise to apply all steps for a range of hypothetical releases to determine the practicality and cost, and where necessary to refine the methodology.

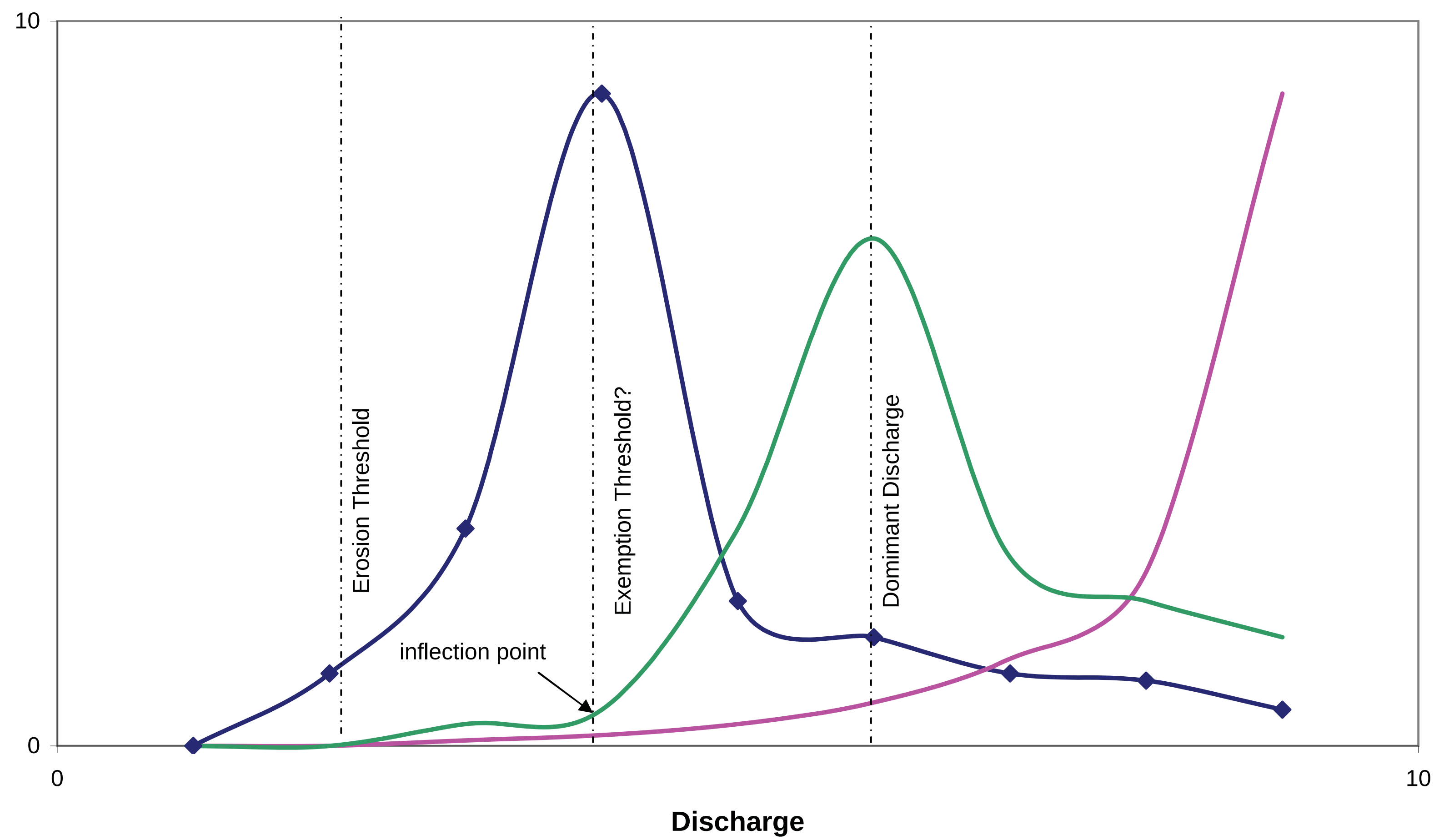

figure 1

EBMUD Reservoir Releases

Dominant Discharge Concept

PWA

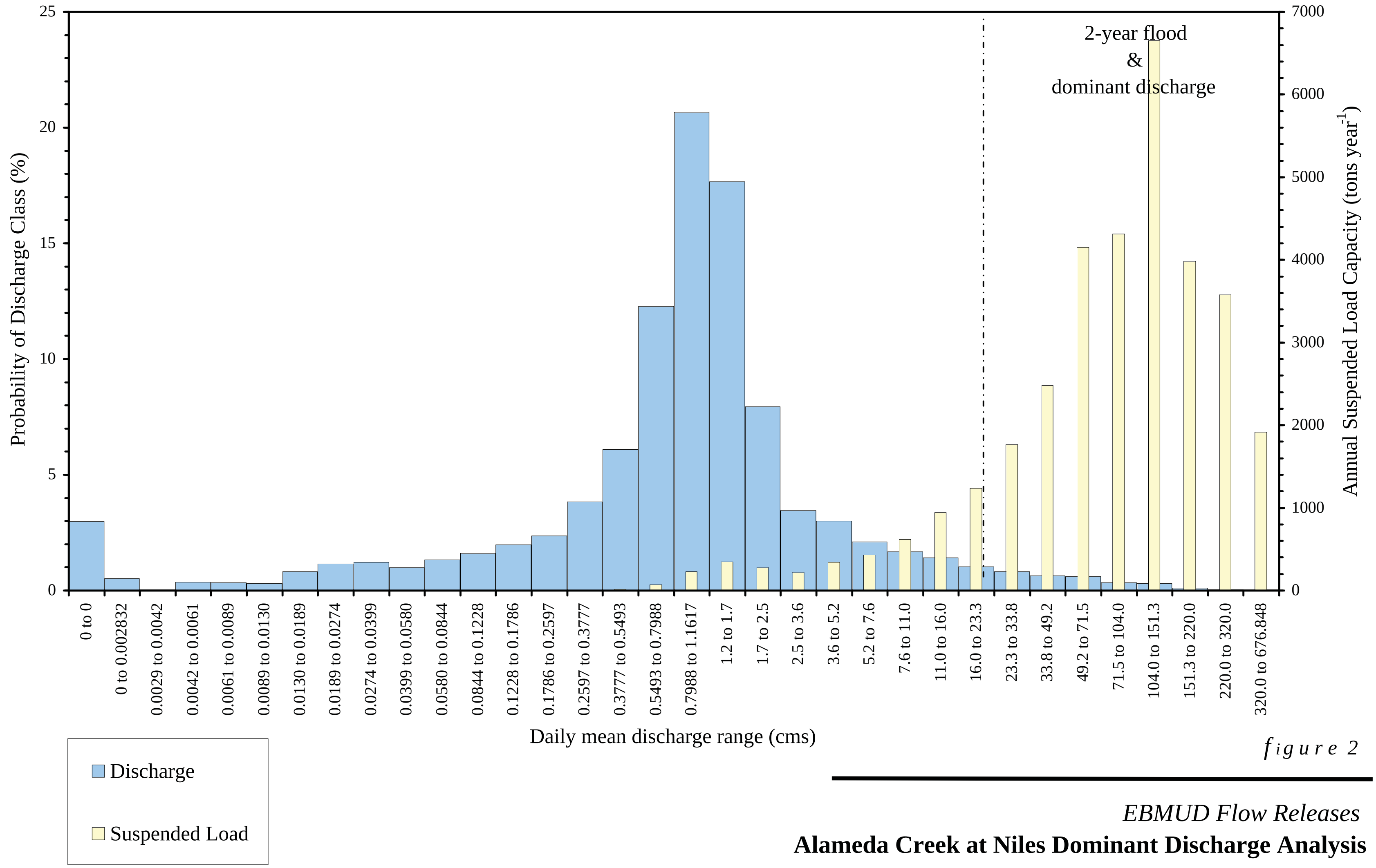

figure 2

EBMUD Flow Releases

Alameda Creek at Niles Dominant Discharge Analysis

PWA

DOCUMENT #:
SA 002

State of California – The Resources Agency
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October 19, 2007

Mr. Bill Wycko
Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103-2479

Dear Mr. Wycko:

Subject: Case No. 2007.0039E – San Antonio Backup Pipeline Project, Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting

The California Department of Fish and Game (DFG) has reviewed the Notice of Preparation (NOP) of an Environmental Impact Review (EIR) for the San Antonio Backup Pipeline Project (proposed project). The San Francisco Public Utilities Commission (SFPUC) proposes to implement four related upgrades to the water management system between the San Antonio Pump Station and the San Antonio Reservoir.

The proposed project would be located between the Hetch Hetchy Alameda Siphons and San Antonio Reservoir in the Sunol Valley. The project area lies just south of the intersection of Highways 680 and 84 along Calaveras Road in Alameda County. The proposed project would include four components to upgrade this portion of the water supply system. The primary project would be the installation of a backup pipeline along the same route as the existing San Antonio pipeline that runs about two miles from the San Antonio Pump Station to the James Turner Dam. To accommodate the increased flows this backup pipeline would be able to handle, upgrades would be necessary at the San Antonio Creek Discharge Facilities at the base of the James Turner Dam at the San Antonio Reservoir, and at the San Antonio Pump Station dechlorination and pH adjustment facility. The proposed project would perform two functions: 1) provide a more reliable and efficient conveyance of emergency discharges from the Hetch Hetchy system when water quality parameters are exceeded; and 2) act as a backup pipeline for moving San Antonio Reservoir water into the Hetch Hetchy system when the San Antonio Pipeline is out of service for maintenance or repair.

DFG recommends a complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats, should be provided to account for and protect special status species and habitat. Rare, threatened and endangered species to

Conserving California's Wildlife Since 1870 be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380). The assessment should identify any rare plants and rare natural communities, following DFG's Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (revised May 8, 2000). The Guidelines are available at www.dfg.ca.gov/whdab/pdfs/guideplt.pdf.

Please be advised that a California Endangered Species Act (CESA) Permit must be obtained if the project has the potential to result in take of species of plants or animals listed under CESA, either during construction or over the life of the project. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the project will impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA Permit.

Please be advised that for any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed, DFG may require a Streambed Alteration Agreement (SAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant. Issuance of SAAs is subject to CEQA. DFG, as a responsible agency under CEQA, will consider the CEQA document for the project. The CEQA document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for completion of the agreement. To obtain information about the SAA notification process, please access our website at www.dfg.ca.gov/1600; or to request a notification package, contact the Streambed Alteration Program at (707) 944-5520.

The NOP states the proposed project would install a 66-inch pipe (material to be determined) alongside the existing San Antonio Pipeline. It would be designed to transfer up to 315 MGD (487cfs) of Hetch Hetchy water from Alameda Siphon No. 3 to the base of James Turner Dam at San Antonio Reservoir. This design capacity is based on anticipated future emergency discharge requirements. This water would be de-chlorinated and pH adjusted at the San Antonio Pump Station (SAPS) before entering the pipeline. Additional chemical storage and distribution facilities would be located adjacent to the existing SAPS. The 487cfs discharge would occur through a new cone valve structure and then into San Antonio Creek. The creek banks in the immediate vicinity of the new and existing cone valves would be reinforced with riprap to protect against bank erosion.

The EIR should disclose impacts to special status species such as federally threatened California tiger salamander (*Ambystoma californiense*), California red-legged frog *(Rana draytonii*), and Central Coast ESU steelhead (*Oncorhynchus mykiss iridieus*). Although we recognize that, at this time, there are barriers in Alameda Creek that preclude steelhead migration to San Antonio Creek, these barriers are in the process of being remediated. Steelhead will likely gain access to San Antonio Creek in the reasonably foreseeable future, and therefore the EIR should disclose the future operational impacts to steelhead (CCR Title 14, section 15064 [(d)(1-3)]). California red-legged frog and California tiger salamander could be breeding in the ponds at the base of Turner Dam. Discharging 487cfs into these ponds thence to San Antonio Creek would have significant impacts on these populations. The EIR should propose mitigation measures that would avoid, minimize, or compensate for the potential impacts and/or take of these special status species due to the construction and future operations of the project.

The EIR should include mitigation measures that treat waters before being discharged into San Antonio creek in order to comply with Fish and Game Code 5650 which states "it is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state...any substance or material deleterious to fish, plant life, mammals, or bird life." Sudden changes in water quality could be deleterious to fish and wildlife in San Antonio Creek and therefore should be considered in the EIR.

The SPFUC proposes to install erosion control methods (e.g., riprap) within and along the banks of San Antonio Creek at the proposed project. DFG understands the importance of erosion control methods on San Antonio Creek. The SFPUC should investigate the use of native vegetation or an alternative method of bioengineering as a means of erosion control rather than the riprap. Bioengineering methods for reducing erosion, such as planting native vegetation, is preferable to a structural approach such as riprap. Structural approaches to stream bank erosion such as riprap tend to fix the stream in one place, exclude riparian vegetation, and prevent the natural movement that creates diverse habitats. Structural approaches are often more expensive and have limited habitat value for fish and wildlife. Over the long term, structural approaches tend to fail or require excessive maintenance. Bioengineering increases the effectiveness of the erosion control method and provides some habitat value as well. For example, streambanks with riprap typically have fewer undercut banks, less low-overhead cover and are less likely than natural stream banks to contribute large woody debris and organic matter from the riparian zone. The use of riprap for erosion control is a temporary and costly fix that lacks the ecological services commonly associated with some bioengineering techniques used for erosion control. Therefore, DFG recommends that bioengeering techniques for erosion control be included as an alternative to riprap in the EIR.

Alternatively, the EIR should include a discussion of the configuration of the cone valve to reduce the potential of erosion. For example, positioning the cone valve parallel to San Antonio Creek could be a more effective way of reducing erosion relative to positioning the cone valve perpindicular to the stream bank.

The alternative analysis in the EIR should include a discussion of potentially discharging this water into San Antonio Reservoir, the Sunol Valley Water Treatment Facility for treatment, or another alternative which would return to the water to the system. These alternatives could then allow the SFPUC to put these waters to beneficial uses rather than having uncontrolled releases in San Antonio Creek. Keeping waters the SFPUC "now has" in the transmission system could be an incremental part of a larger scale water conservation program that could reduce the need to withdraw additional water.

We appreciate your consideration of our comments. DFG personnel are available for consultation regarding resources and strategies to minimize impacts. If you have any questions, please contact Dan Wilson, Environmental Scientist, at (707) 944-5534; or Greg Martinelli, Water Conservation Supervisor, at (707) 944-5570.

Sincerely,

Scott Wilson FOR
Charles Armor
Regional Manager
Bay Delta Region

DOCUMENT #: SA003

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

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November 2, 2007

Mr. Chris Kern
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103-2479

ALA000225
SCH#2007102030

Dear Mr. Kern:

San Antonio Backup Pipeline Projects – Notice of Preparation (NOP)

Thank you for including the California Department of Transportation (Department) in the early stages of the environmental review process for the proposed project. The comments presented below are based on the NOP of a Draft Environmental Impact Report (DEIR) for the San Antonio Backup Pipeline Projects. As lead agency, the San Francisco Planning Department is responsible for all project mitigation, including improvements to state highways. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures in the DEIR. Any required roadway improvements should be completed prior to the issuance of a certificate of occupancy. While an encroachment permit is only required when the project involves work in the State Right of Way (ROW), the Department will not issue an encroachment permit until our concerns are adequately addressed. Therefore, we strongly recommend that the lead agencies ensure resolution of the Department's concerns prior to submittal of an encroachment permit application. Further comments will be provided during the encroachment permit process; see the end of this letter for more information regarding encroachment permits.

The project's environmental analysis needs to include documentation of a current archaeological record search from the Northwest Information Center (NIC) of the California Historical Resources Information System (CHRIS) if construction activities are proposed within State right-of-way (ROW). Current searches must be no more than five years old. The Department requires the records search, and if warranted, a cultural resource study by a qualified, professional archaeologist, to ensure compliance with CEQA, Section 5024.5 of the California Public Resources Code, and Volume 2 of the Department's Environmental Handbook. Work subject to these requirements includes, but is not limited to: lane widening, channelization, auxiliary lanes, and/or modification of existing features such as slopes, drainage features, curbs, sidewalks and driveways within or adjacent to State ROW. These requirements, including applicable mitigation, must be fulfilled before an encroachment permit can be issued for project-related work in State ROW. See the website link below for more information regarding the CHRIS – NIC. (Click on IC Roster).

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http://ohp.parks.ca.gov

We look forward to reviewing the DEIR for this project. Please send a copy to the address at the top of this letterhead, marked ATTN: Lisa Carboni, Mail Stop #10D.

Encroachment Permit
Any work or traffic control within the State ROW requires an encroachment permit that is issued by the Department. Traffic-related mitigation measures will be incorporated into the construction plans during the encroachment permit process. See the following website link for more information: http://www.dot.ca.gov/hq/traffops/developserv/permits/

To apply for an encroachment permit, submit a completed encroachment permit application, environmental documentation, and five (5) sets of plans which clearly indicate State ROW to the address at the top of this letterhead, marked ATTN: Michael Condie, Mail Stop #5E.

Should you have any questions regarding this letter, please call Lisa Carboni at (510) 622-5491.

Sincerely,

Timothy C Sable

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

c: State Clearinghouse

APPENDIX C

WSIP PEIR Mitigation Measures, Applicability to the Proposed Project

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The San Antonio Backup Pipeline project (SABPL or proposed project) was analyzed at a program-level in the Water System Improvement Program (WSIP) Program Environmental Impact Report (PEIR)[1] as one of the facility improvement projects under the WSIP. The PEIR identified programmatic mitigation measures, and under Resolution No. 08-200, the SFPUC adopted the WSIP Mitigation Monitoring and Reporting Program that applies the programmatic mitigation measures to the WSIP facility improvements projects, including the SABPL project. This SABPL Environmental Impact Report (EIR) provides a detailed, project-level analysis of the proposed project based on site-specific and up-to-date information developed subsequent to the preparation of the PEIR. This section identifies the applicability of the WSIP PEIR mitigation measures to the proposed project based on the project-level impact analysis.

Table C-1 lists the programmatic mitigation measures identified in the WSIP PEIR and indicates which of these mitigation measures are applicable to the proposed project. For the programmatic mitigation measures that are applicable, the table identifies the comparable project-level mitigation measure identified in the SABPL EIR that either relies on the programmatic measures or identifies an equivalent or better site-specific mitigation measure to replace the programmatic mitigation measure. The table also provides an explanation for those programmatic mitigation measures that are not applicable to the proposed project.

1 San Francisco Planning Department, *Final Program Environmental Impact Report for the San Francisco Public Utilities Commission's Water System Improvement Program*, San Francisco Planning Department File No. 2005.0159E, State Clearinghouse No. 2005092026. Certified October 30, 2008.

TABLE C-1
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Land Use		
Measure 4.3-2, Facility Siting Studies: Conduct project-specific facility siting studies for non-SFPUC land and implement these studies' recommendations to avoid or minimize impacts on existing land uses.	N	Not applicable; all project facilities are sited on SFPUC-owned land.
Measure 4.3-4a, Architectural Design: Design permanent new, aboveground facilities to be compatible with existing visual character of the site and surrounding area.	Y	The proposed aboveground facilities, including the chemical facility and electrical control building for the new discharge facility at Pit F3-East, would have a similar appearance as the surrounding SFPUC water supply facilities and buildings. Further, existing topography and vegetation would provide partial screening of the proposed aboveground facilities. Although some trees along the Calaveras Road right-of-way would require removal during project construction, Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation) includes provisions for tree replacement to address tree removal impacts.
Measure 4.3-4b, Landscaping Plans: Prepare and implement landscaping plans to restore (recontour, revegetate, landscape) sites to preconstruction conditions. Monitor landscape plantings.	Y	See Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation). The project-level mitigation measure for biological resources requires site restoration with naturally occurring vegetation similar to surrounding habitats or to their site potential, as feasible, and monitoring of restored areas and replacement plantings. This mitigation measure replaces the requirement for preparation and implementation of a landscaping plan in accordance with the PEIR mitigation measure.
Measure 4.3-4c, Landscape Screens: Include new plantings and landscape berms to screen views of new structures and equipment from scenic roads.	N	The proposed aboveground facilities would be similar in appearance as other SFPUC water infrastructure facilities in the Sunol Valley and would be partially screened from Calaveras Road by intervening vegetation and topography. Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation) includes provisions for tree replacement to address tree removal impacts on scenic roads. The aboveground project improvements do not require additional screening. See Impact AE-2, Implementation of the proposed project could result in long-term adverse effects on scenic vistas and scenic resources, and degradation of the visual character of the site and its surroundings.
Measure 4.3-4d, Minimize Tree Removal: Minimize or avoid the removal of trees that screen existing and proposed WSIP facility sites; implement tree replacement plan.	Y	See Mitigation Measures M-BI-1a (General Protection Measures) and M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation).

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Land Use (cont.)		
Measure 4.3-4d (cont.)		The project-level mitigation measures require implementation of protective measures to avoid or minimize impacts on mature native trees during construction, and if removal is necessary, to plant replacement trees at or in close proximity to the removal sites to the extent feasible. If replanting trees on the same location is not feasible or could result in damage to the proposed improvements, the SFPUC in consultation with the applicable resource agencies shall designate a suitable planting site elsewhere in the project vicinity.
Measure 4.3-5, Reduce Lighting Effects: Use cut-off shields and nonglare fixture design, direct lighting onsite and downward, prevent use of highly reflective building materials or finishes.	N	As part of the proposed project and in accordance with the Alameda WMP, nighttime lighting at the new chemical facility, electrical control building for the discharge facility at Pit F3-East, and Alameda Creek Pump Station would be motion-activated, and directed downward and shielded so it is not highly visible or obtrusive. No mitigation is necessary. See Impact AE-3, The proposed project would not create a new permanent source of substantial light and glare.
Geology		
Measure 4.4-1, Quantified Landslide Analysis: Avoid sites with landslide hazards; where they cannot be avoided, conduct site-specific slope stability analyses and implement recommendations.	Y	See Mitigation Measure M-GE-1 (Shoring Plan for Pit F3-East). The proposed project includes construction within the slope of quarry Pit F3-East. The PEIR measure is not applicable because a slope stability analysis at Pit F3-East was prepared as part of the project-specific geotechnical report. The results of the slope stability analysis indicate the quarry pit slopes are stable under static conditions. Mitigation Measure M-GE-1 is prescribed in this EIR to ensure that construction activities within and adjacent to the quarry pit do not cause it to become unstable during construction. See Impact GE-1, The project is located on a geologic unit that could become unstable as a result of project construction.
Measure 4.4-4, Subsidence Monitoring Program: Monitor subsidence and implement corrective actions as warranted.	N	Not applicable; the project does not involve tunneling.
Measure 4.4-9, Characterize Extent of Expansive and Corrosive Soil: Characterize the presence of expansive/corrosive soils; implement recommendations.	N	The presence of expansive and corrosive soils was evaluated as part of the project-specific geotechnical report. The project would be constructed and designed in accordance with the recommendations of the project-specific geotechnical investigation to minimize the effects of any expansive soils. With respect to corrosive soils, the SABPL, transfer pipeline, and other below-ground components would be designed with a cement mortar coating or dielectric coating, and a passive cathodic protection system to protect the pipeline from corrosive soils. With incorporation of these design features, impacts related to expansive and corrosive soils would be less than significant and no mitigation is required. See Impact GE-7, The project would not create significant risks to life or property due to expansive or corrosive soil.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Hydrology		
Measure 4.5-2, Site-Specific Groundwater Analysis and Identified Measures: Conduct project-specific analysis of dewatering and implement measures to ensure that groundwater resources and the beneficial uses of groundwater are not adversely affected.	N	Not necessary. Any project-related effects on the shallow groundwater table would be temporary in nature, as dewatering would be required only during certain phases of construction, and only if groundwater is encountered. See Impact HY-2, Dewatering of excavated areas during project construction would not substantially deplete groundwater supplies.
Measure 4.5-4a, Flood Flow Protection Measures: Preclude exposure of stockpiled soils, hazardous materials, and construction materials to flood flows.	N	The proposed staging areas are located outside of the designated 100-year FEMA flood hazard zone. Mitigation Measure M-HY-1a (Preparation and Implementation of a SWPPP) would require that the construction contractor implement site-specific BMPs to protect water quality during project construction activities. No additional mitigation is necessary.
Measure 4.5-4b, Site-Specific Flooding Analysis and Identified Measures: Implement design measures to preclude projects from causing flooding or damage from redirected flood flows.	N	No mitigation is necessary. The project-level analysis determined that no sensitive receptors would be adversely affected if the proposed floodplain encroachment in the vicinity of Pit F3-East were to result in an increase in 100-year flood elevations. See Impact HY-5, The placement of project facilities within a 100-year flood hazard zone would not substantially impede or redirect flood flows or result in damage to SFPUC facilities or private property.
Measure 4.5-5, **Stormwater Treatment and Groundwater Monitoring:** If treated stormwater is used to maintain Lake Merced water levels, monitor surface water and groundwater quality in the vicinity of Lake Merced. Identify and implement corrective actions (e.g., treatment).	N	Not applicable; this PEIR measure applies only to Groundwater Projects in the San Francisco that have the potential to affect water levels in or near Lake Merced.
Measure 4.5-6, Appropriate Source Controls and Site Design Measures: For projects located in areas not covered by a municipal stormwater permit and disturbing less than one acre of land during construction, implement appropriate source control and site design measures. These measures will ensure compliance with applicable water quality criteria and goals and protect the beneficial uses of the receiving water.	Y	See Mitigation Measure M-HY-1a (Preparation and Implementation of a SWPPP). The proposed project would result in the disturbance of more than one acre of land during construction and is subject to the requirements of the NPDES General Construction Permit. Mitigation Measure M-HY-1a includes provisions to protect water quality during project construction.
Biology		
Measure 4.6-1a, Wetlands Assessment: Wetland scientist will determine whether wetlands could be affected by the project, and, if so, perform a wetland delineation and develop mitigation.	N	Not applicable; a wetlands assessment was performed in support of the project.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)		Applicable to Proposed Project (Y/N)?	Discussion
Biology (cont.)			
Measure 4.6-1b, Compensation for Wetlands and Other Biological Resources: If a WSIP project will affect jurisdictional wetlands, implement avoidance measures, restoration procedures, and compensatory creation or enhancement to ensure no net loss of wetland extent or function. Compensate for sensitive riparian and upland habitats supporting key special-status species. Obtain permits for each project and comply with applicable regulations addressing sensitive habitats and species. The Habitat Reserve Program is an alternative for implementing offsite habitat compensation.		Y	See Mitigation Measure M-BI-3 (Avoidance and Protection Measures for Jurisdictional Water Bodies). The project-level mitigation measure requires avoidance of wetlands and protection of wetlands that cannot be avoided. This mitigation measure is consistent with the PEIR mitigation measure and is specific to the project requirements.
Measure 4.6-2, Habitat Restoration/Tree Replacement: Restore temporarily affected sensitive habitats. Replace trees designated as heritage trees (or similar local designation) consistent with requirements of local ordinances. Minimize loss of sensitive habitats by coordinating WSIP projects.		Y	See Mitigation Measures M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation). The project-level measure is consistent with the PEIR measure and provides additional details that define the trees to be avoided/protected and tree replacement requirements.
Measure 4.6-3a, Protection Measures During Construction for Key Special-Status Species and Other Species of Concern: Where key special-status species and other species of concern are potentially present, implement general practice measures (preconstruction surveys, worker awareness program, environmental inspector, minimization of habitat loss).		Y	See Mitigation Measures M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat), M-BI-1d (Prevent Movement of Specific Species through the Work Areas), M-BI-1e (Preconstruction Surveys and Construction Monitoring and Protocols for California Tiger Salamander, California Red-legged Frog, and Alameda Whipsnake), M-BI-1g (Measures to Minimize Disturbance to Special-Status Bird Species), and M-BI-1h (Conduct Preconstruction Surveys for Any Sensitive Bats Found and Implement Avoidance and Minimization Measures). The project-level measures are consistent with the PEIR measure and provide additional site- and project-specific details where key special-status species and other species of concern are potentially present. An environmental inspector in not required, but a biological monitor is required under Mitigation Measure M-BI-1e.
Measure 4.6-3b, Standard Mitigation Measures for Key Special-Status Plants and Animals: Implement measures to reduce impacts on key special-status species. ***See below for specific species and corresponding sub-PEIR mitigation number.***			
Invertebrates			
Valley Elderberry Longhorn Beetle	I.1	N	Species not identified in project vicinity.
Vernal Pool Crustaceans (Vernal Pool Fairy Shrimp; Conservancy Fairy Shrimp; Vernal Pool Tadpole Shrimp)	I.2	N	Species not identified in project vicinity.
Bay Checkerspot Butterfly; Callippe Silverspot Butterfly	I.3	N	Species not identified in project vicinity.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)		Applicable to Proposed Project (Y/N)?	Discussion
Biology (cont.)			
Measure 4.6-3b (cont.) **Fish**			
Central Valley Fall- and Late-Fall-Run DPS Chinook Salmon; Central Valley DPS Steelhead; Green Sturgeon Southern District DPS; Central Coast DPS Steelhead; Rainbow Trout	F.1	N	Species not identified in project vicinity.
Reptiles and Amphibians			
California Red-Legged Frog; Foothill Yellow-Legged Frog	RA.1	Y	See Mitigation Measures M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat), M-BI-1d (Prevent Movement of Specific Species through the Work Areas), and M-BI-1e (Preconstruction Surveys and Construction Monitoring and Protocols for California Tiger Salamander, California Red-legged Frog, and Alameda Whipsnake). The project-level measures are consistent with the PEIR measure and include site-specific protection measures for all special status species potentially present in the project area.
California Tiger Salamander	RA.2	Y	See Mitigation Measures M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat), M-BI-1d (Prevent Movement of Specific Species through the Work Areas), and M-BI-1e (Preconstruction Surveys and Construction Monitoring for California Tiger Salamander, California Red-legged Frog, and Alameda Whipsnake). The project-level measures are consistent with the PEIR measure and include site-specific protection measures for all special status species potentially present in the project area.
San Francisco Garter Snake	RA.3	N	Species not identified in project vicinity.
Alameda Whipsnake	RA.4	N	See Mitigation Measures M-BI-1b (Worker Training and Awareness Program), M-BI-1c (Minimize Disturbance to Riparian Habitat), M-BI-1d (Prevent Movement of Specific Species through the Work Areas), and M-BI-1e (Preconstruction Surveys and Construction Monitoring for California Tiger Salamander, California Red-legged Frog, and Alameda Whipsnake). The project-level measures are consistent with the PEIR measure and include site-specific protection measures for all special status species potentially present in the project area.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)		Applicable to Proposed Project (Y/N)?	Discussion
Biology (cont.)			
Measure 4.6-3b (cont.) **Birds**			
Swainson's Hawk	B.1	N	Species not identified in project vicinity.
Western Burrowing Owl	B.2 and B.3	N	Species not identified in project vicinity.
Raptors (including Bald Eagle)	B.4	N	Species not identified in project vicinity.
Least Bell's Vireo	B.5	N	Species not identified in project vicinity.
California Black Rail, California Clapper Rail	B.6	N	Species not identified in project vicinity.
Western Snowy Plover	B.7	N	Species not identified in project vicinity.
Mammals			
Salt Marsh Harvest Mouse	M.1	N	Species not identified in project vicinity.
San Joaquin Kit Fox	M.2	N	The project-level habitat assessment found that the project area offers minimal foraging and denning habitat for this species, and this species is absent or extremely scarce in the Sunol Valley. No mitigation is necessary.
Riparian Woodrat	M.3	N	Species not identified in project vicinity.
Plants			
Vernal Pool Plants (Succulent Owl's Clover; Hoover's Spurge; Colusa Grass; San Joaquin Valley Orcutt Grass; Greene's Tuctoria; Hairy Orcutt Grass)	P.1	N	Species not identified in project vicinity.
Riparian Plants			
Delta Button-Celery	P.2	N	Species not identified in project vicinity.
Large-Flowered Fiddleneck	P.3	N	Species not identified in project vicinity.
San Francisco Woolly Sunflower; Marin Western Flax; Fountain Thistle	P.4	N	Species not identified in project vicinity.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Biology (cont.)		
Measure 4.6-4, Pipeline and Water Treatment Plant Treated Water Discharge Restrictions: Design planned discharges from the WSIP pipelines and water treatment plants to natural water bodies to minimize impacts on riparian and aquatic resources and to avoid or minimize temperature effects on aquatic resources.	N	The project-level analysis determined that mandatory compliance with the Waste Discharge Requirements for the SFPUC Drinking Water Transmission System and SFPUC Standard Operating Protocols would ensure that water quality impacts due to discharges of treated water from existing and newly installed pipelines during construction would be less than significant. As part of the project, the SFPUC would construct a new chemical facility to ensure that all discharges of water from the Hetch Hetchy system during project operations could be dechlorinated and pH-adjusted prior to discharge. This would address impacts on riparian and aquatic resources.
Cultural		
Measure 4.7-1, Suspend Construction Work if Paleontological Resource Is Identified: Suspend work and notify a qualified paleontologist when a paleontological resource is discovered at any of the project sites. The paleontologist will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under CEQA criteria. Temporarily halt or divert excavation within 50 feet of a fossil find until the discovery is examined by a paleontologist. If avoidance is not feasible, the paleontologist will prepare an excavation plan.	Y	See Mitigation Measure M-CP-3 (Paleontological Resources Mitigation Program). The project-level measures specify more stringent requirements than the PEIR measure due to the high potential to encounter paleontological resources during construction. Specific requirements include a paleontological resources training for construction workers, a paleontological resources monitoring program, and assessment and salvage of fossil finds, as applicable.
Measure 4.7-2a, Archaeological Testing, Monitoring, and Treatment of Human Remains: Determine if implementation of an archaeological testing or archaeological monitoring program or both is the appropriate strategy for avoidance of potential adverse effects on significant archaeological resources. Review any requirements approved by the State Historic Preservation Officer. Prepare an archaeological testing plan, archaeological monitoring plan, final archeological resources report and, if applicable, an archaeological data recovery plan. The treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity will comply with applicable state laws.	Y	See Mitigation Measure M-CP-4 (Accidental Discovery of Human Remains). Although no known human burial locations have been identified within the project area, the EIR measure addresses the possibility of discovery during construction activities.
Measure 4.7-2b, Accidental Discovery Measures: Distribute archaeological resource “ALERT” sheet to contractors. If an archaeological resource may be present within the project site, an archaeological consultant will evaluate it and make a recommendation as to what action (e.g., preservation in situ) is warranted. The SFPUC will implement appropriate measures.	Y	See Mitigation Measure M-CP-2b (Accidental Discovery of Archaeological Resources).

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Cultural (cont.)		
Measure 4.7-3, Protection of Historic Districts: A qualified historian will assess the city's water system facilities affected by WSIP facility projects for their potential contribution to a historic district. If a historic district would be affected by one or more proposed WSIP facility project(s), develop and implement mitigation measures for effects with attention to the potential district as a whole. If a historic district is identified at the project level, it should be recorded as such, using National/California Register criteria of significance. Document the district by completing the State of California Department of Parks and Recreation Form 523 and submit to the State Historic Preservation Officer.	Y	See also Mitigation Measure M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2, and 3). The Alameda Siphons Nos. 1 and 2 may contribute to a potential historic district, and the proposed project could potentially result in damage to the Alameda Siphons Nos. 1 and 2 during connection of the SABPL to Alameda Siphon No. 3.
Measure 4.7-4a, Alternatives Identification and Resource Relocation: Identify feasible project alternatives to eliminate or reduce the need for demolition or removal of a historic resource to the greatest extent possible. If preservation of the affected historical resource at the current site is determined to be infeasible, the structure will be stabilized and relocated to other appropriate nearby sites, if feasible. After relocation, the resource will be treated according to the Secretary of the Interior's *Standards for the Treatment of Historic Properties.* If the affected historic resource is to be demolished, consult with local historical societies and governmental agencies regarding salvage of materials for public information or reuse in other locations.	N	No historic resources would be demolished or removed as a result of the project.
Measure 4.7-4b, Historical Resources Documentation: Prepare documentation of historic resources prior to any construction work associated with demolition or removal. The appropriate level of documentation will be selected by a qualified professional who meets the standards for history, architectural history, and/or architecture (as appropriate) set forth by the Secretary of the Interior's *Professional Qualification Standards* (36 CFR 61) in consultation with a preservation specialist assigned by the San Francisco Planning Department and the local jurisdiction, if deemed appropriate by the Planning Department.	N	No historic resources would be demolished or removed as a result of the project.
Measure 4.7-4c, Secretary of the Interior's Standards for the Treatment of Historic Properties: Prepare materials describing and depicting the proposed project. Review the proposed project for compliance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. If a project is determined to be inconsistent with the *Standards for the Treatment of Historic Properties*, pursue and implement redesign of the project such that consistency with the standards is achieved.	N	No historic properties would be altered as a result of project implementation.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Cultural (cont.)		
Measure 4.7-4d, Historic Resources Survey and Redesign: Undertake a historic resources survey to identify and evaluate potential historic resources that may exist in the project's area of potential effect. If a survey identifies one or more historical resources, assess the impact the project may have on those historical resources. If the project will cause a substantial adverse change to a historic resource, assign a preservation specialist to review the proposed project for compliance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. If the project is determined to be inconsistent with those standards, pursue and implement redesign of the project such that consistency with the standards is achieved.	N	The historic resources survey was conducted as part of background technical study for the project and is documented in Section 5.4.1.6, Architectural/ Structural Methods, Survey, and Results.
Measure 4.7-4e, Historic Resources Protection Plan: A qualified historian will prepare a plan that specifies procedures for protecting and monitoring historic resources during construction.	Y	See Mitigation Measure M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2 and 3).
Measure 4.7-4f, Preconstruction Surveys and Vibration Monitoring: Include geotechnical investigations if vibration-related impacts could affect historic resources. Follow recommendations of the final geotechnical reports. Conduct a preconstruction survey of existing conditions and monitor the adjacent buildings for damage during construction, if recommended.	Y	See Mitigation Measure M-UT-1h (Measures to Protect Alameda Siphons Nos. 1, 2 and 3). The project-level measure is more specific to the potential impacts of the project and requires that SFPUC engineers evaluate the structural integrity of these historic resources and implement construction techniques to protect them during project construction, including protection from surface vibration.
Traffic		
Measure 4.8-1a, Traffic Control Plan Measures: Elements of the traffic control plan could include: circulation and detour plans, designated truck routes, sufficient staging area, access to driveways, use of standard construction specifications for controlling construction vehicle movements, restrictions on truck trips during peak morning and evening commute hours, lane closure restrictions, maintenance of alternate one-way traffic flow, detour signing, pedestrian and bicycle access and circulation, equipment and materials storage, construction worker parking, roadside safety protocols, considerations for sensitive land uses, coordination with local transit service providers, roadway repair, and conformance with the state's *Manual of Traffic Controls for Construction and Maintenance Work Areas*.	Y	See Mitigation Measure M-TR-3 (Traffic Control Plan). The project-level mitigation measure has been tailored to specify those elements appropriate to the proposed project.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Traffic (cont.)		
Measure 4.8-1b, Coordination of Individual Traffic Control Plans: In the event that more than one construction contract is issued for work along existing or new pipelines, and where construction could occur within and/or across multiple streets in the same vicinity, coordinate the traffic control plans in order to mitigate the impact of traffic disruption by including measures that address overlapping construction schedules and activities, truck arrivals and departures, lane closures and detours, and the adequacy of on-street staging requirements.	Y	See Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan).
Measure 4.8-4, Accommodation of Displaced Public Parking Supply for Recreational Visitors: Include an additional measure in the traffic control plans to accommodate any anticipated visitor parking demand that would be displaced by proposed projects at public recreational facilities.	N	No recreational parking would be displaced under the project.
Air Quality		
Measure 4.9-1a, SJVAPCD Dust Control Measures: Include San Joaquin Valley Air Pollution Control District (SJVAPCD) Basic Control Measures in contract specifications for all construction sites. Include SJVAPCD Enhanced Control Measures in contract specifications when required to mitigate significant PM_{10} impacts. Include SJVAPCD Additional Control Measures in contract specifications for construction sites that are large in area, located near sensitive receptors, or which for any other reason warrant additional emissions reductions. Include SJVAPCD Rule 9510, Indirect Source Review, Section 6.1, Construction Equipment Emissions in contract specifications for any project subject to discretionary approval by a public agency that ultimately results in the construction of a new building, facility, or structure or reconstruction of a building, facility, or structure for the purpose of increasing capacity or activity and also involving 9,000 square feet of space.	N	The project is not located within the jurisdiction of the SJVAPCD.
Measure 4.9-1b, SJVAPCD Exhaust Control Measures: Include SJVAPCD Exhaust Control Measures in contract specifications, where applicable, for heavy-duty equipment to limit exhaust emissions within the San Joaquin Region.	N	The project is not located within the jurisdiction of the SJVAPCD.
Measure 4.9-1c, BAAQMD Dust Control Measures: For projects in the Sunol Valley, Bay Division, Peninsula, and San Francisco Regions, include Bay Area Air Quality Management District (BAAQMD) Basic Control Measures in contract specifications for all construction sites. Include BAAQMD Enhanced Control Measures in contract specifications for sites over four acres. Include BAAQMD Optional Control Measures in contract specifications for sites that are large in area, located near sensitive receptors, or which for any other reason warrant additional emissions reductions.	Y	See Mitigation Measure M-AQ-1a (BAAQMD Basic Construction Measures). The project-level mitigation is consistent with the BAAQMD guidelines for assessing and mitigating air quality impacts.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Air Quality (cont.)		
Measure 4.9-1d, BAAQMD Exhaust Control Measures: For projects in the Sunol Valley, Bay Division, Peninsula, and San Francisco Regions, include BAAQMD Exhaust Control Measures to limit exhaust emissions, where applicable.	Y	See Mitigation Measure M-AQ-1b (BAAQMD Additional Construction Measures for NO_x Reduction). The project-level mitigation is consistent with the BAAQMD guidelines for assessing and mitigating air quality impacts.
Measure 4.9-2a, Health Risk Screening or Use of Soot Filters: Complete a health risk screening if truck volumes associated with a particular project along a particular haul route exceed 40,000 truck trips over the entire construction period. If a potentially significant impact is indicated, complete a site-specific health risk assessment. Consider diesel particulate matter (DPM) emission rates in separate project-level analysis at the time of construction. Develop a mitigation program based on the site-specific health risk assessment implementing methods of reducing DPM emission or exposure to a less-than-significant level.	N	The health risk assessment conducted as part of the background studies for the proposed project determined that DPM exposure at the only sensitive receptor along construction access routes, the SFPUC watershed keeper's residence, would not exceed the BAAQMD's cancer and non-cancer risk thresholds. No mitigation is required.
Measure 4.9-2b, Vacate SFPUC Land Managers' Residences in Sunol Valley: Vacate the two SFPUC Land Managers' residences in the Sunol Valley during construction of the Calaveras Dam or SVWTP – Treated Water Reservoirs projects or complete a health risk screening (and, if warranted, a health risk assessment) to determine health risks at these residences from either of these two projects.	N	The health risk assessment conducted as part of the background studies for the proposed project determined that DPM exposure at the only sensitive receptor along construction access routes, the SFPUC watershed keeper's residence, would not exceed the BAAQMD's cancer and non-cancer risk thresholds. At the time the Draft EIR was prepared, the SFPUC watershed keeper's residence was vacant but even if occupied in the future, no mitigation is necessary.
Measure 4.9-3, Tunnel Gas Odor Control: Add water scrubbers and appropriate chemicals to tunnel ventilation systems if odorous gases become a nuisance odor problem (i.e., odor complaints are received).	N	The project does not include tunneling.
Noise/Vibration		
Measure 4.10-1a, Noise Controls: For all WSIP projects located within 500 feet of any noise-sensitive receptors, implement appropriate noise controls to reduce daytime construction noise levels to meet the 70-dBA daytime speech interference criterion to the extent feasible. For all WSIP projects involving nighttime construction and located within 3,000 feet of any noise-sensitive receptors, implement appropriate noise controls to maintain noise levels at or below any applicable ordinance nighttime noise limits or the 50-dBA nighttime sleep interference criterion to the extent feasible.	Y	Construction-related daytime noise levels were determined to be less than significant. For nighttime construction noise, see Mitigation Measure M-NO-1 (Administrative and Source Controls).

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Noise/Vibration (cont.)		
Measure 4.10-1b, Vacate SFPUC Caretaker's Residence at Tesla Portal: Vacate caretaker's residence at Tesla Portal during construction of the Advanced Disinfection and Tesla Portal Disinfection Station projects as well as those portions of the San Joaquin Pipeline System and Rehabilitation of Existing San Joaquin Pipelines projects located at Tesla Portal.	N	The project is not located at the Tesla Portal.
Measure 4.10-2a, Limit Hourly Truck Volumes: Haul and delivery truck routes for all WSIP projects will, to the extent feasible, avoid local residential streets and follow local designated truck routes. Total project-related haul and delivery truck volumes on any particular haul truck route will be limited to 80 trucks per hour.	N	Although two residences, the Garcia residence and SFPUC watershed keeper's residence, exist in the Sunol Valley, none of the construction access routes are located on residential streets. Truck volumes would vary day to day and would not exceed 80 trucks per hour. See Impact NO-1, Construction activities would result in substantial temporary increases in ambient noise levels that could interfere with nearby land uses.
Measure 4.10-2b, Restrict Truck Operations: Prohibit haul and delivery trucks from operating within 200 feet of any residential uses during the nighttime hours. For receptors beyond 200 feet from a haul route, limit noise levels to the 50-dBA sleep interference criterion at the closest receptor.	N	Not applicable; project-related haul and delivery trucks would not operate along Calaveras Road during the nighttime or evening hours (10 p.m. to 7 a.m.).
Measure 4.10-2c, Vacate SFPUC Land Manager's Residence: Vacate Land Manager's residence adjacent to Alameda East Portal during offsite truck operations associated with the New Irvington Tunnel project, if truck operations occur during the nighttime hours (10 p.m. to 7 a.m.) and are estimated to exceed the 50-dBA sleep interference criterion at this residence.	N	Not applicable; project-related haul and delivery trucks would not operate along Calaveras Road during nighttime hours (10 p.m. to 7 a.m.).
Measure 4.10-3a, Vibration Controls to Prevent Cosmetic or Structural Damage: Incorporate restrictions into all contract specifications (primarily for sheetpile driving, pile driving, or tunnel construction activities), whereby surface vibration will be limited to 0.2 inch/second peak particle velocity (PPV) for continuous vibration (e.g., vibratory equipment and impact pile drivers) and 0.5 inch/second PPV for controlled detonations at the closest receptors to ensure that cosmetic or structural damage does not occur.	N	Not applicable; the project's vibration impacts were determined to be less than significant. See Impact NO-3.
Measure 4.10-3b, Limit Vibration Levels At or Below Vibration Perception Threshold: Maintain vibration levels at or below the vibration perception threshold at adjacent properties to the extent feasible during nighttime. If vibration complaints are received, operational adjustments will be made to reduce vibration annoyance effects.	N	Not applicable; the project's vibration impacts were determined to be less than significant. See Impact NO-3.
Measure 4.10-3c, Limit Tunnel-Related Detonation to Daylight Hours: Limit controlled detonation associated with tunnel construction to daylight hours, Monday through Saturday.	N	Not applicable; the project does not include tunneling.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Services/Utilities		
Measure 4.11-1a, Notify Neighbors of Potential Utility Service Disruption: Notify residents and businesses in project area of potential utility service disruption two to four days in advance of construction.	N	Project construction is not anticipated to result in utility service disruption for residences or businesses.
Measure 4.11-1b, Locate Utility Lines Prior to Excavation: Locate overhead and underground utility lines prior to excavation work.	Y	See Mitigation Measure M-UT-1a (Confirm Utility Line Information).
Measure 4.11-1c, Confirmation of Utility Line Information: Find the exact location of underground utilities by safe and acceptable means. Confirm information regarding the size, color, and location of existing utilities before construction activities commence.	Y	See Mitigation Measure M-UT-1a (Confirm Utility Line Information).
Measure 4.11-1d, Safeguard Employees from Potential Accidents Related to Underground Utilities: While any excavation is open, protect, support, or remove underground utilities as necessary to safeguard employees.	Y	See Mitigation Measure M-UT-1b (Safeguard Employees from Potential Accidents Related to Underground Utilities).
Measure 4.11-1e, Notify Local Fire Departments: Notify local fire departments any time damage to a gas utility results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety.	Y	See Mitigation Measure M-UT-1c (Notify Local Fire Departments).
Measure 4.11-1f, Emergency Response Plan: Develop an emergency response plan in the event of a leak or explosion prior to commencing construction activities.	Y	See Mitigation Measure M-UT-1d (Emergency Response Plan).
Measure 4.11-1g, Prompt Reconnection of Utilities: Promptly reconnect any disconnected utility lines.	Y	See Mitigation Measure M-UT-1e (Ensure Prompt Reconnection of Utilities)
Measure 4.11-1h, Coordinate Final Construction Plans with Affected Utilities: Coordinate final construction plans and specifications with affected utilities.	Y	See Mitigation Measure M-UT-1f (Coordinate Final Construction Plans with Affected Utilities).
Measure 4.11-2, Waste Reduction Measures: Incorporate into contract specifications for each WSIP project the requirement to obtain any necessary waste management permits prior to construction and to comply with conditions of approval attached to project implementation.	N	Seventy-five percent of excavated materials would be reused or recycled in Sunol Valley, which would meet or exceed the State of California's and Alameda County's waste diversion goals. See Impact UT-4, Project construction would not result in a substantial adverse effect related to compliance with federal, state, and local statutes and regulations pertaining to solid waste.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Recreation		
Measure 4.12-1, Coordination with Golf Course/Recreational Facility Managers: Coordinate with managers of golf courses or other recreational facilities directly affected by pipeline construction to minimize adverse impacts on golfers and other recreational users.	N	The project would not directly affect golf courses or other designated recreational facilities.
Measure 4.12-2, Appropriate Siting of Proposed Facilities: Locate WSIP project facilities on park and recreation properties in consultation with park planning staff to minimize the direct loss of recreation and play space and to minimize inconvenience to park and recreation users.	N	The project does not include construction on park or recreation properties.
Agriculture		
Measure 4.13-1a, Supplemental Noticing and Soil Stockpiling: For the San Joaquin Pipeline projects (San Joaquin System and Rehabilitation of Existing San Joaquin Pipeline), stockpile and replace topsoil in mapped areas of Prime and Unique Farmland and Farmland of Statewide Importance that would be temporarily disturbed by pipeline construction, unless other actions are required under specific agreements with individual landowners.	N	The project is not located in the San Joaquin Region.
Measure 4.13-1b, Avoidance or Soil Stockpiling: Minimize any potential impacts on agricultural lands in the Sunol Valley by avoiding these resources wherever possible. Where this is not possible, stockpile, replace, and hydroseed topsoil to prevent erosion, unless other actions are required as a result of contracts affecting use of the property or under specific agreements with individual landowners.	Y	Although not specifically targeted at minimizing impacts on agricultural lands, Mitigation Measure M-BI-1f (Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation) requires that topsoil be salvaged during construction and used for post-construction restoration of disturbed areas. Mitigation Measure M-AG-1 (Compensation for Loss of Unique Farmland) addresses impacts to agricultural resources.
Measure 4.13-2, Siting Facilities to Avoid Prime Farmland: Avoid areas identified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. If avoidance is not feasible, adopt a permanent set-aside for an equivalent acreage of similarly valued farmland in the area.	Y	See Mitigation Measure M-AG-1 (Compensation for Loss of Unique Farmland).

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Hazards		
Measure 4.14-1a, Site Health and Safety Plan: For all projects where the site assessment indicates the potential to encounter hazardous materials, prepare a site health and safety plan identifying the chemicals present, potential health and safety hazards, monitoring, soil-handling methods, appropriate personnel protective equipment, and emergency response procedures.	Y	See Mitigation Measure M-HZ-1b (Implement a Construction Risk and Spoils Management Plan). The project-level mitigation measure combines the requirements for a site health and safety plan and materials disposal plan required in PEIR Measures 4.14-1a and 4.14-1b.
Measure 4.14-1b, Materials Disposal Plan: For all projects where the site assessment indicates the potential to encounter hazardous materials in the soil, prepare a materials disposal plan that specifies the disposal method and approved disposal site for the soil.	Y	See Mitigation Measures M-HZ-1a (Evaluate Soil Quality) and M-HZ-1b (Implement a Construction Risk and Spoils Management Plan). The project-level mitigation measures fulfill the requirements for a site health and safety plan and materials disposal plan required in PEIR Measures 4.14-1a and 4.14-1b.
Measure 4.14-1c, Coordination with Property Owners and Regulatory Agencies: Based on regulatory agency file reviews, assess the potential to encounter unacceptable levels of hazardous materials at known environmental cases, for construction activities to cause groundwater plume migration or interfere with ongoing remediations at known environmental cases, and for increased water levels in reservoirs or lakes to inundate known environmental cases. Modify construction or remediation activities.	N	The project would not interfere with the investigation or remediation of a known environmental case. See Section 5.17.1.1, Hazardous Materials in Soil and Groundwater.
Measure 4.14-2, Health Risk Screening and Airborne Asbestos Monitoring Plan: For tunneling projects where soil or rock may contain naturally occurring asbestos, conduct a health risk screening assessment to identify acceptable levels of asbestos in tunnel emissions. Prepare an airborne asbestos monitoring plan for approval by the BAAQMD.	N	The project would not disturb a rock unit or soil that contains naturally occurring asbestos. See Section 5.17.2.1, Federal and State Regulations.
Measure 4.14-5, Hazardous Building Materials Surveys and Abatement: For all WSIP projects involving demolition or renovation of existing facilities, perform a hazardous building materials survey for each structure prior to demolition or renovation activities. If any friable asbestos-containing materials, lead-containing materials, or hazardous components of building materials are identified, implement adequate abatement practices prior to demolition or renovation.	Y	The project would require decommissioning of the existing chemical facility and demolition of two quarry buildings. Impacts related to the inadvertent release of hazardous chemicals during decommissioning of the existing chemical facility would be less than significant with preparation of a closure plan in accordance with Alameda County Department of Environmental Health facility closure requirements. Impacts related to hazardous building materials would be less than significant with implementation of Mitigation Measure M-HZ-1c (Hazardous Building Materials) and mandatory adherence to Cal/OSHA's Lead in Construction Standard and the requirements of the California Health and Safety Code and the BAAQMD for abatement of asbestos in buildings.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Energy		
Measure 4.15-2, Incorporation of Energy Efficiency Measures: Consistent with the Energy Action Plan II priorities for reducing energy usage, ensure that energy-efficient equipment is used in all WSIP projects. Prepare a repair and maintenance plan for each facility to minimize power use. Evaluate the potential for use of renewable energy resources.	N	Not applicable; the proposed project would incorporate energy efficiency measures in accordance with the 2008 Energy Efficiency Standards for Residential and Nonresidential Buildings and no mitigation would be required. See Impact ME-4, Project operations would not result in substantial adverse effects related to the long-term use of large amounts of fuel or energy, or the use of these resources in a wasteful manner.
Collective Impacts (These are considered cumulative mitigation measures in project-level CEQA documents)		
Measure 4.16-1a, Construction Coordination at Irvington Portal: If construction schedules of multiple WSIP projects occurring at and near Irvington Portal coincide or overlap, the SFPUC will coordinate with construction contractor(s) and neighbors to minimize disturbance of residents in the adjacent neighborhood to the extent practicable. Such coordination will need to balance the duration of construction with the magnitude of construction-related impacts on the same sensitive receptors.	N	The project is not located at the Irvington Portal.
Measure 4.16-4a, Bioregional Habitat Restoration Measures: Address the following bioregional effects and implement conservation principles when implementing habitat compensation mitigation required for individual WSIP facility projects: compound impacts on functional units of habitat as WSIP projects simplify vegetation structure and increase "edge" (the boundary between two different habitats); increased habitat impacts due to the spread of weedy, non-native plant species; genetic diversity impacts on small populations; impacts on wildlife movement due to habitat fragmentation; suppression of natural disturbance regimes; and reduced population recovery opportunities from stochastic events.	N	The project's contribution to cumulative effects on biological resources would be mitigated with project-specific mitigation measures and therefore would not require implementation of bioregional habitat restoration measures. See Impact C-BI, Project implementation would result in a cumulatively considerable contribution to cumulative impacts on biological resources during project construction and operation.
Measure 4.16-4b, Coordination of Construction Staging and Access: Coordinate construction contractor(s) to minimize surface disturbance when construction schedules for WSIP projects affecting the same areas overlap.	N	SFPUC is already coordinating construction schedules, staging, and access issues for SFPUC projects in the Sunol Valley.
Measure 4.16-6a, SFPUC WSIP Projects Construction Coordinator: Identify a qualified construction coordinator to coordinate project-specific traffic control plans; develop a public information campaign to inform the public of construction activities, detour routes, and alternate routes; and work with local and regional agencies to pursue additional traffic mitigation measures and incorporate such measures into the project-specific traffic control plans.	Y	See Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan). The PEIR measure for an SFPUC WSIP projects construction coordinator is incorporated into the project-level measure for cumulative impacts.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Collective Impacts (cont.)		
Measure 4.16-6b, Combined San Joaquin Traffic Control Plan: Develop a San Joaquin Traffic Control Plan that coordinates the project-specific traffic control plans and identifies additional measures (consistent with the standards of San Joaquin County, Stanislaus County, and Caltrans) to minimize the combined impacts of multiple WSIP project construction traffic on I-580, Chrisman Road, and Vernalis Road.	N	The project is not located in San Joaquin County.
Measure 4.16-6c, Combined Sunol Valley Traffic Control Plan: Develop a Sunol Valley Traffic Control Plan that coordinates the project-specific traffic control plans and identifies additional measures (consistent with the standards of Alameda County and Caltrans) to minimize the impacts of construction traffic on Calaveras Road and I-680.	Y	See Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan).
Measure 4.16-7a, Dust and Exhaust Control Measures for All WSIP Projects: Require implementation of Air Quality Measures 4.9-1a thru 4.9-1d for all WSIP projects to address collective construction-related air quality impacts.	N	Specified air quality measures are already required under project-level Mitigation Measures M-AQ-1a (BAAQMD General Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_x Reduction).
Measure 4.16-7b, Health Risk Screening or Use of Soot Filters for All Projects in the San Joaquin and Sunol Valley Regions: Require Measure 4.9-2a for all WSIP projects in the San Joaquin and Sunol Valley Regions to address collective DPM impacts. When this requirement is applied to the New Irvington Tunnel project, it will be applied to both the Sunol Valley and Fremont tunnel portals, taking into account truck traffic from other WSIP projects in the vicinity of both portals.	Y	See Mitigation Measure M-AQ-1b (BAAQMD Additional Construction Measures for NO_x Reduction). The project's contribution to significant and unavoidable cumulative health risk impacts are addressed by Mitigation Measure M-AQ-1b, which requires that "All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NOX and DPM, including all generators meeting Tier 4 standards." The Best Available Control Technology for DPM emissions reductions is Tier 3 engines, and the only practical way to achieve the Tier 3 DPM standard for diesel-fueled equipment (burning diesel fuel) is with diesel particulate filters (soot filters). Therefore, it is assumed that soot filters would be implemented as part of the project-level mitigation.
Measure 4.16-7c, Vacate SFPUC Land Managers' Residences for All Projects in the Sunol Valley Region: Require Measure 4.9-2b for all WSIP projects in the Sunol Valley Region to address collective DPM impacts.	N	Vacation of the land manager's residence would not be required as a result of project-implementation because the project's contribution to cumulative DPM emissions would not be cumulatively considerable.

TABLE C-1 (Continued)
PEIR MITIGATION MEASURES – CONSISTENCY REVIEW FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

PEIR Mitigation Measure(s)	Applicable to Proposed Project (Y/N)?	Discussion
Measure 4.16-8a, Limiting Hourly Truck Volumes and Restricting Truck Operations on Haul Routes for Multiple WSIP Projects: Apply Measures 4.10-2a and 4.10-2b to total haul and delivery truck volumes attributable to all WSIP projects on any particular haul truck route (including haul routes in the Tesla Portal, Irvington Portal, and Lower Crystal Springs Dam vicinities as well as haul routes in the San Francisco Region) to address collective truck-related noise impacts.	N	Based on project traffic volumes for all Sunol Valley projects and the proximity of sensitive receptors, cumulative impacts related to temporary noise disturbance along construction access routes would be less than significant.
Collective Impacts (cont.)		
Measure 4.16-8b, Vacate Land Manager's Residence for All Projects in Sunol Valley Region: To address collective noise impacts, vacate Land Manager's residence adjacent to Alameda East Portal during construction truck operations associated with all WSIP projects in this region if collective daytime truck volumes exceed the 70-dBA speech interference criterion or nighttime truck volumes exceed the 50-dBA sleep interference criterion.	N	Based on project traffic volumes for all Sunol Valley projects and the proximity of the Land Manager's residence, noise levels from cumulative traffic on Calaveras Road would not exceed the 70-dBA speech interference criteria, and the proposed project would not include nighttime haul truck traffic.
Cumulative Effects		
Measure 4.17-6, SFPUC WSIP Projects Construction Coordinator – Other Agencies: The SFPUC WSIP construction coordinator designated in accordance with Measure 4.16-6a will also consider the effects of any traffic generated by SFPUC maintenance activities and other SFPUC projects; and coordinate with Caltrans, other county agencies, and local jurisdictions regarding construction of other private and public development projects so as to minimize traffic impacts on local access roads.	Y	See Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan).
Measure 4.17-8, Coordination of Truck Traffic on Local Streets: The SFPUC WSIP construction coordinator designated in Measure 4.17-6 will also be responsible for coordinating truck traffic generated on these same streets by SFPUC maintenance activities and other SFPUC projects so that SFPUC-related truck noise increases are maintained at or below threshold levels specified in Measures 4.10-2a and 4.10-2b to the extent feasible.	Y	See Mitigation Measure C-M-TR (Combined Sunol Valley Traffic Control Plan).

NOTES:
(a) See WSIP PEIR, Volume 4, Chapter 6, Table 6-2, for description of standard programmatic biological resources mitigation measures that correspond to each special status species.

APPENDIX D

List of Wildlife Species Observed within the Biological Resources Study Area

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SPECIES OBSERVED ON THE SAN ANTONIO BACKUP PIPELINE PROJECT AREA

Common Name	Scientific Name	Habitat Type Where the Species was Observed
Fish		
Mosquito fish	*Gambusia*	Lacustrine
Minnows (unidentified)		San Antonio Creek
Amphibians		
American bullfrog	*Lithobates catesbeianus*	Lacustrine
Pacific chorus frog	*Pseudacris regilla*	Freshwater marsh Seasonal wetland
Western toad	*Bufo boreas*	Freshwater marsh Seasonal wetland
Reptiles		
Western rattlesnake	*Crotalus viridis helleri*	Riparian
Western fence lizard (coast range)	*Sceloporus occidentalis bocourtii*	Non-native annual grasslands Riparian
Birds		
Spotted sandpiper	*Actitis macularia*	Lacustrine (on exposed pump piping at the water surface)
Red-winged blackbird	*Agelaius phoeniceus*	Freshwater marsh Seasonal wetland Non-native annual grasslands Ruderal
Tricolored blackbird	*Agelaius tricolor*	Freshwater marsh Seasonal wetland Non-native annual grasslands Ruderal Alameda Creek channel
Mallard	*Anas platyrhynchos*	Lacustrine
Western scrub jay	*Aphelocoma californica*	Riparian
Oak titmouse	*Baeolophus inornatus*	Non-native annual grasslands (occasional oak trees)
Canada goose	*Branta canadensis*	Lacustrine
Red-tailed hawk	*Buteo jamaicensis*	Non-native annual grasslands (occasional oak trees)
Green heron	*Butorides virescens*	Lacustrine (water’s edge)
California quail	*Callipepla californica*	Non-native annual grasslands (coyote brush)
Anna's hummingbird	*Calypte anna*	Riparian
Lesser goldfinch	*Carduelis psaltria*	Riparian
American goldfinch	*Carduelis tristis*	Riparian
House finch	*Carpodacus mexicanus*	Non-native annual grasslands
Turkey vulture	*Cathartes aura*	Non-native annual grasslands Developed (rubble piles)
Killdeer	*Charadrius vociferus*	Non-native annual grasslands/Ruderal Developed (roads)

SPECIES OBSERVED ON THE SAN ANTONIO BACKUP PIPELINE PROJECT AREA (Continued)

Common Name	Scientific Name	Habitat Type Where the Species was Observed
Birds (cont.)		
American crow	*Corvus brachyrhynchos*	Riparian Non-native annual grasslands
Brewer's blackbird	*Euphagus cyanocephalus*	Non-native annual grasslands Ruderal
American kestrel	*Falco sparverius*	Non-native annual grasslands
American coot	*Fulica americana*	Lacustrine
Bullock's oriole	*Icterus bullockii*	Riparian
Belted kingfisher	*Megaceryle alcyon*	Lacustrine
Acorn woodpecker	*Melanerpes formicivorus*	Non-native annual grasslands (occasional oak trees)
Wild turkey	*Meleagris gallopavo*	Non-native annual grasslands
Song sparrow	*Melospiza melodia*	Freshwater marsh Ruderal
Black-crowned night heron	*Nycticorax nycticorax*	Lacustrine (water's edge)
Savannah sparrow	*Passerculus sandwichensis*	Freshwater marsh Ruderal
Brandt's cormorant	*Phalacrocorax penicillatus*	Lacustrine
Bushtit	*Psaltriparus minimus*	Non-native annual grasslands (occasional oak trees)
Black phoebe	*Sayornis nigricans*	Riparian Freshwater marsh Lacustrine (water's edge)
Western bluebird	*Sialia mexicana*	Non-native annual grasslands
white-breasted nuthatch	*Sitta carolinensis*	Non-native annual grasslands (occasional oak trees)
Rough-winged swallow	*Stelgidopteryx serripennis*	Lacustrine (foraging over quarry pond)
European starling	*Sturnus vulgaris*	Non-native annual grasslands (occasional oak trees) Riparian
Tree swallow	*Tachycineta bicolor*	Lacustrine (foraging over quarry pond)
Bewick's wren	*Thryomanes bewickii*	Non-native annual grasslands (occasional oak trees) Riparian
Western kingbird	*Tyrannus verticalis*	Non-native annual grasslands (occasional oak trees)
Mammals		
Black-tailed jackrabbit	*Lepus californicus*	Non-native annual grasslands
California ground squirrel	*Spermophilus beecheyi*	Non-native annual grasslands
Tule elk	*Cervus elaphus nannodes*	Hilltops east of Calaveras Road

APPENDIX E

List of Plant Species Observed within the Biological Resources Study Area

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Plant Species Observed
San Antonio Backup Pipeline Project Focused Surveys
March 11 and 17, April 21, May 4, 2009, and November 17, 2010

Scientific Name	Common Name
ANACARDIACEAE	SUMAC OR CASHEW FAMILY
Toxicodendron diversilobum	Pacific poisonoak
APIACEAE	CARROT FAMILY
Conium maculatum	Poison hemlock
Foeniculum vulgare	Sweet fennel
Oenanthe sarmentosa	Oenanthe
Torilis nodosa	Knotted hedge-parsley
ASCLEPIADACEAE	MILKWEED FAMILY
Asclepias fascicularis	Narrowleaf milkweed
ASTERACEAE	SUNFLOWER FAMILY
Achillea millefolium	Common yarrow
Artemisia douglasiana	Douglas' mugwort
Baccharis pilularis	Coyotebrush
Baccharis salicifolia	Mule's fat; seepwillow
Carduus pycnocephalus	Italian thistle
Centaurea solstitialis	Yellow star thistle
Cirsium vulgare	Bull thistle
Dittrichia graveolens	Stinkwort
Hypochaeris glabra	Smooth catsear
Matricaria discoidea (=Chamomilla suaveolens)	Disc mayweed; pineapple weed
Picris echioides	Bristly oxtongue
Senecio vulgaris	Common groundsel
Silybum marianum	Milk thistle
Sonchus asper ssp. *asper*	Spiny sowthistle; prickly sow thistle
Taraxacum officinale	Dandelion
AZOLLACEAE	MOSQUITO FERN FAMILY
Azolla filiculoides	Pacific mosquitofern
BORAGINACEAE	FORGET-ME-NOT FAMILY
Amsinckia menziesii var. *intermedia*	Common fiddleneck, intermediate fiddleneck
Plagiobothrys nothofulvus	Rusty popcornflower
BRASSICACEAE	MUSTARD FAMILY
Barbarea orthoceras	American yellowrocket; wintercress
Cardamine oligosperma	Idaho bittercress
Hirschfeldia incana	Shortpod mustard
Raphanus sativus	Wild radish
Rorippa curvisiliqua	Curvepod yellowcress
Rorippa nasturtium-aquaticum	Watercress
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY
Sambucus nigra ssp. *canadensis (=S. mexicana)*	Blue elder, ccommon elderberry, Mexican elderberry
Symphoricarpos albus var. *laevigatus*	Common snowberry
Symphoricarpos mollis	Creeping snowberry

Scientific Name	Common Name
CARYOPHYLLACEAE	PINK FAMILY
Cerastium glomeratum	Sticky chickweed
Stellaria media	Common chickweed
CUCURBITACEAE	MELON FAMILY
Marah fabaceus	California manroot
CYPERACEAE	SEDGE FAMILY
Carex sp.	Sedge
Cyperus eragrosis	Tall flatsedge
Eleocharis palustris (=E. macrostachya)	Common spikerush
Schoenoplectus acutus var. *occidentalis (=Scirpus a.* var. *o.)*	Tule
FABACEAE	PEA FAMILY
Lotus corniculatus	Birdfoot deervetch; birdsfoot trefoil
Lupinus bicolor	
Medicago polymorpha	California burclover
Melilotus indica(indicus)	Sourclover
Trifolium fucatum	Bull clover
Trifolium repens	White clover
Trifolium subterraneum	Subterranean clover
Vicia americana var. *americana*	American vetch
Vicia sativa var. *sativa*	Spring vetch
Vicia villosa var. villosa	Winter vetch
FAGACEAE	OAK FAMILY
Quercus agrifolia	Coast live oak
Quercus lobata	Valley oak
GERANIACEAE	GERANIUM FAMILY
Erodium brachycarpum	Shortfruit stork's bill
Erodium cicutarium	Redstem stork's bill
Erodium moschatum	Musky stork's bill
Geranium dissectum	Cutleaf geranium
Geranium molle	Awnless geranium; dovefoot geranium
HIPPOCASTANACEAE	HORSE-CHESTNUT FAMILY
Aesculus californica	California buckeye
JUNCACEAE	RUSH FAMILY
Juncus bufonius var. *bufonius*	Toad rush
Juncus effusus var. *brunneus*	Soft rush
Juncus phaeocephalus var. *paniculatus*	Brownhead rush
Juncus xiphioides	Irisleaf rush
LAMIACEAE	MINT FAMILY
Lamium amplexicaule	Common henbit
Marrubium vulgare	Horehound
Mentha pulegium	Pennyroyal
Stachys rigida var. *rigida (=S. ajugoides* var. *r.)*	Rough hedgenettle
LAURACEAE	LAUREL FAMILY
Umbellularia californica	California bay

Scientific Name	Common Name
LEMNACEAE	DUCKWEED FAMILY
Lemna sp.	Duckweed
LILIACEAE	LILY FAMILY
Chlorogalum pomeridianum	Wavyleaf soap plant
ONAGRACEAE	EVENING PRIMROSE FAMILY
Epilobium brachycarpum	Autumn willowherb
PAPAVERACEAE	POPPY FAMILY
Eschscholzia californica	California poppy
PLANTAGINACEAE	PLANTAIN FAMILY
Plantago coronopus	Buckhorn plantain
Plantago lanceolata	English plantain
Plantago major	Common plantain
PLATANACEAE	PLANE TREE FAMILY
Platanus racemosa	California sycamore
POACEAE	GRASS FAMILY
Avena barbata	Slender oats
Avena fatua	Wild oats
Briza minor	Little quakinggrass
Bromus carinatus var. *carinatus*	California brome
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft brome; soft chess
Bromus madritensis ssp. *rubens*	Red brome
Cortaderia sp.	Pampas grass
Cynodon dactylon	Bermudagrass
Elymus glaucus	Blue wildrye
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley
Hordeum murinum ssp. *leporinum*	Leporinum barley
Leymus triticoides	Creeping wildrye
Lolium multiflorum	Italian ryegrass
Piptatherum miliaceum	Smilo grass
Poa annua	Annual bluegrass
Polypogon monspeliensis	Annual rabbitsfoot grass
Vulpia microstachys var. *ciliata*	Nuttall's fescue
Vulpia myuros	Rat-tail fescue
POLYGONACEAE	BUCKWHEAT FAMILY
Polygonum arenastrum	Common knotweed
Rumex crispus	Curly dock
PORTULACACEAE	PURSLANE FAMILY
Claytonia perfoliata	Miner's lettuce
PRIMULACEAE	PRIMROSE FAMILY
Anagallis arvensis	Scarlet pimpernel
RHAMNACEAE	BUCKTHORN FAMILY
Ceanothus sp.	Ceanothus
Frangula californica ssp. *californica (=Rhamnus c.* ssp. *c)*	California buckthorn; California coffeeberry

Scientific Name	Common Name
ROSACEAE	ROSE FAMILY
Aphanes arvensis (=A. occidentalis)	Field parsley piert
Rosa californica	California wildrose
Rubus ursinus	California blackberry
RUBIACEAE	MADDER FAMILY
Galium aparine	Bedstraw; cleavers
SALICACEAE	WILLOW FAMILY
Populus fremontii	Fremont cottonwood
Salix gooddingii	Gooding's black willow
Salix lasiolepis	Arroyo willow
SCROPHULARIACEAE	FIGWORT FAMILY
Scrophularia californica	California figwort; California beeplant
Veronica americana	American brooklime
SOLANACEAE	TOMATO FAMILY
Nicotiana glauca	Tree tobacco
Solanum umbelliferum var. *incanum*	Bluewitch
TYPHACEAE	CATTAIL FAMILY
Typha angustifolia	Narrowleaf cattail
Typha sp.	Cattail
URTICACEAE	NETTLE FAMILY
Urtica dioica ssp. *holosericea*	Hoary stinging nettle

APPENDIX F

Special-Status Species Database Results

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

January 16, 2011

Document Number: 110116071457

Martha Lowe
Environmental Science ASsociates
350 Frank H. Ogawa Plaza
Suite 300
Oakland, CA 94612

Subject: Species List for SFPUC San Antonio Backup Pipeline Project

Dear: Ms. Lowe

We are sending this official species list in response to your January 16, 2011 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be April 16, 2011.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 110116071457

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)

Branchinecta lynchi

vernal pool fairy shrimp (T)

Euphydryas editha bayensis

bay checkerspot butterfly (T)

Lepidurus packardi

Critical habitat, vernal pool tadpole shrimp (X)

vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central California Coastal steelhead (T) (NMFS)

Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)

winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana draytonii

California red-legged frog (T)

Critical habitat, California red-legged frog (X)

Reptiles

Masticophis lateralis euryxanthus

Alameda whipsnake [=striped racer] (T)

Critical habitat, Alameda whipsnake (X)

Birds

Sternula antillarum (=Sterna, =albifrons) browni

California least tern (E)

Mammals

Reithrodontomys raviventris

salt marsh harvest mouse (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

Plants

Lasthenia conjugens

Contra Costa goldfields (E)

Critical habitat, Contra Costa goldfields (X)

Proposed Species

Amphibians

Rana draytonii

Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

NILES (446C)

LA COSTA VALLEY (446D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be April 16, 2011.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
Data request for the La Costa Valley and Niles USGS 7.5 Minute Topographic Quadrangles

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Accipiter cooperii Cooper's hawk	ABNKC12040			G5	S3	
2	Accipiter striatus sharp-shinned hawk	ABNKC12020			G5	S3	
3	Agelaius tricolor tricolored blackbird	ABPBXB0020			G2G3	S2	SC
4	Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SC
5	Antrozous pallidus pallid bat	AMACC10010			G5	S3	SC
6	Aquila chrysaetos golden eagle	ABNKC22010			G5	S3	
7	Campanula exigua chaparral harebell	PDCAM020A0			G2	S2.2	1B.2
8	Corynorhinus townsendii Townsend's big-eared bat	AMACC08010			G4	S2S3	SC
9	Emys marmorata western pond turtle	ARAAD02030			G3G4	S3	SC
10	Falco mexicanus prairie falcon	ABNKD06090			G5	S3	
11	Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	unknown code...	G4T3	S2	
12	Helianthella castanea Diablo helianthella	PDAST4M020			G2	S2	1B.2
13	Lasiurus cinereus hoary bat	AMACC05030			G5	S4?	
14	Linderiella occidentalis California linderiella	ICBRA06010			G3	S2S3	
15	Masticophis lateralis euryxanthus Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
16	Oncorhynchus mykiss irideus steelhead - central California coast DPS	AFCHA0209G	Threatened		G5T2Q	S2	
17	Rana boylii foothill yellow-legged frog	AAABH01050			G3	S2S3	SC
18	Rana draytonii California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
19	Streptanthus albidus ssp. peramoenus most beautiful jewel-flower	PDBRA2G012			G2T2	S2.2	1B.2
20	Sycamore Alluvial Woodland	CTT62100CA			G1	S1.1	

CNPS Inventory of Rare and Endangered Plants

ECOLOGICAL REPORT

Scientific name	Family	Life form	Bloom period	Communities	Elevation	CNPS status
Atriplex joaquiniana	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Playas (Plyas) •Valley and foothill grassland (VFGrs)/alkaline	1 - 835 meters	List 1B.2
Campanula exigua	Campanulaceae	annual herb	May-Jun	•Chaparral (Chprl)(rocky, usually serpentinite)	275 - 1250 meters	List 1B.2
Centromadia parryi ssp. congdonii	Asteraceae	annual herb	May-Oct(Nov), Months in parentheses are uncommon.	•Valley and foothill grassland (VFGrs)(alkaline)	0 - 230 meters	List 1B.2
Eriogonum nudum var. decurrens	Polygonaceae	perennial herb	Jun-Oct	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)(maritime ponderosa pine sandhills)/sandy	50 - 800 meters	List 1B.1
Helianthella castanea	Asteraceae	perennial herb	Mar-Jun	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Riparian woodland (RpWld) •Valley and foothill grassland (VFGrs)	60 - 1300 meters	List 1B.2
Monardella antonina ssp. antonina	Lamiaceae	perennial rhizomatous herb	Jun-Aug	•Chaparral (Chprl) •Cismontane woodland (CmWld)	500 - 1000 meters	List 3

Scientific name	Family	Life form	Bloom period	Communities	Elevation	CNPS status
Monardella villosa ssp. globosa	Lamiaceae	perennial rhizomatous herb	Jun-Jul(Aug), Months in parentheses are uncommon.	•Broadleafed upland forest (BUFrs)(openings) •Chaparral (Chprl)(openings) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)	100 - 915 meters	List 1B.2
Streptanthus albidus ssp. peramoenus	Brassicaceae	annual herb	(Mar),Apr-Sep(Oct), Months in parentheses are uncommon.	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/serpentinite	94 - 1000 meters	List 1B.2
Stuckenia filiformis	Potamogetonaceae	perennial rhizomatous herb aquatic	May-Jul	•Marshes and swamps (MshSw)(assorted shallow freshwater)	300 - 2150 meters	List 2.2

CNPS Online Inventory, August 1, 2011

APPENDIX G

Terrestrial Habitat Assessment

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SAN FRANCISCO PUBLIC UTILITIES COMMISSION
SAN ANTONIO BACKUP PIPELINE PROJECT

Terrestrial Habitat Assessment

Prepared for
San Francisco Public Utilities Commission

January 2011

ESA

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SAN FRANCISCO PUBLIC UTILITIES COMMISSION
SAN ANTONIO BACKUP PIPELINE PROJECT

Terrestrial Habitat Assessment

Prepared for
San Francisco Public Utilities Commission

January 2011

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Olympia

Petaluma

Portland

Sacramento

San Diego

Seattle

Tampa

Woodland Hills

206166.04

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San Francisco Public Utilities Commission San Antonio Backup Pipeline Project Terrestrial Habitat Assessment

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CHAPTER 1
Introduction

1.1 Background and Purpose for the Terrestrial Habitat Assessment

This terrestrial Habitat Assessment documents sensitive species potentially occurring in the San Francisco Public Utilities Commission (SFPUC) San Antonio Backup Pipeline (SABPL) project area. The intent and scope of this document is to identify the habitat types present in the project area, the quality of those habitat types relative to sensitive species, and the likelihood for sensitive species to occur in the project area. The SABPL project is one of many facility improvement projects being implemented as part of the SFPUC's Water System Improvement Program.

1.2 Project Location

The SABPL project is located in an unincorporated area of Alameda County, California, within the Sunol Valley (see **Figures 1** and **2**). The project area is located along Calaveras Road south of the intersection of Interstate 680 (I-680) and State Route 84 (SR 84). Project construction would occur entirely on Alameda watershed lands[1] owned by the City and County of San Francisco (CCSF) and managed by the SFPUC. The general project area extends roughly two miles from the San Antonio Pump Station in the south to the North Spoils Site in the north. The nearest community is the town of Sunol located approximately one mile northwest of the project area.

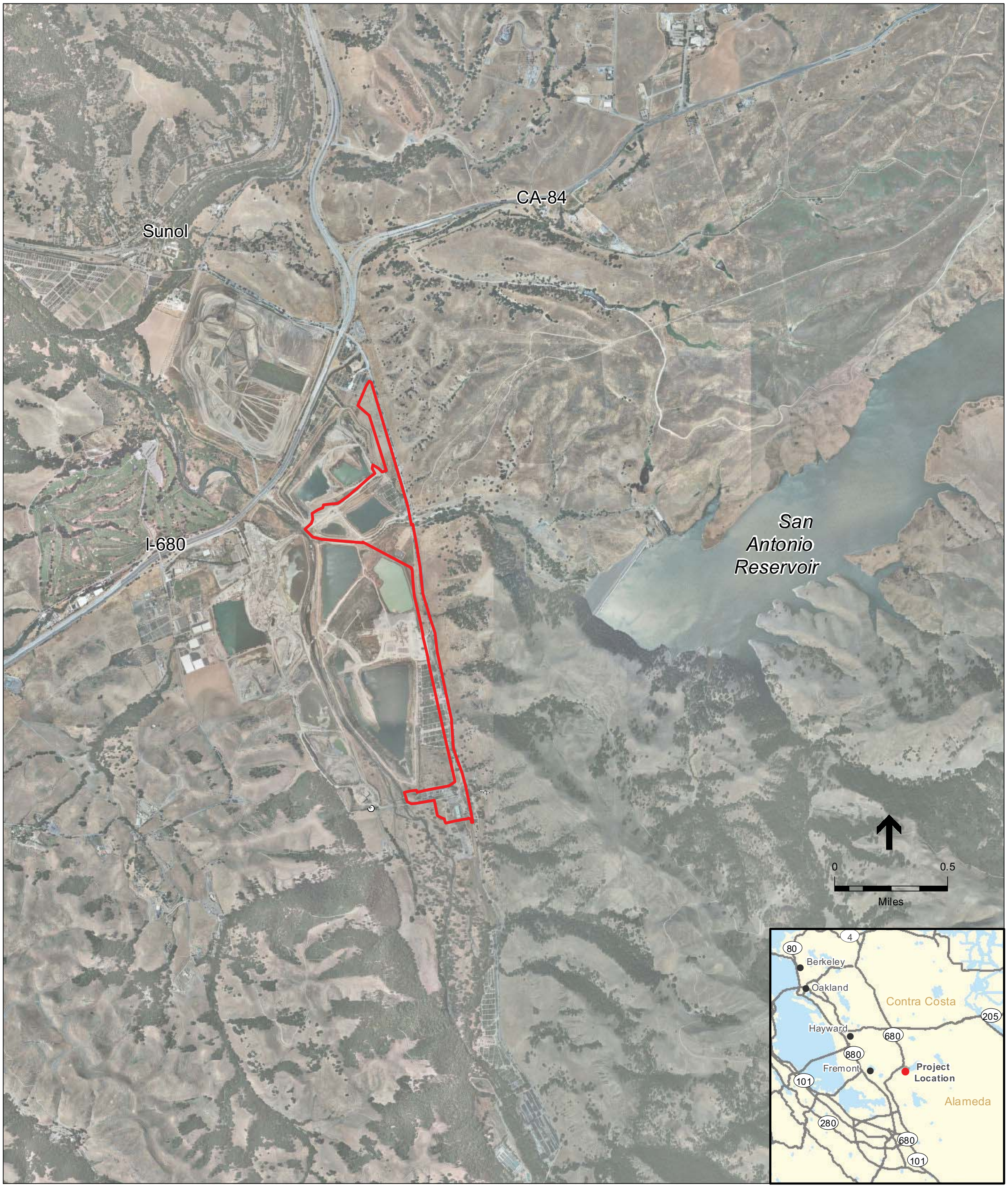
1.3 Project Description

The proposed SABPL project would include the following components:

- 7,000-foot-long, 66-inch-diameter San Antonio Backup Pipeline (SABPL)
- Discharge Facility at quarry Pit F3-East (including discharge valve vault, electrical control building, baffled outfall, and reinforced concrete apron)
- Chemical facility
- Slurry cutoff-wall around quarry Pits F3-East and F3-West
- Alameda Creek Pump Station (including Transfer Pipeline)

---

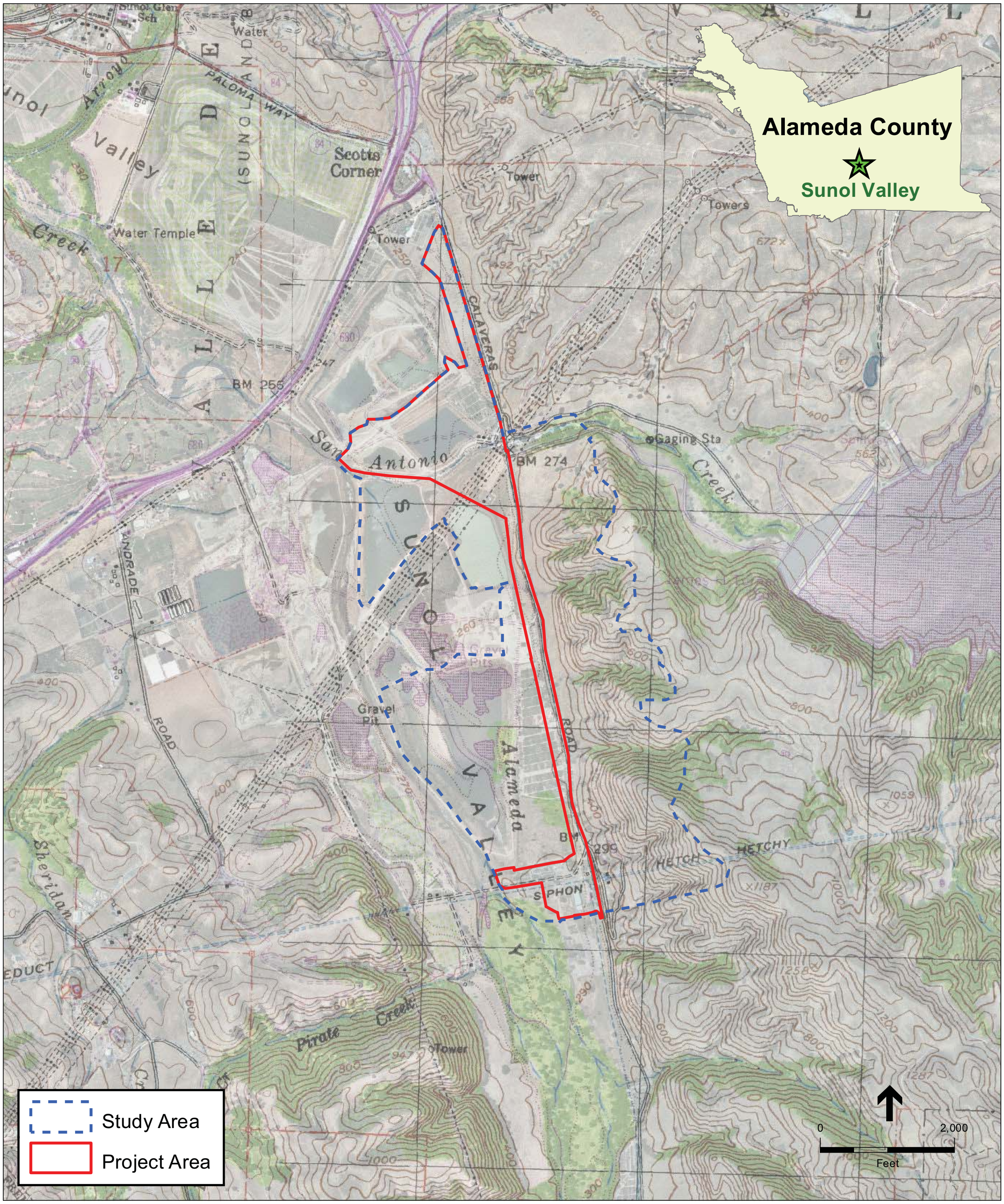
1 The Alameda watershed refers to the City and County of San Francisco owned lands managed by the SFPUC as part of the SFPUC regional water system; the Alameda watershed lands are located within the much larger hydrologic boundary of the southern Alameda Creek watershed.



SOURCE: SFPUC, 2010

SFPUC San Antonio Backup Pipeline Project . 206166.04

Figure 1
SABPL Project Location



SOURCE: USGS, 2010; SFPUC 2010

San Antonio Backup Pipeline Project . 206166.04

Figure 2
Project Area

All project activities would be contained within the boundaries of the project area, as shown in **Figure 3**.

1.3.1 San Antonio Backup Pipeline and Discharge Facility

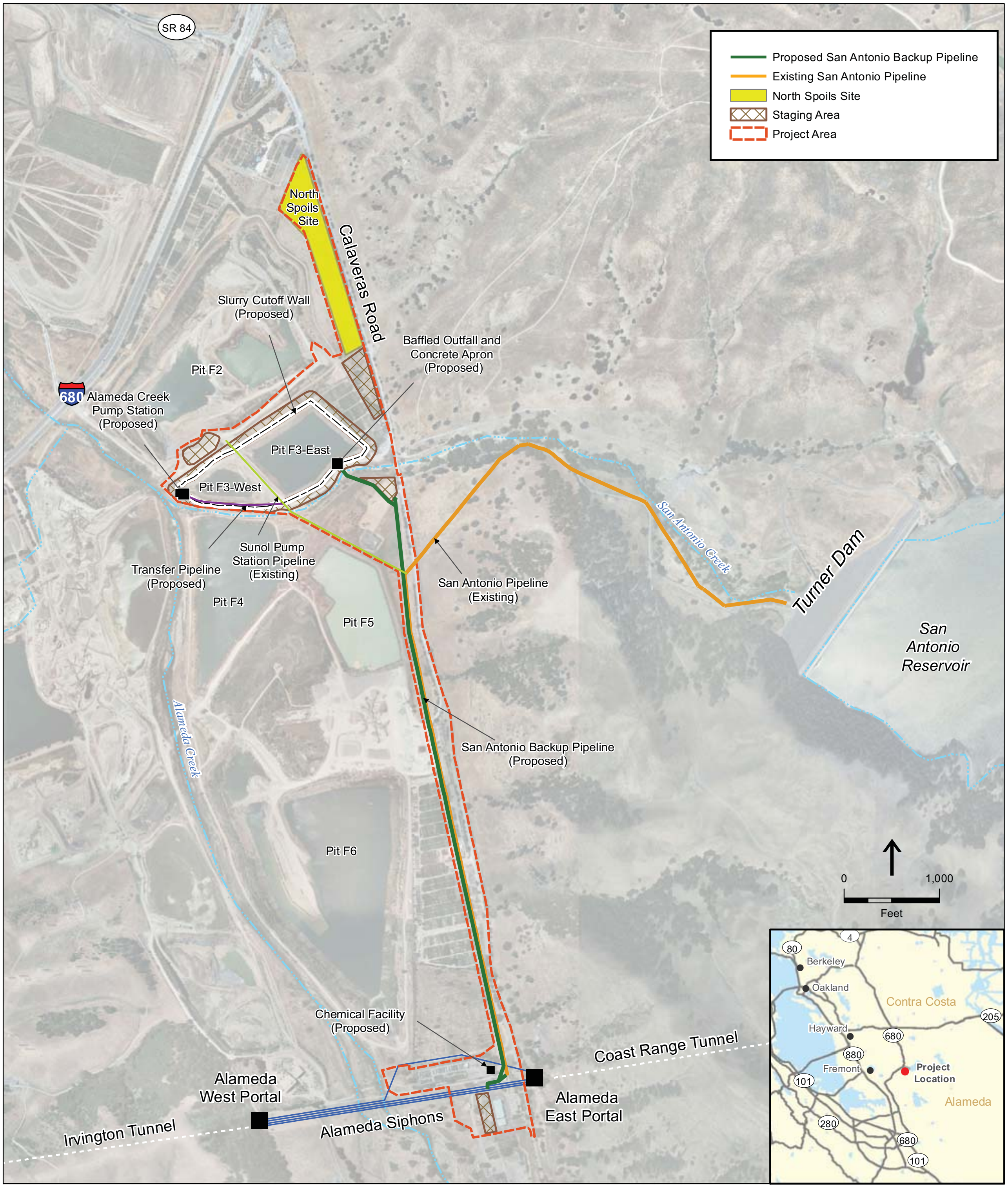
The proposed 7,000-foot-long, 66-inch-diameter SABPL would be installed in an open trench extending north from the San Antonio Pump Station to the southern slope of quarry Pit F3-East. The trench would be 12- to 15-feet wide, and have a maximum depth of 20 feet below the ground surface. The SABPL would be offset roughly ten feet west of the existing SAPL and would parallel the west side of Calaveras Road for approximately 6,200 feet. Near the intersection of Calaveras Road and the Turner Dam access road, the remaining 800-foot-long section of the SABPL would be routed northwest beneath San Antonio Creek to the southern slope of Pit F3-East.A discharge valve vault and electrical control building would be constructed on the south side of San Antonio Creek. The dimensions of the discharge valve vault would be approximately 19 feet wide, 38 feet long, and 16 feet deep. The electrical control building for the discharge facility would be roughly 15 feet long, 15 feet wide, and 16 feet tall. A baffled outfall and concrete splash pad would be constructed on the quarry pit slope at the northern terminus of the SABPL, In addition, a stub (approximately 20 feet long) would be installed immediately west of Calaveras Road and south of San Antonio Creek to provide a potential future connection point for a new pipeline segment to the base of Turner Dam.[2]

Cross-connections (interties with existing conveyance facilities) would be constructed at three locations along the alignment. Each cross-connection would include an air gap system. Air gaps would consist of vertical piping extending from the top of the pipeline approximately eight feet above the ground surface, with an elbow and an angled 40- to 80-foot-long section of pipe providing the space for the gap.

1.3.2 Slurry Cutoff Wall

A new slurry cutoff wall would be constructed around the perimeter of Pits F3-East and F3-West to minimize the seepage of groundwater into the pits and help maintain water levels at or below elevation 195 feet mean sea level. The cutoff wall would consist of a trench filled with a bentonite slurry and a soil-bentonite backfill mixture. The bentonite slurry would prevent the trench walls from collapsing during excavation of the trench. The entire slurry cutoff wall would be 5,000 feet long, 3 feet wide, and approximately 80 feet deep. The proposed slurry cutoff wall would require an approximately 125-foot-wide work platform along the cutoff wall alignment.

2 Implementation of a new pipeline segment to Turner Dam was originally proposed as part of this project, but has since been dropped. If the SFPUC were to construct this pipeline in the future, the project would undergo further CEQA evaluation at that time.



SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project
Figure 3
Site Plan

1.3.3 Alameda Creek Pump Station and Transfer Pipeline

The Alameda Creek Pump Station would consist of pumps, pipelines, a wet well, and a control building that would house electrical equipment. Minor grading would be required for the Alameda Creek Pump Station, parking area, and driveway. The Alameda Creek Pump Station would be constructed just northeast of the confluence of San Antonio and Alameda Creeks, on the west end of Pit F3-West. The 140-foot-wide by 180-foot-long pump station site would be enclosed by a 7-foot-high security fence, and would house pumps, pipelines, a wet well, an electrical transformer[3] and a 15-foot by 15-foot metal control building that would include the electrical equipment and controls for the pump station. The wet well would be approximately 45 feet deep. A portion of the existing access road would be paved to form a driveway and parking area. In addition, an approximately 500-foot-long, 15-foot-tall retaining wall would be constructed along the southern boundary of the pump station site adjacent to the access road. Exterior lighting with a motion sensor would be permanently installed at the Alameda Creek Pump Station.

The proposed 36-inch-diameter Transfer Pipeline would be used to convey water from the Alameda Creek Pump Station to the existing 36-inch-diameter Sunol Pump Station Pipeline. The Transfer Pipeline would be made of steel pipe approximately 1,250 feet long and would be aligned along the southern perimeter of Pits F3-East and F3-West.

1.3.4 New Chemical Facility

The proposed new chemical facility near the San Antonio Pump Station would include a chemical storage and containment area, a chemical loading area, an electrical control room, and a subterranean chemical feed system. The proposed chemical facility would be 48 feet long, 42 feet wide, and 22 feet tall. A 1,600-square-foot asphalt parking area would be constructed adjacent to the control building, with a permanent 8- to 10-foot-high security fence to surround the new control building and parking area. Exterior lighting with a motion sensor would be permanently installed on the new chemical facility.

1.4 Study Area, Survey Dates, and Surveying Personnel

All proposed project activities would be contained within the boundaries of the study area (shown in **Figure 2**). The study area for the wildlife habitat assessment encompasses the entire project area and, where appropriate, extends beyond the project area to include areas of potential indirect impact resulting from construction. Those portions previously surveyed for other recent SFPUC projects were briefly reviewed to ascertain whether conditions were the same or had changed since preparation of technical memoranda and environmental reports; those portions not previously surveyed were investigated in more detail.

3 The main purpose of a transformer is to alter a supply voltage from a primary power circuit to a secondary power circuit at the voltage desired to run a particular piece of electrical equipment. Electrical equipment running at a higher voltage is more efficient and requires smaller conduits.

Environmental Science Associates (ESA) biologists conducted a reconnaissance survey of the site on April 21, 2009. On May 4, 2009, ESA biologists conducted a focused survey of potential burrowing owl habitat within a 500-foot project buffer, as well as additional reconnaissance-level surveys in selected portions of the study area. An additional reconnaissance survey was conducted by ESA biologists on November 17, 2010 to characterize several small areas newly added to the SABPL project area and to verify current site conditions in light of recent and ongoing disturbance and modifications resulting from construction of the New Irvington Tunnel and Alameda Siphons Seismic Reliability Upgrade projects.

1.5 Survey Methods

The *Alameda Siphons Seismic Reliability Upgrade Project Biological Assessment* (Irvington Partners Joint Venture, 2008) and the *New Irvington Tunnel Project Environmental Site Assessment* (Baseline Environmental Consulting, 2008) were consulted for their analyses of local biological resources and potential project effects. The California Natural Diversity Database (CNDDB) was consulted concerning sensitive wildlife resources in the project vicinity (CDFG, 2009), and an official species list was obtained from the U.S. Fish and Wildlife Service (USFWS, 2009). Additional biological data was provided by the SFPUC (SFPUC, 2008; SFPUC 2011).

ESA's reconnaissance surveys identified species present in the study area and identified habitat elements that could support sensitive wildlife species not directly observed. Particular concern was given to identify potential breeding and foraging habitat, and movement corridors, for California tiger salamander (*Ambystoma californiense*), foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana draytonii*), western pond turtle (*Actinemys marmorata*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), coast horned lizard (*Phrynosoma coronatum*), burrowing owl (*Athene cunicularia*), San Joaquin kit fox (*Vulpes macrotis mutica*), San Francisco dusky-footed woodrat (*Neotoma fuscipes*), American badger (*Taxidea taxus*), and sensitive bird and bat species.

The focused burrowing owl survey on May 4, 2009 was consistent with a Phase II assessment in accordance with the April 1993 *Burrowing Owl Consortium Survey Protocol and Mitigation Guidelines*. This consisted of two ESA biologists walking multiple transects along the grassland slopes east of Calaveras Road for a distance of approximately 1.0 mile. Transects were walked while scanning for burrowing owls, ground squirrels, and burrow complexes.

Vegetation types and wildlife habitats on the study area were characterized by field observations and review of prior biological reports.

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CHAPTER 2
Habitat Types and Sensitive Species in the Study Area

2.1 Environmental Setting

Sunol Valley is part of the San Francisco Bay Area sub-region of the California Floristic Province (Hickman, 1993). Oriented in a north-south direction, the valley is surrounded by numerous low-elevation ridges (less than 2,000 feet) that drain indirectly to Alameda Creek. Alameda Creek is the largest drainage in the Alameda Creek Watershed, which in turn is the largest in the Bay Area, draining a 650-square-mile area that ultimately empties into the southern portion of San Francisco Bay.

Sunol Valley supports extensive sand and gravel mining operations, and to a lesser extent provides flat expanses of land for use by commercial plant nurseries. The surrounding hillsides support cattle grazing, and these hills, associated stock ponds, San Antonio Reservoir, Alameda Creek and other local creeks, and Sunol Wilderness areas provide habitat for a variety of sensitive species.

2.2 Habitat Types

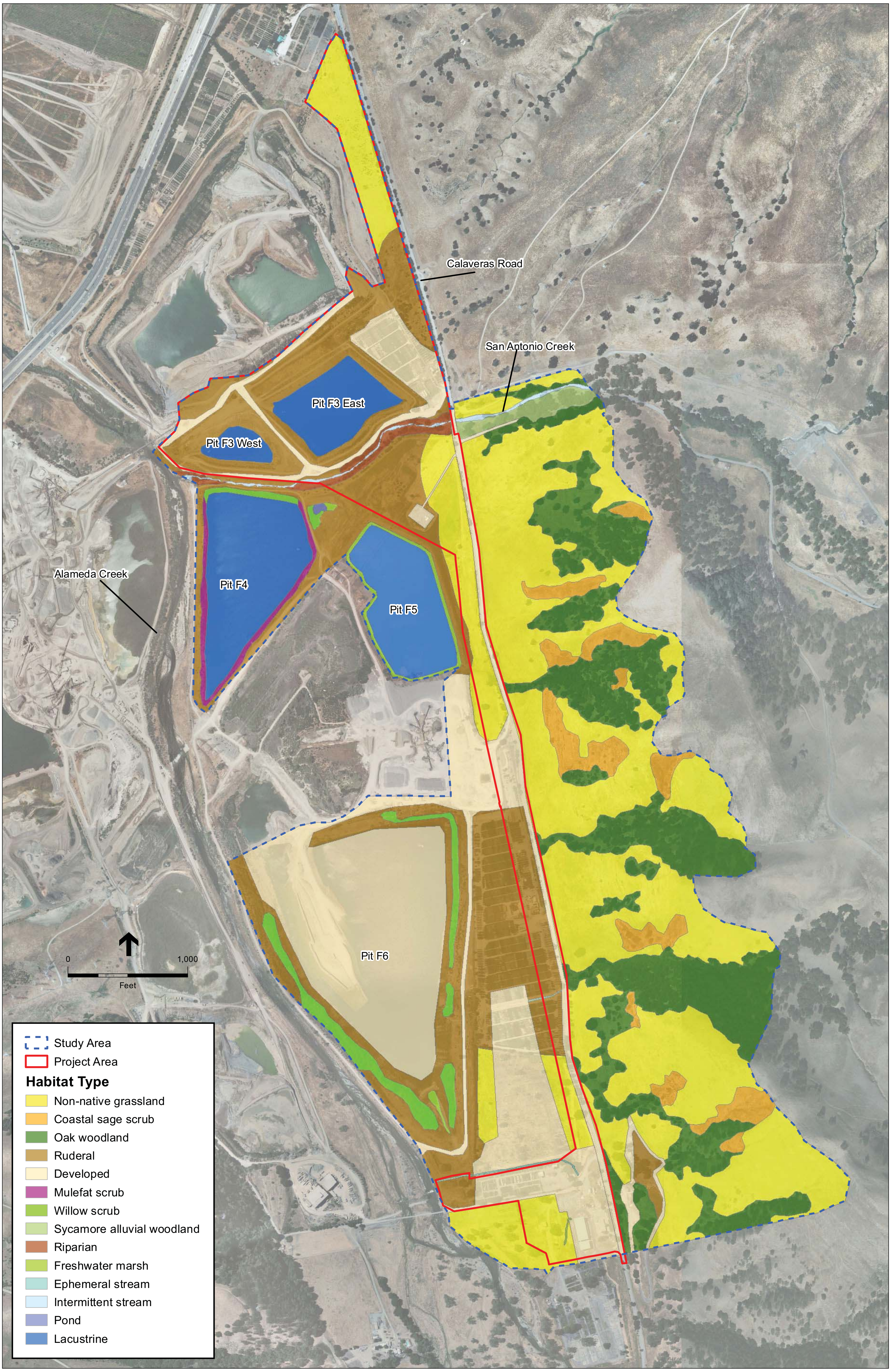
The project area supports developed, non-native annual grassland/ruderal, lacustrine, freshwater marsh/seasonal wetland, and riparian habitat (see **Figure 4**). The majority of the project area supports developed/ruderal habitats. Most of the project area, including non-native grassland, has been previously disturbed by grading, excavation, commercial development, or construction of infrastructure. Recently disturbed areas still support very limited plant cover, most of it weedy. Other areas have established annual grasslands dominated by non-native species. Oak woodlands, sycamore alluvial woodland, and coastal sage scrub occur within the wildlife habitat assessment study area on the hillslopes to the east of Calaveras Road. These habitat types are not discussed in detail below as they are not found within the project area. They are mapped on Figure 4 because they have the potential to support special-status species that are not expected to occur within the project area but that could suffer from indirect impacts resulting from project construction.

2.2.1 Developed Areas

Much of the project area is developed as active quarry facilities, active SFPUC facilities, abandoned commercial plant nurseries, and associated roads (see **Photo 1**), as well as areas recently cleared for construction of the NIT and Alameda Siphons Projects. Developed areas associated with existing facilities support a few planted areas including species such as eucalyptus (*Eucalyptus globulus*), oleander (*Nerium oleander*), and Monterey pine (*Pinus radiata*). Otherwise, vegetation has been removed or is precluded through ongoing quarry and construction activities in these developed areas and they thus provide little habitat for wildlife, but appear to be heavily used as movement corridors by wild pig (*Sus scrofa*) and mule deer (*Odocoileus hemionus*). California ground squirrels (*Spermophilus beecheyi*), while not abundant in any portion of the study area, were observed to have burrows in relatively friable soil along roadside fencelines. Developed portions of the study area may support nesting birds such as tree swallows (*Tachycineta bicolor*), rough-winged swallows (*Stelgidopteryx serripennis*), house finch (*Carpodacus mexicanus*), and mourning dove (*Zenaida macroura*), among others, that are protected under the Migratory Bird Treaty Act.

PHOTO 1
Developed Areas: Calaveras Road, large commercial nursery areas (since abandoned and now supporting ruderal habitat), and quarry activities are visible in this representative photo (as of April, 2009) of developed portions of the study area.

The amount of developed habitat in the project area increased considerably in 2010 during construction of the NIT and Alameda Siphons projects. Site clearance, and hence conversion to developed habitat, occurred at the north spoils site, in the vicinity of the proposed chemical facility, near Air Gap #1, and in most of the southern portion of the SABPL pipeline alignment. In these areas, vegetation has been removed, burrows have been collapsed, and the site graded; however, mature trees such as valley oak (*Quercus lobata*), California sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*), and planted cork oak (*Quercus suber*) have been retained where possible, thus providing more structure than usual for these habitat types.



SOURCE: SFPUC, 2010; SFPUC, 2008; ESA, 2011

SFPUC San Antonio Backup Pipeline Project

Figure 4

Habitat Types in the SABPL Biological Resources Study Area

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2.2.2 Non-native Annual Grassland/Ruderal

Developed portions of the study area are interspersed with non-native annual grasslands and ruderal areas. Non-native annual grassland and ruderal portions of the study area are characterized by low habitat structure, low diversity, and the growth of invasive non-native species (see **Photo 2** and **Photo 3**). Dominant vegetation includes soft chess (*Bromus hordeaceus*), wild oat (*Avena fatua*), foxtail barley (*Hordeum murinum* var. *leporinum*), Italian ryegrass (*Lolium multiflorum*), and clover (*Trifolium* spp.), with lesser amounts of purple owl's clover (*Castilleja exerta*), cutleaf geranium (*Geranium dissectum*), star thistle (*Centaurea* spp.), Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum* spp.), red-stem filaree (*Erodium cicutarium*), wild radish (*Raphanus sativa*), and mustard (*Brassica* spp.). A western rattlesnake (*Crotalus viridis helleri*) was observed, and Pacific gopher snake (*Pituophis catenifer catenifer*) and California kingsnake (*Lampropeltis getula californiae*) are also commonly found in grasslands where prey is abundant. Burrowing owls may occur in short grasslands where ground squirrel burrow complexes are present. Open grasslands may also provide nesting habitat for short-eared owl (*Asio flammeus*), foraging habitat for raptors, and denning and foraging habitat for San Joaquin kit fox and American badger.

Grasslands in the study area support low densities of small and medium-sized mammals such as mice, California vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), California ground squirrel, cottontail (*Sylvilagus auduboni*), and black-tailed jackrabbit (*Lepus californicus*).

Ruderal refers to areas that have been previously cleared or developed, are not in active use, and have developed little vegetation (or that contain developed vegetation that is mostly weedy non-grass species). Typical plant species found in ruderal habitats within the project area include yellow star thistle (*Centaurea solstitialis*), Italian thistle, milk thistle (*Silybum marianum*), stinkwort (*Dittrichia graveolens*), fennel (*Foeniculum vulgare*), and shortpod mustard (*Hirschfeldia incana*). The vegetation in many ruderal areas is sparse and does not resemble any identified natural community (such as non-native grassland). In some areas, shrubs such as coyote bush *(Baccharis pilularis*) have become established and contribute a significant amount of cover. However, these areas do not comprise a scrub community, due to the lack of shrub and herbaceous associates commonly found in coyote brush scrub. In some ruderal and developed areas in the Sunol Valley, large mature native trees have been preserved, providing significant wildlife habitat.

To the north of the San Antonio Pump Station, east from SMP-30's Pit F6, an open area measuring roughly seventeen acres in size[4] offers low-quality grassland habitat with isolated native trees and scattered shrubs. At least half of this area was used as grounds for a former commercial nursery, as evidenced by an extensive network of aboveground pipes. The land is flat and heavily compacted. No ground squirrels and only a few small mammal burrows were observed in this area.

[4] As of November 2010 this area had been reduced by several acres due to the clearing of vegetation for laydown and staging associated with the NIT and Alameda Siphons projects.

PHOTO 2
Non-native Annual Grassland/Ruderal: The proposed alignment traverses discontinuous patches of annually mowed non-native annual grasslands and ruderal vegetation.

PHOTO 3
Non-native Annual Grassland/Ruderal: Grassy hills within a 500-foot buffer of the project area (e.g., the study area), east of Calaveras Road, offer potential habitat for burrowing owls but few ground squirrel burrows were observed.

North of the former Naka Nurseries, Inc.[5], between Calaveras Road and a CEMEX gate, the proposed pipeline route traverses a narrow strip of grassland that becomes wider as it approaches Pit F5. The eastern upland periphery of Pit F5 is thick with mustard and wild radish, and numerous Brewer's blackbird (*Euphagus cyanocephalus*) and red-winged blackbirds were observed foraging and roosting in the ruderal vegetation.

[5] Information obtained from a SFPUC Real Estate Services map regarding Sunol Valley Leases and Permits, dated 01/04/06. This nursery has since been decommissioned.

The area south of San Antonio Creek, where Staging Area 2 is proposed to be sited, supports some annual grasslands but is dominated by dense ruderal vegetation with scattered a few trees and shrubs. As in other grassland and ruderal areas, no ground squirrels and only a few small mammal burrows were observed.

The north spoils site located east of SMP-24, north of an abandoned commercial nursery, and west of Calaveras Road, and was previously evaluated under the *New Irvington Tunnel Project Environmental Site Assessment* (Baseline Environmental Consulting, 2008) supports grasslands and ruderal habitat. From Calaveras Road, it was observed that much of this area was also possibly used as commercial nursery grounds, as evidenced by networks of aboveground pipes. An access road through the nursery would be used to access the north spoils site. In November 2010, the former nursery was still in the process of being decommissioned and was essentially barren, with highly compacted soils.

Within a 500-foot project buffer applicable to burrowing owls, potential burrowing owl habitat is present along the entire length of the project, but outside the project area, on grassland slopes east of Calaveras Road. Vegetation along these slopes consists of a variety of non-native annual grasses and forbs including soft chess, wild oat, foxtail barley, geranium, filaree, field vetch (*Vicia* spp.), and thistle. California poppy (*Eschscholzia californica*), annual lupine (*Lupinus bicolor*), blue dicks (*Dichelostemma capitatum*), and popcorn flower (*Plagiobothrys* spp.) were also observed. The hills are subject to grazing but vegetation was 12 to 18 inches in height during the focused survey. Two transects were walked in each direction, from San Antonio Creek to the south end of the former Naka Nurseries, Inc. No owls or owl sign were seen during the surveys, and no burrows suitably-sized for owl occupation were observed. Noticeably scarce in the survey area were the ground squirrel burrow complexes that are routinely colonized by burrowing owls. Despite the relatively tall grassland vegetation and obscured burrow entrances, ground squirrels were both visible and audible where present; thus, large burrow complexes, if present, would have been identified during surveys.

2.2.3 Lacustrine

Quarry pits within the study area provide lacustrine, or open water, habitat used by waterfowl and other birds for foraging (see **Photo 4**). Quarry Pit F3-East, operated by Hanson Aggregates under Surface Mining Permit 24 (SMP-24), measures approximately nine acres in size and is continually pumped by Hansen Aggregates to provide water for quarry operations. The pit's water depth is not known, but the level is deep enough to preclude the growth of emergent vegetation and surface algae. Banks are steep at approximately a 4:1 slope ratio and are vegetated by red brome (*Bromus rubens*), winter vetch (*Vicia villosa*), and wild oats. Upper slopes support the growth of occasional jubata grass (*Cortaderia jubata*), mulefat (*Baccharis salicifolia*), and coyote brush. The toe of Pit F3-East's southeastern slope supports a moderate growth of willows (*Salix* spp.). Such pits provide potential habitat for western pond turtle and California red-legged frog. An American bullfrog (*Lithobates catesbeianus*) tadpole was observed in the shallows of the pit's west corner.

PHOTO 4
Lacustrine:
Pit F3-East within SMP-24, the discharge point for the proposed pipeline, offers lacustrine habitat. The proposed alignment also skirts other quarry pits providing lacustrine habitat.

A small pond is located to the east of Pit F4 (see Figure 4) outside of the project area but inside the study area. The pond receives water via surface runoff and seepage from Pit F4 and its water level fluctuates throughout the year. During the reconnaissance survey it measured approximately 80 feet by 30 feet with a maximum depth of approximately 5 feet. The pond supports emergent freshwater marsh consisting of cattail and tule at its eastern edge. The steep side slopes support ruderal vegetation on the east and willow riparian forest and scrub on the west. No amphibians were observed within the pond, but it may support Sierran treefrog (*Pseudacris sierra*) and possibly western toad (*Bufo boreas*) and California red-legged frog.

2.2.4 Freshwater Marsh

The southern portion of the project area supports a few small areas of freshwater marsh (see **Photo 5**). Within the SMP-30 Pit F6 at the southern end above the level of fluctuating inundation, are a series of small pools supporting wetland vegetation. These pools are the remnants of a former single large pond, measuring roughly 0.12 acre in size, that was inadvertently created in 2005 when a berm was constructed to keep water off an adjacent road. The berm effectively created a terrace above the quarry pit that was perennially filled by seeping groundwater, supported cattail growth, and in which adult bullfrogs were observed. In November 2007, mining activities breached the north bank of the pond, which subsequently drained and left behind three small pools (Irvington Partners Joint Venture, 2008). These pools, and several below them that only form when water levels in Pit F6 fall below the elevation at which they occur, provide potential aquatic breeding habitat for California red-legged frog as well as non-breeding aquatic refugia for the species.

PHOTO 5
Freshwater Marsh/ Seasonal Wetland: The fence-line drainage west of the San Antonio Pump Station supports a small wetland. Water is up to 12 inches deep and supports breeding Pacific chorus frog.

Runoff from the San Antonio Pump Station drains to the west into proposed Staging Area A and forms a freshwater marsh along the fenceline for a distance of approximately 350 feet. Cattails are emergent, and water was ponded to a depth of approximately three to twelve inches for the length of the drainage. Pacific chorus frog tadpoles were observed at this location.

Approximately 100 feet west of the project area, Pit F5 is entirely fringed by a ring of cattails and tules roughly five feet in width. Numerous blackbirds were observed in here, and depending on water quality, this active quarry pond could provide habitat for western pond turtle, adult non-breeding California red-legged frogs, and tricolored blackbird.

2.2.5 Riparian

Riparian habitat is present at three locations within or immediately adjacent to the project area (see **Photo 7** and **Photo 8**). North of the San Antonio Pump Station and associated access road is an intermittent drainage measuring approximately 730 feet in length. At the time of the 2009 surveys the drainage supported a growth of dense riparian vegetation including blackberry (*Rubus* spp.), cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), valley oak (*Quercus* lobata), and conifers. Also present were invasive bamboo and jubata grass, possibly escaped remnants from the former plant nursery. Most of this vegetation has since been removed in association with the NIT and Alameda Siphons projects, although efforts were made to retain some of the native trees.

One ephemeral stream, an unnamed tributary that formerly emptied into Alameda Creek, begins in the hills east of Calaveras Road, is conveyed under Calaveras Road in a culvert, and then empties into an unvegetated rip-rapped channel within the project area. At the time of ESA's

PHOTO 7
Riparian:
A discharge pipe from SMP-30 empties into the San Antonio Creek channel. Flows are consistent enough to support riparian growth along the stream corridor.

PHOTO 8
Riparian:
At the proposed stream crossing, upstream from Photo 6, the San Antonio Creek streambed is a dry, grassy contour that supports a sparsely distributed mulefat within the channel, and coast live oaks, buckeye, sycamore, and planted cottonwoods along its banks.

2009 surveys, the channel ultimately emptied into quarry Pit F6 via a culvert. By November 2010, the western half of the channel had been filled to create a staging area for the NIT and Alameda Siphons projects and it was unclear whether the channel had been culverted under the staging area. This channel provides little or no habitat values for wildlife that depend on water or wetland habitats.

Near the confluence of San Antonio Creek and Alameda Creek, SMP-30's Pit F4 has a discharge pipe that empties continuously, or nearly so, into the San Antonio Creek channel. This area supports dense riparian growth including poison hemlock (*Conium maculatum*), willows and mulefat (see **Photo 7**). Flowing water reaches a depth of approximately 12 inches in some locations. Minnows were observed in this area.

San Antonio Creek within the project area is a seasonal drainage that is dry for most of the year at the crossing location. The stream channel and banks are heavily vegetated with non-native annual grasses and ruderal vegetation, with an occasional mulefat and California poppy on the channel floor (**see Photo 8**). The northern bank is vertical, measuring approximately 12 feet in height, but the southern bank is relatively gentle and shallow, with a slope of roughly 2:1 and not more than four feet in height. Behind the margin of coast live oaks and buckeye (*Aesculus californica*) lining the gentle southern bank are a planted row of young cottonwoods.

2.3 Sensitive Species in the Study Area

Based on habitat present within the project area and locally documented occurrences, the following sensitive species may occur within the project area or within the wildlife habitat assessment study area where they could be indirectly impacted by project construction (see **Table 1**). This list of species was compiled from the California Natural Diversity Database (CNDDB), USFWS official lists and review of previous environmental studies of the project vicinity and surrounding watershed. The Official USFWS Species List and CNDDB List for the La Costa Valley and Niles USGS 7.5-minute quadrangles, which constitute the full list of species considered, are located in Appendix B. See **Figure 5** for a map of sensitive species occurrences in the project vicinity.

2.3.1 California Tiger Salamander (*Ambystoma californiense*)

Status

The central California Distinct Population Segment (DPS) of California tiger salamander is federally listed as threatened and is a candidate state threatened species.

General Ecology and Distribution

California tiger salamander is principally an upland species found in annual grasslands and in the grassy understory of valley-foothill hardwood habitats in Central and Northern California. They require underground refuges (usually ground squirrel or other small mammal burrows), where they spend the majority of their annual cycle. Between December and February, when seasonal ponds begin to fill, adult California tiger salamanders engage in mass migrations to aquatic sites during a few rainy nights and are explosive breeders (Barry and Shaffer, 1994).

During drought years when ponds do not form, adults may spend the entire year in upland environments, while juveniles may spend 4 to 5 years in their upland burrows before reaching sexual maturity and breeding for the first time (Petranka, 1998; Trenham et al, 2000). Adult

TABLE 1
FOCUSED LIST OF SPECIAL-STATUS SPECIES CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Project Area**
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING			
Animals			
Amphibians			
California tiger salamander *Ambystoma californiense*	FT/ CC	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds, vernal pools, and slow-moving or receding streams.	**Moderate potential.** Numerous breeding locations are known within 1.0 mile, and an individual was found in the Sunol Valley Chloramination Facility, suggesting the project area is within a potential CTS movement corridor. Small mammal burrows offer aestivation and foraging opportunities. However, suitable breeding habitat is not present within the project area nor the study area.
California red-legged frog *Rana draytonii*	FT/CSC	Breed in stock ponds, pools, and slow-moving streams.	**Moderate potential.** This species is known from upstream portions of Alameda Creek within 2.5 miles, downstream portions within 0.25 mile, and from San Antonio Creek at the base of Turner Dam within 0.9 mile. Two adults were sighted in February 2010 in the southeastern portion of the study area, one in a seasonal wetland that is no longer present. Aquatic habitat within the study area provides aquatic refugia. Grasslands, small mammal burrows, and rock and debris piles offer summer habitat. The species is not expected to breed within the project area.
Reptiles			
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/CT	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands.	**Low to moderate potential.** Core habitat is absent from the project area. Marginally suitable foraging and dispersal habitat is present grasslands and ruderal habitat within the project area. Adjacent scrub on the slopes east of Calaveras Road provides suitable habitat within the study area.
Birds			
American peregrine falcon (nesting) *Falco peregrinus anatum*	--/CE	Nests on cliffs, tall buildings, high bridges, and specially-designed towers.	**Low potential.** Suitable nesting habitat is absent from the project area. Nesting on interior quarry pit slopes or utility towers seems unlikely.
Bald eagle *Haliaeetus leucocephalus*	--/CE	Nest in mountainous habitats near reservoirs, lakes and rivers, usually in coniferous trees, close to permanent water.	**Low potential.** Large trees in the project area could provide potential nesting habitat, but this is unlikely. Nesting is documented from Calaveras Reservoir.
Mammals			
San Joaquin kit fox *Vulpes macrotis mutica*	FE/ST	Arid grasslands and open scrubland.	**Low potential.** Suitable habitat is present for denning and foraging, but kit fox is known from just one sighting in the Sunol Valley, with the next nearest sighting over 16 miles east. However, the species has a low potential to disperse through the study area.

TABLE 1 (Continued)
FOCUSED LIST OF SPECIAL-STATUS SPECIES CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
FEDERAL OR STATE FULLY PROTECTED/SPECIES OF SPECIAL CONCERN			
Animals			
Amphibians			
Foothill yellow-legged frog *Rana boylii*	--/CSC	A year-round resident of cobble-lined streams; breeds in spring months after high water subsides.	**Absent.** Suitable habitat is absent from the project area. This species is limited to perennial, high-gradient drainages.
Reptiles			
Western pond turtle *Actinemys marmorata*	--/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands.	**Presumed present.** This species is known from Alameda Creek and San Antonio Creek. Western pond turtle may be found in quarry pits, riparian areas, and uplands.
Coast horned lizard *Phyrnosoma coronatum*	--/CSC	Sandy areas and river washes, as well as riparian woodland clearings, chaparral, and alkali flats.	**Low potential.** This species has a low potential to occur in the study area. May be present in sandy washes of Alameda Creek channel, or in rock and debris piles near quarry pits.
Birds			
Tricolored blackbird *Agelaius tricolor*	--/CSC	A colonial nester; nests in dense freshwater emergent vegetation.	**High potential.** Breeding is known from the Sunol Valley and large flocks were observed foraging over the project area. Potential breeding habitat exists in freshwater marshes and ruderal vegetation in or near the project area.
Golden eagle *Aquila chrysaetos*	CDFG fully protected	Nests in open areas on cliffs and in large trees.	**Moderate potential.** Open areas with large sycamore, cottonwood and oak trees in the southern project area and along San Antonio Creek east of Calaveras Road could provide nesting habitat. Known nesting sites on slopes above base of Turner Dam.
Short-eared owl *Asio flammeus*	--/CSC	Nests in grasslands, usually on the ground.	**Low potential.** Grasslands in the project area could provide nesting habitat for short-eared owl. Known nesting site along southeastern San Antonio Reservoir. However, grassland extent is limited and some is mowed annually. Much grassland habitat has been recently cleared in association with other SFPUC projects.
Burrowing owl *Athene cunicularia*	--/CSC	Nests and forages in low-growing grasslands that support burrowing mammals.	**Low potential.** Grasslands in the project area and 500-foot buffer support few small mammal burrows and fewer burrow complexes. Few holes were observed in rock and debris piles. No owls observed during breeding season surveys.
Northern harrier *Circus cyaneus*	--/CSC	Nests in coastal freshwater and saltwater marshes, nests and forages in grasslands.	**Low potential.** Nesting sites are potentially present in quarry ponds supporting freshwater emergent marshes.
White-tailed kite (nesting) *Elanus leucurus*	CDFG fully protected	Nests near wet meadows and open grasslands in dense oak, willow or other large tree stands.	**Moderate potential.** Potential nesting habitat is present along riparian corridors, and in oak woodlands to the east of Calaveras Road and at the southern end of the project area.

TABLE 1 (Continued)
FOCUSED LIST OF SPECIAL-STATUS SPECIES CONSIDERED FOR THE SAN ANTONIO BACKUP PIPELINE PROJECT

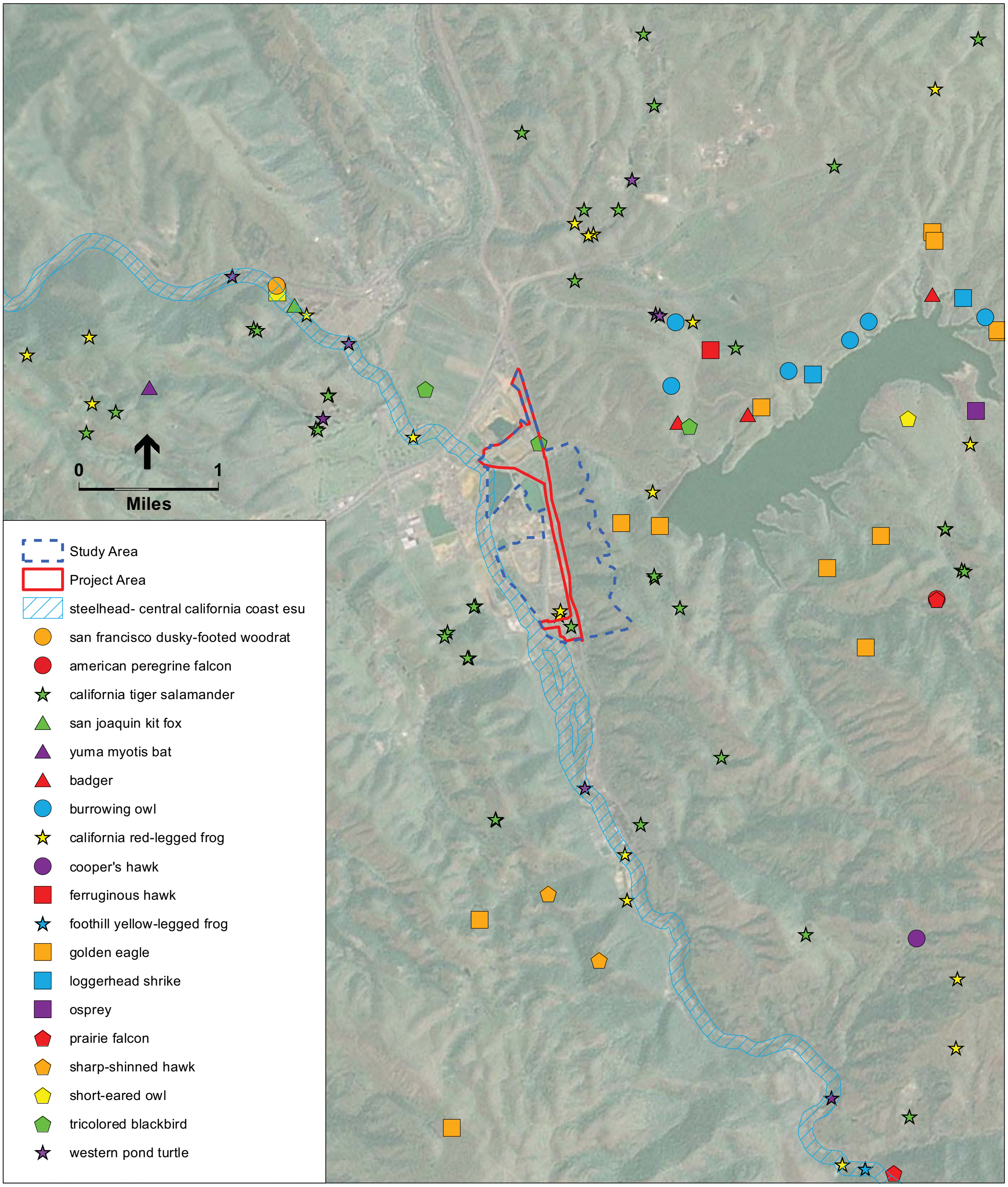
Common Name *Scientific Name*	Listing Status USFWS/ CDFG/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Animals (cont.)			
Birds (cont.)			
Horned lark *Eremophila alpestris*	--/CSC	Year-long resident in California. Nests on the ground, in grasslands.	**Moderate potential.** Nesting is documented on north slopes of San Antonio Reservoir. Suitable habitat is present in the project area in grasslands and along access roads.
Loggerhead shrike *Lanius ludovicianus*	--/CSC	Scrub, open woodlands, and grasslands.	**High potential.** Shrike nesting sites may occur in grasslands, shrubs, and trees throughout the study area.
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Day roosts are mainly in caves, crevices and mines; also found in buildings and under bark. Forages in open lowland areas.	**Low to moderate potential.** Potential roosting habitat is available in large diameter oaks and cottonwoods, and under bridges.
Tule elk *Cervus elaphus nannodes*	--/Local protection	The San Antonio elk herd is a resident herd from hills surrounding the San Antonio Reservoir.	**Low potential.** Tule elk are present on the slopes east of Calaveras Road and sign was observed within 400 feet of the road. May be affected by project noise during construction.
Hoary bat *Lasiurus cinereus*	--/CSC	Roosts in dense foliage of large trees.	**Low to moderate potential.** Roosting habitat is available in large, dense oak trees.
Yuma myotis *Myotis yumanensis*	--/CSC	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring.	**Low to moderate potential.** Roosting habitat is available in large diameter oaks and cottonwoods, and under bridges.
San Francisco dusky-footed woodrat *Neotoma fuscipes*	--/CSC	Occur in forests with established understory. Construct nests from woody debris.	**Low potential.** Woodland and scrub are generally absent from the project area. Riparian corridors within the project area lack forest understory, and habitat size is too small to support the species.
Townsend's big-eared bat *Plecotus townsendii*	--/CSC	Roosts in caves, mines, buildings or other human-made structures for roosting. Forages in open lowland areas.	**Low to moderate potential.** Roosting habitat is available in large diameter oaks and cottonwoods, and under bridges.
American badger *Taxidea taxus*	--/CSC	Grasslands, savannas, deserts, timberline mountain meadows.	**Low potential.** Denning habitat may be present in study area grasslands; but foraging habitat is limited by lack of abundant small mammal activity in the project area and no denning opportunities were noted within the project area.

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)
FE = Listed as Endangered (in danger of extinction) by the Federal Government.
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.
FC = Candidate to become a *proposed* species.
FSC = Federal Species of Concern. May be Endangered or Threatened, but not enough biological information has been gathered to support listing at this time.

STATE: (California Department of Fish and Game
CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CC= Candidate to become a *proposed* species
CSC = California Species of Special Concern

SOURCE: CDFG, 2011; USFWS, 2011; SFPUC, 2008, 2009, and 2011



SOURCE: CNDDB, 2010; SFPUC, 2008; SFPUC, 2010; ESRI, 2010

San Antonio Backup Pipeline Project . 206166.04

Figure 5
Special Status Species in the Project Area Vicinity

California tiger salamanders readily aestivate[6] in grasslands near ponds and at great distances from breeding ponds. Adults are known to travel distances greater than 1 kilometer (0.62 mile) from breeding ponds and have been documented at distances of 2 kilometers (1.2 miles) or more (Orloff, 2007). Typical aestivation sites include the burrows of California ground squirrels and valley pocket gophers (*Thomomys bottae*).

Project Area Occurrence

California tiger salamander occurs in at least five stock ponds located in surrounding foothills on both sides of Sunol Valley, at distances ranging from 0.6 to 0.8 mile from the project area (CDFG, 2009). A road mortality was recorded 1.4 miles south along Calaveras Road (CDFG, 2009), and a live individual was observed in 2009 in a sump at the Sunol Valley Chloramination Facility at the southern end of the project area (SFPUC, 2009a), suggesting that California tiger salamander uses the valley floor as a movement corridor. California tiger salamanders may utilize grassland habitat throughout the project area for dispersal; aestivation and foraging opportunities are limited by the small number of mammal burrows observed in the project area's ungrazed grassland and ruderal areas and have been further reduced by site preparation and fencing for construction of the NIT and Alameda Siphons projects, which overlap with the SABPL project area. This species is expected to occur occasionally in the project area, mainly using the grassland habitat for dispersal.

2.3.2 California Red-legged Frog (*Rana draytonii*)

Status

The California red-legged frog is federally listed as a threatened species, and is a California species of special concern.

General Ecology and Distribution

This ranid species is principally a pond frog that can be found in quiet permanent waters of ponds, pools, streams, springs, marshes, and lakes. Moist woodlands, forest clearings, and grasslands also provide suitable habitat for this species in the non-breeding season. Adult frogs seek waters with dense shoreline vegetation, such as cattails, that provide good cover, but may be found in unvegetated waters as well.

Red-legged frogs breed from January to May. Eggs are attached to vegetation in shallow water and are deposited in irregular clusters. Tadpoles grow to three inches before metamorphosing. Red-legged frogs are active year-round along the coast but inland populations may aestivate from late summer to early winter. Adults consume insects such as beetles, caterpillars and isopods, while tadpoles forage on algae and detritus.

Historically, the California red-legged frog occurred along the coast from the vicinity of Point Reyes National Seashore, Marin County, and inland from Redding, Shasta County southward to

[6] Aestivation is a state of dormancy similar to hibernation that occurs during summer and fall.

northwestern Baja California, Mexico (Jennings and Hayes, 1994). The majority of California red-legged frog occurrences in the San Francisco Bay Area are from Contra Costa and Alameda Counties.

Project Area Occurrence

California red-legged frog is known to occur in Alameda Creek both upstream and downstream of the project area. Upstream from the project area at a distance of 1.6 miles, several juvenile frogs were observed in 1998 in the deep pools of a glide-and-run portion of Alameda Creek; in 1999, an adult was observed in Alameda Creek 0.6 mile downstream of the San Antonio Creek confluence (CDFG, 2009); and California red-legged frog is known to occur in San Antonio Creek at the foot of Turner Dam at a distance of 0.9 mile from the project area. Downstream from the project area at a distance of 1.9 miles, up to fifteen adult red-legged frogs were observed over several years in off-channel ponds between Western Star Nursery and Alameda Creek (CDFG, 2009) but have not been observed there in the past two survey years (ESA, 2008; ESA, unpubl.data).

The nearest documented breeding habitat is in a small, shallow pond 1.4 miles northeast of the project area (CDFG, 2009). During surveys for the Alameda Siphons project, one California red-legged frog was observed within a seasonal wetland and one in an overflow ditch south of Pit F6 and just east of Calaveras Road (SFPUC, 2011). The wetland feature has recently been removed as a result of the Alameda Siphons project. The small pools at the southern end of SMP-30 Pit F6, discussed previously in the freshwater marsh habitat type, may provide potential low-quality breeding habitat for California red-legged frog (Irvington Partners Joint Venture, 2008). Additionally, the small pond at the northern end of the study area and east of Pit F4 may provide breeding habitat for California red-legged frog. Potential non-breeding aquatic refugia in the project area occur in the freshwater marsh near the San Antonio Chloramination Facility and in the SMP-24 pits, and infrequent small mammal burrows and rock and debris piles in project-area grasslands offer summer habitat. Based on the proximity of known occurrences and the presence of suitable habitat, this species is expected to occasionally occur in the project area.

2.3.3 Foothill Yellow-legged Frog (*Rana boylii*)

Status

Foothill yellow-legged frog is a California species of special concern.

General Ecology and Distribution

The foothill yellow-legged frog is found in or near rocky streams in a variety of habitats, including valley-foothill hardwood, valley-foothill riparian, coastal scrub, mixed chaparral, and wet meadows. Tadpoles are thought to graze on algae and diatoms, while adults eat both aquatic and terrestrial invertebrates. They are heavily predated by garter snakes. Adults bask on exposed streamside rock surfaces, diving into the stream when disturbed to take refuge under rocks or sediment. During cold weather, frogs seek shelter under submerged rocks or under rocks within a few feet of shore. Home ranges are thought to be very local, no more than 35 feet along a stream (CWHR, 2005). Breeding occurs from mid-March to May commensurate with seasonal rains, after which females deposit eggs in clusters of 200 to 300 attached to submerged cobble, boulder or bedrock substrate within glides, runs and pools (EBRPD, 2007). Tadpoles take anywhere from 5 to 22 days to hatch (CWHR, 2005; EBRPD, 2007) and metamorphose in roughly three to four months.

The foothill yellow-legged frog occurs in most of northern California west of the Cascade crest, along western Sierra Nevada slopes south to Kern County, and in the Coast Ranges from the Oregon border south to the Transverse Mountains in Los Angeles County. Isolated populations are also known from the Central Valley floor in San Joaquin County and from the mountains of Los Angeles County.

Project Area Occurrence

Foothill yellow-legged frog is known from the upper reaches of Alameda Creek but suitable habitat is absent in the project area (CDFG, 2009; SFPUC, 2008). The nearest documented occurrence is in Alameda Creek 4.6 miles upstream from the San Antonio Pump Station (CDFG, 2009). Within the study area, an unnamed intermittent drainage northeast of the San Antonio Pump Station and perpendicular to Calaveras Road provides cool and shaded cascading pools, but water flow is not perennial and pools lose their connectivity during the dry season. No amphibians were observed in upper portions of this drainage, though Pacific chorus frog tadpoles were observed in shallow pools near and east of Calaveras Road, outside the project area.

2.3.4 Western Pond Turtle (*Actinemys marmorata*)

Status

Western pond turtle is a California species of special concern.

General Ecology and Distribution

Western pond turtles are commonly found in ponds, lakes, marshes, rivers, streams, and irrigation ditches with rocky or muddy substrates surrounded by aquatic vegetation. These watercourses usually are within woodlands, grasslands, and open forests, between sea level and 6,000-foot elevation. Turtles bask on logs or other objects when water temperatures are lower than air temperatures. Nests are located at upland sites, often up to 0.25 mile from an aquatic site (Jennings and Hayes, 1994; Stebbins, 2003; Zeiner et al., 1988-1990). General dispersal may occur throughout upland habitat.

Western pond turtles are uncommon and discontinuously distributed throughout California west of the Cascade-Sierran crest, with isolated populations in the Mojave River area and Andreas Canyon (Jennings and Hayes, 1994).

Project Area Occurrence

Western pond turtle is known from Alameda Creek and tributaries, and is presumed present at aquatic sites throughout the study area, potentially including pits within the SMP-24 and SMP-30 quarry areas. The nearest documented occurrences are from Alameda Creek at a distance of 1.1 miles south of the San Antonio Pump Station, and from a tributary to Vallecitos Creek at a distance of 1.2 miles northeast of SMP-24 (SFPUC, 2008). During reconnaissance surveys, this species was observed in San Antonio Creek at the base of Turner Dam. Within the project area, intermittent drainages, quarry pits, and upland areas provide potential pond turtle habitat.

2.3.5 Alameda Whipsnake (*Masticophis lateralis euryxanthus)*

Status

Alameda whipsnake is a federal and state threatened species.

General Ecology and Distribution

Alameda whipsnakes are dependent upon open chaparral, sage scrub, and coastal scrub. Core habitat most commonly occurs on east, southeast, south, and southwest facing slopes (Federal Register, 2000). However, telemetry data indicate that although core habitat is centered on shrub communities, they extensively utilize adjacent habitats including grassland, oak savanna, and occasionally oak-bay woodland (ESA, 2009a). Alameda whipsnakes use grassland habitats for periods of up to several weeks, with males using grassland habitats more frequently in the mating season and females using grassland habitats after mating occurs. Rock outcrops are an important feature of Alameda whipsnake habitat because they provide retreat opportunities and support lizard populations (USFWS, 2002; 2005).

While Alameda whipsnakes are regularly observed in nonscrub areas, the ultimate role of such habitat in the life history of this snake species is still emerging. While it is not fully understood how far or often Alameda whipsnakes venture away from scrub habitat, or whether such movements represent individuals that have become permanently separated from scrub habitat, recent studies indicate that snakes routinely move several miles farther from scrub habitat than previously described (Swaim, 2007).

Historically, Alameda whipsnakes were probably found in the coastal scrub and oak woodland communities of the East Bay in Contra Costa, Alameda, western San Joaquin, and northern Santa Clara Counties (USFWS, 2002). Currently, they are only found in the inner Coast Range in western and central Contra Costa and Alameda Counties (USFWS, 2002). Five isolated populations of Alameda whipsnake are now recognized within its historical range: Tilden–Briones, Oakland–Las Trampas, Hayward–Pleasanton Ridge, Sunol–Cedar Mountain, and Mt. Diablo–Black Hills (USFWS, 1997).

Project Area Occurrence

Alameda whipsnake is known from three occurrences in the La Costa Valley and Niles USGS 7.5-minute topographic quadrangles, which includes San Antonio Reservoir and Sunol Valley. All locations are sensitive and thus are suppressed data, though CDFG disclosed that the nearest occurrence is 5.0 miles south of the project area (Darlene McGriff, pers. comm., 2009). Documented habitat described for these occurrences is riparian woodland bordered by slopes vegetated with annual grasses, soft chaparral, and blue oak woodland, with numerous rock outcrops; chaparral, oak woodland, and grassland; and chaparral scrub. Sage scrub habitat is absent from the project area, but is present in small, discontinuous patches on the upper south and west-facing slopes east of Calaveras Road within the study area. Marginally suitable foraging and dispersal habitat is present within the project area in grasslands and ruderal habitat between Calaveras Road and Alameda Creek, but based on the distance from known occurrences, this species has a low likelihood of occurrence within the project area and much of the habitat within the proposed project area has recently been cleared and fenced for the NIT and Alameda Siphons projects and no longer provides foraging and dispersal habitat for this species.

2.3.6 Coast Horned Lizard (*Phrynosoma coronatum*)

Status

The coast horned lizard is a California species of special concern.

General Ecology and Distribution

The coast horned lizard occurs in the Sierra Nevada foothills from Butte County to Kern County and throughout the central and southern California coast. The species is found in several habitat types including areas with an exposed gravelly-sandy substrate containing scattered shrubs, clearings in riparian woodlands, dry uniform chamise chaparral, and annual grassland with scattered perennial seepweed or saltbush. Horned lizard populations reach maximum abundance in sandy loam areas and on alkali flats often dominated by iodine bush. Coast horned lizards utilize small mammal burrows or burrow into loose soils under surface objects during extended periods of inactivity or hibernation (Jennings and Hayes, 1994).

Project Area Occurrence

This species has not been documented in the Sunol Valley. The nearest reported occurrence is in eastern La Costa Valley at a distance of 4.8 miles east of the project area (SFPUC, 2008). Alkali areas with sandy loam soils and alkali flats are not present within the project area. Washes associated with Alameda Creek are characterized as large cobble beds with minimal areas of sand, though sand is accumulated or exposed at the foot of both wooden bridges crossing the creek. Sandy areas are absent within the project area, though a few small mammal burrows are present in area grasslands and surface debris is abundant along the access road traversing the ruderal area between the western rim of Pit F3-East and Pit F3-West. Based on the absence of suitable habitat, coast horned lizard has a low likelihood to occur within the project area.

2.3.7 Western Burrowing Owl (*Athene cunicularia*)

Status

The western burrowing owl is a California species of special concern.

General Ecology and Distribution

Western burrowing owls are relatively small, semicolonial owls, and are mostly residents of open dry grasslands and desert areas. They occupy burrows for both breeding and roosting. They use burrows excavated by ground squirrels and other small mammals and will use human-made burrows and cavities. Where the number and availability of natural burrows is limited, owls may occupy human-made burrows such as drainage culverts, cavities under piles of rubble, discarded pipe, and other tunnel-like structures (Shuford and Gardali, 2008). Burrowing owls hunt from perches and are opportunistic feeders. They consume arthropods, small mammals (e.g., meadow voles), birds, amphibians, and reptiles. Insects are often taken during the day, while small mammals are taken at night (Shuford and Gardali, 2008).

Project Area Occurrence

Burrowing owl is known from the northern slopes of San Antonio Reservoir, with the nearest occurrence being 1.1 miles east of SMP-24 (SFPUC, 2008). Potential habitat occurs adjacent to the project area within grassland foothills on the east side of Calaveras Road, but no owls and very few small mammal burrow complexes were observed during a focused survey of the 500-foot project buffer area. Grasslands within the project area are very compacted and ground squirrels were not observed in these areas. Abundant debris piles are present along an access road traversing the ruderal area between the western rim of Pit F3-East and the adjacent quarry pit, but few small mammal burrows and no burrowing owls or their sign were observed during the reconnaissance survey. Based on the absence of suitable habitat features identified during focused surveys, burrowing owl have a low likelihood of occurrence within, or within 500 feet of, the project area.

2.3.8 Fully-protected Birds and Birds of Prey

American peregrine falcon (*Falco peregrinus anatum*). American peregrine falcon is found in a variety of habitats and is one of the most widespread birds in the world, though U.S. populations plunged due to increased pesticide use from the 1950s to 1970s (White et al, 2002). Peregrine falcon forages in open areas, but historical cliff nesting has been adapted to include tall buildings in large cities.

Nesting sites are documented within five miles of the project area, though exact locations are suppressed due to the sensitivity of the species (CDFG, 2009). This species was not observed during field assessments, and the cliffs, tall buildings, high bridges, or specially-constructed towers that could provide potential nesting habitat are absent from the project area.

Golden Eagle (*Aquila chrysaetos*). Golden eagles nest in open areas on cliffs and in large trees, often constructing multiple nests in one breeding territory (Zeiner et al., 1988-1990). They prefer open habitats such as rolling grasslands, deserts, savannahs, and early successional forest and shrub habitats, with cliffs or large trees for nesting and cover (Zeiner et al., 1988-1990).

Nest locations are documented in oak woodland on the slopes above and to the southwest of Turner Dam, at a distance of 0.49 mile from the project area (SFPUC, 2009). Additional nests are documented east of San Antonio Reservoir, approximately 3.6 miles from the project area, and in hills west of Sunol Valley approximately 4.0 miles south of the project area. This species was not observed during field assessments and potential nesting habitat is available in large sycamore trees adjacent to open grassland in the vicinity of the southern project area. However, due to the ongoing disturbance adjacent to this area, nesting golden eagles are considered unlikely anywhere but in trees on the slopes to the east of Calaveras Road.

Short-Eared Owl (*Asio flammeus*). The short-eared owl is an open country bird that is seen most often at dawn and dusk. Short-eared owls usually nest on dry ground in depressions that are concealed by vegetation, sometimes nesting within burrows. Breeding is from early March through July with a typical clutch size of five to seven eggs. This owl is a widespread winter migrant with resident populations in portions of California (Shuford and Gardali, 2008). The short-eared owl is one of the most widely distributed owls in the world.

Short-eared owl nesting is documented from western La Costa Valley at a distance of 2.7 miles east of the project area. Very limited suitable habitat is present in the project area due to the extensive clearance of non-native grassland and ruderal areas during construction of other SFPUC projects.

White-tailed Kite (*Elanus leucurus*). White-tailed kites forage in open grasslands, meadows, farmlands, and emergent wetlands. They typically nest in oak woodlands or trees, especially along marsh or river margins, although they will use any suitable tree or shrub that is of moderate height. They are rarely found far from agricultural areas (Zeiner et al., 1988-1990).

No nest locations are documented within six miles of the project area, but suitable habitat is available along San Antonio Creek at the proposed pipeline crossing, and within the study area in oak woodlands east of Calaveras Road. This species was observed foraging east of Calaveras Road, north of the project area. However, potential foraging habitat has become increasingly limited within the project area due to site clearance for other SFPUC projects.

Bald Eagle (*Haliaeetus leucocephalus*). Bald eagles occupy a wide range of habitats, including woodlands, forests, grasslands, and wetlands. They winter throughout California near lakes, reservoirs, rivers, and some rangelands and coastal wetlands. Nesting is usually restricted to mountainous habitats near reservoirs, lakes, and rivers. Bald eagles usually nest in large coniferous trees within 1 mile of permanent water. They forage over large water bodies or rivers with easily approached snags and other perches (Zeiner et al., 1988-1990).

Bald eagle nesting is documented from Calaveras Reservoir approximately 6.0 miles southeast of the project area (SFPUC, 2008). Large quarry ponds in the project area could provide potential foraging habitat if fish are present. However, the absence of documented occurrences in the area (CDFG, 2009), including San Antonio Reservoir, makes it unlikely that this species is nesting in the project vicinity. This species was not observed during field assessments.

Northern Harrier (*Circus cyaneus*). Northern harriers are found in a wide variety of habitats from Central Valley grasslands up to lodgepole pines and alpine meadow habitats. They are known to frequent meadows, grasslands, open rangelands, desert sinks, freshwater and saltwater emergent wetlands. Harriers are seldom found in wooded areas. Harriers nest on the ground, usually within patches of dense, tall vegetation in undisturbed areas (Shuford and Gardali, 2008).

No nesting locations are documented within six miles of the project area. Suitable nesting habitat is present in project area grasslands and ruderal vegetation, though the region's mining activity likely creates a significant noise disturbance such that nesting is avoided in the area. In addition, potential foraging habitat has become increasingly limited within the project area due to site clearance for other SFPUC projects.

2.3.9 Nesting Birds

Tricolored Blackbird (*Agelaius tricolor*). Tricolored blackbirds are a colonial species that nest in dense vegetation in and around freshwater wetlands. When nesting, tricolored blackbirds generally require freshwater wetland areas large enough to support colonies of 50 pairs or more. They prefer freshwater emergent wetlands with tall, dense cattails or tules for nesting, but will also breed in thickets of willow, blackberry, wild rose, or tall herbs. During the nonbreeding season, flocks are highly mobile and forage in grasslands, croplands, and wetlands (Shuford and Gardali, 2008).

Tricolored blackbirds are locally common throughout the Central Valley and breeding habitat is documented from the Sunol Valley (CDFG, 2009; SFPUC, 2008). During the reconnaissance survey, a large mixed flock of tricolored and red-winged blackbirds (*Agelaius phoeniceus*) numbering in the hundreds-to-thousands was observed flying back and forth over the project area, and a smaller flock of tricolored blackbirds numbering approximately 100 was observed foraging in the floodplain of Alameda Creek beneath the two wooden bridges; this pure flock was also observed flying back and forth over the quarry area. Breeding may occur in a large freshwater marsh west of Pit F4, which contains abundant cattails and measures roughly six acres in size, and may occur in another large freshwater marsh west of SMP-30 which measures roughly eight acres in size. Low-quality nesting habitat occurs in the project area in tall mustard (*Brassica* sp.), and other herbaceous vegetation, but tricolored blackbirds are not expected to nest in these areas when high-quality aquatic emergent habitat is present nearby.

Horned Lark (*Eremophila alpestris*). California horned larks are brown songbirds that form large flocks for foraging and roosting. They build grass-lined nests directly on the ground, in dry, open habitats with sparse vegetation. This species is a common to abundant resident songbird in a variety of open habitats. Range-wide, California horned larks breed in level or gently sloping shortgrass prairie, montane meadows, barren fields, opens coastal plains, fallow grain fields, row crops, and alkali flats.

Horned larks range across North America from Alaska and the Canadian arctic southward to southern Mexico. Within the project vicinity, nesting is documented from grasslands on the north slopes of San Antonio Reservoir. In the project area, limited areas of potentially suitable habitat is present in grasslands on the margins of access roads.

Loggerhead Shrike (*Lanius ludovicianus*). Loggerhead shrikes are a California semipermanent resident species that occurs in abundance in the Central Valley and central coast where shrub habitats and open woodlands are available. Shrikes generally forage on the fringes of open habitats where suitable hunting perches are available. This species typically hunts from dead trees, tall shrubs, utility wires and fences, impaling their prey on sharp twigs, thorns, or barbed wire.

Breeding is documented from the northern slopes of San Antonio Reservoir (SFPPUC, 2008). Shrike populations are generally known from wooded riparian corridors and grazed lands, with breeding often associated with blackberry and willows ranging in size from individual shrubs to dense thickets. Shrikes are common throughout California and are expected to occur in the project area along San Antonio Creek, along an intermittent drainage northwest of the San Antonio Pump Station, and along the southeast fringes of Pit F3-East where shrubby willows provide adequate cover and nesting sites. This species was observed during the reconnaissance survey.

2.3.10 Tule Elk (*Cervus elaphus nannodes*)

Status

Tule elk is currently protected under Senate Bill 722 (enacted in 1971), which prohibits the taking of tule elk until the statewide population exceeds 2000 statewide, or until suitable habitat can no longer be found. Additionally, federal protection is offered by P.L. 94-389, the Joint Resolution for Federal Participation in Preserving the Tule Elk Population in California (enacted 1976). This resolution provides for federal participation in preserving tule elk populations in California, and recognized that the species is rare.

General Ecology and Distribution

Tule elk are endemic to California, and nearly faced extinction in the last century due to settlement pressures. They have been reintroduced into various parts of California and at least eighteen herds are established. Tule elk use brush, scrub and herbaceous habitats throughout the year. Diet varies geographically and includes grasses, forbs, tender twigs and leaves of shrubs and trees, fungi, mast, and aquatic vegetation. Calving occurs in areas with available water and brushy vegetation, secluded from human impacts. Threats include predation by mountain lions and coyotes, illegal poaching by humans, and human interference (CDFG, 2005).

Project Area Occurrence

The San Antonio herd descends from a small group reintroduced to the area in the late 1970s. The herd was observed during reconnaissance surveys on hilltops east of Calaveras Road. Calaveras Road is fenced on both sides of the road at a height greater than three feet for the entire length of the project area, and presumably for the length of the road. Tule elk are deterred by fencing greater than three feet in height, are sensitive to human disturbance and avoid areas near human activities (Ferrier and Roberts, 1973). Due to fencing and Tule elk's tendency to favor remote areas with scrub habitat, it is unlikely that Tule elk would be encountered in the project area.

2.3.11 San Francisco Dusky-footed Woodrat (*Neotoma fuscipes*)

Status

The San Francisco dusky-footed woodrat is a California species of special concern.

General Ecology and Distribution

San Francisco dusky-footed woodrat is common in the Coast Ranges and the interior of California in a variety of habitats including forests and shrubland, especially near water, and is generally absent in agricultural and grassland areas. Woodrats inhabit the dense forest understory but require multi-story habitat layers for foraging. The forest understory needs to be sufficiently open for shrubs, forbs, and grasses to persist (CWHR, 2005), as they feed on woody plants, fungi, graminoids, forbs, seeds, acorns, berries, fruits, nuts, flowers, shrubs and tree leaves. They build nests from woody debris, usually on the ground, but occasionally nest in tree hollows and rock piles.

Project Area Occurrence

Dusky-footed woodrat is known from the Sunol Valley, with a documented occurrence approximately 2 miles north of the project area along Alameda Creek, near the Western Star Nursery. Within the project area, the forest understory or dense scrub habitat required to support dusky-footed woodrat is absent. Marginally suitable habitat is present within the study area on the east side of Calaveras Road along riparian corridors associated with seasonal and intermittent creeks, and scat possibly belonging to woodrat was observed in a large oak tree hollow near San Antonio Creek east of Calaveras Road. This species is not expected to occur within the project area.

2.3.12 American Badger (*Taxidea taxus*)

Status

The American badger is a California species of special concern.

General Ecology and Distribution

Badgers range throughout the state except for the humid coastal forests of northwestern California in Del Norte County and the northwestern portion of Humboldt County (Williams, 1986). They occupy a diversity of California habitats, including grasslands, savannas, mountain meadows near timberline, and deserts. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground; a minimum of 25 acres is required for persistence of an individual (CWHR, 2005). Their diet consists of small-to-medium-sized mammals including shrews, mice, voles, gophers, and ground squirrels, as well as terrestrial insects, invertebrates, lizards, snakes, small-to-medium-sized birds, and eggs.

Project Area Occurrence

Suitable habitat is absent in the project area. Grasslands and ruderal areas within the project area are heavily compacted, resulting in a low density of small mammal burrows; no ground squirrels were observed in these areas. Within the study area, on the east side of Calaveras Road, suitable habitat is available in the form of non-native annual grassland foothills but no badger dens were observed. Few ground squirrel complexes were observed during a focused survey for burrowing owl, but the area appears to support a moderate number of moles and gophers. Badgers are described from grassland hills on the north banks of San Antonio Reservoir, with the nearest occurring 1.0 mile east of SMP-24 (SFPUC, 2008). The absence of denning habitat and the low density of small mammal burrows make it unlikely that badger would be encountered in the project area.

2.3.13 San Joaquin Kit Fox (*Vulpes macrotis mutica*)

Status

The San Joaquin kit fox is federally listed as an endangered species and state listed as a threatened species.

General Ecology and Distribution

The San Joaquin kit fox is a permanent resident of arid grasslands and open scrubland, where friable soils are present. Dens are required year-round for reproduction, shelter, temperature regulation, and protection from predators (USFWS, 1998). Grasslands with friable soils are considered the principal habitat for denning, foraging, and dispersal, while open oak woodlands provide lower quality foraging and dispersal habitat. Kit foxes will use habitats that have been extensively modified by humans, including grasslands and scrublands with active oil fields, wind turbines, and agricultural matrices (USFWS, 1998).

San Joaquin kit foxes occur only in and around the Central Valley, inhabiting open habitat in the San Joaquin Valley and surrounding foothills. Kit fox population densities are greatest in the southern portion of their range; populations in the northern portion of their range are highly fragmented and sparsely distributed (Orloff et al., 1986). In the northern portion of its range, California ground squirrels are a chief component of the kit fox diet (Hall, 1983).

Project Area Occurrence

One kit fox occurrence has been documented in the Sunol Valley, between the Western Star Nursery and Alameda Creek approximately 2.0 miles northwest of Pit F3-East, where two adult foxes were sighted along the Sunol Aqueduct access road in 2006 (CDFG, 2009). The next nearest occurrence with habitat connectivity is more than 16 miles east of the Sunol Valley. No ground squirrels and few small mammal burrows were observed in project area grasslands, and suitable denning habitat is absent from the project area due to graded and compacted ruderal and non-native annual grasslands that are naturalizing after use as commercial plant nursery grounds. The distance from other known occurrences and the minimal foraging opportunities available in the project area make it unlikely that kit fox would be encountered.

2.3.14 Sensitive Bat Species

Sensitive bat species known from the project vicinity include Yuma myotis, hoary bat, pallid bat and Townsend's big-eared bat (*Corynorhinus townsendii*) (CDFG, 2009; SFPUC, 2008). Yuma myotis is documented from hills approximately 2.5 miles west of the project area. Hoary bat, pallid bat, and Townsend's big-eared bat are known from the project vicinity, but the exact locations are suppressed due to the sensitivity of the species (CDFG, 2009). Quarry pits and the Alameda Creek channel provide potential foraging habitat for insectivorous bats, and potential roosting habitat is available in buildings, under bridges, and in tree hollows within the project area. The house and open barn near the proposed Staging Area 2 were inspected but no bats or bat sign were observed. The Calaveras Road bridge over San Antonio Creek and two wooden bridges crossing Alameda Creek near the southern project area were also inspected but no bats were observed. Large tree hollows are present in the project vicinity and could provide potential habitat for tree-roosting bats near the SMP-24 access gate at Calaveras Road, and west of the San Antonio Pump Station in the southern project area. These hollows were observed in large sycamore, oak, and cottonwood trees along San Antonio Creek, on slopes east of Calaveras Road, and in grasslands west of the proposed chemical facility. Although extensive site clearance has temporarily removed bat foraging habitat in much of the project area, the large trees in these areas, for the most part, have been preserved.

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CHAPTER 3

References, Communications, and Report Preparation

3.1 References

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3.2 List of Preparers

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APPENDIX A

List of Species Observed Within the Study Area

SPECIES OBSERVED WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat Type Where the Species was Observed
Fish		
Mosquito fish	*Gambusia*	Lacustrine
Minnows (unidentified)		San Antonio Creek
Amphibians		
American bullfrog	*Lithobates catesbeianus*	Lacustrine
Pacific chorus frog	*Pseudacris regilla*	Freshwater marsh Seasonal wetland
Western toad	*Bufo boreas*	Freshwater marsh Seasonal wetland
Reptiles		
Western rattlesnake	*Crotalus viridis helleri*	Riparian
Western fence lizard (coast range)	*Sceloporus occidentalis bocourtii*	Non-native annual grasslands Riparian
Birds		
Spotted sandpiper	*Actitis macularia*	Lacustrine (on exposed pump piping at the water surface)
Red-winged blackbird	*Agelaius phoeniceus*	Freshwater marsh Seasonal wetland Non-native annual grasslands Ruderal
Tricolored blackbird	*Agelaius tricolor*	Freshwater marsh Seasonal wetland Non-native annual grasslands Ruderal Alameda Creek channel
Mallard	*Anas platyrhynchos*	Lacustrine
Western scrub jay	*Aphelocoma californica*	Riparian
Oak titmouse	*Baeolophus inornatus*	Non-native annual grasslands (occasional oak trees)
Canada goose	*Branta canadensis*	Lacustrine
Red-tailed hawk	*Buteo jamaicensis*	Non-native annual grasslands (occasional oak trees)
Green heron	*Butorides virescens*	Lacustrine (water’s edge)
California quail	*Callipepla californica*	Non-native annual grasslands (coyote brush)
Anna's hummingbird	*Calypte anna*	Riparian
Lesser goldfinch	*Carduelis psaltria*	Riparian
American goldfinch	*Carduelis tristis*	Riparian
House finch	*Carpodacus mexicanus*	Non-native annual grasslands
Turkey vulture	*Cathartes aura*	Non-native annual grasslands Developed (rubble piles)
Killdeer	*Charadrius vociferus*	Non-native annual grasslands/Ruderal Developed (roads)

SPECIES OBSERVED WITHIN THE STUDY AREA (Continued)

Common Name	Scientific Name	Habitat Type Where the Species was Observed
Birds (cont.)		
American crow	*Corvus brachyrhynchos*	Riparian Non-native annual grasslands
Brewer's blackbird	*Euphagus cyanocephalus*	Non-native annual grasslands Ruderal
American kestrel	*Falco sparverius*	Non-native annual grasslands
American coot	*Fulica americana*	Lacustrine
Bullock's oriole	*Icterus bullockii*	Riparian
Belted kingfisher	*Megaceryle alcyon*	Lacustrine
Acorn woodpecker	*Melanerpes formicivorus*	Non-native annual grasslands (occasional oak trees)
Wild turkey	*Meleagris gallopavo*	Non-native annual grasslands
Song sparrow	*Melospiza melodia*	Freshwater marsh Ruderal
Black-crowned night heron	*Nycticorax nycticorax*	Lacustrine (water's edge)
Savannah sparrow	*Passerculus sandwichensis*	Freshwater marsh Ruderal
Brandt's cormorant	*Phalacrocorax penicillatus*	Lacustrine
Bushtit	*Psaltriparus minimus*	Non-native annual grasslands (occasional oak trees)
Black phoebe	*Sayornis nigricans*	Riparian Freshwater marsh Lacustrine (water's edge)
Western bluebird	*Sialia mexicana*	Non-native annual grasslands
white-breasted nuthatch	*Sitta carolinensis*	Non-native annual grasslands (occasional oak trees)
Rough-winged swallow	*Stelgidopteryx serripennis*	Lacustrine (foraging over quarry pond)
European starling	*Sturnus vulgaris*	Non-native annual grasslands (occasional oak trees) Riparian
Tree swallow	*Tachycineta bicolor*	Lacustrine (foraging over quarry pond)
Bewick's wren	*Thryomanes bewickii*	Non-native annual grasslands (occasional oak trees) Riparian
Western kingbird	*Tyrannus verticalis*	Non-native annual grasslands (occasional oak trees)
Mammals		
Black-tailed jackrabbit	*Lepus californicus*	Non-native annual grasslands
California ground squirrel	*Spermophilus beecheyi*	Non-native annual grasslands
Tule elk	*Cervus elaphus nannodes*	Hilltops east of Calaveras Road

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APPENDIX B

USFWS Official List for the La Costa Valley and Niles USGS 7.5-minute quadrangles CNDDB List for the La Costa Valley and Niles USGS 7.5-minute quadrangles

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United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
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January 16, 2011

Document Number: 110116071457

Martha Lowe
Environmental Science ASsociates
350 Frank H. Ogawa Plaza
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Oakland, CA 94612

Subject: Species List for SFPUC San Antonio Backup Pipeline Project

Dear: Ms. Lowe

We are sending this official species list in response to your January 16, 2011 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be April 16, 2011.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 110116071457

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
- Conservancy fairy shrimp (E)

Branchinecta lynchi
- vernal pool fairy shrimp (T)

Euphydryas editha bayensis
- bay checkerspot butterfly (T)

Lepidurus packardi
- Critical habitat, vernal pool tadpole shrimp (X)
- vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
- delta smelt (T)

Oncorhynchus mykiss
- Central California Coastal steelhead (T) (NMFS)
- Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha
- Central Valley spring-run chinook salmon (T) (NMFS)
- winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
- California tiger salamander, central population (T)

Rana draytonii
- California red-legged frog (T)
- Critical habitat, California red-legged frog (X)

Reptiles

Masticophis lateralis euryxanthus
- Alameda whipsnake [=striped racer] (T)
- Critical habitat, Alameda whipsnake (X)

Birds

Sternula antillarum (=Sterna, =albifrons) browni
- California least tern (E)

Mammals

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Plants

Lasthenia conjugens
Contra Costa goldfields (E)
Critical habitat, Contra Costa goldfields (X)

Proposed Species

Amphibians

Rana draytonii
Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

NILES (446C)

LA COSTA VALLEY (446D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be April 16, 2011.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
Data request for the La Costa Valley and Niles USGS 7.5 Minute Topographic Quadrangles

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	***Accipiter cooperii*** Cooper's hawk	ABNKC12040			G5	S3	
2	***Accipiter striatus*** sharp-shinned hawk	ABNKC12020			G5	S3	
3	***Agelaius tricolor*** tricolored blackbird	ABPBXB0020			G2G3	S2	SC
4	***Ambystoma californiense*** California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SC
5	***Antrozous pallidus*** pallid bat	AMACC10010			G5	S3	SC
6	***Aquila chrysaetos*** golden eagle	ABNKC22010			G5	S3	
7	***Campanula exigua*** chaparral harebell	PDCAM020A0			G2	S2.2	1B.2
8	***Corynorhinus townsendii*** Townsend's big-eared bat	AMACC08010			G4	S2S3	SC
9	***Emys marmorata*** western pond turtle	ARAAD02030			G3G4	S3	SC
10	***Falco mexicanus*** prairie falcon	ABNKD06090			G5	S3	
11	***Falco peregrinus anatum*** American peregrine falcon	ABNKD06071	Delisted	unknown code...	G4T3	S2	
12	***Helianthella castanea*** Diablo helianthella	PDAST4M020			G2	S2	1B.2
13	***Lasiurus cinereus*** hoary bat	AMACC05030			G5	S4?	
14	***Linderiella occidentalis*** California linderiella	ICBRA06010			G3	S2S3	
15	***Masticophis lateralis euryxanthus*** Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
16	***Oncorhynchus mykiss irideus*** steelhead - central California coast DPS	AFCHA0209G	Threatened		G5T2Q	S2	
17	***Rana boylii*** foothill yellow-legged frog	AAABH01050			G3	S2S3	SC
18	***Rana draytonii*** California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
19	***Streptanthus albidus ssp. peramoenus*** most beautiful jewel-flower	PDBRA2G012			G2T2	S2.2	1B.2
20	***Sycamore Alluvial Woodland***	CTT62100CA			G1	S1.1	

APPENDIX H

Wetland Delineation

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DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94103-1398

JUL 08 2011

Regulatory Division

SUBJECT: File Number 08-00207

Ms. YinLan Zhang
San Francisco Public Utilities Commission
Bureau of Environmental Management
1145 Market Street, Suite 500
San Francisco, CA 94103

Dear Ms. Zhang:

This letter is written in response to your submittal of November 23, 2009 requesting confirmation of the extent of Corps of Engineers jurisdiction at San Antonio Backup Pipeline Project site, near Sunol, Alameda County, California.

Enclosed aare maps showing the extent and location of Corps of Engineers jurisdiction, entitled "USACE File # 08-00207S, San Francisco Public Utilities Commission, San Antonio Backup Pipeline" in 7 sheets, dated June 14, 2010. We have based this jurisdictional delineation on the current conditions on the site as verified during a site visit performed by our staff on February 27, 2008. A change in those conditions may also change the extent of our jurisdiction. This jurisdictional delineation will expire in five years from the date of this letter. However, if there has been a change in circumstances that affects the extent of Corps jurisdiction, a revision may be completed before that date.

You are advised that the Corps has established an Administrative Appeal Process, as described in 33 C.F.R. Part 331 (65 Fed. Reg. 16,486; March 28, 2000), and outlined in the enclosed flowchart and "Notification of Administrative Appeal Options, Process, and Request for Appeal" form (NAO-RFA). If you do not intend to accept the approved jurisdictional determination, you may elect to provide new information to the District Engineer for reconsideration or submit a completed NAO-RFA form to the Division Engineer to initiate the appeal process. You will relinquish all rights to appeal, unless the Corps receives new information or a completed NAO-RFA form within sixty (60) days of the date of the NAO-RFA.

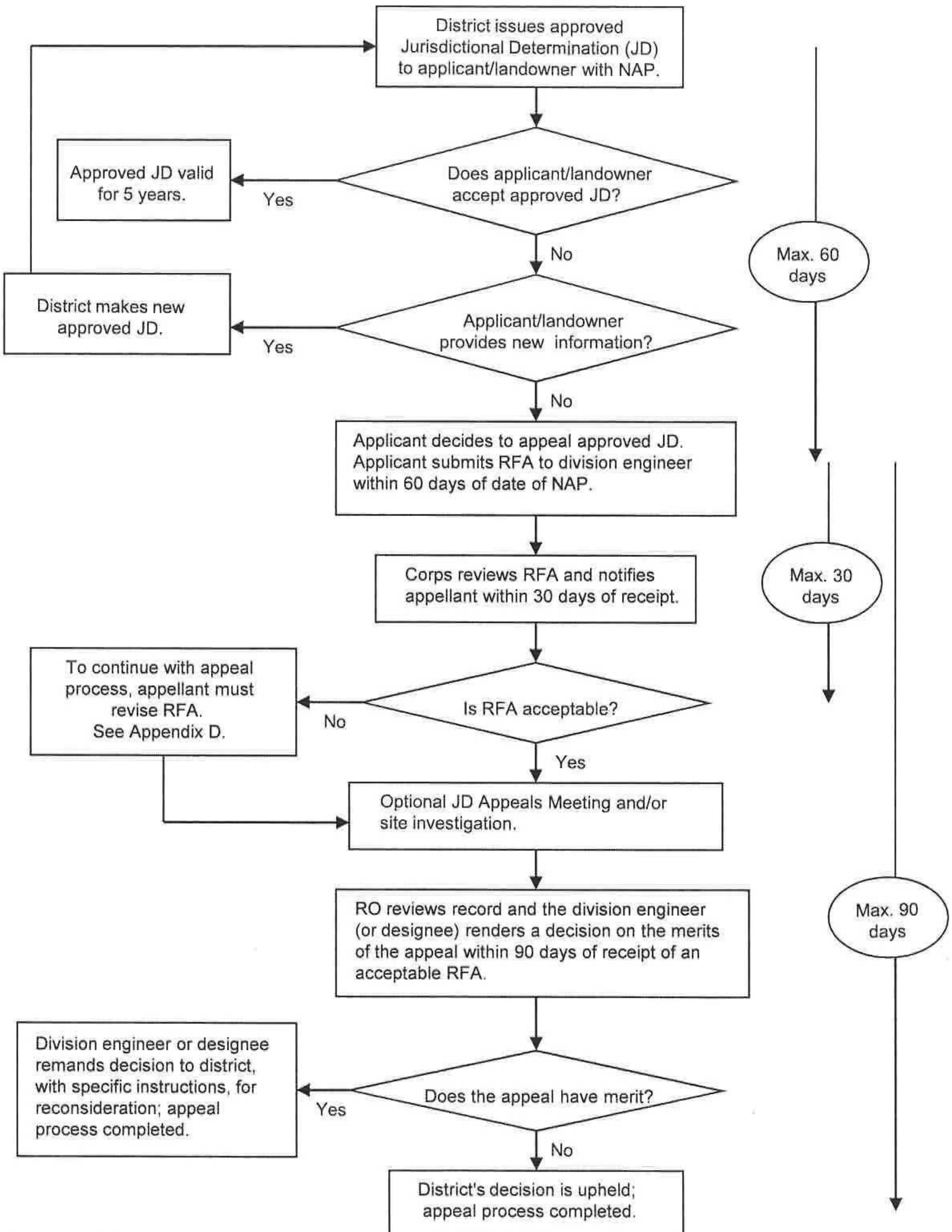
Should you have any questions regarding this matter, please call Bob Smith of our Regulatory Division at (415) 503-6792. Please address all correspondence to the Regulatory Division and refer to the File Number at the head of this letter. If you would like to provide comments on our permit review process, please complete the Customer Survey Form available online at http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

Jane M. Hicks
Chief, Regulatory Division

Enclosures

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: SFPUC		File Number: 2008-00207S	Date: 6/18/10
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
X	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. The district engineer must receive your objections within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. The division engineer must receive this form within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. The division engineer must receive this form within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. The division engineer must receive this form within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

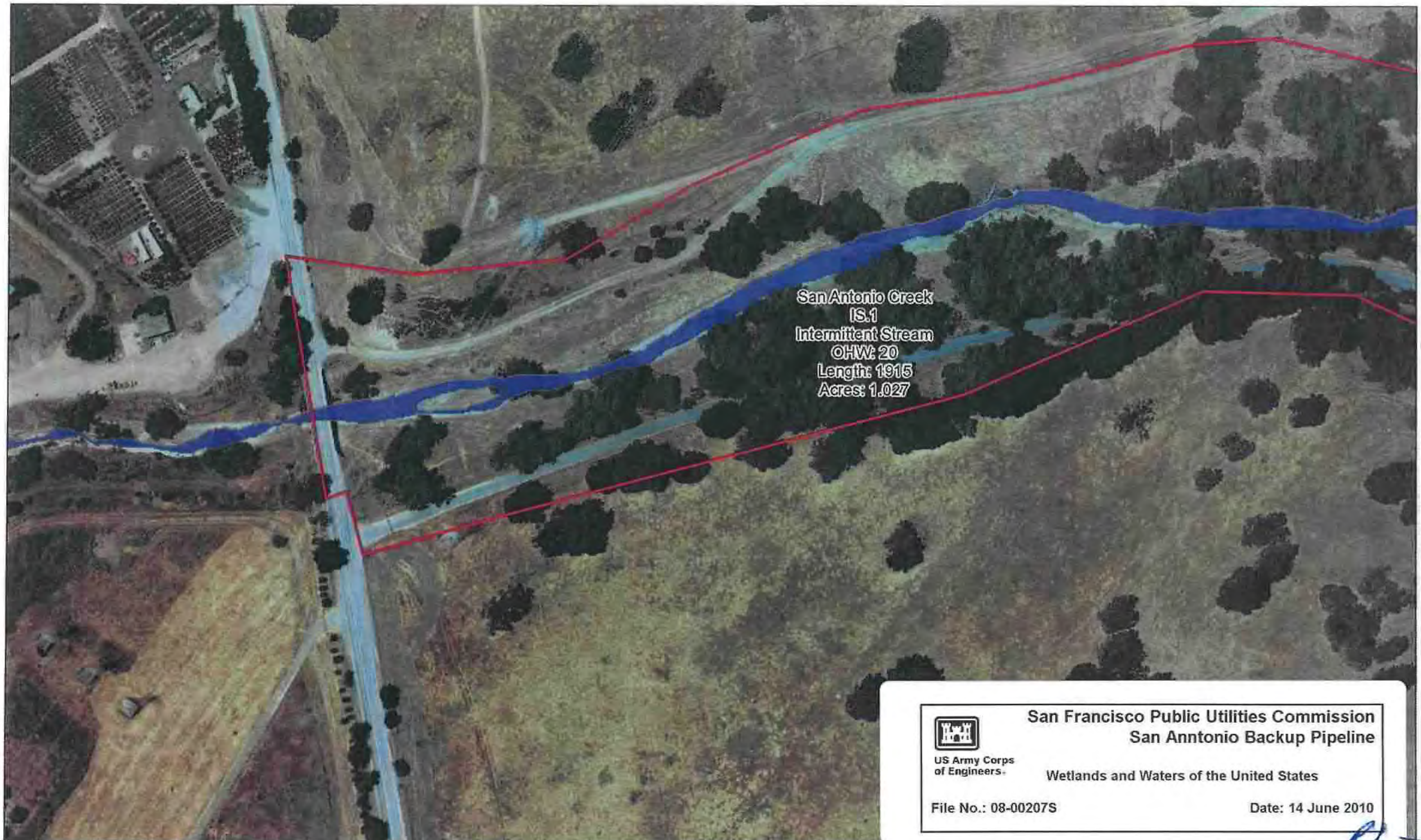
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Mr. Cameron Johnson Chief, South Branch, Regulatory Division U.S. Army Corps of Engineers, San Francisco District 1455 Market Street, San Francisco, CA 94103-1398 Tel. : (415) 503-6773 Fax: (415) 503-6690	If you only have questions regarding the appeal process you may also contact: Mr. Tom Cavanaugh, Appeal Review Officer U.S. Army Corps of Engineers, South Pacific Division 1455 Market Street, Attn: CESPD-PDS-O San Francisco, CA 94103-1399 Tel. (415)503-6574 FAX (415)503-6646

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_______________________ Signature of appellant or agent.	Date:	Telephone number:



0 100
Feet

- Data Points
- Study Area

Waters of the U.S.

- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland

Appendix G
SFPUC San Antonio Backup Pipeline Project

Delineation of Waters of the U.S.: Map 1 of 3

For contiguous features see adjacent maps for feature information

Map scale: 1:2400

Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

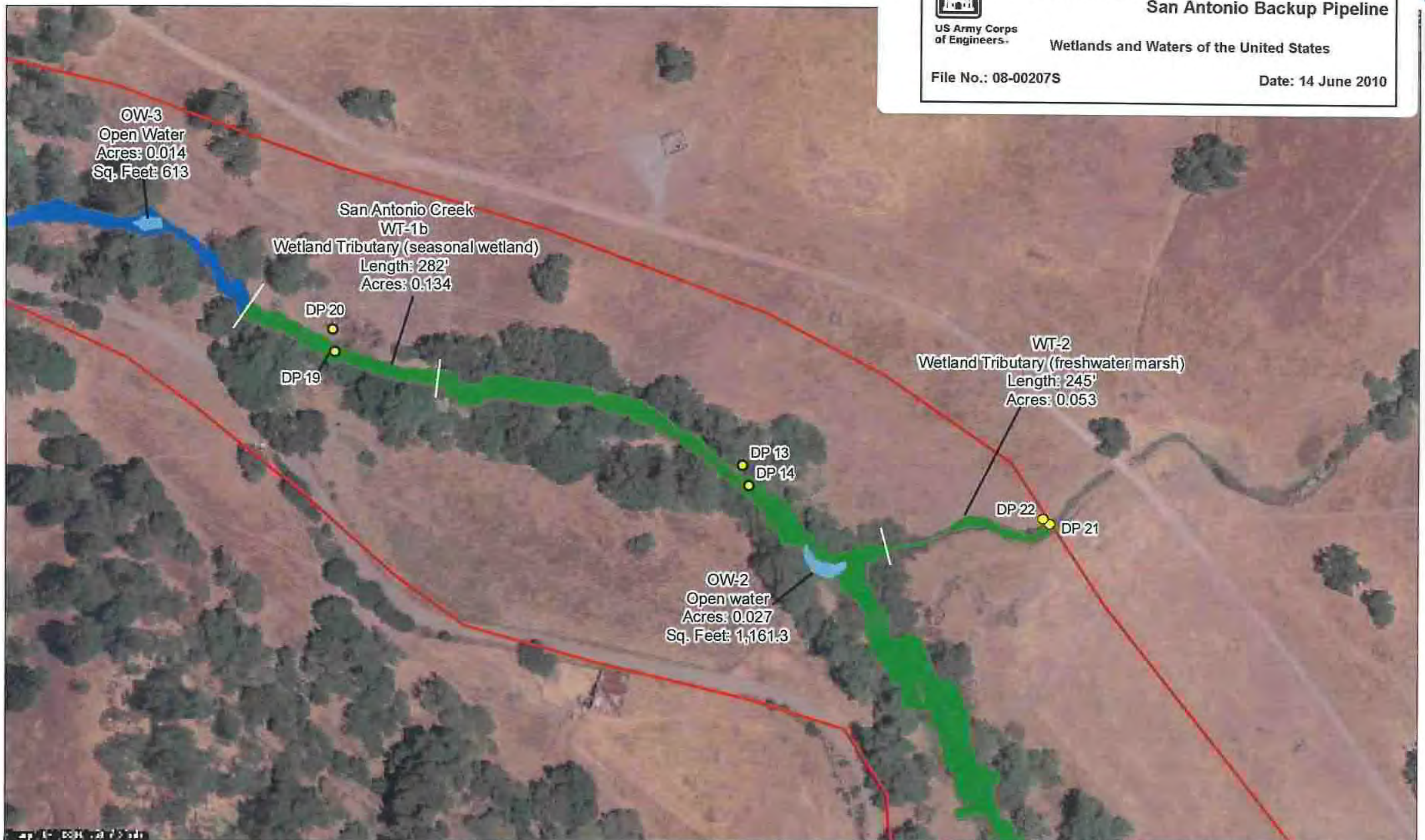
San Francisco Public Utilities Commission
San Antonio Backup Pipeline

US Army Corps of Engineers

Wetlands and Waters of the United States

File No.: 08-00207S

Date: 14 June 2010



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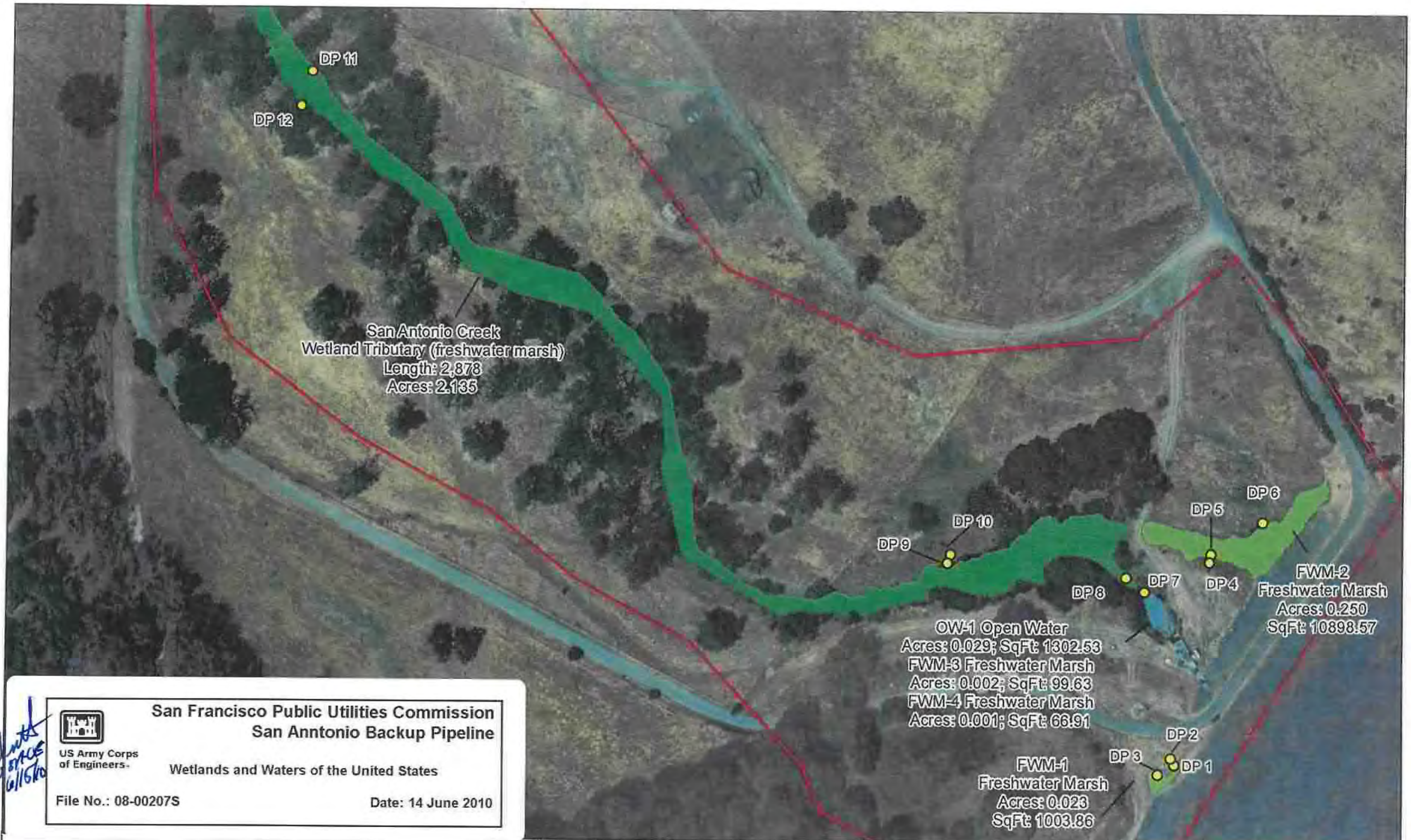
Feet

Data Points	**Waters of the U.S.**	Open Water
Study Area	Ephemeral Stream	Wetland Tributary
	Intermittent Stream	Freshwater Marsh
		Seasonal Wetland

Appendix G
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 2 of 3
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2010; Jones and Stokes, 2009



US Army Corps of Engineers

San Francisco Public Utilities Commission
San Anntonio Backup Pipeline

Wetlands and Waters of the United States

File No.: 08-00207S **Date: 14 June 2010**

0 100
Feet

- Data Points
- Study Area

Waters of the U.S.
- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland

Appendix G
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 3 of 3
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

San Francisco Public Utilities Commission
San Anntonio Backup Pipeline

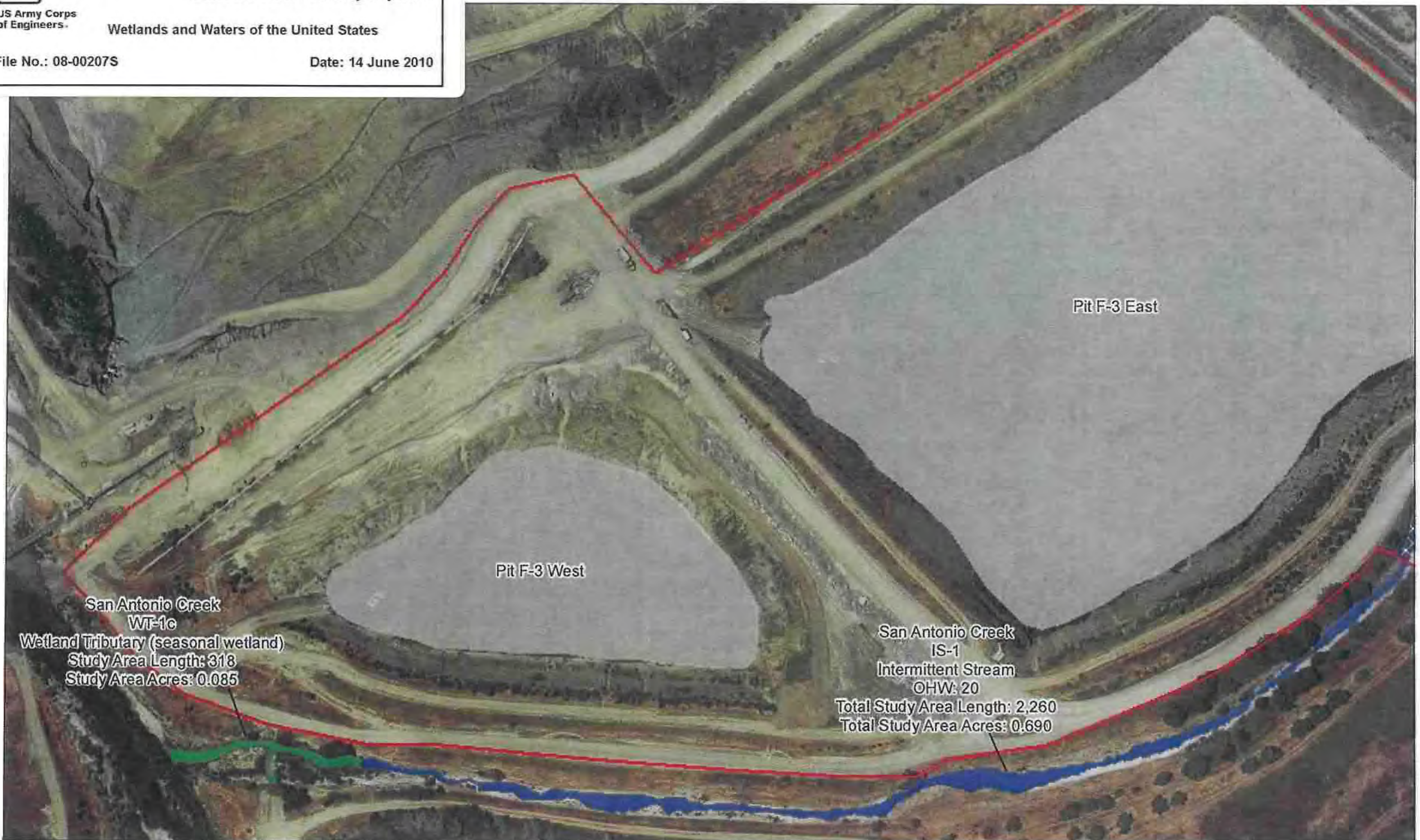
US Army Corps of Engineers

Wetlands and Waters of the United States

File No.: 08-00207S

Date: 14 June 2010

USACE 6/15/10



Data Points
Project Footprint

Waters of the U.S.
- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland
- Not Corps jurisdictional

Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 1 of 4

Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information

Map scale: 1:2400

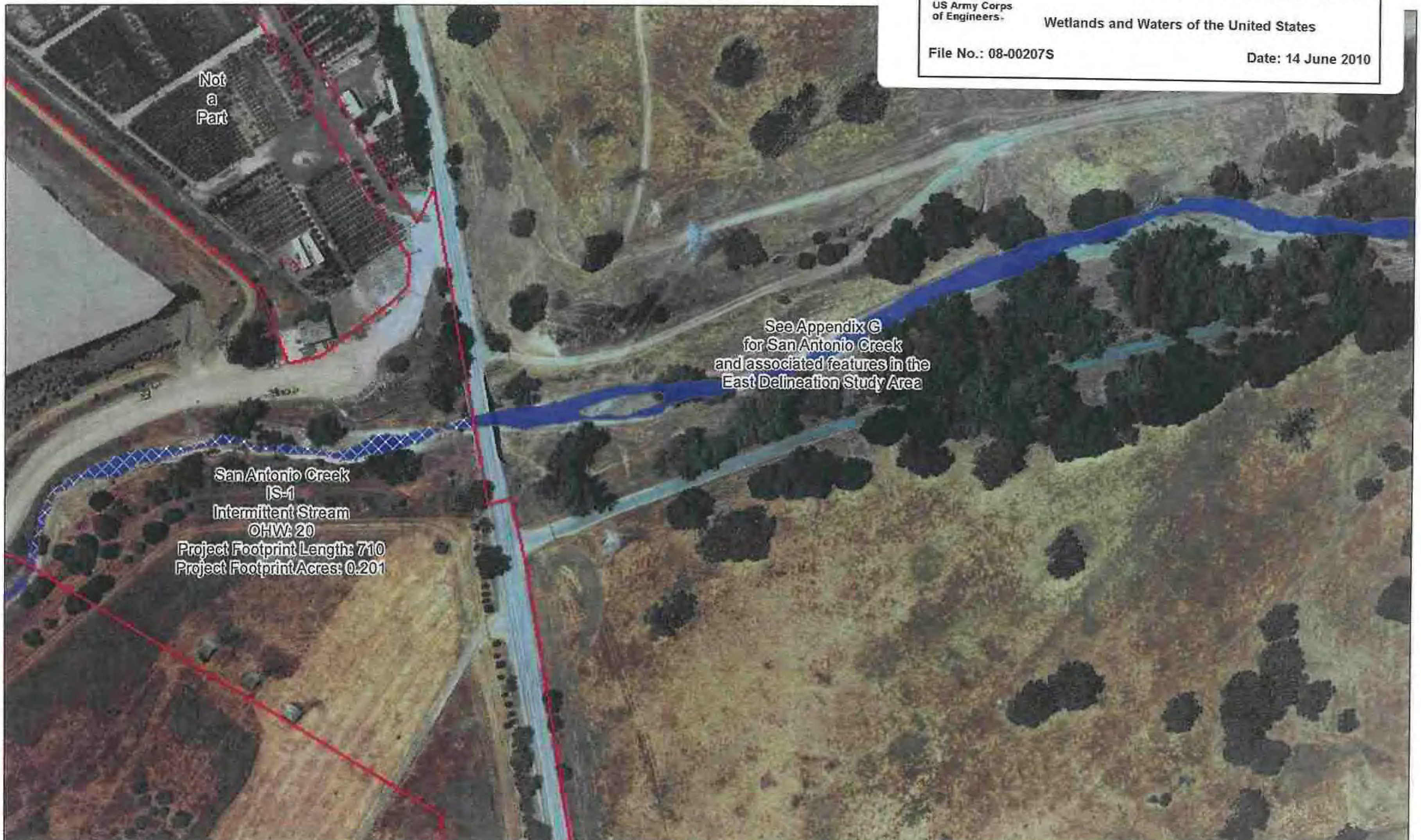
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

US Army Corps of Engineers

San Francisco Public Utilities Commission
San Anntonio Backup Pipeline

Wetlands and Waters of the United States

File No.: 08-00207S **Date: 14 June 2010**



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Feet

- Data Points
- Project Footprint

Waters of the U.S.
- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland
- Not Corps jurisdictional

Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 2 of 4
Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009; ESA+Orion, 2009; Jones and Stokes, 2009

USACE 6/15/10

San Francisco Public Utilities Commission
San Anntonio Backup Pipeline

US Army Corps of Engineers

Wetlands and Waters of the United States

File No.: 08-00207S

Date: 14 June 2010

0 100
Feet

- Data Points
- Project Footprint

Waters of the U.S.

- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland
- Not Corps jurisdictional

Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 3 of 4

Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information

Map scale: 1:2400

Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

Ahmett Uskeé
6/15/10

San Francisco Public Utilities Commission
San Anntonio Backup Pipeline

US Army Corps of Engineers

Wetlands and Waters of the United States

File No.: 08-00207S

Date: 14 June 2010

0 100
Feet

- Data Points
- Project Footprint

Waters of the U.S.
- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland

Not Corps jurisdictional

Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 4 of 4

Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information
Map scale: 1:2400

Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
SAN ANTONIO BACKUP PIPELINE PROJECT

Final Delineation of Waters of the United States, Alameda County, California

Prepared for
San Francisco Public Utilities Commission

November 2009

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SAN FRANCISCO PUBLIC UTILITIES COMMISSION
SAN ANTONIO BACKUP PIPELINE PROJECT

Final Delineation of Waters of the United States, Alameda County, California

Prepared for
San Francisco Public Utilities Commission

November 2009

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Los Angeles

Petaluma

Portland

Sacramento

San Diego

San Francisco

Seattle

Tampa

Woodland Hills

206166.04

ESA

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Final Delineation of Waters of the U.S. SFPUC San Antonio Backup Pipeline, Alameda County, California

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Appendices

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ACRONYMS AND ABBREVIATIONS USED IN THIS DOCUMENT

Bay Area	San Francisco Bay Area
CCSF	City and County of San Francisco
CFR	Code of Federal Regulations
CWA	Clean Water Act
EDSA	East Delineation Study Area
EPA	United States Environmental Protection Agency
FAC	Facultative plant species
FACU	Facultative upland plant species
FACW	Facultative wetland plant species
GIS	Geographic Information System
GPS	Global Positioning System
NI	No wetland indicator assigned (for plants)
NRPW	Non-relatively permanent waters
OBL	Obligate wetland plant species
OHWM	Ordinary high water mark
NWI	National Wetlands Inventory
RPW	Relatively permanent waters
SAPL	San Antonio Pipeline
SABPL	San Antonio Backup Pipeline
SF District	San Francisco District of the Army Corps of Engineers
SFPUC	San Francisco Public Utilities Commission
SMP	Surface Mining Permit (e.g., SMP-24)
SWANCC	Solid Waste Agency of Northern Cook County
TNW	Traditionally navigable waters
UPL	Obligate upland plant species
Corps	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
WRCC	Western Regional Climate Center

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CHAPTER 1.0
Introduction

1.1 Objective

This report documents the extent of jurisdictional waters of the United States, including wetlands and other waters, that occur within the San Francisco Public Utilities Commission's (SFPUC) proposed San Antonio Backup Pipeline (SABPL) Project in the Sunol Valley, Alameda County, California. The purpose of this document is to identify features under jurisdiction of the U.S. Army Corps of Engineers (Corps) and to provide the background information necessary to support applications for wetland permitting required to carry out the proposed project. The wetland delineation process involves determining the boundaries between wetlands and surrounding uplands through the investigation of the three parameters that define a wetland: vegetation, soils, and hydrology.

1.2 Summary of Results

ESA+Orion staff conducted a formal wetland delineation of the SABPL project footprint and immediately adjacent areas, as well as the reach of San Antonio Creek between Turner Dam and Calaveras Road[1], on March 16-18 and April 13, 2009. Further biological resources investigations, including wetland assessment, were conducted by ESA staff on April 21 and May 4, 2009. The field delineation documented all jurisdictional wetlands and other waters of the U.S. within and immediately adjacent to the project footprint. Results were verified in the field on November 5, 2009 by Bob Smith of the Corps. Totals for area and linear feet of Waters of the U.S. within the SABPL Delineation Study Area are as follows: 0.912 acre (39,738.73 square feet) of ephemeral and intermittent stream, open water, seasonal wetland, freshwater marsh, and wetland tributary (which includes seasonal wetlands) and 3,308 linear feet of intermittent and ephemeral stream and wetland tributary. Totals for Waters within the project footprint only are: 0.223 acre (10,025.98 square feet) of ephemeral and intermittent stream, seasonal wetland, and freshwater marsh and 890 linear feet of ephemeral and intermittent stream. A detailed summary of all jurisdictional features documented within the SABPL Delineation Study Area is presented in Table 4-1, located in Chapter 4 of this report. Delineation maps are presented in Appendix A.

1 The wetland delineation study area is comprised of two parts: 1) the SABPL Delineation Study Area, which includes the Project footprint and immediately adjacent areas,and 2) the reach of San Antonio Creek between Calaveras Road and Turner Dam, which is referred to in this document as the East Delineation Study Area. The wetland delineation study area is shown in Figures 2-1, 4-1, and C.2.

1.3 Responsible Parties

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1.4 Project Description

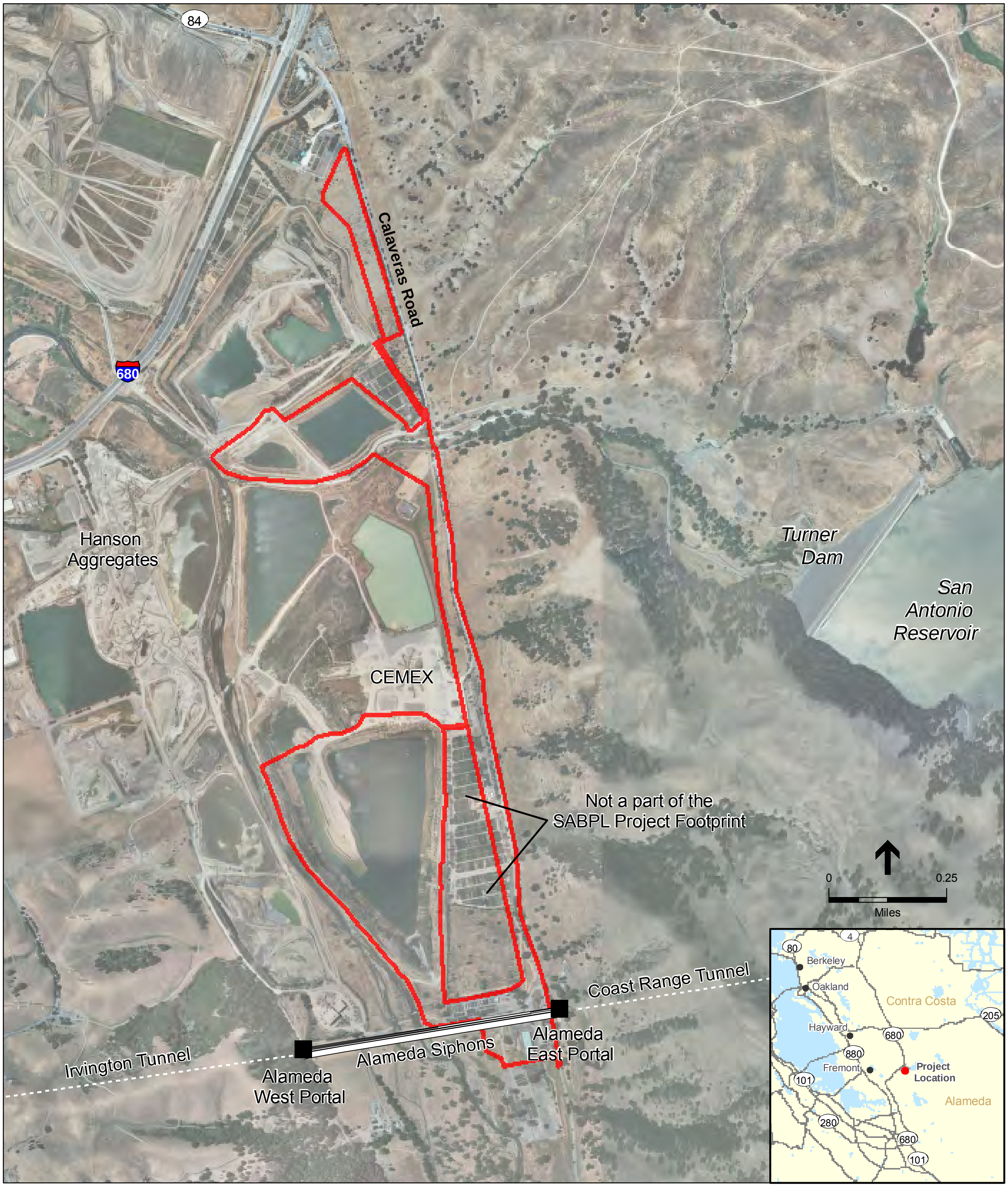
The SABPL project would include the following components:

- San Antonio Backup Pipeline;
- Discharge Valve Vault and Electrical Control Building near the SMP-24 Quarry Pit;
- New Chemical Facility near San Antonio Pump Station; and
- Other Related and Auxiliary Improvements.

The SABPL project is located in an unincorporated area of Alameda County, south of the intersection of Interstate 680 (I-680) and Highway 84 along Calaveras Road. Project construction would occur on lands owned by the City and County of San Francisco (CCSF) and managed by the SFPUC within the Sunol Valley and the Alameda watershed. The nearest community is the town of Sunol, approximately two miles north of the project site. The general project area extends roughly one and one-half miles from the San Antonio Pump Station to the Hanson Aggregates quarry (Surface Mining Permit 24 or SMP-24), which is approximately three-quarters of a mile south of the intersection of I-680 and Highway 84. **Figure 1-1** shows the project location and regional context.

The proposed project would improve the reliability of regional water system operations with respect to two existing facilities in the Sunol Valley—the San Antonio Pipeline (SAPL) and the San Antonio Pump Station Chemical Facility. **Figure 1-2** depicts the locations of proposed facilities and the project footprint.

The proposed project includes installation of approximately 7,000 feet (1.3 miles) of pipeline from Alameda Siphon No. 3 at the San Antonio Pump Station along the west side of Calaveras Road, beneath the San Antonio Creek channel, to the lip of Pit F3-East within the SMP-24 quarry area. The proposed project would route discharges of quality-impaired Hetch Hetchy water to Pit F3-East within the SMP-24 quarry area. A stub consisting of a 20-foot-long section of pipe would be installed immediately west of Calaveras Road and south of San Antonio Creek to provide a potential future connection point for a new pipeline segment to the base of Turner Dam. Implementation of a new pipeline segment to Turner Dam was originally proposed as part of the



SOURCE: ESA+Orion, 2009

SFPUC San Antonio Backup Pipeline Project . 206166.04

Figure 1-1
SABPL Project Location

SOURCE: ESA+Orion, 2009

SFPUC San Antonio Backup Pipeline Project . 206166.04

Figure 1-2
SABPL Proposed Project Elements

project, but has since been deleted. This delineation, however, includes the data collected for this deleted portion of the project (known as the East Delineation Study Area in this report). If the SFPUC were to contemplate such a pipeline and decide to pursue it as a project in the future, the project would undergo evaluation under CEQA at that time. A new Discharge Valve Vault and Electrical Control Building would be installed south of San Antonio Creek approximately 200 feet before the terminus of the SABPL. The Discharge Valve Vault would be an approximately 20-foot-wide, 35-foot-long, and 18-foot-deep concrete vault containing a 54-inch-diameter control valve. The Discharge Valve Vault would be supported by an adjacent Electrical Control Building connected to existing overhead PG&E electrical lines and housing an uninterruptible power supply (UPS), an air conditioning unit for the UPS, a chlorine analyzer, and water quality sensors and transmitters to monitor dissolved oxygen, pH, and temperature. The Electrical Control Building would be approximately 14.5 feet long, 14.5 feet wide, and 15.5 feet tall. A 1,600-square-foot asphalt parking area would be constructed adjacent to the Electrical Control Building. A 50-foot-wide, 60-foot-long, and 8- to 10-foot-high perimeter security fence would surround the building and parking area. Exterior lighting would be permanently installed on the building. The Electrical Control Building would be accessed by an existing unpaved access road to the site that could require some grading. The discharge point of the SABPL would be at the edge of the F3-East quarry pit wall. Riprap or other erosion protection may be needed at the discharge point to armor the pit wall and protect against erosion and instability. The proposed project would be capable of discharging up to 313 mgd (484 cubic feet per second [cfs]) of Hetch Hetchy flow to the SMP-24 F3-East quarry pit.[2] The SABPL project includes construction of a new chemical facility at the San Antonio Pump Station. The proposed San Antonio Pump Station Chemical Facility would include a chemical storage and containment area, a chemical loading area, and an electrical control room. Auxiliary facilities that would be constructed as part of the SABPL include three air gap systems and a cathodic protection system.

[2] SMP-24 property is currently leased to Hanson Aggregates for gravel mining. As part of dewatering operations performed to facilitate mining, Hanson Aggregates pumps groundwater that seeps into the F3-East quarry pit to Alameda Creek, resulting in discharges ranging from 1.44 mgd to 6.6 mgd. Discharges from the quarry pit to Alameda Creek are covered under RWQCB Order No. R2-2008-0011, NPDES General Permit No. CAG982001 (Aggregate Mining, Sand Washing, and Sand Offloading General Permit).

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CHAPTER 2.0
Setting

2.1 Project Site

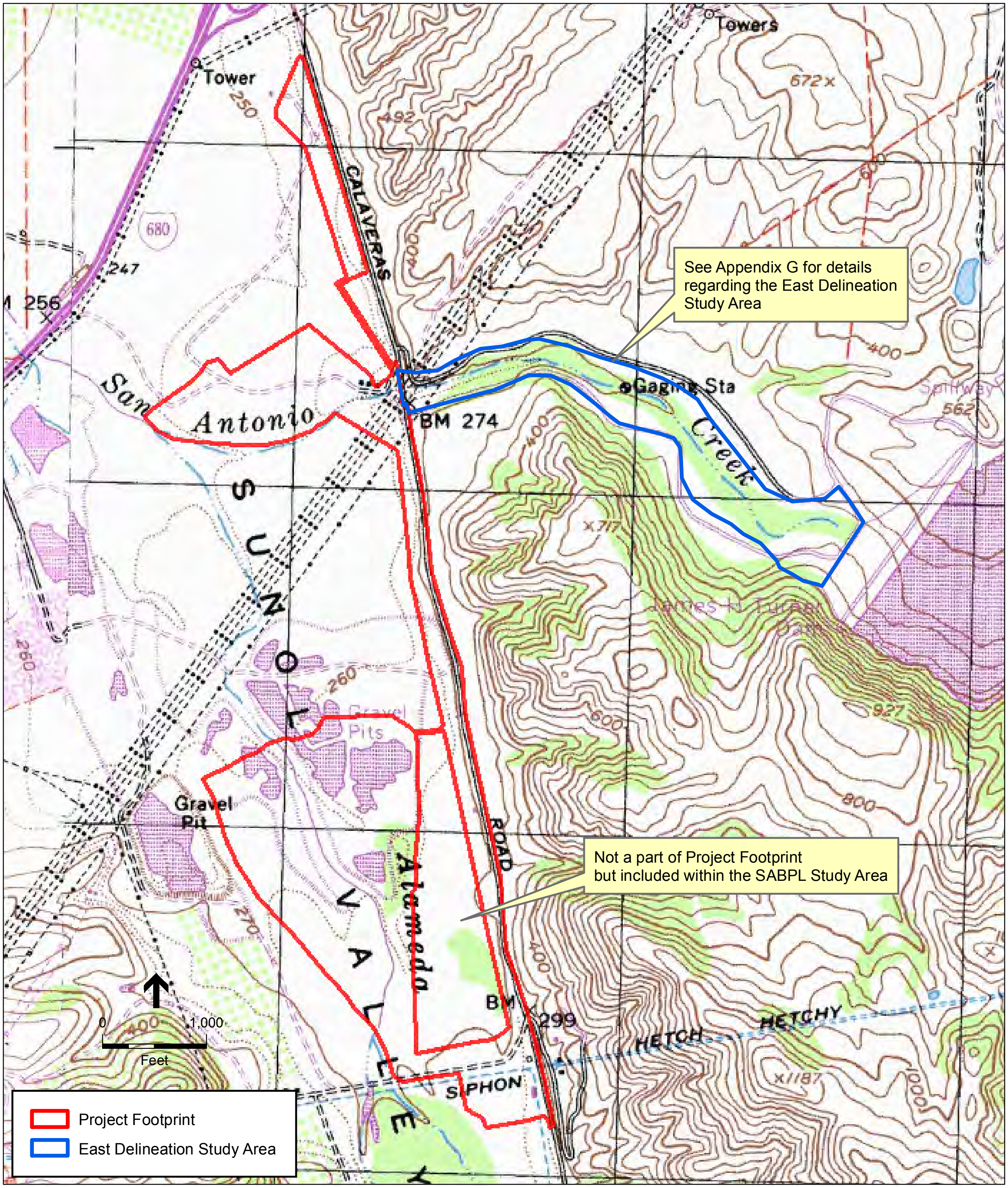
The SABPL Project site is situated in the Sunol Valley, along Calaveras Road south of Highway 680 (see Figure 1-1).

For the purposes of this delineation, the wetland delineation study area is comprised of two parts: 1) the SABPL Delineation Study Area, which includes the project footprint (see Figures 1-1 and 1-2) and immediately adjacent areas and 2) the reach of San Antonio Creek between Calaveras Road and Turner Dam, which is referred to in this document as the East Delineation Study Area. The wetland delineation study area is shown in **Figures 2-1**, **4-1**, and **C.2**. The environmental setting and results discussions for the SABPL Delineation Study Area are presented below and in Section 4, *Results*. The environmental setting and results discussions for the East Delineation Study Area are presented in **Appendix G**.

A previous wetland delineation in support of the SFPUC Alameda Siphons Seismic Reliability Upgrade Project and the SFPUC New Irvington Tunnel Project was conducted and verified by the Corps in February 2009. This delineation included the northern spoils area and SMP-30 and overlapped in several other portions of the current delineation. Under the current delineation, only features that were not mapped or appeared significantly different from the previous delineation were investigated. Most of the features investigated under the previous delineation were not found to be jurisdictional. These are shown on the delineation maps in Appendix A, but not discussed as part of the results of this investigation.

All of the wetland delineation study area is managed by the SFPUC. Land uses in the vicinity of the study area include cattle ranching, watershed management, aggregate mining, commercial nursery operations, and SFPUC water infrastructure management and operations.

Land use within the SABPL Delineation Study Area in the Sunol Valley is largely aggregate mining, with some areas committed to Hetch Hetchy infrastructure. The former commercial nurseries within SABPL Delineation Study Area have largely been closed and vacated although two still are in operation. The surface topography of nearly all of the study area in Sunol Valley has been altered and the original natural communities removed. The vegetation remaining in this portion of the Sunol Valley is primarily ruderal, or disturbed, habitats, include non-native grasslands, and some areas with planted vegetation.



SOURCE: SFPUC, 2009; ESA+Orion, 2009

SFPUC San Antonio Backup Pipeline Project . 206166.04

Figure 2-1
SABPL Wetland Delineation Study Areas

2.2 Climate and Topography

The overall California climate is characterized as Mediterranean, with the majority of precipitation occurring as rain in the winter months, and generally mild temperatures year round. The annual average rainfall in the study area is 19.99 inches at Calaveras Reservoir, the closest weather station providing historical climatic averages (WRCC, 2009). According to the Livermore, California WETS[3] station data the median length of the growing season in the study area is approximately 365 days (NRCS, 2002). Elevation in the project area ranges from about 250 ft at the confluence of San Antonio Creek and Alameda Creek to 300 ft at the base of Turner Dam.

2.3 Soils

The National Resources Conservation Service Web Soil Survey (USDA, 2009) was consulted to determine the soil types occurring within the project area for this delineation. A map depicting the soils within the wetland delineation study area is presented in Appendix D. A brief description of each mapped soil series within the SABPL Delineation Study Area follows. According to the Alameda County soil survey (USDA, 2009), Riverwash is considered a hydric soil, in addition, this soil type may be considered hydric if wetland vegetation and hydrology are also present (Corps, 2008). None of the other soil types are considered hydric but the Yolo loam series contains unnamed inclusions that occur in depressions and may be considered hydric (USDA, 2009).

Mapped soils within the SABPL Delineation Study Area:

- Danville silty clay loam, 3-10% slopes
- Livermore gravelly loam
- Livermore very gravelly coarse sandy loam
- Yolo loam over gravel 0-3% slopes
- Yolo loam, 0-3% slopes and 3-10% slopes
- Riverwash
- Zamora silt loam, 0-4% slopes

Danville silty clay loam, 3-10% slopes

The Danville series are very deep, well drained soils formed in alluvial fans and terraces derived from sedimentary rock. These soils have slow to medium runoff and slow permeability. The surface layer consists of grayish brown (10YR 5/2; dark gray when moist, 10YR 3/1), silty clay loam about 21 inches thick. The subsoil is grayish brown (10YR 5/2; very dark grayish brown when moist, 10YR 3/2), slightly acid silty clay and heavy silty clay loam extending to a depth of 61 inches. The soil classification for this soil is fine, montmorillonitic, thermic Pachic Argixerolls (USDA, 1981; NRCS, 2009). This soil is found along Calaveras Road on the terraces and fans between the historic floodplain of Alameda Creek and the steeply sloping hillsides to the east.

[3] The NRCS Wetlands Determination (WETS) tables give a month by month summary and probability analysis of temperature and precipitation. The tables also provide average length of growing season using three index temperatures (32, 28, and 24 degrees Fahrenheit) at 50 and 70% probabilities.

Livermore gravelly loam and very gravelly coarse sandy loam

The Livermore series are very deep, somewhat excessively drained soils formed in very gravelly alluvium derived from sedimentary and metasedimentary rock. Livermore soils are on low, nearly level terraces and gently sloping alluvial fans. The surface soils are brown (10YR 5/3; dark brown when moist, 10 YR 3/3) very gravelly, very porous, slightly acid coarse sandy loam and up to 21 inches in depth. The subsoil is brown (10YR 5/3; dark brown when moist, 10YR 3/3) very gravelly coarse sandy loam, massive, and slightly hard. The soil classification for this type is loamy-skeletal, mixed, superactive, thermic Typic Haploxerolls (NRCS, 2009). Livermore soils are found on the lower slopes and terraces of the San Antonio Creek valley and along the pipeline corridor west of Calaveras Road.

Riverwash

Riverwash consists of erratically stratified layers of water-deposited sand, gravel, stones, and cobbles. Layers of sandy loam and silt loam are deposited for short periods but are subject to intermittent scouring and removal. Thickness of the strata is variable. Organic matter content varies across strata but is typically low. Riverwash is found in low gradient, active stream channels, on flood plains, and adjacent to drainageways and slopes are typically 0 to 5 percent. These areas are inundated during periods of waterflow and are subject to constant deposition and removal of material. Runoff is slow. The hazard of erosion is slight to very severe, depending on water velocity and sediment size. Riverwash is used as a source of sand and gravel. It is almost devoid of vegetation and has no agricultural use. Within the SABPL Delineation Study Area, this soil type is mapped along the San Antonio Creek channel.

Yolo loam over gravel 0-3% slopes

Yolo soils are well drained, with medium runoff, and moderate permeability. The Yolo loam over gravel 0-3% slopes can be found in almost flat alluvial areas. The surface color is very dark grayish brown (10YR 3/2) silt loam to about two inches, underlain by two layers with varying structure and a color of dark brown (10YR 3/3) silt loam (to at least 19 inches). The soil classification for this type is a fine-silty, mixed, superactive, nonacid, thermic Mollic Xerofluvents (NRCS, 2009). Extensive areas of this soil type were mapped in the former floodplain of Alameda Creek.

Yolo loam, 0-3% slopes and 3-10% slopes

The Yolo soils are very deep, well drained soils formed in alluvium derived from sedimentary rock. The surface layer is grayish brown or brown (2.5 YR, 5/2, 5/3) silt loam, very dark, grayish brown when moist (10 YR 3/2)., underlain by brown, grayish brown, or pale brown (10 YR 5/3, 5/2, or 6/3) silt loam or silty clay loam and has thin strata of very fine sandy loam. The soil classification for this type is fine-silty, mixed, nonacid, thermic Mollic Xerorthents (USDA, 1981; NRCS, 2009). This soil type was mapped at the northern portion of the SABPL Delineation Study Area in the Alameda Creek floodplain and on the toe slopes on the south side of San Antonio Creek.

Zamora silt loam, 0-4% slopes

Zamora soils are on nearly level to strongly sloping fans and terraces usually 0 to 9 percent slopes at elevations of 30 to 1,300 feet. The soils formed in alluvium from material weathered from mixed sedimentary rocks. Typically, Zamora soils have grayish brown, slightly acidic loam A horizons; brown silty clay loam, neutral Bt horizons; and yellowish brown C horizons. Zamora soils are well-drained, with slow to medium runoff and moderately slow permeability. The Zamora series is a member of the fine-silty, mixed, thermic family of Mollic Haploxeralfs. This soil type is mapped at the northern spoils site.

2.4 Hydrology

Surface Waters

The study area for this delineation lies within the 700 square mile Alameda Creek watershed. Alameda Creek's headwaters are near Mount Hamilton. Major tributaries to the south are Arroyo Hondo and Calaveras Creek to the south; major tributaries to the north are Vallecitos Creek and Arroyo de la Laguna. San Antonio Creek once a significant tributary, but no longer so due to its altered hydrology, empties into Alameda Creek within the study area. Alameda Creek flows to San Francisco Bay through Niles Canyon, entering the Bay at Fremont.

Alameda Creek's hydrology upstream from the study area has been altered because of construction of Calaveras Dam on Calaveras Creek below Arroyo Hondo, and the Alameda Creek Diversion Dam, which directs winter flows from Alameda Creek into Calaveras Reservoir. Turner Dam impounds San Antonio Creek just above the study area. Alameda Creek is mapped as perennial in its upper reaches and intermittent within the study area. San Antonio Creek is also mapped as intermittent in the study area.

Intermittent Streams

Intermittent streams receive water from direct precipitation and runoff, as well as groundwater, and typically flow throughout the rainy season. Depending on their drainage size these streams may flow into the early summer but run dry as groundwater levels recede in mid-summer through fall. Alameda Creek adjacent to, and San Antonio Creek within, the project study area are mapped as USGS 'blue line' intermittent streams.

Ephemeral Streams

Ephemeral streams are those that carry water originating from direct precipitation and surface runoff. These streams flow only during and closely following rainfall events as they receive no hydrologic input from groundwater. One ephemeral stream was documented within the study area.

Groundwater

The broad Sunol Valley collects and conveys groundwater from the surrounding steep hills and numerous tributaries to Alameda Creek. Within the study area there are deep alluvial deposits along Alameda Creek and groundwater flows through the valley, collecting in the numerous quarry pits located there.

2.5 Vegetation

The vegetation within the study area was classified using *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986). Upland and riparian natural communities are described briefly below. Wetland communities are described in Section 4.3.

Much of the area within the SABPL Delineation Study Area has been previously disturbed by grading, excavation, nursery and mining operations, and construction of infrastructure. Recently-disturbed areas still support very limited plant cover, and most of it is weedy. Other areas have established annual grasslands dominated by non-native species. San Antonio Creek west of Calaveras Road supports annual grassland and ruderal vegetation, with discontinuous and sparse remnants of mixed riparian woodland occurring within its channelized banks.

Upland Communities

Non-native Grassland

Non-native Grassland consists of a dense to sparse cover of non-native annual grasses and is found on a wide variety of soils and slopes. Dominant species vary from site to site but the most common annual grasses are ripgut brome (*Bromus diandrus*), soft brome (*B. hordeaceus*), wild oats (*Avena fatua*, *A. barbata*), and Italian ryegrass (*Lolium perenne* var. *multiflorum*). Common non-native herbaceous species include stork's bill (*Erodium* spp.) and smooth catsear (*Hypochaeris glabra*). In less disturbed situations, non-native Grassland also supports a variety of native grasses and forbs. Typical native herb species include California poppy (*Eschscholzia californica*), sky lupine (*Lupinus nanus*), and owl's clover (*Castilleja exserta* ssp. *exserta*, *Orthocarpus* spp., and *Triphysaria* spp.). In more disturbed sites, the dominant species are often large, annual, highly competitive and persistent herbs such as shortpod mustard (*Hirschfeldia incana*), Italian thistle *(Carduus pycnocephalus*), milk thistle (*Silybum marianum*), stinkwort (*Dittrichia graveolens*), and yellow star thistle (*Centaurea solstitialis*).

In the SABPL Delineation Study Area, the areas graded long ago support non-native Grassland, dominated by grasses such as Italian ryegrass, ripgut brome, and wild oats, although the species richness tends to be quite low. More recently-disturbed areas tend to support weed-dominated Non-native Grassland, with a high proportion of stinkwort, Italian thistle, yellow star thistle, and milk thistle.

Ruderal

Although not a natural community within the Holland (1986) classification, the term Ruderal is used to describe disturbed areas that eventually develop some vegetative cover. Such areas occupy extensive acreage in the Sunol Valley. They are characterized by low vegetative cover, a predominance of weedy herbs, and limited cover by non-native grasses. The species composition of Ruderal areas is variable and highly dependent on site conditions. Typical species in the study area are Italian thistle, yellow star thistle, milk thistle, stinkwort, wild oats, brome grasses, and a variety of low-growing annual herbs. Ruderal vegetation is found along Calaveras Road, in former nursery areas, and in the aggregate mining areas on berms and slopes.

Riparian Communities

Mixed Riparian Woodland

Mixed Riparian Woodland is a natural community with no single dominant tree. In the study area, this community consists of California sycamore (*Platanus racemosa*), willows (*Salix* spp.), and occasional California buckeye (*Aesculus californica*). The understory is variable, but in the study area consists largely of California blackberry (*Rubus ursinus*), poison-oak (*Toxicodendron diversilobum*), and mugwort (*Artemisia douglasiana*). Within the SABPL Delineation Study Area, this community is found along San Antonio Creek.

Mulefat Scrub

Mulefat Scrub is a very open, rather tall shrub community strongly dominated by mulefat (*Baccharis salicifolia*). It is found primarily in larger stream channels that carry flow in the winter but are typically dry in the summer. Mulefat depends on access to groundwater, so it is usually closely associated with active channels. Other species found in Mulefat Scrub include sandbar willow (*Salix exigua*), arroyo willow (*S. lasiolepis*), California brickellbush (*Brickellia californica*), and many weedy annual species. Within the SABPL Delineation Study Area Mulefat Scrub occurs patchily within San Antonio Creek, and is most dense near the confluence with Alameda Creek.

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CHAPTER 3.0
Methods

3.1 Definitions

Many of the terms used throughout this report have specific meanings with respect to the delineation of Waters of the U.S. These terms are defined below:

Waters of the United States: The Code of Federal Regulations (33 CFR § 328.3[a]; 40 CFR § 230.3[s]) defines 'waters of the United States' as:

> (1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters including interstate wetlands; (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters which are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce; (4) All impoundments of waters otherwise defined as waters of the United States under the definition; (5) Tributaries of waters identified in paragraphs (1) through (4); (6) Territorial seas; and (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).

Wetlands: The U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) define wetlands as, "Those areas that are saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for the life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Corps wetlands must typically exhibit three parameters: 1) wetland hydrology, 2) hydrophytic vegetation, and 3) hydric soils in order to meet the federal definition.

> **Wetland Hydrology:** This term encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. These include both riverine and non-riverine hydrology indicators, such as sediment deposits, drift lines, and oxidized rhizospheres along living roots in the upper 12 inches of the soil. In the Arid West, hydrologic indicators may be absent in any given year due to annual variability in precipitation and in times of drought. The *Arid West Supplement* (Corps, 2008) cites a technical standard that can be used for disturbed or problematic sites that support wetland vegetation and soils but where wetland hydrology is

not apparent. 'This standard calls for 14 or more consecutive days of flooding, ponding, or a water table 12 inches or less below the soil surface during the growing season at a minimum frequency of 5 years in 10'.

Hydrophytic Vegetation: Hydrophytic vegetation is defined as plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. Emphasis is placed on the assemblage of plant species that exert a controlling influence on the character of the plant community, rather than on a single indicator species, i.e., there must be a prevalence of hydrophytic vegetation present in order to satisfy this wetland parameter.

***Wetland Indicator Status*:** Refers to the probability that a plant will occur in a wetland or not. Indicator status categories are as follows:

- *Obligate (OBL)*: almost always occurs in wetlands
- *Facultative wetland (FACW)*: usually occurs in wetlands, sometimes may occur in uplands
- *Facultative (FAC)*: equally likely to occur in wetlands or nonwetlands
- *Facultative upland (FACU)*: usually occurs in uplands but may occasionally occur in wetlands
- *Obligate upland (UPL)*: almost never occurs in wetlands
- *No indicator (NI)*: no indicator assigned due to lack of information

Hydric Soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils are often characterized by redoximorphic features (such as **redox concentrations**, formerly known as mottles), which form by the reduction, translocation, and/or oxidation of iron and manganese oxides. Hydric soils may lack hydric indicators for a number of reasons. In such cases the same standard used to determine wetland hydrology when indicators are lacking can be used.

Ordinary High Water Mark: Ordinary high water mark (OHWM) is defined in 33 CFR § 328.3[e] as '…that line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter or debris, or other appropriate means that consider the characteristics of the surrounding area'.

Other Waters: The term "other waters of the United States" includes water bodies, such as rivers and streams, that may not meet the full criteria for wetlands designation but that do exhibit evidence of an OHWM and are navigable or hydrologically connected to a navigable water body. Under the latest regulatory guidance, all such waters must have a significant nexus to a navigable water body to be considered jurisdictional by the Corps.

Wetland Tributary: According to recent guidance from the Corp's S.F. District (Corps, 2007) when a stream or a portion of a stream has both an OHWM and wetland characteristics it should be identified as both a stream and a wetland and the areal extent should be classified as wetland for impact analysis. Further guidance from Corps staff (D. Martel, personal communication, 2006) is that a minimum of five percent wetland cover is needed in order to classify a stream or portion of a stream as a wetland tributary.

Traditionally Navigable Waters: Traditionally navigable waters (TNW) are all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

Relatively Permanent Waters: Relatively permanent waters (RPW) are non-navigable tributaries of traditional navigable waters that are relatively permanent, meaning they typically flow year-round or have continuous flow at least seasonally (e.g., typically three months).

Non-Relatively Permanent Waters: Non-relative permanent waters (NRPW) include non-navigable tributaries with ephemeral or seasonal flows lasting less than three months.

Significant Nexus: This term refers to the hydrologic and ecologic connection between a TNW and its tributaries. Under recent guidance from the Corps and EPA certain wetlands and waters must have a significant nexus with a TNW in order to be considered jurisdictional.

Growing Season: The growing season is that part of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5°C/41° F). Growing season dates should be determined through onsite observations whenever possible. Since onsite data gathering is often not possible growing season dates can be approximated by using WETS tables from the nearest appropriate WETS station. The WETS table 70% probability average beginning and ending dates for 28° F temperatures can be used to represent the "normal" growing season for wetland determinations (NRCS, 1995). According to the Livermore WETS Station data (see Appendix G) the normal growing season for the Sunol Valley region would be 365 days.

3.2 Regulatory Setting

Wetlands and other waters (e.g., rivers, streams, and natural ponds) are a subset of waters of the U.S. and receive protection under Section 404 of the Clean Water Act (CWA). The Corps has primary federal responsibility for administering regulations that concern waters of the U.S. and requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the EPA has the ultimate authority under the CWA and can veto the Corps' issuance of a permit to fill jurisdictional waters of the U.S.

In recent years several Supreme Court cases have challenged the scope and extent of the Corps' jurisdiction over waters of the United States and have led to several reinterpretations of that authority. The most recent of these decisions are the case of Solid Waste Agency of Northern Cook County (SWANCC) v. the Army Corps of Engineers (January 9, 2001) and Rapanos v. United States (June, 2006). The SWANCC decision found that jurisdiction over non-navigable, isolated, intrastate waters could not be based solely on the use of such waters by migratory birds. The reasoning behind the SWANCC decision could be extended to suggest that waters need a demonstrable connection with a ‘navigable water’ to be protected under the CWA. The introduction of the term isolated has led to the consideration of the relative connectivity between waters and wetlands as a jurisdictionally relevant factor. The more recent Rapanos case further questioned the definition of “waters of the United States” and the scope of federal regulatory jurisdiction over such waters but resulted in a split decision which did not provide definitive answers but expanded on the concept that a ‘significant nexus’ with traditional navigable waters was needed for certain waters to be considered within the jurisdiction of the Corps.

On June 5, 2007 the EPA and the Corps released guidance on CWA jurisdiction in response to the Rapanos Supreme Court decisions, which can be used to support a finding of CWA coverage for a particular water body when either a) there is a significant nexus between the stream or wetland in question and navigable waters in the traditional sense; or b) a relatively permanent water body is hydrologically connected to traditional navigable waters and/or a wetland has a surface connection with that water. According to this guidance the Corps and the EPA will take jurisdiction over the following waters: 1) Traditional navigable waters; 2) Wetlands adjacent to traditional navigable waters, including adjacent wetlands that do not have a continuous surface connection to traditional navigable waters; 3) Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); 4) Wetlands adjacent to non-navigable tributaries, as defined above, that have a continuous surface connection to such tributaries (e.g. they are not separated by uplands, a berm, dike, or similar feature).

The EPA and the Corps will claim jurisdiction over the following waters, based on a fact-specific determination of significant nexus, as defined below, to a traditional navigable water: non-navigable tributaries that are not relatively permanent; wetlands adjacent to non-navigable tributaries that are not relatively permanent; and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The EPA and the Corps generally do not assert jurisdiction over the following features: swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The EPA and the Corps have defined the significant nexus standard as follows:

> A significant nexus analysis assesses the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters.

Significant nexus analysis includes consideration of hydrologic and ecologic factors including: volume, duration, and frequency of flow; proximity to a traditional navigable water; size of the watershed; average annual rainfall; average annual winter snow pack; potential of tributaries to carry pollutants and flood waters to traditional navigable waters; provision of aquatic habitat that supports a traditional navigable water; potential of wetlands to trap and filter pollutants or store flood waters; and maintenance of water quality in traditional navigable waters.

3.3 Office Preparation

Literature Review

ESA reviewed the following information relevant to this delineation:

- *The Jepson Manual: Higher Plants of California* (Hickman, 1993);
- San Francisco Public Utilities Commission's Water System Improvement Program, Draft Program EIR (SF Planning Department, 2007);
- San Francisco Public Utilities Commission, Alameda Watershed Management Plan (SFPUC, 2001);
- SFPUC Delineation of Waters of the United States: New Irvington Tunnel and Alameda Siphons Projects, 2007 (updated and verified 02/2009);
- High resolution aerial photographs of the Project site and vicinity (SFPUC, 2008);
- U.S.D.A. Soil Survey for Alameda County (online web application);
- *National List of Plant Species That Occur in Wetlands* (USFWS, 1988; 1996); and
- Standard biological references and field guides.

3.4 Field Survey Methods

Dates

ESA+Orion and EMPSi biologists B. Leitner and T. Brookheart conducted a routine delineation of waters of the U.S. within the wetland delineation study area during March 16-18, and April 13, 2009. Follow-up investigations were conducted by ESA+Orion biologist M. Lowe on April 21 and May 4, 2009.

Field Delineation Methods

Data Collection

Field preparation included production of high resolution aerials for each site. All wetland and drainage signatures on the aerials were investigated within each study area, as well as all wetlands and streams mapped on USGS topographic maps for each site. Each study area was walked or driven such that visual coverage was 100%. All waters of the U.S. within the study areas and immediately adjacent were delineated. Data were collected at 19 data points within the study area. In accordance with Corp's S.F. District guidance, sample points were taken at sites representative of the vegetation, hydrology, and physical characteristics across the various wetland types and at adjacent upland areas. Results were extrapolated to nearby wetlands exhibiting similar vegetation and hydrologic conditions. Multiple exploratory soil pits were also dug to check soils for hydric indicators at various locations. Paired sample points were established except in cases where upland vegetation and soils were homogenous across sample points and/or wetland boundaries were easily determined. Arid West data sheets were used to record information at each data point.

Determination of Hydrophytic Vegetation

At each data point vegetation was analyzed within a five foot radius for herbaceous species, 10 feet for shrub species, and a 30 foot radius for trees. Shrubs and trees were only recorded if they were rooted within the proposed wetland area. All species noted within the study plots were recorded on the data sheets. The indicator status of each species was confirmed in the field, to the extent feasible, with the *National List of Plant Species That Occur in Wetlands*, for Region 0 (California) (USFWS, 1988) and dominance and/or prevalence calculations were generally performed in the field as well. For species not listed in the 1988 U.S. Fish and Wildlife Service (USFWS) list, either the 1996 *National List* (USFWS, 1996) or taxonomic literature and local knowledge was used to determine if the species is associated with wetland or non-wetland conditions. For species listed as no indicator (NI), the National Wetlands Inventory (NWI) species lists for adjacent regions were consulted, and that status (if any) was used. When the vegetation passed either the dominance or prevalence test the point was considered to have hydrophytic vegetation.

Determination of Hydric Soils

Soils were analyzed in accordance with the Corps' *Arid West Manual* (2008). Soil pits were excavated to the maximum depth possible and soil color was matched against a standard color chart (Munsell, 2000). Soils were also inspected for redoximorphic features and soil texture was determined. It was then possible to determine if the soils met any of the hydric soils criteria listed on the Arid West data sheets. Where soils did not exhibit hydric soil criteria consideration was given as to whether the data point in question had the potential to be saturated, ponded or have a water table within 12 inches of the surface for 14 or more consecutive days during the growing season. With the presence of wetland vegetation and hydrology, this technical standard can be used to characterize a soil as hydric (Corps, 2008).

Determination of Wetland Hydrology

Hydrology was assessed using the Corps' 2008 *Arid West Manual's* revised hydrology indicators (e.g., oxidized rhizospheres along living roots, aquatic invertebrates, drift deposits in a riverine). Most wetland areas encountered were saturated and/or had standing water at the time of the delineation field work. An additional indicator was used—the presence of cow hoofprints. These were reliably notable in areas supporting wetland vegetation and hydric soils and were considered an indicator that soils in these locations are saturated for some period of time during the rainy season. Where hydrology indicators were weak or duration of flow unknown, consideration was given as to whether the technical standard quoted above for hydrology and soils might reasonably be applied to a given site.

Mapping and Acreage Calculations

Stream ordinary high water marks and wetland boundaries were recorded in the field using a Trimble Geo-XT global positioning unit (GPS) with sub-meter accuracy (after post-processing differential correction). Attribute data was also collected, including wetland type and ordinary high water mark (OHWM) measurements. Occasionally features were mapped by hand using high resolution aerials and field notes were taken on the characteristics of each feature (vegetation type and quality, disturbance levels, etc.). Field data was overlayed on digital ortho-rectified aerial photographs covering the study areas and used to map the delineation results. This included correction of original data as well as heads up digitizing using field maps and notes. Stream length and area calculations for other waters of the U.S. and wetlands were computed using ArcGIS 9.2.

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CHAPTER 4.0
Results

4.1 Organization

Field delineation results for the SABPL Delineation Study Area are presented below. Delineation maps and datasheets for the SABPL Delineation Study Area, and other supporting information, such as jurisdictional determination analysis maps, soils information, and representative photographs for the entire wetland study area are presented in Appendices A through F. See **Figure 4-1** for an overview of the delineated features in both the SABPL Delineation Study Area and the East Delineation Study Area. Results for the East Delineation Study Area are presented in Appendix G.

4.2 Results

A total of 0.912 acre (39,738.73 square feet) and 3,308 linear feet of jurisdictional Waters of the U.S. occur within the San Antonio Backup Pipeline Delineation Study Area. A total of 0.223 acre (10,025.98 square feet) and 890 linear feet of jurisdictional Waters of the U.S. occur within the project footprint. **Table 4-1** below presents all delineated features within the SABPL Delineation Study Area and summarizes estimated Corps jurisdictional areas for each feature type, as well as subtotals for wetlands and other waters within this study area. Table 4-1 also presents estimates for Waters of the U.S. within the project footprint only. All features and areas in this delineation have been reviewed and verified by the Corps.

4.3 Other Waters of the U.S.

Perennial Drainages

There are no perennial streams found within the SABPL Delineation Study Area. Alameda Creek lies just to the west of the project area and is the major receiving body for all waters flowing west from the foothill areas east of Calaveras Road. This includes San Antonio Creek. Flow in these reaches of Alameda Creek is intermittent.

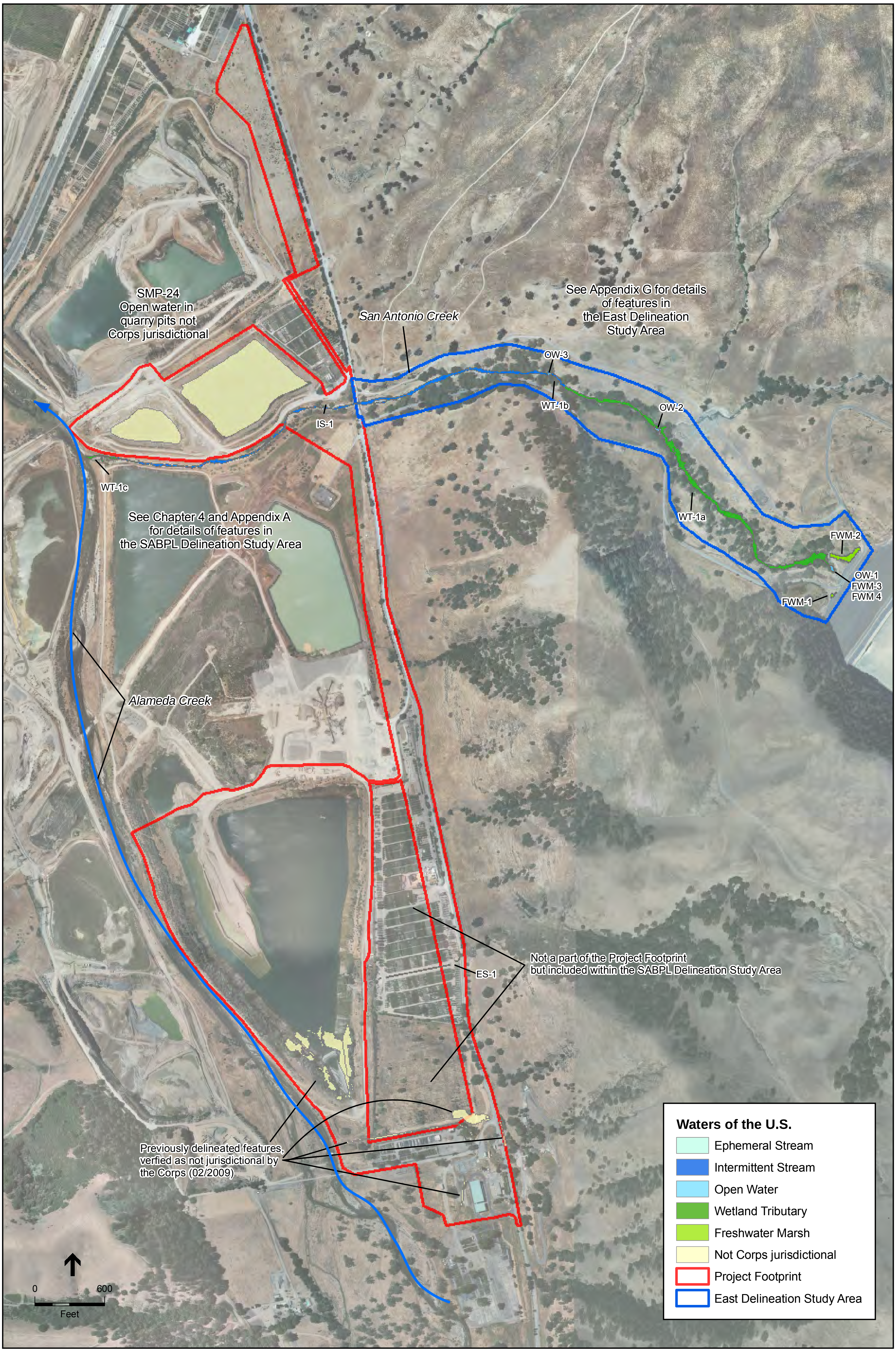
Intermittent Drainages

San Antonio Creek is the only “blue line” stream in the SABPL Delineation Study Area and is characterized as intermittent (IS-1). It is also characterized as a wetland tributary (see discussion below). The reach of San Antonio Creek characterized solely as an intermittent stream extends

TABLE 4-1
WATERS OF THE U.S. WITHIN AND ADJACENT TO THE
SAN ANTONIO BACKUP PIPELINE DELINEATION STUDY AREA

		Totals within SABPL Study Area			Totals within Project Footprint				
Project Site/Feature Type	**Feature**	**Linear ft.**	**Area (sq ft)**	**Area (ac)**	**Linear ft.**	**Area (sq ft)**	**Area (ac)**	**Datapoint**	**Map #**
Other Waters									
Ephemeral stream (ES)									
	ES-1	730	6,004.46	0.138	180	1,258	0.022	N/A	3
Subtotal		**730**	**6,004.46**	**0.138**	**180**	**1,258.22**	**0.022**		
Intermittent stream (IS)									
	IS-1	2,260	30,015.99	0.689	710	8,767.76	0.201	N/A	1, 2
Subtotal		**2,260**	**30,015.99**	**0.689**	**710**	**8,767.76**	**0.201**		
Total Other Waters		***2,990***	***36,020.45***	***0.827***	***890***	***10,025.98***	***0.223***		
Wetlands									
Wetland tributary (WT)									
	WT-1c	318	3,718.28	0.085	--	--	--	8	1
Subtotal		**318**	**3,718.28**	**0.085**	--	--	--		
Total Wetlands		***318***	***3,718.28***	***0.085***	--	**--**	**--**		
Total Waters of the U.S.		**3,308**	**39,738.73**	**0.912**	**890**	**10,025.98**	**0.223**		

SOURCE: ESA+Orion, 2009



SOURCE: SFPUC, 2009; ESA+Orion, 2009

San Antonio Backup Pipeline Project . 206166.04

Figure 4-1
SABPL Wetland Delineation Overview

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from approximately 320 feet upstream from the confluence of San Antonio Creek and Alameda Creek to Calaveras Road. The creek west of Calaveras Road has been channelized as it passes through areas of aggregate mining. Several common elderberry and California buckeye (*Aesculus californica*) are found on the upper banks. The streambed shows obvious signs of scour from periods of high flow and drift lines are evident.

Ephemeral Drainages

One jurisdictional ephemeral drainage was identified in the study area (ES-1). This drainage conveys water from the foothill areas east of Calaveras Rd through a culvert and into a large stone lined plunge pool. There is no vegetation present. From the pool, a concrete rubble lined channel is routed straight west through a nursery before entering another culvert and pipeline that directs water into SMP-30. Because the quarry pit has a direct hydrological connection with Alameda Creek via groundwater exchange, this drainage is considered jurisdictional.

Open Water

Three quarry pits are found within the project study area. One of these, SMP-30, is an active mining site for the collection of construction aggregates. The two northern quarry pits within SMP-24, (Pit F3-East and Pit F3-West), are no longer actively mined, but collect groundwater, which is used by Hansen Aggregates for their operations and discharged to Alameda Creek. Willows and mulefat are found at the OHWM of Pit F3-East and Pit F3-West but do not extend up the steep banks. Wetlands and other waters in SMP-30 were not considered jurisdictional by the Corps (SFPUC, 2009). Similarly, the open waters within Pit F3-East and Pit F3-West (OW-4 and OW-5, respectively, 13.45 acres; 585,859.44 square feet) in SMP-24 have been declared not jurisdictional by the Corps (M. Weinand, personal communication, 2009). They are not considered waters of the U.S. because they were created in dry lands, incidental to construction or excavation activities for the purpose of obtaining fill, sand, or gravel and, although excavation has ceased, they are still considered part of an active mining operation.

4.4 Wetlands

The delineation field work was conducted in the spring after a slightly above average seasonal rainfall in late 2008 - early 2009 (USGS, 2009).

Wetland Tributaries

San Antonio Creek is characterized, in part, as a ‘wetland tributary’ in this report and has both an OHWM and in this reach (WT-1c) the stream supports wetland characteristics and an OHWM. The primary hydrologic input for the seasonal wetlands at WT-1c is discharged from the CEMEX quarry operation located to the south of San Antonio Creek. While flow here is likely not perennial, it is suspected that, under normal conditions, the area is flooded for the 14 consecutive days required to fulfill the technical standard for wetland hydrology and soils (see Section 3.1, *Definitions*).

Freshwater Marsh

Freshwater marsh was documented at one location in the SABPL Delineation Study Area. Fresh water marsh is typically indicative of wetland areas that hold water most of the year is dominated by perennial species such as cattails (*Typha latifolia*; OBL), curly dock (*Rumex crispus*; FACW), duckweed (*Azolla filiculoides*; OBL), and iris-leaved rush (*Juncus xiphioides*, OBL). This freshwater marsh has recently emerged in the project area and is found in the southern portion of the project footprint. The water source for this wetland is provided from a pump diversion that directs water (presumably from a leak associated with a pipeline) into the storm drain on the east side of Calaveras Road which drains through a culvert and onto the hillside. This wetland was previously delineated for the Alameda Siphons Project and considered non-jurisdictional because of its artificial water source (SFPUC, 2009).

Seasonal Wetland

A seasonal wetland surrounds the freshwater marsh that is found in the southern portion of the project site. This area has only recently become a wetland feature. Species present at this site include a few cattails (*Typha* sp.; OBL), duckweed (*Azolla filiculoides*; OBL), dock (*Rumex conglomeratus*; FACW), and tall flatsedge (*Cyperus eragrostis*, FACW). This seasonal wetland was delineated previously for the Alameda Siphons project and declared non-jurisdictional at that time (SFPUC, 2009). It was reconsidered for the current delineation because it had grown substantially. However, it is still considered non-jurisdictional because it was created by an artificial water source and lacks a hydrologic connection with Alameda Creek.

A seasonal wetland was also found within the OHWM of San Antonio Creek at its confluence with Alameda Creek and was mapped as a wetland tributary (WT-1c, see discussion above for details).

Several roadside ditches are found draining the foothills just east of Calaveras Road. The ditches do convey water during storm events, but lack an OHWM and wetland vegetation and are presumed to carry only ephemeral flow. These small ditches were not delineated.

4.5 Clean Water Act Analysis

Jurisdictional Determination Analysis Maps are presented in Appendix C. This section provides a brief summary of the Section III Clean Water Act Analysis (CWA Analysis), Parts A and B for all delineated features, which is supplemental information requested by the Corp's SF District. Information used to support the CWA Analysis presented herein includes the following: Review of U.S. Geological Survey (USGS) topographic quadrangles and high resolution aerials covering the project study areas; review of previous delineations covering areas adjacent to or in the vicinity of the current delineation; and field studies conducted in March through May 2009. Proposed classification of waters as relatively permanent waters (RPWs) and non-relatively permanent waters (NRPWs) are based on results of the literature review and field surveys in connection with the delineation and biological reconnaissance of the study area. There are a number of potential biological, chemical, and physical processes being performed by the tributaries and wetlands included in this delineation. These include transport of water and nutrients to downstream waters, processing of organic wastes, attenuation of downstream flooding through interception of surface runoff and water storage onsite, reduction of suspended sediment delivered to downstream waters, groundwater replenishment, provision of spawning and rearing habitat for special-status wildlife, and supporting biodiversity at the site and watershed levels through provision of wetland and riparian habitat. No specific studies regarding duration of flow, groundwater measurement, or ecological function and values of streams and wetlands covered in this delineation were conducted. However, the USGS does maintain a monitoring station on San Antonio Creek. This station is approximately 0.25 miles east of Calaveras Road, located at a concrete weir and shows that flows are perennial to near perennial in the reach upstream. The magnitude at which these functions are being performed is also, for the most part, unknown, particularly for an individual tributary or feature. The cumulative functions of headwater streams and their associated wetlands are recognized as critically important in maintaining water quality and nutrient status of downstream waters (Alexander et al., 2007).

San Antonio Creek is a mapped as a USGS blue line intermittent stream, with direct hydrologic connection to Alameda Creek, which flows directly, and for approximately 20 stream miles from the project site, to San Francisco Bay, a traditionally navigable water (TNW). The project site is located downstream of San Antonio Reservoir, a TNW. The downstream portions of the study reach may have perennial to near perennial flow but the upper reach does not. Therefore, overall, the reaches of San Antonio Creek within the SABPL Delineation Study Area are considered to be relatively permanent waters (RPW).

While San Antonio Creek is generally thought of as an intermittent stream, the reach just upstream from the confluence with Alameda Creek was actually mapped as a wetland tributary and can be characterized as seasonal wetland. The natural flow of San Antonio Creek has been highly altered by the presence of Turner Dam which was built in 1964. Downstream of the dam flows are no longer subject to high fluctuations as the dam and reservoir capture upstream flows. The SFPUC does not regularly release water through the blow-off valve and the reservoir has only overtopped the spillway three times since construction. Perennial flows in the creek resulting from dam seepage extend only just downstream of the USGS stream gauge weir.

As the watershed size increases with increasing distance from Turner Dam, the western section of the stream (from Calaveras Road to the confluence with Alameda Creek) has increased evidence of more irregular and higher energy flows. Drift lines are visible in places and obvious scour can be seen in the stream bed. As already mentioned, the reach just upstream from the confluence with Alameda Creek has perennial to near perennial flow.

Even with its altered hydrology San Antonio Creek and its instream wetlands in the study area still perform all the basic stream functions noted above. In particular, the creek supports special-status wildlife, including California red-legged frog and western pond turtle, in the reaches upstream of the SABPL Delineation Study Area. San Antonio Creek is considered jurisdictional by the Corps.

The ephemeral stream (ES-1), lacks a direct hydrologic connection with Alameda Creek. ES-1, while a natural, intermittent drainage of reasonable size upstream from the project area, becomes ephemeral and a non-relatively permanent water (NRPW) on the project site and has been channelized and directed into SMP-30. However, its waters likely seep from there into the groundwater flow of Alameda Creek and, in addition this stream supports western toad and Pacific tree-frog and provides water and habitat for other wildlife species. So ES-1 is considered jurisdictional by the Corps, since its contribution to downstream waters is significant.

Pit F3-East and Pit F3-West in SMP-24 (OW-4 and OW-5 respectively) receive and collect groundwater from the San Antonio and Alameda Creek basins and water is discharged from the pits to Alameda Creek. So there is a basic hydrologic connection between these features and the creeks. These pits are no longer being mined but are still part of an active mining operation and the Corps has indicated that they are not considered jurisdictional.

CHAPTER 5.0
Report Preparation and References

5.1 Report Preparation

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Report Preparation:	Ty Brookheart, Barbara Malloch-Leitner, Martha Lowe
GIS:	Martha Lowe, Rosanna McGuire
Graphics:	Perry Jung, Ron Teitel

5.2 References and Sources Consulted

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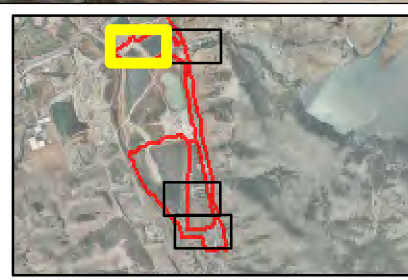
APPENDIX A

Delineation Maps

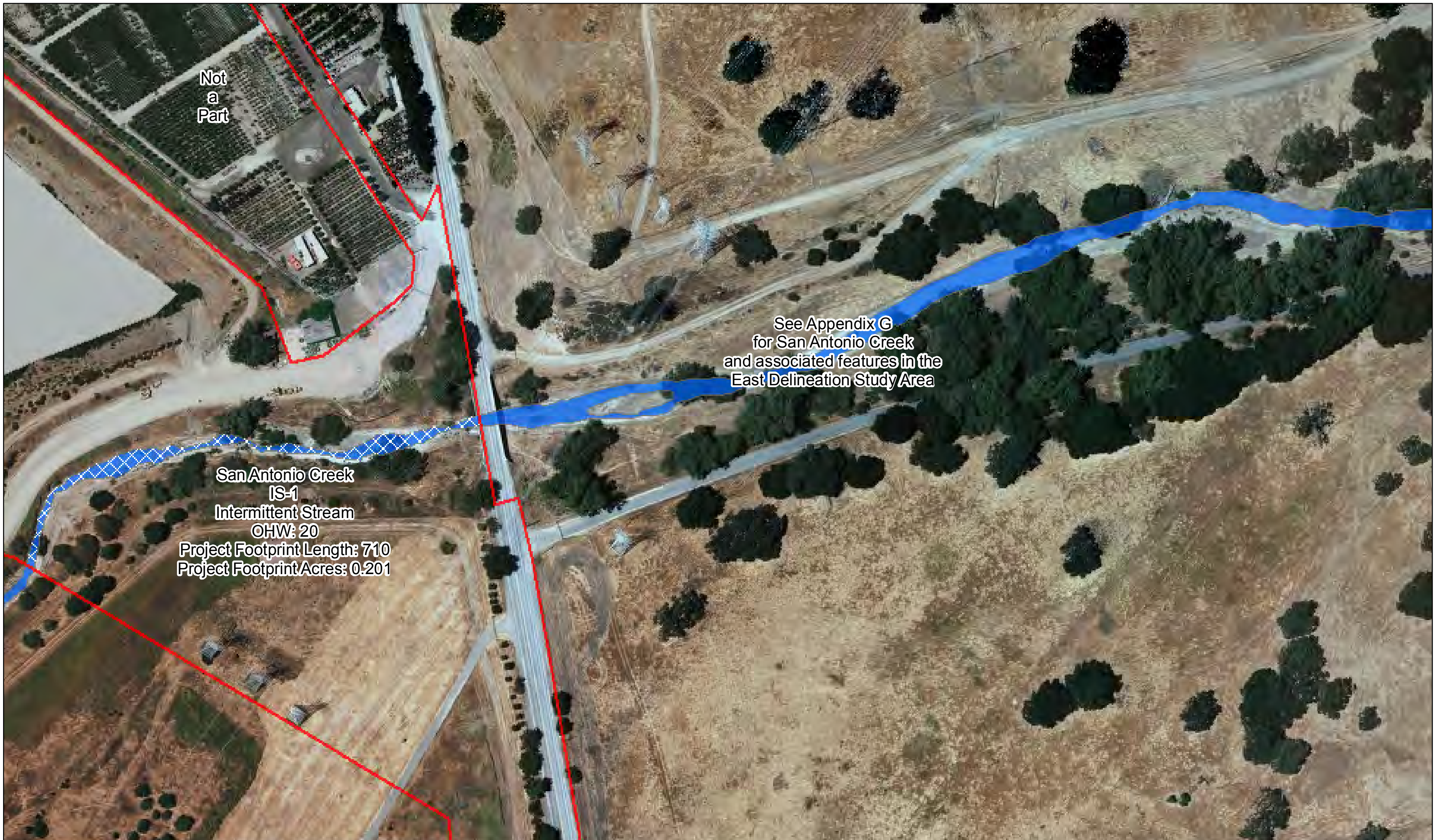
0 100
Feet

Data Points
Project Footprint

Waters of the U.S.
- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland
- Not Corps jurisdictional



Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 1 of 4
Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

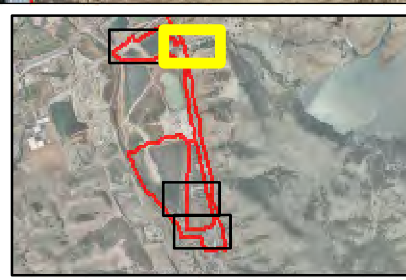


0 100
Feet

- Data Points
- Project Footprint

Waters of the U.S.

- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland
- Not Corps jurisdictional



Appendix A

SFPUC San Antonio Backup Pipeline Project

Delineation of Waters of the U.S.: Map 2 of 4

Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information

Map scale: 1:2400

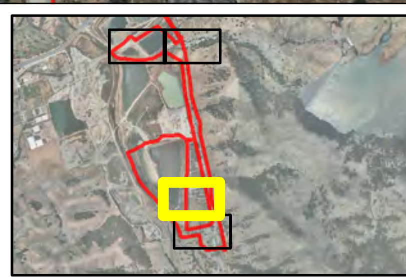
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

0 100
Feet

- Data Points
- Project Footprint

Waters of the U.S.

- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland
- Not Corps jurisdictional



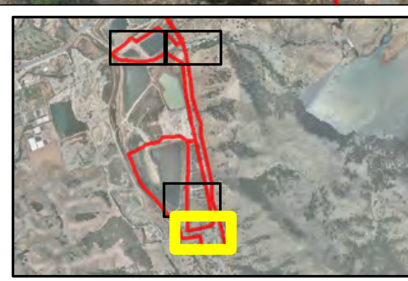
Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 3 of 4
Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

0 100
Feet

Data Points
Project Footprint

Waters of the U.S.

Ephemeral Stream
Intermittent Stream
Open Water
Wetland Tributary
Freshwater Marsh
Seasonal Wetland
Not Corps jurisdictional



Appendix A
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 4 of 4
Waters overlaid with white crosshatching are within the Project Footprint
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

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APPENDIX B

Wetland Datasheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3/17/09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 15

Investigator(s): T Brookhart and B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): slope on roadside Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): C - Mediterranean California Lat: 37°33'36.01824"N Long: 121°51'39.66287"W Datum: NAD83

Soil Map Unit Name: Yolo loam over gravel NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (X) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (X) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (X)	No ( )
Hydric Soil Present?	Yes (X)	No ( )
Wetland Hydrology Present?	Yes (X)	No ( )

Is the Sampled Area within a Wetland? Yes (X) No ( )

Remarks: This is a fairly recent wetland that has been created by the diversion of water from a leak in the pipeline system. The water is conveyed to this location by the use of an electric pump and hose that can be found on the east side of Calaveras Road. The water is then directed into the storm drain where it crosses the road in a culvert and empties into the sample site.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Azolla filiculoides*	45	Yes	OBL
2. *Cyperus eragrostis*	25	Yes	FACW
3. *Typha (sp)*	3	No	OBL
4. *Anagallis minima*	2	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	75 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	48	x 1 =	48
FACW species	27	x 2 =	54
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	75 (A)		102 (B)

Prevalence Index = B/A = 1.36

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (X) No ( )

Remarks: Plot is just below an area of very tall Typha (sp) and has some open water areas (15%). Water is slow moving, but draining downhill.

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
6	10 YR 2/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [x] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Aggregate layer

Depth (inches): 6"

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes (●)	No ( )	Depth (inches): < 1"
Water Table Present?	Yes (●)	No ( )	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes (●)	No ( )	Depth (inches):

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline | City/County: Alameda County, CA | Sampling Date: 3/17/09

Applicant/Owner: San Francisco Public Utilities Commission | State: CA | Sampling Point: 16

Investigator(s): T Brookhart and B Leitner | Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): slope on roadside | Local relief (concave, convex, none): convex | Slope (%): 3

Subregion (LRR): C - Mediterranean California | Lat: 37˚33'35.82938"N | Long: 121˚51'39.64853"W | Datum: NAD83

Soil Map Unit Name: Yolo loam over gravel | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	○	◉
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: This is a fairly recent wetland that has been created by the diversion of water from a leak in the pipeline system. The water is conveyed to this location by the use of an electric pump and hose that can be found on the east side of Calaveras Road. The water is then directed into the storm drain where it crosses the road in a culvert and empties into the sample site.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus diandrus*	10	Yes	UPL
2. *Cirsium vulgare*	30	Yes	FACU
3. *Vicia (sp)*	5	No	FAC
4. *Anagallis minima*	2	No	FACW
5. *Picris echioides*	4	No	FAC
6. *Lolium perenne var. multiflorum*	10	Yes	FAC*
7.			
8.			
Total Cover:	61 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	2	x 2 =	4
FAC species	19	x 3 =	57
FACU species	30	x 4 =	120
UPL species	10	x 5 =	50
Column Totals:	61	(A)	231 (B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: Plot is directly upland of site 15 (which is in a wetland).

SOIL

Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
6	10 YR 3/2	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Aggregate layer

Depth (inches): 6"

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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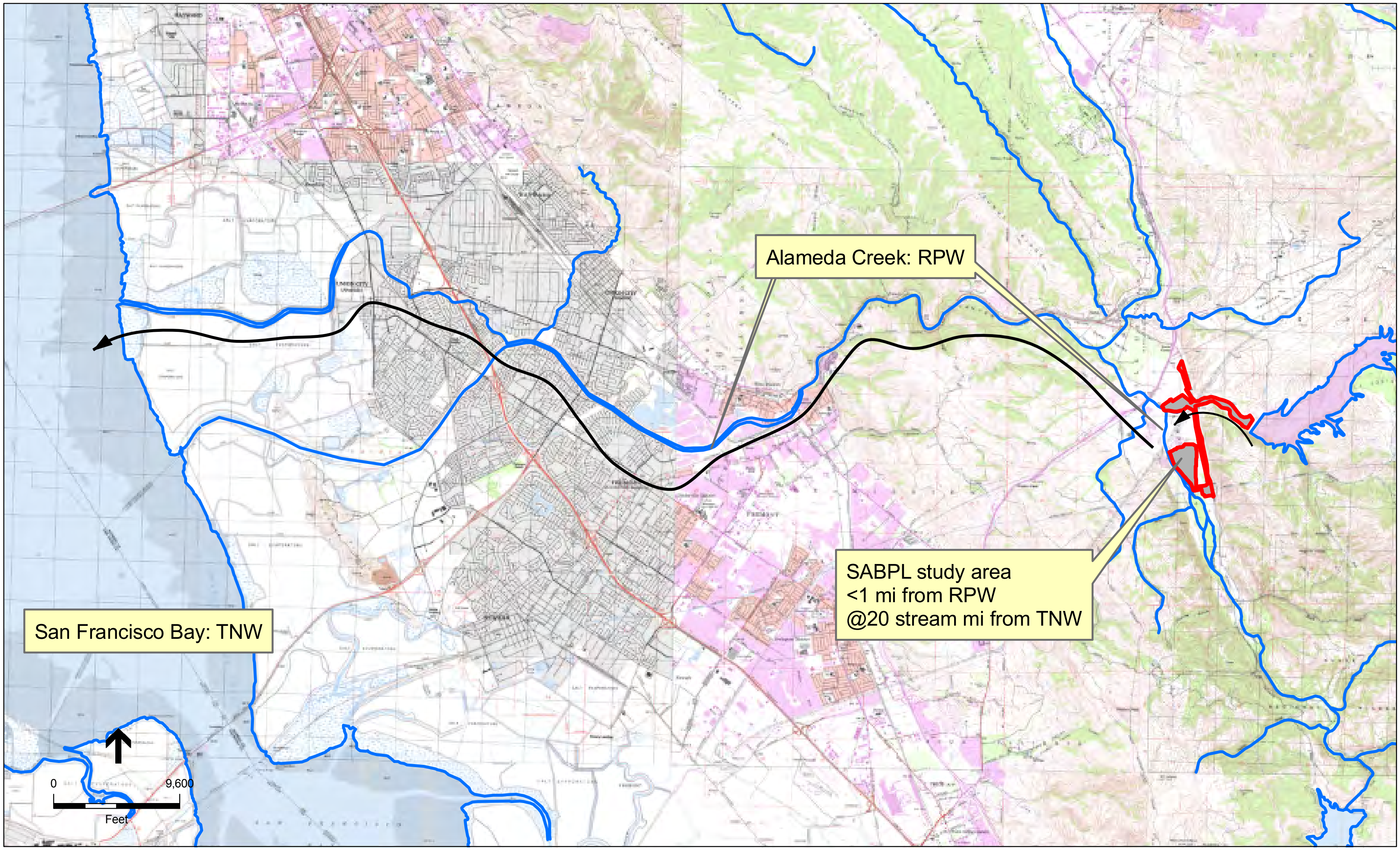
APPENDIX C
Jurisdictional Determination Analysis Maps



SOURCE: SFPUC, 2009; ESA+Orion, 2009

SFPUC San Antonio Backup Pipeline. 206166.04

Figure C.1

Jurisdictional Determination Map: Connection to TNW

SOURCE: SFPUC, 2009; ESA+Orion, 2009

San Antonio Backup Pipeline Project . 206166.04

Figure C.2

Jurisdictional Determination Analysis Map for SABPL Project and San Antonio Creek East of Calaveras Road

APPENDIX D

Soils

Soil Map—Alameda Area, California
(SABPL Study Area)

Map Scale: 1:17,800 if printed on A size (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:17,800 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California
Survey Area Data: Version 5, Jul 22, 2008

Date(s) aerial images were photographed: 6/13/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Alameda Area, California (CA609)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
DaB	Danville silty clay loam, 3 to 10 percent slopes	22.3	6.6%
Lg	Livermore gravelly loam	16.5	4.9%
Lm	Livermore very gravelly coarse sandy loam	7.2	2.1%
LpF2	Los Gatos-Los Osos complex, 45 to 75 percent slopes, eroded	1.6	0.5%
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	3.0	0.9%
PoE2	Positas gravelly loam, 20 to 40 percent slopes, eroded	1.1	0.3%
PoF2	Positas gravelly loam, 40 to 60 percent slopes, eroded	4.6	1.4%
Rh	Riverwash	43.4	12.8%
YmA	Yolo loam, 0 to 3 percent slopes	19.6	5.8%
YmB	Yolo loam, 3 to 10 percent slopes	11.6	3.4%
Yo	Yolo loam over gravel, 0 to 3 percent slopes	180.8	53.2%
Za	Zamora silt loam, 0 to 4 percent slopes	28.0	8.2%
Totals for Area of Interest		**339.8**	**100.0%**

Hydric Soils (CA)

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      i. a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      ii. a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      iii. a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:
Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
Federal Register. September 18, 2002. Hydric soils of the United States.
Federal Register. July 13, 1994. Changes in hydric soils of the United States.
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
National Research Council. 1995. Wetlands: Characteristics and boundaries.
Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.
Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.
Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

Report—Hydric Soils (CA)

Hydric Soils (CA)– CA609 - Alameda Area, California							
Map symbol and map unit name	Component/ Local Phase	Hydric status	Landform	Hydric criteria met (code)	Farmable condition	Comp. pct.	Altered hydrology notes
DaB: Danville silty clay loam, 3 to 10 percent slopes	(C) - Danville-	No	Fan terraces,fans	—	—	85	—
	(I) - Los Osos-	No	—	—	—	0-10	—
	(I) - Los Gatos-	No	—	—	—	0-5	—
Lg: Livermore gravelly loam	(C) - Livermore-	No	Fluvial terraces,alluvial fans	—	—	85	—
	(I) - Positas-	No	—	—	—	0-5	—
	(I) - Yolo-	No	—	—	—	0-5	—
	(I) - Pleasanton-	No	—	—	—	0-5	—
Lm: Livermore very gravelly coarse sandy loam	(C) - Livermore-	No	Alluvial fans,fluvial terraces	—	—	85	—
	(I) - Yolo-	No	—	—	—	0-5	—
	(I) - Pleasanton-	No	—	—	—	0-5	—
	(I) - Positas-	No	—	—	—	0-5	—
LpF2: Los Gatos-Los Osos complex, 45 to 75 percent slopes, eroded	(C) - Los Gatos-	No	Hills	—	—	40	—
	(C) - Los Osos-	No	Hills	—	—	40	—
	(I) - Gaviota-	No	—	—	—	0-10	—
	(I) - Millsholm-	No	—	—	—	0-5	—
	(I) - Henneke-	No	—	—	—	0-5	—
PoC2: Positas gravelly loam, 2 to 20 percent slopes, eroded	(C) - Positas-	No	Fluvial terraces	—	—	85	—
	(I) - Perkins-	No	—	—	—	0-5	—
	(I) - Azule-	No	—	—	—	0-5	—
	(I) - Pleasanton-	No	—	—	—	0-5	—
PoE2: Positas gravelly loam, 20 to 40 percent slopes, eroded	(C) - Positas-	No	Fluvial terraces	—	—	85	—
	(I) - Azule-	No	—	—	—	0-5	—
	(I) - Pleasanton-	No	—	—	—	0-5	—
	(I) - Perkins-	No	—	—	—	0-5	—

Hydric Soils (CA)– CA609 - Alameda Area, California							
Map symbol and map unit name	**Component/ Local Phase**	**Hydric status**	**Landform**	**Hydric criteri a met (code)**	**Farmable condition**	**Comp. pct.**	**Altered hydrology notes**
PoF2: Positas gravelly loam, 40 to 60 percent slopes, eroded	(C) - Positas-	No	Fluvial terraces	—	—	85	—
	(I) - Azule-	No	—	—	—	0-5	—
	(I) - Pleasanton-	No	—	—	—	0-5	—
	(I) - Perkins-	No	—	—	—	0-5	—
Rh: Riverwash	(C) - Riverwash-	Yes	Channels	4	Neither wooded nor farmable under natural conditions	100	—
YmA: Yolo loam, 0 to 3 percent slopes	(C) - Yolo-	No	Fans,valley floors	—	—	85	—
	(I) - Unnamed-	Yes	Depressions	2B3	Farmable under natural conditions	0-5	—
	(I) - Livermore-	No	—	—	—	0-5	—
	(I) - Sycamore-	No	—	—	—	0-5	—
YmB: Yolo loam, 3 to 10 percent slopes	(C) - Yolo-	No	Fans	—	—	85	—
	(I) - Unnamed-	Yes	Depressions	2B3	Farmable under natural conditions	0-5	—
	(I) - Livermore-	No	—	—	—	0-5	—
	(I) - Sycamore-	No	—	—	—	0-5	—
Yo: Yolo loam over gravel, 0 to 3 percent slopes	(C) - Yolo-	No	Valley floors	—	—	85	—
	(I) - Unnamed-	Yes	Depressions	2B3	Farmable under natural conditions	0-5	—
	(I) - Livermore-	No	—	—	—	0-5	—
	(I) - Sycamore-	No	—	—	—	0-5	—
Za: Zamora silt loam, 0 to 4 percent slopes	(C) - Zamora-	No	Flood plains	—	—	85	—
	(I) - Pleasanton-	No	—	—	—	0-10	—
	(I) - Rincon-	No	—	—	—	0-5	—

Data Source Information

Soil Survey Area: Alameda Area, California
Survey Area Data: Version 5, Jul 22, 2008

APPENDIX E
WETS Table for Livermore, Alameda County

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WETS Station : LIVERMORE, CA4997 Creation Date: 08/29/2002
Latitude: 3740 Longitude: 12146 Elevation: 00480
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.0	37.4	47.2	2.99	1.39	3.66	6	0.0
February	61.9	40.3	51.1	2.73	1.28	3.34	6	0.0
March	65.6	42.3	53.9	2.44	1.00	2.97	6	0.0
April	71.3	44.2	57.8	0.95	0.50	1.17	3	0.0
May	77.1	48.5	62.8	0.43	0.05	0.51	1	0.0
June	84.1	52.5	68.3	0.09	0.00	0.12	0	0.0
July	89.1	54.9	72.0	0.03	0.00	0.00	0	0.0
August	88.8	54.9	71.9	0.08	0.00	0.00	0	0.0
September	86.0	53.2	69.6	0.24	0.00	0.24	0	0.0
October	78.2	48.3	63.3	0.82	0.25	1.00	1	0.0
November	65.1	41.8	53.5	1.75	0.54	2.08	4	0.0
December	57.1	36.9	47.0	2.04	1.02	2.49	4	0.0
Annual	-----	-----	-----	------	10.76	16.37	--	----
Average	73.5	46.3	59.9	------	------	------	--	----
Total	-----	-----	-----	14.61	------	------	31	0.0

GROWING SEASON DATES

Probability	Temperature 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	> 365 days > 365 days	1/ 9 to 12/29 355 days	2/26 to 11/27 276 days
70 percent *	> 365 days > 365 days	> 365 days > 365 days	2/14 to 12/ 9 299 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1930-2002 prcp

Station : CA4997, LIVERMORE
------- Unit = inches

yr jan feb mar apr may jun jul aug sep oct nov dec annl

30				0.63									0.63
31	3.45	1.67	M0.57	0.36	0.93	0.11	0.00	0.00	M0.00	0.27	1.89	5.63	14.88
32	1.29	3.15	0.19	0.41	0.37	0.00	0.00	0.00	0.00	0.00	0.51	2.03	7.95
33	4.51	0.44	2.09	0.13	0.70	0.03	0.00	0.00	0.01	0.75	0.00	3.69	12.35
34	1.29	2.86	0.00	0.13	0.60	0.53	0.00	0.00	0.27	0.62	2.71	2.32	11.33
35	3.53	0.52	3.16	3.28	0.00	0.00	0.00	0.04	0.00	0.79	0.21	1.53	13.06
36	3.28	6.76	0.71		0.46	0.10	0.00	0.00	0.00	0.40	0.02	3.26	14.99
37	3.38	4.13	5.07	0.68	0.17	0.20	0.00	0.00	0.00	0.55	2.46	4.57	21.21
38	2.40	6.14	4.09	0.90	0.02	0.00	0.00	0.00	0.00	1.00	1.08	0.52	16.15
39	2.40	1.57	2.18	0.53	0.18	0.00	M0.00	0.00	0.16	1.23	0.15	0.78	9.18
40	8.13	M4.54	2.60	0.35	0.14	0.00	0.00	0.00	0.25	0.50	0.43	4.63	21.57
41	3.24	4.19	2.07	2.76	0.23	0.00	0.00	0.03	0.00	0.72	0.89	5.34	19.47
42	3.89	1.68	1.42	3.10	1.00	0.00	0.00	0.00	0.09	1.08	3.05	1.73	17.04
43	4.48	1.68	2.39	1.14	0.00	0.06	0.00	0.00	0.00	0.30	0.53	1.23	11.81
44	2.36	4.89	1.01	M0.94	0.73	0.00	0.00	0.00	0.00	0.77	3.41	2.03	16.14
45	0.87	3.68	3.19	0.20	0.17	0.00	0.00	0.02	0.00	1.07	2.07	M2.98	14.25
46	0.76	1.23	1.69	0.02	0.61	0.00	0.24	0.00	0.02	0.02	2.93	2.07	9.59
47	0.69	1.45	2.34	0.53	0.17	0.36	0.00	0.00	0.00	1.84	0.85	0.51	8.74
48	0.20	1.11	2.79	2.50	1.03	M0.16	0.03	M0.00	M0.00	M0.46	0.34	M2.71	11.33
49	M1.39	2.47	3.38	0.02	M0.34	M0.00	0.03	0.16	0.05	0.08	1.20	M1.21	10.33
50	4.65	1.54	1.44	M0.85	M0.59	0.01	M0.00	0.00	0.08	M1.84	M5.95	4.95	21.90
51	2.23	M1.81	M1.82	0.55	M0.35	M0.06	M0.00	M0.00	0.00	1.04	M3.01	6.07	16.94
52	7.60	1.40	M2.36	2.20	M0.16	0.04	M0.00	0.00	M0.10	0.01	2.11	6.33	22.31
53	2.07	0.05	M1.12	M1.42	0.61	0.59	M0.00	M0.15	0.00	M0.21	M1.33	M0.64	8.19
54	2.19	2.27	M3.00	0.73	0.16	M0.27	0.00	0.00	M0.04	M0.00	1.68	M3.33	13.67
55	M2.45	1.69	M0.38	M1.28	0.65	0.00	0.00	M0.01	0.01	M0.01	M1.31	10.15	17.94
56	5.49	M1.15	0.14	1.92	M0.63	0.00	0.00	0.00	M0.63	0.79	0.03	0.48	11.26
57	2.65	M2.23	1.30	1.14	M2.65	M0.04	0.00	0.00	M0.05	1.06	0.37	M1.62	13.11
58	3.16	5.37	4.44	3.74	0.66	0.41	0.00	0.00	0.02	0.09	0.14	0.86	18.89
59	2.45	3.59	0.29	0.35	0.00	0.00	0.00	0.07	1.89	0.00	0.00	0.75	9.39
60	2.98	4.12	0.60	0.48	0.42	0.00	0.02	0.00	0.01	0.05	2.92	1.25	12.85
61	2.08	1.04	1.92	1.03	0.69	0.19	0.00	0.13	0.16	0.15	2.24	0.82	10.45
62	0.73	5.61	1.82	0.22	0.00	0.00	0.00	0.00	0.00	3.64	0.28	1.55	13.85
63	1.40	4.50	2.60	3.47	M0.70	0.00	0.00	0.00	0.33	0.93	3.18	0.19	17.30
64	2.37	0.08	1.57	0.21	0.48	0.32	0.00	0.12	0.04	0.85	2.44	4.91	13.39
65	2.11	0.59	1.73	1.53	0.00	0.00	0.00	0.21	0.00	0.03	4.22	3.23	13.65
66	1.05	1.17	0.17	0.33	0.10	0.12	0.17	0.00	0.11	0.00	3.43	2.35	9.00
67	6.14	0.29	4.15	4.65	0.19	0.48	0.00	0.00	0.02	0.24	0.88	1.62	18.66
68	3.93	0.90	2.40	0.43	0.15	0.00	0.00	0.00	0.00	0.43	2.48	3.04	13.76
69	6.28	4.76	0.55	1.24	0.08	0.00	0.00	0.00	0.00	1.10	0.49	2.34	16.84
70	5.38	1.18	1.42	0.40	0.07	0.32	0.00	0.00	0.00	0.41	5.24	5.27	19.69
71	1.19	0.33	1.75	1.37	0.54	0.00	0.00	0.00	0.13	0.04	0.46	3.27	9.08
72	0.90	0.79	0.14	0.64	0.00	0.04		0.00	0.58	2.98		2.22	8.29
73	5.50			0.29	0.03	0.00	0.00	0.00	0.08	2.08	3.71	3.80	15.49
74	1.50	0.71	2.69	1.62	0.00	0.00	0.00	0.00	0.00	0.50	0.66		7.68
75	0.84	3.65	5.24	1.42	0.00	0.06	0.10	0.35	0.00	1.27	0.08	0.21	13.22
76	0.30	1.46	0.48	0.39	0.00	0.18	0.00	0.91	0.95	0.50	0.50	0.73	6.40
77	1.15	0.83	0.82	0.16	1.01	0.00	0.10	0.00	0.22	0.13		3.07	7.49
78	5.44	2.95		2.49	0.01	0.00	0.00	0.00	0.04	0.00	2.16	0.58	13.67
79	4.52	3.19	1.86	0.88	0.34	0.00	0.06	0.00	0.00	1.51	1.13	2.66	16.15
80	4.16	4.24	1.36	1.32	0.48	0.00	0.70	0.00	0.00	0.04	0.28	1.18	13.76
81	3.97	1.11	2.94	0.61	0.11	0.00	0.00	0.00	0.06	2.07	3.44	2.57	16.88
82	5.29	2.16	5.58	1.50	0.00	0.28	0.00	0.01	1.48	2.24	3.72	2.80	25.06
83	6.28	5.56	6.14	3.51	0.21	0.00	0.00	0.50	1.02	0.27	5.44	3.44	32.37
84	0.33	1.87	1.00	0.53	0.01	0.03	0.00	0.00	0.04	1.25	4.71	1.51	11.28
85	0.48	1.25	2.62	0.32	0.07	0.22	0.00	0.03	0.13	0.89	2.69	1.97	10.67
86	2.04	7.11	4.09	0.40	0.14	0.00	0.01	0.00	0.45	0.04	0.08	0.92	15.28
87	1.83	3.47	2.30	0.16	0.09		0.00	0.00	0.00	0.87	1.40	2.30	12.42
88	1.78	0.38	0.26	1.15	0.45	0.10	0.00	0.00	0.00	0.11	1.92	2.03	8.18
89	0.81	0.95	2.94	0.88	0.08	0.10	0.00	0.00	1.33	1.13	1.02	0.10	9.34
90	1.54	2.46	0.87	0.37	1.78	0.00	0.02	0.00	0.06	0.08	0.39	1.45	9.02
91	0.31	2.20	5.87	0.34	0.35	0.08	0.00	0.21	0.04	1.65	0.31	1.19	12.55

92	1.39	4.61	1.97	0.43	0.00	0.09	0.00	0.00	0.00	0.90	0.15	4.79	14.33
93	6.41	4.53	2.91	0.63	0.51	0.30	0.00	0.00	0.00	0.57	2.00	1.81	19.67
94	0.94	3.33	0.15	1.20	1.78	0.04	0.00	0.00	0.00	0.58		1.36	9.38
95	6.64	0.33	6.66	1.02	0.92	0.70	0.00	0.00	0.00	0.00	0.01	5.37	21.65
96	5.17	4.10	2.34	1.91	1.05	0.00	0.00	0.00	0.00	1.08	2.55	4.43	22.63
97	5.81	0.15	0.06	0.15	0.29	0.17	0.00	0.42	0.00	0.28	4.23	1.95	13.51
98	5.47	7.30	2.37	1.37	2.00	0.13	0.00	0.00	0.18	0.54	2.48	0.73	22.57
99	3.23	3.33	1.67	0.99	0.08	0.01	0.00	0.03	0.04	0.15	1.26	0.25	11.04
0	4.61	4.87	1.25	0.59	0.69	0.18	0.00	0.01	0.24		0.49	0.45	13.38
1	1.92	2.89	1.22	1.80	0.00	0.12	0.00	0.00	0.09	0.37	1.92	5.09	15.42
2													

WETS Station : NEWARK, CA6144
Latitude: 3731 Longitude: 12202 Elevation: 00010
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

	Temperature (Degrees F.)			Precipitation (Inches)				
					30% chance will have			
Month	avg daily max	avg daily min	avg	avg	less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.6	42.0	49.8	2.96	1.35	3.62	6	0.0
February	61.1	45.2	53.1	2.81	1.27	3.43	6	0.0
March	63.7	47.3	55.5	2.39	1.03	2.92	6	0.0
April	67.2	49.8	58.5	2.62	0.40	2.83	2	0.0
May	70.4	52.9	61.7	0.42	0.03	0.47	1	0.0
June	74.5	56.0	65.3	0.12	0.00	0.12	0	0.0
July	76.7	57.7	67.2	0.03	0.00	0.00	0	0.0
August	77.1	58.4	67.7	0.07	0.00	0.01	0	0.0
September	76.8	57.5	67.2	0.20	0.00	0.24	0	0.0
October	72.8	53.8	63.3	0.90	0.29	1.10	2	0.0
November	64.1	47.1	55.6	1.84	0.61	2.20	4	0.0
December	57.7	41.7	49.7	2.08	1.16	2.57	5	0.0
Annual	-----	-----	-----	------	11.48	19.40	--	----
Average	68.3	50.8	59.6	------	------	------	--	----
Total	-----	-----	-----	16.44	------	------	32	0.0

GROWING SEASON DATES

	Temperature		
Probability	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days

70 percent *	----------	12/30 to 12/30	> 365 days
	> 365 days	> 365 days	> 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

Station : CA6144, NEWARK
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.00	0.00	0.59	0.17	3.10	3.86
49	0.97	2.45	4.33	0.00	0.19	0.01	0.03	0.08	0.00	0.26	1.22	1.67	11.21
50	5.18	M1.49	1.76	0.96	0.15	0.00	0.03	0.00	0.05	M0.80	M3.15	M3.94	17.51
51	2.42	1.88	1.83	0.75	0.41	0.04	0.00	0.01	0.00	M0.86	3.14	M6.44	17.78
52	6.63	1.15	M4.00	1.38	0.04	M0.17	0.00	0.00	0.00	0.05	2.29	M6.05	21.76
53	2.02	0.00	0.93	1.23	M0.63	0.16	0.00	0.12	0.02	M0.25	1.77	1.04	8.17
54	M2.42	M1.37	2.84	0.74	M0.16	M0.29	0.00	0.00	0.00	0.06	M1.20	M2.97	12.05
55	M4.44	M1.75	0.17	M0.87	M0.80	0.00	0.00	0.00	0.01	0.00	1.29	M7.93	17.26
56	M6.27	0.97	M0.04	1.35	0.83	0.00	0.00	0.00	0.25	0.69	0.02	0.32	10.74
57	M2.31	M1.96	1.63	1.26	M2.38	0.00	0.00	0.00	M0.25	M1.61	M0.51	3.34	15.25
58	4.27	M5.45	M4.36	M3.23	0.63	M0.02	0.02	0.00	0.05	M0.04	M0.16	M0.85	19.08
59	M2.78	M2.50	0.30	0.06	0.00	0.00	0.00	0.00	M0.75	0.05	0.00	M0.45	6.89
60	5.33	M3.41	M0.98	M0.35	0.45	0.00	0.00	0.00	0.02	0.17	M3.82	M1.06	15.59
61	M3.27	M1.04	M1.19	0.82	M0.56	0.18	0.00	0.09	0.30	0.05	M2.95	M0.91	11.36
62	M1.20	M6.62				0.00	0.00	0.00	0.00	M4.53	0.34	2.20	14.89
63	1.51	M2.88	M3.09	4.19	0.57	0.08	0.00	0.01	0.09	1.21	M2.93	0.24	16.80
64	3.54	0.00	1.31	0.07	0.45	0.41	0.00	0.09	0.00	0.67	M1.99	M4.23	12.76
65	M1.45	0.50	1.55	1.77	0.00	0.00	0.00	0.18	0.00	0.11	M4.21	2.84	12.61
66	1.54	1.27	0.32	0.36	0.05	0.11	0.24	0.00	0.13	0.00	2.71	2.28	9.01
67	M5.63	0.25	M2.84	M3.57	0.11	0.51	0.00	0.00	0.00	0.22	1.02	2.18	16.33
68	3.77	M0.56	M2.17	0.76	0.18	0.00	0.00	0.72	0.00	0.27	M2.48	M2.26	13.17
69	6.24	M3.96	1.38	M1.15	0.02	0.00	0.00	0.00	0.05	0.47	0.36	1.23	14.86
70	5.36	0.93	1.51	0.20	0.01	0.20	0.00	0.00	0.00	0.56	5.90	4.87	19.54
71	0.73	M0.79	1.43	1.25	0.12	0.00	0.00	0.09	0.12	0.01	0.81	2.90	8.25
72	0.77	0.65	0.04	0.38	0.00	0.20	0.00	0.00	0.58	M2.87	M5.90	1.70	13.09
73	3.79	M5.33	2.05	0.39	0.03	0.00	0.00	0.00	0.04	M1.63	M2.99	M3.84	20.09
74	M2.41	0.88	M2.23	M1.66	0.00	0.63	0.15	0.00	0.00	M0.89	0.61	1.38	10.84
75	0.84	M2.21	M3.28	M1.67	0.02	0.00	0.13	0.43	0.01	1.12	0.27	0.18	10.16
76	0.27	0.90	1.41	0.57	0.01	0.08	0.09	0.65	0.68	0.52	M0.82	0.89	6.89
77	0.81	0.63	1.64	0.18	1.09	0.00	0.14	0.00	0.44	0.22	M0.92	3.04	9.11
78	M6.26	3.07	M3.60	2.96	0.00	0.00	0.00	0.00	0.05	0.00	2.12	0.48	18.54
79	4.09	3.26	1.79	0.54	0.19	0.00	0.07	0.01	0.00	1.71	1.14	2.66	15.46
80	2.89	5.87	1.54	0.84	0.06	0.00	0.38	0.00	0.00	0.02	0.17	1.20	12.97
81	3.41	1.39	2.66	0.37	0.08	0.01	0.00	0.00	0.02	2.01	3.04	1.89	14.88
82	4.26	2.90	4.39	2.12	0.00	0.10	0.00	0.09	0.86	1.95	2.85	2.42	21.94
83	5.97	3.67	7.17	3.50	0.42	0.00	0.00	0.04	0.60	0.51	6.04	3.60	31.52
84	0.14	2.04	1.15	51.00	0.00	0.10	0.00	0.04	0.24	1.74	4.33	1.68	62.46
85	0.86	1.04	2.43	0.05	0.25	0.03	0.03	0.00	0.40	1.02	2.41	1.95	10.47
86	1.82	5.30	3.48	0.59	0.27	0.00	0.00	0.00	0.62	0.07	0.06	0.98	13.19
87	2.13	2.72	1.54	0.15	0.02	0.00	0.00	0.00	0.00	0.87	0.97	2.16	10.56
88	2.46	0.31	0.06	1.00	0.47	0.05	0.00	0.00	0.01	0.16	1.81	2.92	9.25
89	0.93	1.07	2.66	0.56	0.09	0.00	0.00	0.00	0.63	2.05	0.87	0.00	8.86
90	1.78	1.90	0.93	0.26	1.88	0.00	0.00	0.00	0.09	0.12	0.51	1.75	9.22
91	0.28	2.31	5.37	0.35	0.19	0.12	0.00	0.11	0.07	1.62	0.33	1.88	12.63
92	1.41	5.33	3.56	0.48	0.00	0.16	0.00	0.00	0.00	0.79	0.13	4.79	16.65
93	6.90	4.72	2.50	0.79	0.50	0.38	0.00	0.00	0.00	0.54	2.92	2.15	21.40
94	1.85	3.24	0.18	1.05	1.69	0.05	0.00	0.00	0.14	0.31	2.98	1.46	12.95
95	8.36	0.16	6.25	1.09	0.99	1.10	0.00	0.00	0.00	0.00	0.01	4.60	22.56
96	4.32	3.95	1.89	1.00	1.11	0.00	0.00	0.00	0.00	0.60	1.40	5.67	19.94

97	5.37	0.28	0.14	0.17	0.29	0.37	0.00	0.48	0.00	0.59	5.29	1.98 14.96
98	5.90	10.79	2.57	1.74	2.06	0.01	0.00	0.00	0.09	0.62	1.95	1.27 27.00
99	3.22	3.82	1.85	1.21	0.03	0.03	0.00	0.00	0.27	0.35	1.01	0.33 12.12
0	4.72	6.26	2.03	0.65	0.69	0.29	0.00	0.03	0.17	1.94	0.44	0.54 17.76
1	2.08	3.32	1.25	1.32	0.00	0.15	0.00	0.01	0.04	0.27	1.97	4.68 15.09
2												

WETS Station : OAKLAND MUSEUM, CA6336 Creation Date: 08/29/2002
Latitude: 3748 Longitude: 12216 Elevation: 00030
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.3	44.6	51.0	4.85	2.24	5.93	7	0.0
February	61.6	47.9	54.7	4.40	1.83	5.35	7	0.0
March	63.3	49.1	56.2	3.56	1.54	4.34	6	0.0
April	66.5	50.6	58.5	1.35	0.53	1.66	3	0.0
May	69.0	53.4	61.2	0.59	0.05	0.65	1	0.0
June	71.7	55.7	63.7	0.12	0.00	0.12	0	0.0
July	72.5	56.9	64.7	0.07	0.00	0.00	0	0.0
August	73.5	58.3	65.9	0.10	0.00	0.01	0	0.0
September	74.7	58.3	66.5	0.31	0.00	0.36	0	0.0
October	72.1	55.4	63.8	1.38	0.53	1.69	2	0.0
November	63.9	49.5	56.7	3.24	1.30	3.93	5	0.0
December	57.7	44.6	51.1	3.13	1.71	3.88	5	0.0
Annual	-----	-----	-----	------	16.81	25.64	--	----
Average	67.0	52.0	59.5	------	------	------	--	----
Total	-----	-----	-----	23.10	------	------	36	0.0

GROWING SEASON DATES

Probability	Temperature 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	----------	----------	> 365 days
	> 365 days	> 365 days	> 365 days
70 percent *	----------	----------	> 365 days
	> 365 days	> 365 days	> 365 days

* Percent chance of the growing season occurring between the Beginning

and Ending dates.

total 1971-2002 prcp

Station : CA6336, OAKLAND MUSEUM
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
71	1.73	0.43	2.80	0.93	0.13	0.00	0.00	0.00	0.26	0.10	2.04	4.19	12.61
72	1.32	1.58	0.18	1.02		0.34	0.00	0.01	0.90	4.25	6.39	3.20	19.19
73	10.43	6.31	2.95	0.02	0.04	0.00	0.00	0.00	0.64	1.77	9.67	5.39	37.22
74	3.39	1.76	5.15	3.33	0.00	0.15	1.19	0.00	0.00	M1.16	0.78	2.52	19.43
75	2.29	3.88	5.68	2.25	0.01	0.08	0.21	0.05	0.03	3.85	0.56	0.52	19.41
76	0.31	2.01	1.08	0.89	0.00	0.04	0.00	1.09	0.61	0.57	1.09	2.30	9.99
77	1.55	0.77	2.10	0.00	0.54	0.00	0.01	0.00	0.68	0.21	2.83		8.69
78	7.87	4.80	6.89	3.76	0.00	0.00	0.00	0.00	0.59	0.00	1.64	0.70	26.25
79	7.18	5.52	2.82	1.04	0.10	0.00	0.43	0.00	0.00	2.37	3.96	5.77	29.19
80	4.81	7.63	M1.82	1.66	0.44	0.00		0.00	0.00	0.13	0.20	2.42	19.11
81	6.15	1.33	4.41	0.30	0.10	0.00	0.00	0.00	0.08	2.80	5.93	4.65	25.75
82	10.75	3.80	8.55	4.13	0.00	0.19	0.03	0.00	M0.00	2.89	5.31	3.11	38.76
83	7.22	8.08	9.83	3.87	0.42		0.00	0.05	0.61	0.23	7.12	6.84	44.27
84	0.33	2.28	1.60	0.98	0.09	M0.00	0.00	0.17	0.31	2.99	M6.89		15.64
85	0.77	2.08	3.65	0.15	0.04			0.00	0.53	1.18	M3.26	1.67	13.33
86	5.24	8.92	5.89	0.70	0.13	0.00	0.03	0.00	1.54	0.14	0.32	1.47	24.38
87	3.60	4.93	2.32	0.20	0.04	0.00	0.00	0.00	0.00	1.57	2.34	4.29	19.29
88	3.83	0.49	0.03	2.77	0.98	0.44	0.00	0.01	0.00	0.37	2.49	3.81	15.22
89	1.27		5.16	0.63	0.04	0.04	0.00	0.00	1.45	1.73	1.25	0.00	11.57
90	4.41		1.21	0.24	2.92	0.01	0.00	0.00	0.06	0.35	0.49	1.58	11.27
91	0.42	3.49	7.04	0.72	0.20	0.24	0.00	0.19	0.00	M1.20	0.36	2.22	16.08
92	1.71	7.53	4.54	0.26	0.00	0.30	0.00	0.03	0.00	2.49	0.30	6.82	23.98
93	8.90	3.94	2.61	0.60	0.94	0.11	0.00	0.00	0.00	0.62	2.08	3.01	22.81
94	2.56	4.52	0.28	1.69	1.54	0.00	0.00	0.00	0.04	0.40	9.37	3.23	23.63
95	M9.77	0.21	7.60	1.86	1.07	0.92	0.00	0.00	0.00				21.43
96	6.40	M5.87	2.01		2.67	0.00					3.44	8.90	29.29
97	7.80	0.22	0.56	0.57	0.27	0.28	0.00	1.25	0.01	1.18	M6.79	3.36	22.29
98	12.45	15.14	2.76	1.83	2.98	0.01	0.00	0.00	0.04	0.81	3.82	1.23	41.07
99	4.04	7.17	2.89	1.80	0.09	0.03	0.00	0.06	0.13	0.50	2.55	0.48	19.74
0	7.13	9.94	2.45	1.01	1.21		0.00	0.00	0.26	2.75	M0.70	0.77	26.22
1	3.27	7.39	1.27	1.69	0.00	0.07	0.00	0.00	0.26	0.54	4.41	9.40	28.30
2													

WETS Station : TRACY PUMPING PLANT, CA9001 Creation Date: 08/29/2002
Latitude: 3748 Longitude: 12135 Elevation: 00060
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	54.8	38.5	46.7	2.68	1.16	3.26	6	0.0
February	61.6	41.9	51.8	2.29	1.01	2.79	5	0.0
March	66.4	45.0	55.7	1.98	0.80	2.40	5	0.0
April	72.8	48.0	60.4	0.73	0.39	0.90	2	0.0
May	80.0	53.4	66.7	0.45	0.00	0.46	1	0.0

June	87.4	57.5	72.4	0.09	0.00	0.07	0	0.0
July	92.1	60.4	76.3	0.04	0.00	0.00	0	0.0
August	91.6	60.3	76.0	0.06	0.00	0.00	0	0.0
September	87.4	58.5	72.9	0.25	0.00	0.19	0	0.0
October	78.5	52.2	65.4	0.72	0.22	0.91	1	0.0
November	64.6	44.1	54.3	1.63	0.58	2.03	4	0.0
December	55.3	38.0	46.7	1.55	0.75	1.89	4	0.0
Annual	-----	-----	-----	------	8.76	13.96	--	----
Average	74.4	49.8	62.1	------	------	------	--	----
Total	-----	-----	-----	12.48	------	------	28	0.0

GROWING SEASON DATES

	Temperature		
Probability	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	1/17 to 12/20 338 days
70 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1955-2002 prcp

Station : CA9001, TRACY PUMPING PLANT
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
55		0.87	0.59	1.24	0.36	0.00	0.00	0.00	0.00	0.12	1.07	6.33	10.58
56	4.13	0.48	0.00	1.35	0.46	0.00	0.00	0.00	0.68	0.32	0.04	0.21	7.67
57	1.78	2.38	0.93	M0.92	M1.32	0.02	0.00	0.00	0.17	M0.70	0.21	1.81	10.24
58	3.19	4.68	3.78	3.03	0.67	0.15	0.00	0.09	0.06	0.00	0.00	0.59	16.24
59	2.53	3.05	0.11	0.10	0.05	0.00	0.00	0.00	2.60	0.00	0.00	0.79	9.23
60	2.27	2.39	0.27	0.24	0.25	0.00	0.01	0.00	0.01	0.07	2.91	0.40	8.82
61	2.21	0.58	1.13	0.69	0.89	0.00	0.00	0.06	0.19	0.03	2.50	0.55	8.83
62	0.60	5.93	1.02	0.01	0.00	0.00	0.00	0.00	0.05	2.87	0.18	1.35	12.01
63	1.90	2.45	1.84	2.27	0.30	0.00	0.00	0.00	0.17	0.68	3.21	0.11	12.93
64	1.48	0.01	0.80	0.17	0.15	1.80	0.02	0.30	0.00	1.03	1.95	3.74	11.45
65	1.90	0.50	1.19	1.16	0.00	0.00	0.05	0.36	0.00	0.02	3.14	2.23	10.55
66	0.82	1.19	0.11	0.42	0.15	0.00	0.25	0.00	0.06	0.00	3.21	2.93	9.14
67	5.27	0.24	3.11	2.53	0.02	0.55	0.00	0.00	0.00	0.09	0.66	0.92	13.39
68	3.32	1.33	1.64	0.44	0.00	0.00	0.00	0.60	0.00	0.19	2.22	2.44	12.18
69	5.02	3.88	0.29	0.65	0.00	0.00	0.00	0.00	0.04	0.95	0.36	1.97	13.16
70	5.40	1.70	1.17	0.21	0.00	0.19	0.00	0.00	0.00	0.64	4.42	3.62	17.35
71	0.81	0.28	1.11	1.00	1.32	0.00	0.00	0.00	0.03	0.00	0.36	2.06	6.97
72	0.51	0.62	0.05	0.30	0.03	0.02	0.00	0.00	0.69	1.77	4.15	1.17	9.31
73	4.38	3.97	2.35	0.41	0.00	0.00	0.00	0.00	0.00	1.35	3.36	2.80	18.62

74	2.03	0.26	1.82	1.23	0.00	0.05	0.10	0.00	0.00	0.63	0.31	1.96	8.39
75	0.33	3.04	3.40	0.92	0.00	0.00	0.18	0.32	0.00	0.98	0.28	0.30	9.75
76	0.25	1.17	0.25	0.55	0.00	0.03	0.00	0.73	0.89	0.43	0.45	0.69	5.44
77	0.52	0.66	0.74	0.63	0.83	0.00	0.01	0.00	0.24	0.13	1.71	2.45	7.92
78	5.61	2.87	3.11	1.14	0.00	0.00	0.00	0.00	0.07	0.00	1.93	0.25	14.98
79	3.68	2.53	2.05	0.62	0.00	0.00	0.20	0.00	0.00	1.30	0.92	2.24	13.54
80	3.46	3.28	1.02	0.98	0.13	0.00	0.62	0.00	0.00	0.03	0.17	0.85	10.54
81	3.16	0.75	2.11	0.27	0.02	0.00	0.00	0.00	0.08	1.29	3.12	2.09	12.89
82	5.46	1.47	4.10	1.45	0.00	0.29	0.00	0.00	2.20	1.64	3.87	1.99	22.47
83	5.12	3.89	5.89	2.91	0.16	0.00	0.00	0.51	0.76	0.43	4.93	2.88	27.48
84	0.45	1.48	0.45	0.30	0.01	0.01	0.00	0.00	0.00	1.41	3.80	1.25	9.16
85	0.42	0.81	1.20	0.21	0.00	0.40	0.00	0.00	0.00	0.48		2.89	6.41
86	1.66	5.10	4.74	0.31	0.07	0.00	0.03	0.00	0.71	0.00	0.00	0.87	13.49
87	1.48	4.15	1.65	0.13	0.00	0.00	0.00	0.00	0.00	M0.58	M1.02	M2.11	11.12
88	M2.27	M0.45	0.83	M1.35	M0.32	0.76	0.00	0.00	0.00	0.24	M1.02	M1.63	8.87
89	M0.83	M0.92	M1.67	M0.30	0.10	M0.02	0.00	M0.01	M1.56	M0.64	M0.85	M0.05	6.95
90	M1.04	M2.11	M0.57	M0.47	M2.00	0.00	0.00	0.00	M0.07	0.15	0.20	1.08	7.69
91	M0.22	M1.98	M3.60	M0.37	0.26	M0.00	0.10	0.15	0.00	1.01	M0.25	M0.70	8.64
92	M1.43	M3.73	M1.46	0.60	0.00	0.14	0.00	0.00	0.00	M0.71	M0.29	M4.42	12.78
93	M5.86	M2.89	M2.83	M0.53	M0.93	M0.14	0.00	0.00	0.00	0.30	2.11	1.39	16.98
94	1.02	2.71	0.07	1.01	1.39	0.00	0.00	0.00	0.05	0.33	2.55	0.67	9.80
95	5.13	0.16	M5.19	0.71	0.48	0.71	0.00	0.00	0.00	0.00	0.00	4.67	17.05
96	M4.02	3.79	2.45	1.09	1.19	0.00	0.00	0.00	0.00	1.11	1.99	3.58	19.22
97	5.22	M0.17	0.11	0.03	0.55	0.15	0.00	0.05	0.00	0.22	3.22	1.59	11.31
98	4.57	7.27	1.43	1.08	3.15	0.10	0.00	0.00	0.13	0.52	1.81	0.44	20.50
99	3.08	2.38	1.99	0.71	0.06	0.00	0.00	0.00	0.07	0.06	0.96	0.27	9.58
0	4.32	4.42	0.79	0.42	0.51	0.02	0.00	0.00	0.02	3.87	0.52	0.47	15.36
1	1.84	2.38	1.16	1.08	0.00	0.05	0.00	0.00	0.25	0.17	1.79	4.55	13.27
2													

WETS Station : UPPER SAN LEANDRO FLTR, CA9185   Creation Date: 08/29/2002
Latitude: 3746   Longitude: 12210   Elevation: 00390
State FIPS/County(FIPS): 06001   County Name: Alameda
Start yr. - 1971   End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	avg daily max	avg daily min	avg	avg	30% chance will have less than	30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	57.6	40.7	49.1	5.20	2.32	6.34	8	0.0
February	61.3	42.6	51.9	4.64	2.07	5.66	7	0.0
March	62.7	43.9	53.3	4.49	2.34	5.48	8	0.0
April	66.6	44.9	55.7	1.70	0.71	2.07	3	0.0
May	69.5	48.0	58.8	0.75	0.06	0.83	1	0.0
June	73.0	51.6	62.3	0.15	0.00	0.18	0	0.0
July	75.4	53.3	64.3	0.06	0.00	0.00	0	0.0
August	75.3	54.2	64.8	0.11	0.00	0.02	0	0.0
September	76.1	53.9	65.0	0.36	0.00	0.38	1	0.0
October	72.8	51.0	61.9	1.52	0.55	1.88	2	0.0
November	64.4	45.2	54.8	3.88	1.54	4.70	6	0.0
December	58.6	41.4	50.0	3.84	1.81	4.69	6	0.0
Annual	-----	-----	-----	------	20.36	29.92	--	----
Average	67.8	47.6	57.7	------	------	------	--	----

Total	-----	-----	-----	26.69	------	------	42	0.0

GROWING SEASON DATES

Probability	24 F or higher	28 F or higher	32 F or higher
	Temperature		
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

Station : CA9185, UPPER SAN LEANDRO FLTR
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.02	0.00	0.64	0.86	4.10	5.62
49	1.58	3.12	4.59	0.02	0.78	0.00	0.05	M0.12	0.00	0.32	M1.73	M2.24	14.55
50	9.80	2.31	3.32	1.57	0.91	0.02	0.00	0.00	0.00	2.36	6.08	6.19	32.56
51	6.25	M2.47	M2.24	1.09	0.70	0.01	0.00	0.34	0.03				13.13
58								0.00	0.06	0.22	0.12	1.93	2.33
59	4.73	4.70	0.83	0.02	M0.02	0.00	0.00	0.03	3.31	0.03	0.00	1.61	15.28
60	M3.01	5.63	3.05	0.97	0.96	M0.00	M0.00	0.00	0.00	0.32	M5.81	0.91	20.66
61	2.99	M1.44	3.76	M1.29	0.79	0.00	0.00	0.13	0.34	M0.34	4.07	2.90	18.05
62	1.74	8.93	2.61	0.53	0.00	0.00	0.00	0.14	0.43	13.13	0.95	2.97	31.43
63	2.62	4.47	4.09	5.64	0.69	0.00	0.00	0.00	0.23	1.83	4.10	0.57	24.24
64	4.91	0.19	2.13	0.32	0.66	0.69	0.03	0.05	0.00	1.35	4.21	7.52	22.06
65	4.86	0.98	2.04	3.99	0.00	0.00	0.02	0.10	0.00	0.28	5.48	4.22	21.97
66	2.98	2.97	0.84	0.73	0.34	0.00	0.15	0.14	0.15	0.00	5.03	4.18	17.51
67	10.20	0.37	5.23	5.80	0.09	1.15	0.00	0.00	0.02	0.66	1.20	3.79	28.51
68	6.61	2.81	3.61	0.44	0.57	0.00	0.00	0.25	0.03	0.28	3.26	4.74	22.60
69	9.00	9.14	1.63	2.27	0.00	0.12	0.00	0.00	0.00	2.31	0.73	5.70	30.90
70	9.71	1.59	1.99	0.06	0.01	0.81	0.00	0.00	0.00	0.77	8.03	8.77	31.74
71	1.61	0.76	3.81	1.02	0.23	0.00	0.00	0.00	0.18	0.12	2.13	4.43	14.29
72	1.73	1.97	0.19	1.89	0.01	0.30	0.00	0.00	1.56	3.70	7.02	3.85	22.22
73	11.00	6.89	3.77	0.09		0.00	0.00	0.00	0.79	1.52	9.20	6.94	40.20
74	4.01	2.21	6.80	4.68	0.00	0.10	1.16	0.00	0.00	0.90		2.37	22.23
75	2.21	6.17	6.05	2.85	0.00	0.11	0.14	0.11	0.02	6.41	1.05	0.38	25.50
76	0.33	1.10	2.51	0.98	0.00	0.06	0.00	1.30	0.88	0.72	1.34	1.98	11.20
77	1.29	1.22	2.52	0.20	1.22	0.00	0.00	0.03	0.96	0.48	3.95	5.73	17.60
78	9.51	4.82	7.30	6.17	0.03	0.00	0.00	0.00	0.48	0.00	2.43	0.91	31.65
79	8.83	5.82	4.06	0.96	0.19	0.00	0.02	0.00	0.00	3.11	3.45	5.79	32.23
80	5.79	7.40	2.55	2.19	0.36	0.05	0.19	0.00	0.00	0.15	0.35	2.33	21.36
81	6.05	1.45	5.60	0.61	0.25	0.00	0.00	0.00	0.08	3.66	6.77	6.93	31.40
82	9.38	5.03	7.68	5.05	0.00	0.12	0.05	0.01	1.12	2.80	7.94	4.33	43.51
83	8.11	8.20	13.10	3.57	0.41	0.00	0.00	0.17	0.45	0.93	9.18	7.77	51.89
84	0.22	2.83	2.21	0.99	0.17	0.92	0.00	0.09	0.04	3.82	8.90	2.08	22.27

85	0.56	2.35	4.24	0.08	0.56	0.26	0.08	0.07	0.54	0.90	3.85	1.90	15.39
86	5.23	10.80	6.52	0.81	0.26	0.00	0.04	0.00	1.90	0.17	0.58	1.90	28.21
87	4.25	5.77	3.26	0.53	0.10	0.00	0.00	0.00	0.00	1.24	2.30	5.13	22.58
88	4.40	0.50			0.70	0.41	0.00	0.00	0.00	0.62	5.01	4.17	15.81
89	1.41	1.80	6.85	0.59	0.03	0.08	0.01	0.00	0.91	3.31	2.10	0.03	17.12
90	4.66	2.44	1.31	0.48	3.83	0.01	0.00	0.00	0.12	0.57	0.73	2.21	16.36
91	0.53	3.06	8.35	0.49		0.13	0.00	0.10	0.00	2.76	0.57	2.57	18.56
92	1.84	7.74	4.68	0.34	0.00	0.02		0.01	0.00	2.12	0.27	8.14	25.16
93	9.17	4.55	2.73	1.37	1.19	0.22	0.00	0.00	0.00	0.66	1.75	2.89	24.53
94	2.29	5.51	0.33	1.83	1.69	0.02	0.00	0.00	0.02	0.29	9.46	3.03	24.47
95	11.17	0.12	8.41	2.49	2.13	1.00	0.00	0.00	0.00	0.00	0.10	8.38	33.80
96	6.68	6.29	3.35	2.45	3.18	0.00	0.00	0.00	0.10	1.08	4.38	10.98	38.49
97	M8.77	0.40	0.55	1.22	0.16	0.44	0.00	1.23	0.01	0.93	7.68	3.61	25.00
98	12.19	15.43	3.13	2.47	3.62	0.12		0.00	0.11	0.70	3.93	2.45	44.15
99	4.54	8.07	3.82	2.02	0.06	0.03	0.00	0.11	0.02	0.34	2.08	0.64	21.73
0	8.13	8.48		0.94		0.21		0.00	0.47			1.28	19.51
1	3.46		1.73	1.95	0.00	0.22	0.00	0.00	0.20	0.50	4.33	10.42	22.81
2													

APPENDIX F

Representative Photographs

Photo 1: Looking northeast over one of the Hanson Aggregates quarry pits (OW-4).

Photo 2: Looking west from Calaveras Road (ES-1).

SOURCE: EMPSi, 2009

Photo 3: Looking northwest over the newly formed wetlands just off Calaveras Road (SW-1).

SOURCE: EMPSi, 2009

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APPENDIX G

East Delineation Study Area

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G.1: East Delineation Study Area Results

Setting

Cattle ranching and watershed management are the primary land uses in the East Delineation Study Area (ESDA).

Soils

Two mapped soil types (see Appendix D) were unique to the ESDA:

Los Gatos-Los Osos complex, 45-75% slopes, eroded

The Los Gatos-Los Osos complex consists of soils on uplands. The Los Gatos soil is a moderately deep, well drained soil formed in material weathered from sedimentary rock. It has rapid runoff and moderately slow permeability. Typically the surface layer is brown (10YR 4/3) or dark brown (10 YR 4/3, 3/3), loam or silt loam about 11 inches thick. It is dark brown (7.5 YR 3/2) when moist. The subsoil is brown or reddish brown heavy loam (10 YR 4/3) to reddish brown (5 YR 5/4) massive, hard, friable and slightly sticky and plastic. It is dark brown or reddish brown (7.5 YR 3/2, 5 YR ¾ when moist (USDA, 1981; NRCS, 2009). The classification of this soil is fine-loamy mixed, mesic Typic Argixerolls.

The Los Osos soil is moderately deep and well drained upland soils formed in material that weathered from sandstone and shale. Typically, the surface layer is grayish brown (10YR 5/2, 5/3), clay loam about 14 inches thick. The subsoil extends to a depth of 30 inches. It is dark yellowish brown (10 YR 3/2; when moist, 10 YR 4/4), moderately acid silty clay loam and heavy silty clay loam. Below that is weathered shale. The classification of this soil is fine, smectitic, thermic Typic Argixerolls (NRCS, 2009). Los Gatos-Los Osos complex soils are found on the steep uplands in the San Antonio Creek valley.

Positas gravelly loam, 20-40% slopes, eroded

The Positas series is a deep to very deep, moderately well drained soil, with medium to very high runoff, and slow to very slow permeability that formed in alluvial material. The surface soil generally consists of a dark brown (7.5YR 3/3) gravelly loam underlain by dark reddish brown (5YR 3/3) clay layers (with varying structures) to at least 20 inches. The soil classification for this type is a fine, smectitic, thermic Mollic Palexeralfs (NRCS, 2009). This soil type was mapped at the upper end of the study area in the vicinity of Turner Dam and on the north side of San Antonio Creek.

Vegetation

In the San Antonio Creek valley, non-native grassland is the dominant natural community outside of the wooded natural communities and comprises much of the woodland understory. Other natural communities within the ESDA along San Antonio Creek include a mosaic of mixed oak woodland, and sycamore alluvial and mixed riparian woodland. Non-native grassland and mixed riparian woodland are described in the main text body (Section 2.5).

Mixed Oak Woodland

Mixed Oak Woodland is dominated in the ESDA by coast live oak (*Q. agrifolia*), valley oak (*Quercus lobata*), and blue oak (*Quercus douglasii*), and contains other hardwoods such as California bay (*Umbellularia californica*) and California buckeye (*Aesculus californica*). Understory shrubs in these woodlands include poison-oak (*Toxicodendron diversilobum*), toyon (*Heteromeles arbutifolia*), California blackberry (*Rubus ursinus*) and hollyleaf buckthorn (*Rhamnus crocea*). Herbaceous associates include Pacific blacksnakeroot *(Sanicula crassicaulis*), baby blue-eyes (*Nemophila menziesii)*, woodland-star (*Lithophragma* spp.), and vetch (*Vicia sativa* and *V. americana*). Coast Live Oak Woodland is found on the hillsides within the study area, such as the slopes near Turner Dam and steeper slopes in the San Antonio Creek valley.

Sycamore Alluvial Woodland

Sycamore Alluvial Woodland is found on cobbly and gravelly braided depositional channels and floodplains of intermittent streams with periodic high flows capable of moving very large-diameter sediment particles. The soils are coarse, very well drained, and often very deep. The woodland is overwhelmingly dominated by widely-spaced California sycamore (*Platanus racemosa*), with other tree associates including California buckeye (*Aesculus californica*), coast live oak, valley oak, and willows. The understory includes shrubs such as common elderberry (*Sambucus nigra* var. *canadensis =S. mexicana*), snowberry (*Symphoricarpos albus* var. *laevigata*) mulefat (*Baccharis salicifolia*), mugwort (*Artemisia douglasiana*), California blackberry, poison-oak, and herbaceous species typical of Non-native Grassland. Within the study area, Sycamore Alluvial Woodland is found along San Antonio Creek, east of Calaveras Road, intermixed with areas of Mixed Riparian Woodland too small to map.

Mixed Riparian Woodland

Mixed Riparian Woodland is a natural community with no single dominant tree. In the study area, this community consists of California sycamore, Goodding's black willow (*Salix gooddingii*), and occasional California bay and valley oak (*Quercus lobata*). The understory is variable, but in the study area consists largely of snowberry, California blackberry, poison-oak, and mugwort. Within the study area, this community is found along San Antonio Creek.

Organization of Results

Field delineation results are presented below. Delineation maps and datasheets are presented in Sections G.2 and G.3 of this Appendix. Representative photographs are in Section G.4 See **Figure G-1** for an overview of the delineated features.

Results

A total of 3.64 acres (158,538.29 square feet) and 5,075 linear feet of jurisdictional waters of the U.S. occur within the EDSA. **Table G-1** below presents all delineated features within the study area and summarizes estimated Corps jurisdictional areas for each feature type, as well as subtotals for wetlands and other waters within the study area. All areas in this delineation are final, having been verified by the Corps during a field verification site visit November 5, 2009.

Other Waters of the U.S.

Intermittent Drainages

San Antonio Creek is the only “blue line” stream in the ESDA and is characterized as intermittent (IS-1). It is also characterized as a wetland tributary (see discussion below). The portion of San Antonio Creek within the EDSA characterized solely as an intermittent stream extends from the bridge over Calaveras Road to the beginning of the seasonal wetland area found just downstream of a weir located on San Antonio Creek. The streambed shows obvious signs of scour from periods of high flow and drift lines are evident. San Antonio Creek is tributary to Alameda Creek west of the ESDA.

Open Water

Three small pools are found on San Antonio Creek (OW-1, 2, and 3) east of Calaveras Road. These pools are likely jurisdictional as they are within the stream boundaries of San Antonio Creek and are bordered by freshwater marsh and seasonal wetlands. In addition, OW-1 is reported to support California red-legged frog[1] and a western pond turtle was observed here during the delineation field work.

Wetlands

The delineation field work was conducted in the spring after a slightly above average seasonal rainfall in late 2008 - early 2009 (USGS, 2009). San Antonio Creek was heavily disturbed by cattle grazing and trampling throughout much of the ESDA. In some areas, vegetation was grazed to the point where identification and estimation of percent cover became difficult.

Wetland Tributaries

San Antonio Creek is characterized, in part, as a ‘wetland tributary’ in this report and has both an OHWM and wetland characteristics (see Section 3.1, *Definitions*). For these reaches (WT-1a and b) the stream supports wetland characteristics and an OHWM. WT-1a, which extends from the cone-valve structure at Turner Dam to the USGS stream gauge weir, supports freshwater marsh. Below the weir, WT-1b supports seasonal wetlands as water heads subsurface.

[1] This pond just downstream of Turner Dam was surveyed by Jones and Stokes in 2006 and both red-legged frog and pond turtle were observed.

TABLE G-1
WATERS OF THE U.S.
WITHIN THE EAST DELINEATION STUDY AREA

Project Site/Feature Type	Feature	Linear ft.	Area (sqft)	Area (ac)	Data-point	Map#
Other Waters						
Intermittent stream (IS)						
	IS-1	1,915	44,741.01	1.027	na	1,2
Subtotal		**1,915**	**44,741.01**	**1.027**		
Open water (OW)						
	OW-1	--	1,302.53	0.030	na	3
	OW-2	--	1,161.32	0.027	na	2
	OW-3	--	613.05	0.014	na	2
Subtotal		**--**	3,076.90	0.071		
Total Other Waters		***1,915***	***47,817.91***	***1.098***		
Wetlands						
Wetland tributary (WT)						
	WT-1a (FWM)	2,878	92,789.35	2.130	8,9,11, 14	2,3
	WT-1b (SW)	282		0.135	19	
Subtotal		**3,160**	**98,651.39**	**2.265**		
Freshwater Marsh (FWM)						
	FWM-1	--	1,003.86	0.023	1,2,3	3
	FWM-2	--	10,898.58	0.250	4,5	3
	FWM-3	--	99.63	0.002	7	3
	FWM-4	--	66.92	0.002	na	3
Subtotal		**--**	**12,068.99**	**0.277**		
Total Wetlands		***3,160***	***110,720.38***	***2.542***		
Total Waters of the U.S.		***5,075***	***158,538.29***	***3.640***		

SOURCE: ESA, 2009

Freshwater Marsh

Freshwater marsh was documented at four locations in the study area. Fresh water marsh is typically indicative of wetland areas that hold water most of the year. These freshwater marsh areas define the upper reaches of San Antonio Creek, which is mapped as a wetland tributary. They are dominated by perennial species such as cattails (*Typha latifolia*; OBL), curly dock (*Rumex crispus*; FACW), duckweed (*Azolla filiculoides*; OBL), and iris-leaved rush (*Juncus xiphioides*, OBL). Numerous Gooding's (*Salix goodingii*; OBL) and arroyo willow (*S. lasiolepis*; FACW) also border or are found within the wetland boundary, sometimes growing in areas of inundation.

Seasonal Wetland

The reach of San Antonio Creek below the USGS stream gauge weir is comprised of seasonal wetland within the creek's OHWM and was mapped as a wetland tributary (WT-1b). Vegetation at sample point 19, taken at a wetter area in this wetland, was dominated by water parsley (*Oenanthe sarmentosa*; OBL), with common rush(*Juncus effusus*; OBL), iris-leaved rush, and common flatsedge (*Cyperus eragrostis*; FACW) also present.

Clean Water Act Analysis

Jurisdictional Determination Analysis Maps are presented in Appendix C and cover both sections of the wetland delineation study area. All delineations and determinations are final, having been verified by the Corps during a field verification site visit November 5, 2009.

No specific studies regarding duration of flow, groundwater measurement, or ecological function and values of streams and wetlands covered in this delineation were conducted. However, the USGS does maintain a monitoring station on San Antonio Creek. This station is approximately 0.25 miles east of Calaveras Road, located at a concrete weir and data shows that flows are perennial to near perennial in the reach upstream.

San Antonio Creek is a mapped as a USGS blue line intermittent stream, with direct hydrologic connection to Alameda Creek west of the ESDA. Alameda Creek flows directly, and for approximately 20 stream miles from the project site, to San Francisco Bay, a traditionally navigable water (TNW). The project site is located directly downstream of San Antonio Reservoir, a TNW. The upstream portions of the study reach have perennial to near perennial flow but the lower reach between the USGS weir and Calaveras Road rarely flows on more than an ephemeral basis. Therefore, overall, the reaches of San Antonio Creek within the ESDA are considered to be relatively permanent waters (RPW).

While San Antonio Creek is generally thought of as an intermittent stream, most of the creek east of Calaveras Road was actually mapped as a wetland tributary and can be characterized as freshwater marsh and seasonal wetland. The natural flow of San Antonio Creek has been highly altered by the presence of Turner Dam which was built in 1964. As a result, perennial flows in the upper reaches of the creek result from seepage through and around the earthen dam. Seepage flows are directed into the creek by perforated culverts, one at the north side of the dam and one at the south. This seepage results in highly regulated flows that persist year around in most years with seasonal fluctuations resulting from changes in soil moisture, humidity, temperature and other factors that typically affect hydrology.

This consistent and regulated flow regime has transformed these upper reaches of creek from what was originally a high energy seasonal stream into a wetland tributary with low, slow moving flows that pond behind the USGS stream gauge weir located about 0.25 mile upstream from Calaveras Road. The historical OHWM now defines the wetland boundary in most places. There is very little active incision or erosion evident in the stream reaches east of Calaveras Road. Even with its altered hydrology, San Antonio Creek and its instream, abutting, and adjacent wetlands in the ESDA still performs all the basic stream functions noted above. In particular, the creek supports special-status wildlife, including California red-legged frog and western pond turtle. San Antonio Creek will therefore likely be considered jurisdictional by the Corps.

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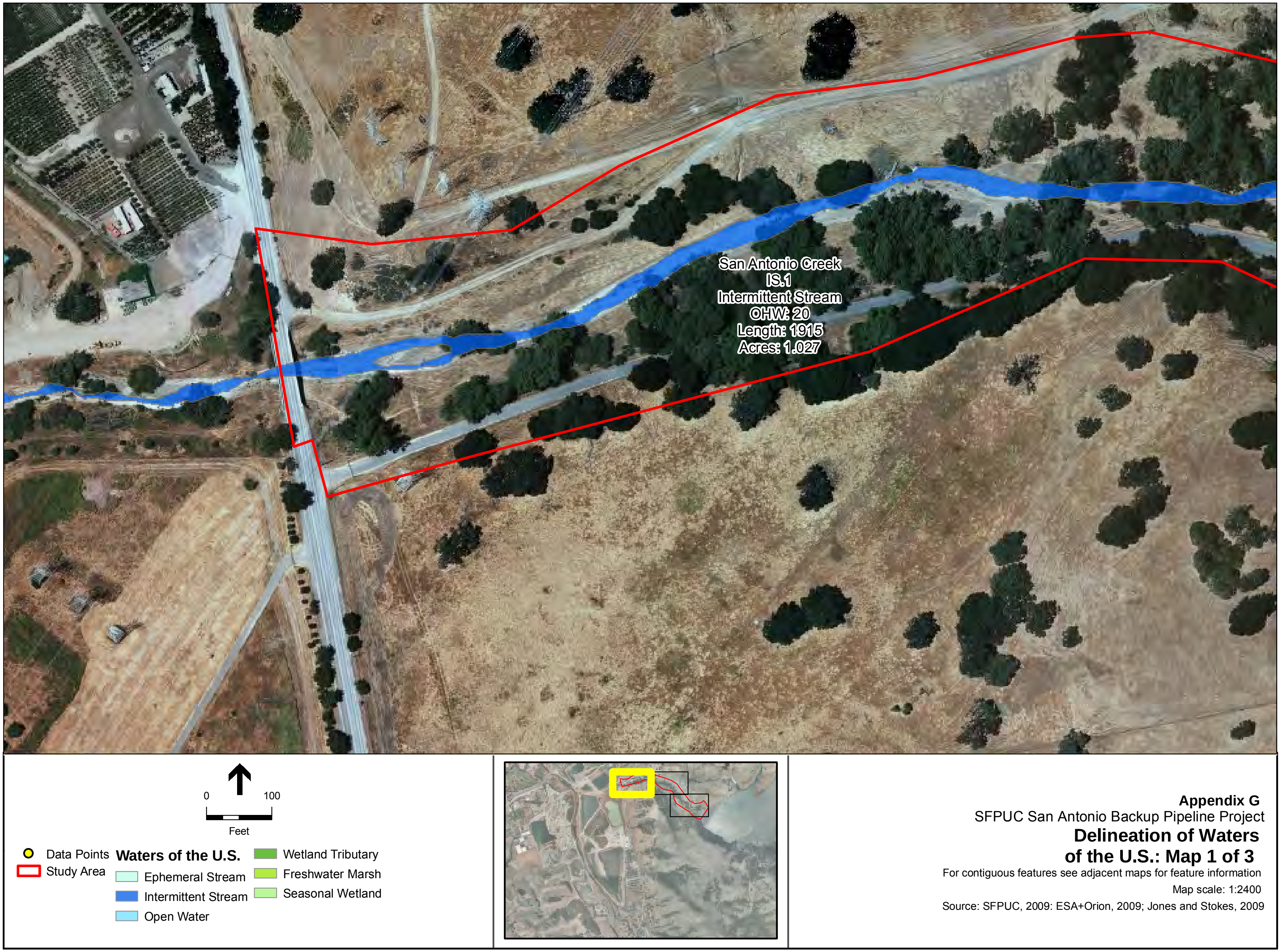
G.2: Delineation Maps


San Antonio Creek
IS.1
Intermittent Stream
OHW: 20
Length: 1915
Acres: 1.027
0
100
Feet
Data Points
Study Area
Waters of the U.S.
Ephemeral Stream
Intermittent Stream
Open Water
Wetland Tributary
Freshwater Marsh
Seasonal Wetland
Appendix G
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters
of the U.S.: Map 1 of 3
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

0 100
Feet

- Data Points
- Study Area

Waters of the U.S.

- Ephemeral Stream
- Intermittent Stream
- Open Water
- Wetland Tributary
- Freshwater Marsh
- Seasonal Wetland

Appendix G
SFPUC San Antonio Backup Pipeline Project

Delineation of Waters of the U.S.: Map 2 of 3

For contiguous features see adjacent maps for feature information

Map scale: 1:2400

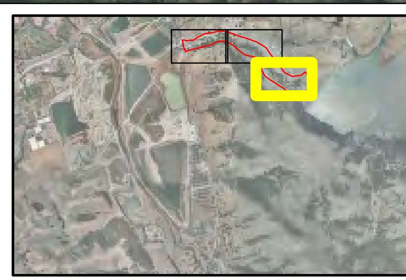
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

0 100
Feet

Data Points
Study Area

Waters of the U.S.

Ephemeral Stream
Intermittent Stream
Open Water
Wetland Tributary
Freshwater Marsh
Seasonal Wetland



Appendix G
SFPUC San Antonio Backup Pipeline Project
Delineation of Waters of the U.S.: Map 3 of 3
For contiguous features see adjacent maps for feature information
Map scale: 1:2400
Source: SFPUC, 2009: ESA+Orion, 2009; Jones and Stokes, 2009

G.3: Datasheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline Project City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 1

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37˚34'21.45501"N Long: 121˚551'02.72180"W Datum: NAD83

Soil Map Unit Name: Yolo Loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? **Yes** ◉ **No** ○

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus effusus*	20	Yes	OBL
2. *Rumex crispus*	5	Yes	FACW
3. *Vulpia (sp)*	5	Yes	FAC
4. *Juncus xiphioides*	5	Yes	OBL
5.			
6.			
7.			
8.			
Total Cover:	35 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 60 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	35 (A)		50 (B)

Prevalence Index = B/A = 1.43

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ○

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
12	2.5Y 3/2	95	7.5 YR	5	RM	RC	SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☒ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ **No** ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): > 1
Water Table Present?	Yes ◉	No ○	Depth (inches): SURFACE
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): SURFACE

Wetland Hydrology Present? Yes ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3/16/09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 2

Investigator(s): T Brookhart and B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): stream channel Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37˚34'21.54714"N Long: 121˚51'02.79301"W Datum: NAD83

Soil Map Unit Name: Yolo loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (•)
Hydric Soil Present?	Yes ( )	No (•)
Wetland Hydrology Present?	Yes (•)	No ( )

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks: This is a fairly recent wetland that has been created by the diversion of water from a leak in the pipeline system. The water is conveyed to this location by the use of an electric pump and hose that can be found on the east side of Calaveras Road. The water is then directed into the storm drain where it crosses the road in a culvert and empties into the sample site.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus (sp)*	20	Yes	FAC
2. *Vicia (sp)*	10	Yes	FACU
3. *Vulpia (sp)*	30	No	FAC
4. *Geranium dissectum*	10	No	UPL
5.			
6.			
7.			
8.			
Total Cover:	)70%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 30 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	50	x 3 =	150
FACU species	10	x 4 =	40
UPL species	10	x 5 =	50
Column Totals:	70 (A)		240 (B)

Prevalence Index = B/A = 3.43

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks: Site is at the base of Turner Dam. Bare ground due to some cattle and ground squirrel activity.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
16	5 Y 5/3	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 6"

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Saturation at 6 inches. This area is probably a bit wetter than usual. This site is at the base of Turner Dam

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline Project City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 3

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR): Lat: 37˚34'21.45501"N Long: 121˚551'02.72180"W Datum: NAD83

Soil Map Unit Name: Yolo Loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	◉	○
Hydric Soil Present?	◉	○
Wetland Hydrology Present?	◉	○

Is the Sampled Area within a Wetland? **Yes** ◉ **No** ○

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Typha (sp)*	15	Yes	OBL
2. *Rorippa nasturtium*	42	Yes	OBL
3. *Conium maculatum*	2	Yes	FACW
4. *Juncus xiphioides*	5	Yes	OBL
5. *Picris echioides*	5	No	FAC
6.			
7.			
8.			
Total Cover:	69 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % % Cover of Biotic Crust 5 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	62	x 1 =	62
FACW species	2	x 2 =	4
FAC species	5	x 3 =	15
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	69 (A)		81 (B)

Prevalence Index = B/A = 1.17

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ○

Remarks: Site is located at the outfall drain of the base of Turner Dam. Drain water enters wetland via a rock filled channel and exists via a 24" culvert. Water flowing during survey. Bare soil due to livestock presence.

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
12	2.5Y 2/1	98	10 YR 5/8	2	RM	RC	LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [x] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes (●) **No** ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes (●)	No ( )	Depth (inches): > 1
Water Table Present?	Yes (●)	No ( )	Depth (inches): SURFACE
Saturation Present? (includes capillary fringe)	Yes (●)	No ( )	Depth (inches): SURFACE

Wetland Hydrology Present? Yes (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Contiguous with Site 1

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3/16/09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 4

Investigator(s): T Brookhart and B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): stream channel Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37°34'24.23901"N Long: 121°51'02.18034"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: This site is directly outside of a wetland area with Typha and tall Juncus species.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus (sp)*	70	Yes	FACW*
2. *Piptatherum miliaceum*	20	Yes	Not Listed
3. *Cirsium vulgare*	8	Yes	FACU
4. *Picris echioides*	2	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	70	x 2 =	140
FAC species	2	x 3 =	6
FACU species	8	x 4 =	32
UPL species	20	x 5 =	100
Column Totals:	100 (A)		278 (B)

Prevalence Index = B/A = 2.78

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Site is at the base of Turner Dam. This site is just outside of a wetland.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
12	5 Y 4/2	100					Sand clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	○	◉	
Water Table Present?	○	◉	
Saturation Present? (includes capillary fringe)	◉	○	12"

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Saturation at 12 inches.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline Project City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 5

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR): Lat: 37˚34'24.35147"N Long: 121˚551'02.16033"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area**
Wetland Hydrology Present?	Yes (●)	No ( )	**within a Wetland?** **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Typha (sp)*	20	Yes	OBL
2. *Juncus phaeocephalus*	20	Yes	FACW
3. *Juncus effusus*	15	Yes	OBL
4. *Juncus xiphioides*	5	Yes	OBL
5.			
6.			
7.			
8.			
Total Cover:	60 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	20	x 2 =	40
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	60 (A)		80 (B)

Prevalence Index = B/A = 1.33

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks: Dead material in area, mostly Typha

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
12	2.5Y 2/1	98						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☒ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◉ No ○ Depth (inches): > 1

Water Table Present? Yes ◉ No ○ Depth (inches): SURFACE

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): SURFACE

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline Project City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 6

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): Lat: 37˚34'24.817997"N Long: 121˚51'01.29185"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus effusus*	70	Yes	OBL
2. *Conium maculatum*	5	Yes	FACW
3. *Picris echioides*	5	Yes	FAC
4. *Cirsium vulgare*	5	Yes	FACU
5.			
6.			
7.			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	5	x 4 =	20
UPL species		x 5 =	0
Column Totals:	85 (A)		115 (B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
12	5 YR 3.5/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [x] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [x] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** (●) **No** ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [x] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	( )	(●)	
Water Table Present?	(●)	( )	> 1
Saturation Present? (includes capillary fringe)	(●)	( )	> 1

Wetland Hydrology Present? **Yes** (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline — City/County: Alameda County, CA — Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission — State: CA — Sampling Point: 7

Investigator(s): T Brookhart, B Leitner — Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): — Local relief (concave, convex, none): — Slope (%): 0

Subregion (LRR): C - Mediterranean California — Lat: 37°34'24.76608"N — Long: 121°551'03.24536"W — Datum: NAD83

Soil Map Unit Name: Riverwash — NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	●	
Hydric Soil Present?	●	
Wetland Hydrology Present?	●	

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Typha latifolia*	40	Yes	OBL
2. *Baccharis salicifolia*	5	Yes	FACW
3. *Juncus effusus*	5	Yes	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover:	50 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 35 % — % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	5	x 2 =	10
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	50 (A)		55 (B)

Prevalence Index = B/A = 1.10

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
12	5 YR 2.5/1	100					Sandy Clay	remnant riverbed- gravel/cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☒ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 6-10

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): surface
Water Table Present?	Yes ◉	No ○	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): surface

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 8

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37°34'24.00653"N Long: 121°551'03.71862"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus xiphioides*	30	Yes	OBL
2. *Juncus effusus*	30	Yes	OBL
3. *Typha angustifolia*	10	Yes	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover:	70 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	70 (A)		70 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
12	5 Y 5/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☒ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 6-10

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☒ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 1
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): surface

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 9

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37°34'24.15607"N Long: 121°51'06.70353"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix goodingii*	40	Yes	OBL
2.			
3.			
4.			
Total Cover:	40 %		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Schoenoplectus americanus*	40	Yes	OBL
2. *Juncus xiphioides*	28	Yes	OBL
3. *Rumex crispus*	2	Yes	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	70 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	98	x 1 =	98
FACW species	2	x 2 =	4
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	100 (A)		102 (B)

Prevalence Index = B/A = 1.02

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
12	7.5 YR 3/1	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [x] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 6-10

Hydric Soil Present? **Yes** (●) **No** ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [x] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [x] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes (●) No ( ) Depth (inches): 1

Water Table Present? Yes ( ) No (●) Depth (inches):

Saturation Present? (includes capillary fringe) Yes (●) No ( ) Depth (inches): surface

Wetland Hydrology Present? **Yes** (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline | City/County: Alameda County, CA | Sampling Date: 3/16/09

Applicant/Owner: San Francisco Public Utilities Commission | State: CA | Sampling Point: 10

Investigator(s): T Brookhart and B Leitner | Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): stream channel | Local relief (concave, convex, none): | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 37°34'24.15607"N | Long: 121°51'06.70353"W | Datum: NAD83

Soil Map Unit Name: Riverwash | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) **No** (●)

Remarks: This site is directly outside of a wetland area with Typha and tall Juncus species.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus hordeaceus*	25	Yes	FACU
2. *Geranium molle*	8	Yes	UPL
3. *Trifolium (sp)*	2	No	NI
4. *Hirschfeldia incana*	3	No	UPL
5. *Conium maculatum*	2	No	FACW
6.			
7.			
8.			
Total Cover:	40 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	2	x 2 =	4
FAC species		x 3 =	0
FACU species	25	x 4 =	100
UPL species	11	x 5 =	55
Column Totals:	38 (A)		159 (B)

Prevalence Index = B/A = 4.18

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ( ) **No** (●)

Remarks: Upland site of coupled wetland site (Data sheet 9)

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
16	10 YR 4/2	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ◯ No ◉

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◯ No ◉ Depth (inches):
Water Table Present? Yes ◯ No ◉ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ◯ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◯ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 11

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37°34'30.70607"N Long: 121°51'17.94060"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? Yes (●) No ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus effusus*	45	Yes	OBL
2. *Juncus xiphioides*	5	Yes	OBL
3. *Rumex crispus*	2	Yes	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	52 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	2	x 2 =	4
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	52 (A)		54 (B)

Prevalence Index = B/A = 1.04

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Just below a patch of cattails. Lots of tall juncus

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
12	5 Y 2.5/2	100					Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [x] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 6-10

Hydric Soil Present? **Yes** (●) **No** ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [x] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [x] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes (●)	No ( )	Depth (inches): 2
Water Table Present?	Yes (●)	No ( )	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes (●)	No ( )	Depth (inches): surface

Wetland Hydrology Present? **Yes** (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline
City/County: Alameda County, CA
Sampling Date: 3/16/09
Applicant/Owner: San Francisco Public Utilities Commission
State: CA
Sampling Point: 12
Investigator(s): T Brookhart and B Leitner
Section, Township, Range: CA T4S R4E
Landform (hillslope, terrace, etc.): stream channel
Local relief (concave, convex, none):
Slope (%): 0
Subregion (LRR): C - Mediterranean California
Lat: 37˚34'30.26569"N
Long: 121˚51'18.11880"W
Datum: NAD83
Soil Map Unit Name: Riverwash
NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (•)
Hydric Soil Present?	Yes ( )	No (•)
Wetland Hydrology Present?	Yes ( )	No (•)

Is the Sampled Area within a Wetland? Yes ( ) **No** (•)

Remarks: This site is directly outside of a wetland area with Typha and tall Juncus species.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus racemosa*	20	Yes	FACW
2.			
3.			
4.			
Total Cover:	20 %		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus hordeaceus*	50	Yes	FACU
2. *Geranium dissectum*	5	No	UPL
3. *Claytonia perfoliata*	2	No	UPL
4. *Carduus pycnocephalus*	10	Yes	UPL
5.			
6.			
7.			
8.			
Total Cover:	67 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33.3 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	20	x 2 =	40
FAC species		x 3 =	0
FACU species	50	x 4 =	200
UPL species	17	x 5 =	85
Column Totals:	87 (A)		325 (B)

Prevalence Index = B/A = 3.74

Hydrophytic Vegetation Indicators:

- ( ) Dominance Test is >50%
- ( ) Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ( ) **No** (•)

Remarks: Upland site of coupled wetland site (Data sheet 13)

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
12	10 YR 3/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ●

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ●	Depth (inches):
Water Table Present?	Yes ○	No ●	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ●	Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3-16-09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 13

Investigator(s): T Brookhart, B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37°34'36.45340"N Long: 121°51'23.48429"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )
Hydric Soil Present?	Yes (•)	No ( )
Wetland Hydrology Present?	Yes (•)	No ( )

Is the Sampled Area within a Wetland? **Yes** (•) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus racemosa*	5	No	FACW
2. *Salix goodingii*	10	Yes	OBL
3.			
4.			
Total Cover:	15 %		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus effusus*	8	Yes	OBL
2. *Plantago major*	5	No	FACW*
3. *Leymus triticoides*	12	Yes	FAC*
4. *Mentha pulegium*	5	No	OBL
5.			
6.			
7.			
8.			
Total Cover:	30 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 50 % % Cover of Biotic Crust d %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	23	x 1 =	23
FACW species	10	x 2 =	20
FAC species	12	x 3 =	36
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	45 (A)		79 (B)

Prevalence Index = B/A = 1.76

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (•) **No** ( )

Remarks:

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
5	10 YR 3/2	90	7.5 YR 3/4	10	C	M	sand	
5-10	10 YR 3/1	100					sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☒ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 6-10

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): surface

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline | City/County: Alameda County, CA | Sampling Date: 3/16/09

Applicant/Owner: San Francisco Public Utilities Commission | State: CA | Sampling Point: 14

Investigator(s): T Brookhart and B Leitner | Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): stream channel | Local relief (concave, convex, none): | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 37°34'36.34855"N | Long: 121°51'23.57321"W | Datum: NAD83

Soil Map Unit Name: Riverwash | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	40	Yes	FACW
2.			
3.			
4.			
Total Cover:	40 %		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Rumex crispus*	5	Yes	FACW
2. *Juncus (sp)*	5	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	10 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	50	x 2 =	100
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	50 (A)		100 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks: open water 70% and remaining cover dead vegetation

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
12	2.5 Y 3/1	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [x] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [x] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes (●) **No** ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [x] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [x] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [x] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes (●)	No ( )	Depth (inches): 6 inches
Water Table Present?	Yes (●)	No ( )	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes (●)	No ( )	Depth (inches):

Wetland Hydrology Present? Yes (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline | City/County: Alameda County, CA | Sampling Date: 3/17/09

Applicant/Owner: San Francisco Public Utilities Commission | State: CA | Sampling Point: 19

Investigator(s): T Brookhart and B Leitner | Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): stream channel | Local relief (concave, convex, none): | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 37 34'37.91487"N | Long: 121 51'30.52628"W | Datum: NAD83

Soil Map Unit Name: Riverwash | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Oenanthe sarmentosa*	40	Yes	OBL
2. *Juncus effusus*	5	Yes	OBL
3. *Juncus xiphioides*	3	Yes	OBL
4. *Cyperus eragrostis*	2	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	50 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	48	x 1 =	48
FACW species	2	x 2 =	4
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	50 (A)		52 (B)

Prevalence Index = B/A = 1.04

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
6	2.5 Y 3/1	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [x] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 6"

Hydric Soil Present? Yes (●) No ( )

Remarks: This area is over an historic stream bed (San Antonio Creek) and soil is about 6 inches deep before reaching the cobble of the old streambed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [x] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [x] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [x] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	(●)	( )	4"
Water Table Present?	(●)	( )	
Saturation Present? (includes capillary fringe)	(●)	( )	

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: San Antonio Backup Pipeline City/County: Alameda County, CA Sampling Date: 3/17/09

Applicant/Owner: San Francisco Public Utilities Commission State: CA Sampling Point: 20

Investigator(s): T Brookhart and B Leitner Section, Township, Range: CA T4S R4E

Landform (hillslope, terrace, etc.): stream channel Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 37 34'38.30355"N Long: 121 51'30.55981"W Datum: NAD83

Soil Map Unit Name: Riverwash NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Rumex crispus*	5	Yes	FACW
2. *Trifolium fucatum*	5	No	FACU
3. *Vicia (sp.)*	10	Yes	FAC
4. *Bromus hordeaceus*	30	Yes	FACU
5. *Geranium molle*	5	No	UPL
6.			
7.			
8.			
Total Cover:	55 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 45 % % Cover of Biotic Crust 35 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	5	x 2 =	10
FAC species	10	x 3 =	30
FACU species	35	x 4 =	140
UPL species	5	x 5 =	25
Column Totals:	55 (A)		205 (B)

Prevalence Index = B/A = 3.73

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Upland plot from site 19 (wetland)

SOIL

Sampling Point: 20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
10	2.5 Y 4/2	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches):

Wetland Hydrology Present? Yes ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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G.4: Representative Photographs

Photo 1: Open water pool (OH-1) with freshwater marsh at the outlet pool next to Turner Dam.

Photo 2: Looking east along the boundary of San Antonio Creek (WT-1)- 0.25 miles from Turner Dam.

Photo 3: San Antonio Creek (WT-1) - Looking southwest.

SOURCE: EMPSi, 2009

Photo 4: Looking southeast over San Antonio Creek (WT-1)

Photo 5: Looking east from the weir on San Antonio Creek (WT-1)

SOURCE: EMPSi, 2009

Photo 6: Looking west toward the bridge on Calaveras Road (IS-1).

SOURCE: EMPSi, 2009

APPENDIX I

Tree Survey

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SAN ANTONIO BACKUP PIPELINE PROJECT

FINAL TREE SURVEY REPORT

PREPARED FOR:

San Francisco Public Utilities Commission
1155 Market Street
San Francisco, CA 94102

PREPARED BY:

EMPSi
944 Market Street, Suite 509
San Francisco, CA 94102

EMPS Inc.

UNDER CONTRACT TO:

ESA+Orion
225 Bush Street, Suite 1700
San Francisco, CA 94104

Table of Contents

Figures

Tables

SAN ANTONIO BACKUP PIPELINE PROJECT

Tree Survey Report

Purpose and Scope

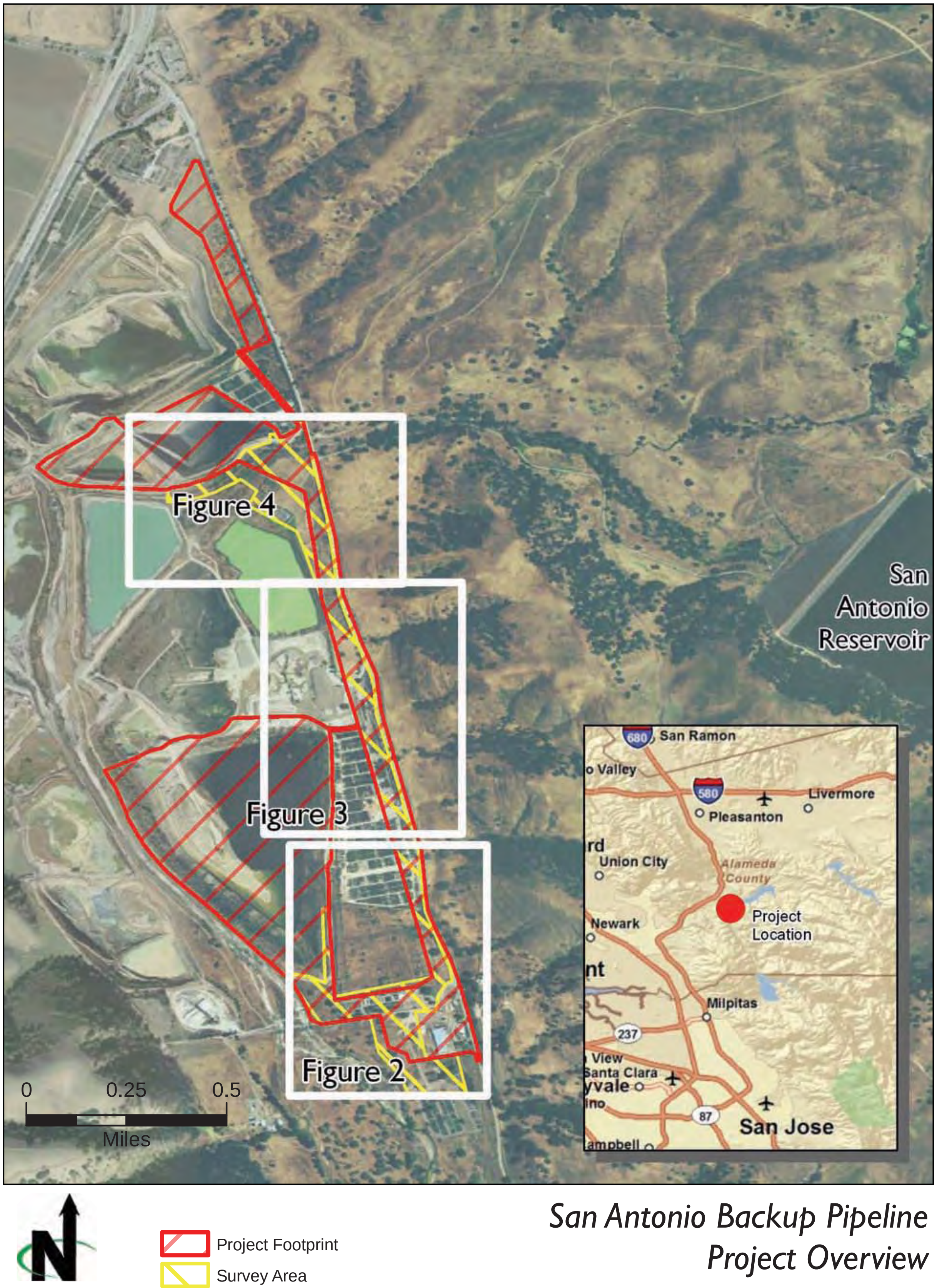
EMPSi was subcontracted by ESA+Orion to perform a tree survey and produce a tree survey report for the San Francisco Public Utilities Commission (SFPUC) San Antonio Backup Pipeline (SABPL) project (proposed project). The survey area is based on the SFPUC-defined project footprint, and modified to encompass a 60-foot buffer from the edge of the pipeline and omit areas where tree disturbance is not anticipated (i.e. no surveys within or around the SMP-30 quarry pit; only the southeast boundary of SMP-24 quarry pits was surveyed). The proposed project is located in an unincorporated area of Alameda County, approximately one mile south of the intersection of Interstate 680 (I-680) and State Route 84 (SR-84) along Calaveras Road. The SFPUC would construct the proposed improvements on lands owned by the City and County of San Francisco (CCSF) and managed by the SFPUC within the Sunol Valley Region of the SFPUC's regional water system in the Alameda watershed. An overview of the survey area and project footprint is provided in **Figure 1**.

The SFPUC Alameda Watershed Management Plan (Alameda WMP), adopted by the CCSF in 2000, provides goals, policies, and management actions to guide activities within watershed lands. The Alameda WMP does not have specific policies pertaining to tree preservation (SFPUC, 2001).

Cities and counties are mutually exempt from complying with each other's building and zoning codes (California Government Code Section 53090 et seq). In addition, pursuant to California Government Code Section 53091, the SFPUC, as a public water utility, is not subject to the building and zoning ordinances of local jurisdictions for projects like the SABPL (facilities for the production, generation, storage, treatment, or transmission of water).[1] The SFPUC has authority over management of extraterritorial lands like the project site pursuant to the City Charter. Nonetheless, for purposes of impact evaluation under the California Environmental Quality Act (CEQA), local tree protection ordinances are used as significance criteria for WSIP facility improvement projects outside of the CCSF.

The Alameda County Tree Ordinance (No. 0-2004-23, Chapter 12.11 of the Alameda County General Ordinance Code) applies to trees within the Alameda County right-of-way. The ordinance requires an encroachment permit for planting, pruning, or removing trees in the right-of-way with a Diameter at Breast Height (DBH) (4.5 feet above-ground) of two inches or more, taller than ten feet in the right-of-way of a county road. The ordinance requires replacement of removed trees. The county does not have an ordinance that applies to those trees within the survey area but outside of the county ROW. No other local tree ordianances apply to the proposed project.

1 Although California Public Resources Code (PRC) Section 21083.4 addresses oak habitat evaluation, this applies only to counties and is not applicable to the SFPUC.



San Antonio Backup Pipeline
Project Overview

Figure 1

Trees within the survey area were surveyed and tagged in accordance with the Alameda County Tree Ordinance and industry standards using the following criteria:

- trees with a DBH greater than two inches and within the Alameda County ROW along Calaveras Road;
- native oaks with a DBH of five inches or more; and
- all other trees with a DBH of six inches or more.

Tree location data was collected with a Trimble Geo XH handheld Global Positioning System (GPS). The GPS data was used to map tree resources within the survey area using ArcGIS software. Tree resources in the survey area are shown on **Figures 2, 3 and 4**. The following sections describe the survey methods and provide a summary of the tree resources surveyed.

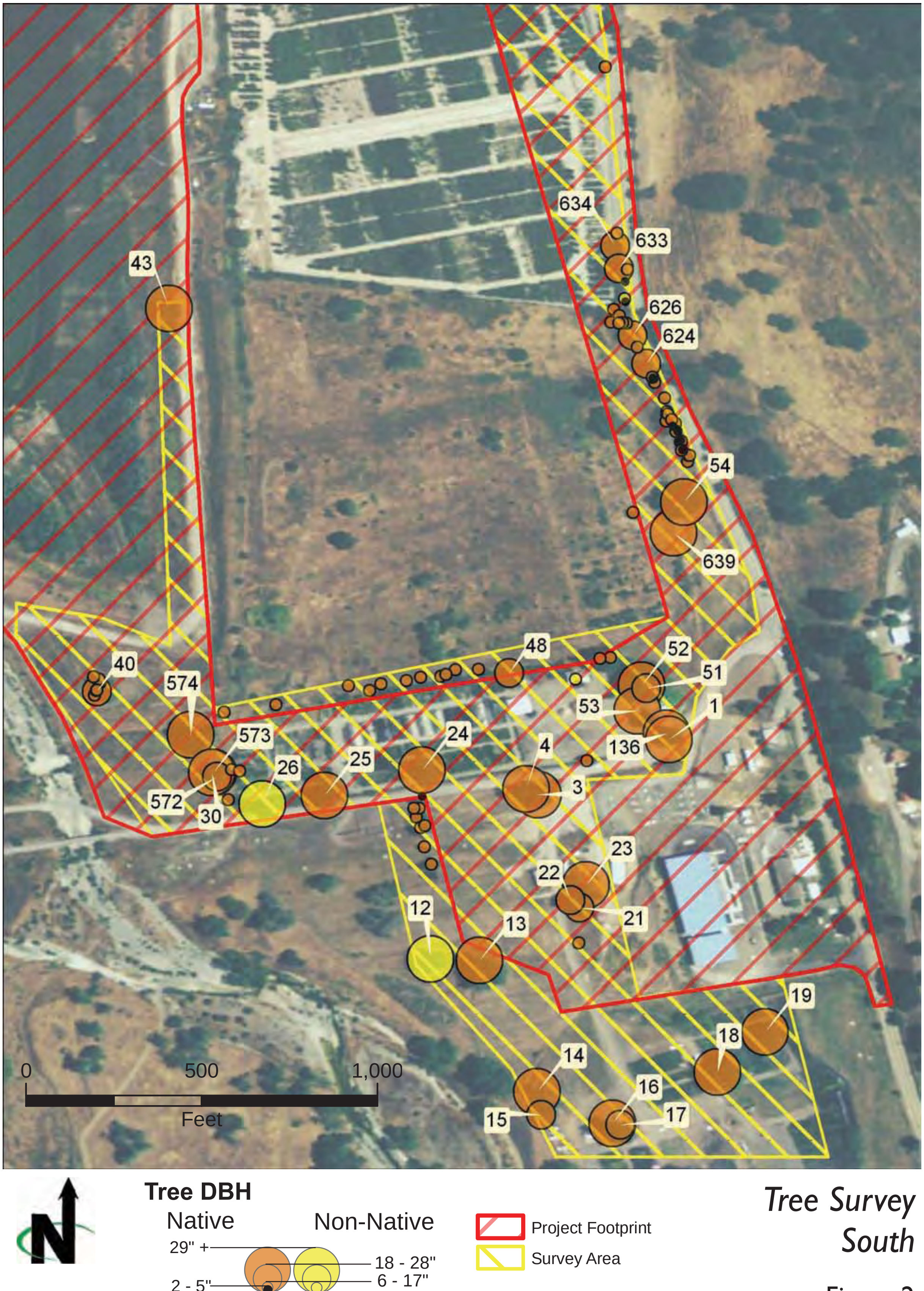
Survey Methods

The project site was surveyed on March 24, 25, and 26, 2009, and June 5, 2009. The survey methods follow standard professional practices. The survey consisted of identifying, measuring, assessing, and tagging all qualifying trees in the survey area. Trees were tagged with numbered one-inch aluminum tags. Information collected included DBH, radius of the dripline (measured at the largest radius), and the general condition of the tree and its components (root collar, trunk, limbs, and foliage). The "Condition" of the tree is defined as follows:

Good: Tree is without any visible deficiencies. Tree is in excellent health and is structurally sound, with little evidence of dieback and good overall annual growth. The tree shows no sign of disease, decay, or mistletoe infestation. The tree has a balanced branching structure.

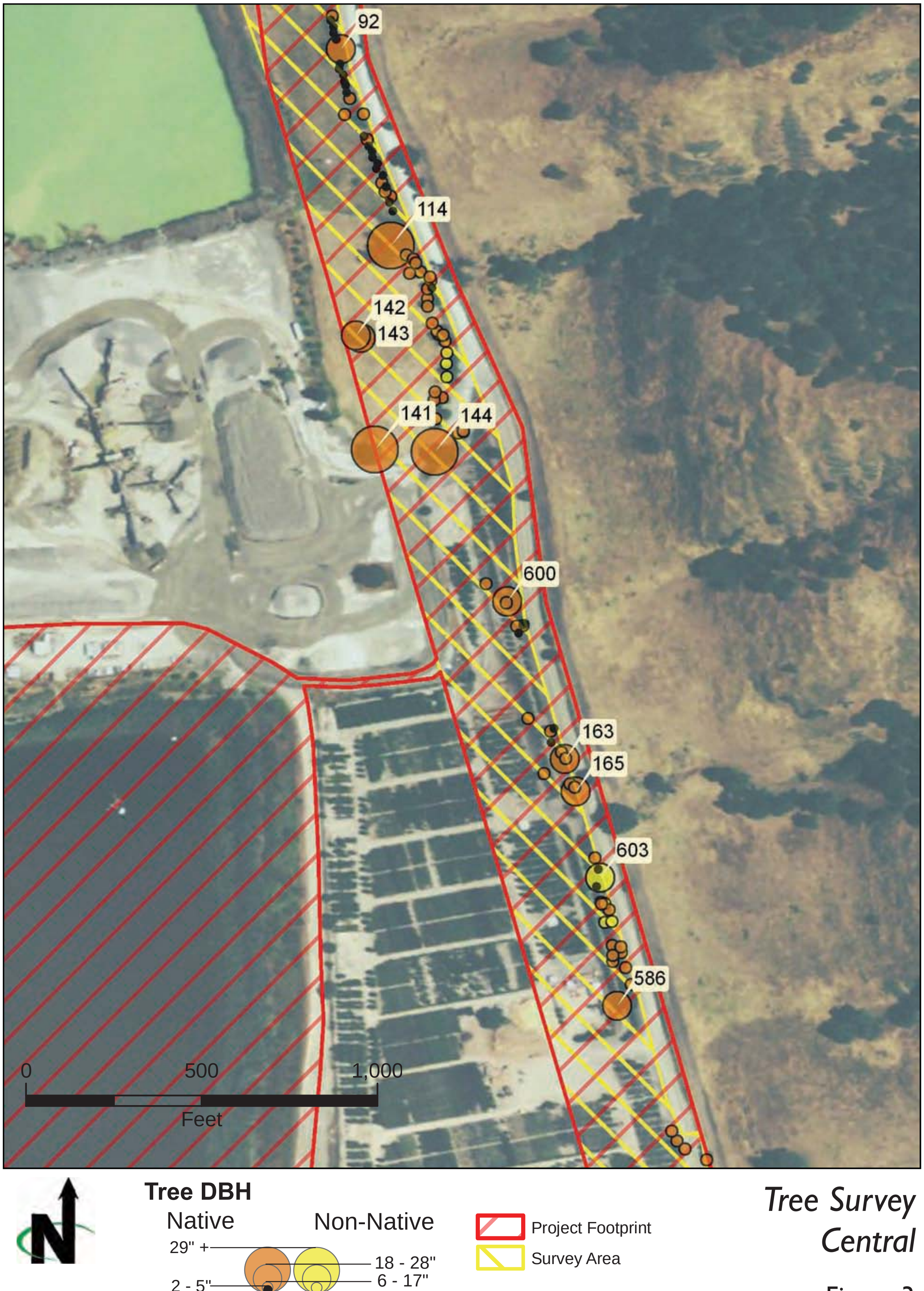
Fair: Tree has no major deficiencies but may have minor dieback or overcrowding. Tree is in good health and is structurally sound. Defects are not a risk to the tree's long term survival.

Poor: Tree has major to minor deficiencies. Tree is in average to poor health and may have some structural deficiencies such as decay and numerous dead limbs. Overall health and integrity of the tree is adversely affected, limiting growth, and is likely detrimental to long-term health of tree. Tree may also have extensive dieback, sparse foliage, and/or unbalanced or asymmetrical form.



Tree Survey South

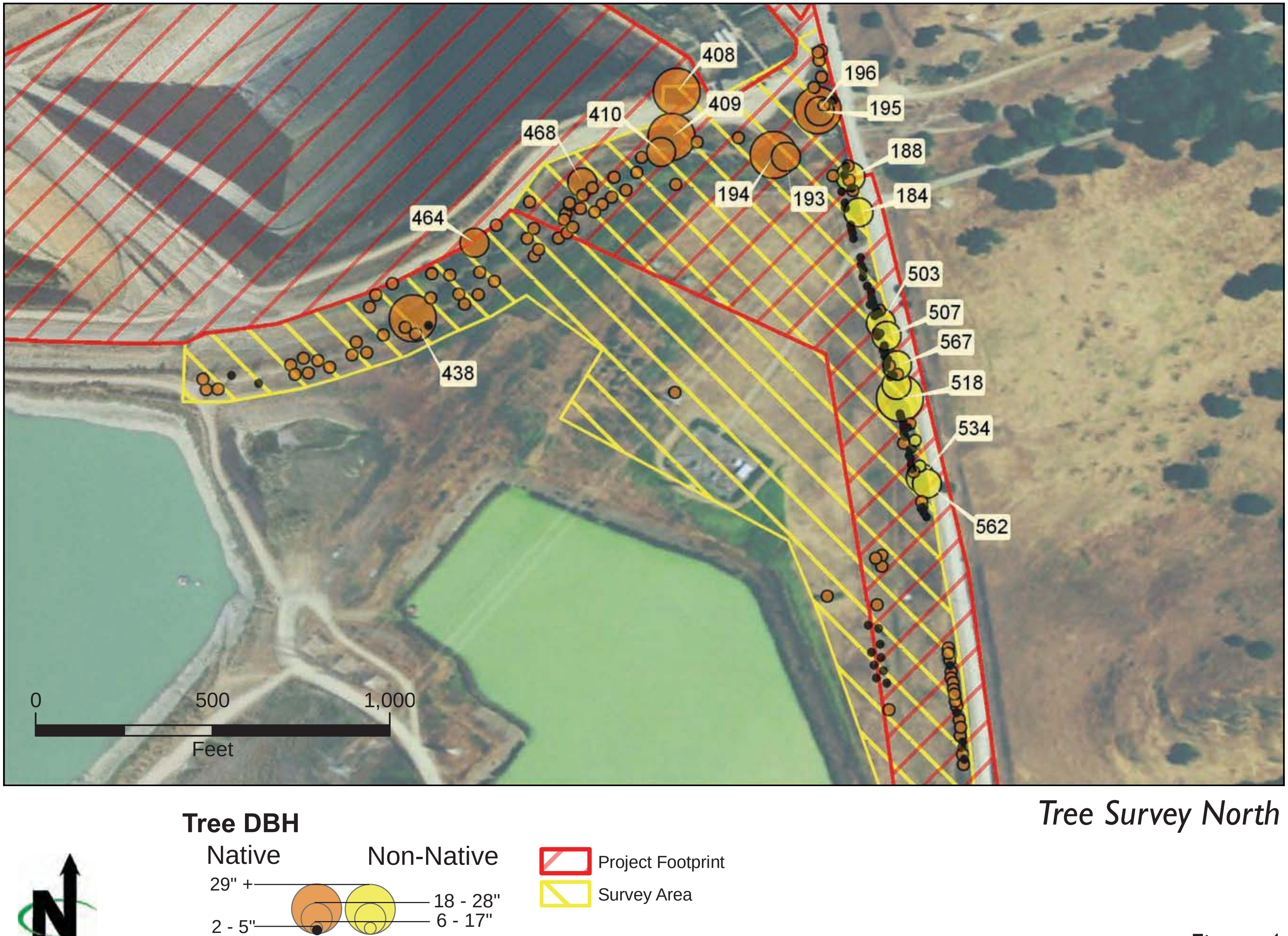
Figure 2



Tree Survey Central

Figure 3

I-10



Tree Survey North

Figure 4

Survey Results

A summary of the tree survey results are presented in **Table 1**. **Figure 5** presents summary DBH and species occurrence data for the entire survey area. **Figures 6 to 10** present size and occurrence data for the five most common native species found in the survey area (California buckeye (*Aesculus californica)*, California walnut (*Juglans hindsii*), California sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*), and valley oak (*Q. lobata*). Additionally, **Appendix I** provides a table listing all trees surveyed and includes the DBH of each tree, tag number, total number of trunks, crown diameter, tree condition, and any unique features, such as bird nests, that might help identify the impacts of removal or facilitate in identification. A total of 391 trees were surveyed within the survey area.

The most prominent trees found in the survey area are the large California sycamore trees that are located at the southern portion of the survey area. The largest of these trees has a DBH of 69 inches. Several large coast live oaks and valley oaks can also be found in this area (Figure 2).

Calaveras Road is lined with coast live oaks, valley oaks, several large non-native cork oaks (*Q. suber*). A few other scattered non-natives that are likely the result of plantings or volunteers from one of the adjacent tree nurseries are also found along the roadway. These include three large Deodar cedar (*Cedrus deodara*) trees at the Cemex quarry entrance. The northern section of the survey area located within the Alameda County ROW for Calaveras Road includes numerous small California walnut trees that appear to have been planted. (Refer to Photos 1 and 2 in **Appendix II**).

The western portion of San Antonio Creek is also bordered on its southern side by numerous plantings (in two rows). These plantings include several species – black cottonwood (*Populus trichocarpa*), Goodings's willow (*Salix goodingii*), and California sycamore. This reach of San Antonio Creek is also lined with the majority of the survey area's California buckeye and blue elderberry (*Sambucus mexicana*). There are also a few large sycamores where San Antonio Creek crosses Calaveras Road (Figure 4).

TABLE 1: TREE SURVEY SUMMARY

SPECIES	<6 inches	6 to 18 inches	>18 inches	Total Count
Black cottonwood (*Populus trichocarpa*)	0	32	2	34
Blackwood acacia (*Acacia melanoxylon*)	0	1	1	1
Blue elderberry (*Sambucus mexicana*)	0	11	0	12
California buckeye (*Aesculus californica*)	0	17	3	20
California pepper (*Schinus molle*)	0	0	1	1
California sycamore (*Platanus racemosa*)	12	26	26	64
California walnut (*Juglans hindsii*)	68	22	0	90
Coast live oak (*Quercus agrifolia*)	16	67	6	88
Cork oak (*Quercus suber*)	0	4	10	14
Deodar cedar (*Cebrus deodara*)	0	3	0	3
Goodings willow (*Salix goodingii*)	0	9	0	9
Olive (*Olea europaea*)	0	4	0	4
Ponderosa pine (*Pinus ponderosa*)	0	1	2	3
Port Orford cedar (*Chamaecyparis lawsoniana*)	0	0	1	1
Valley oak (*Quercus lobata*)	9	28	11	47
TOTAL	**104**	**223**	**66**	**391**

Notes:
See Figures 2, 3, and 4 for locations of trees listed. See Appendix I for specific species and tag numbers.
a. DBH = Diameter at Breast Height. DBH = diameter measurement of the largest trunk or major branch of the tree at 4.5 feet above ground level.
b. Bold = A native species.
SOURCE: EMPSi, 2009

References

EMPSi, 2009. Environmental Management and Planning Solutions Inc. GIS and tree survey data collected in support of the San Antonio Backup Pipeline Project.

SFPUC, 2001. San Francisco Public Utilities Commission, *Final Alameda Watershed Management Plan*, 2001.

Figure 5: Total Project DBH measurements and counts for all trees surveyed

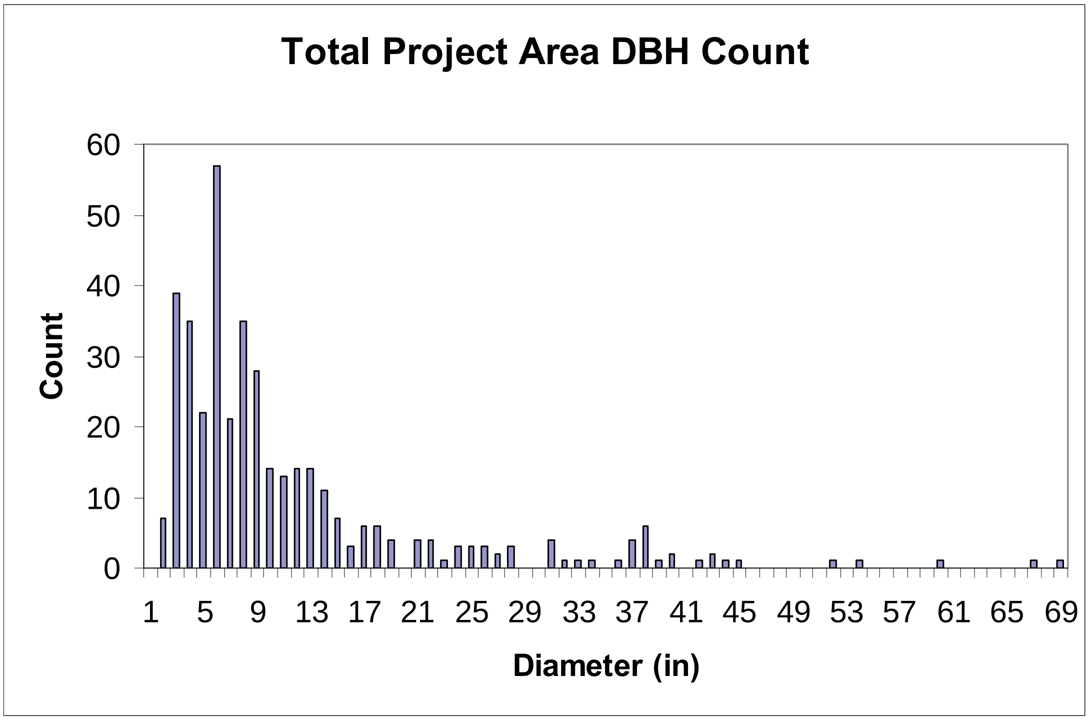


Figure 6: California black walnut DBH measurements and total counts

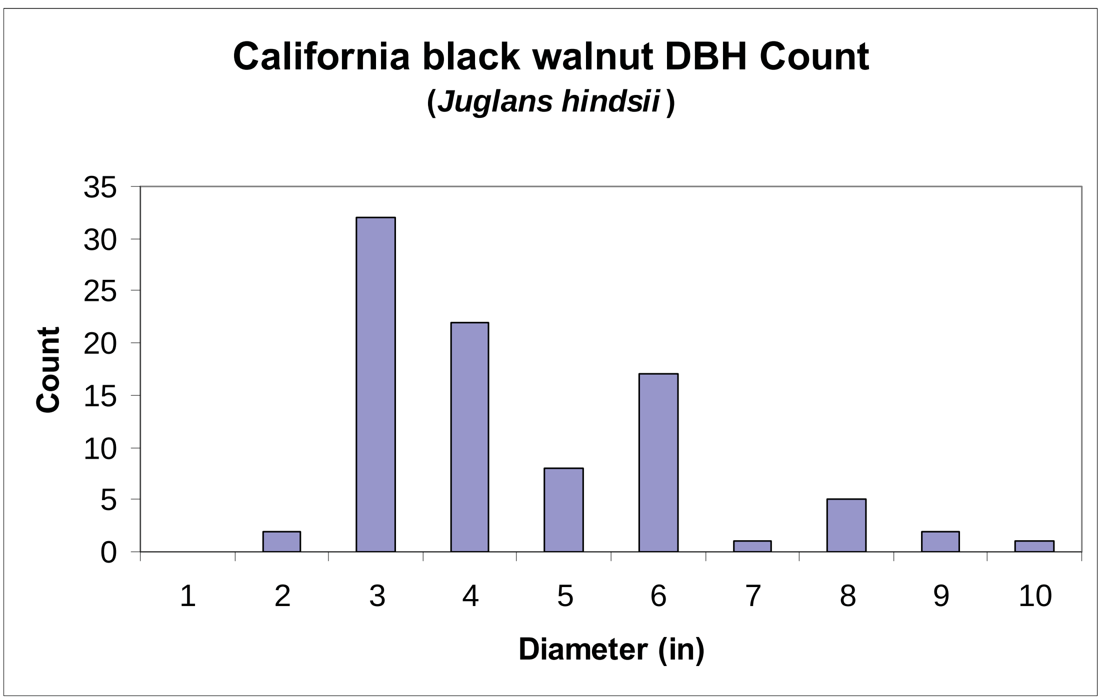


Figure 7: California sycamore DBH measurements and total counts

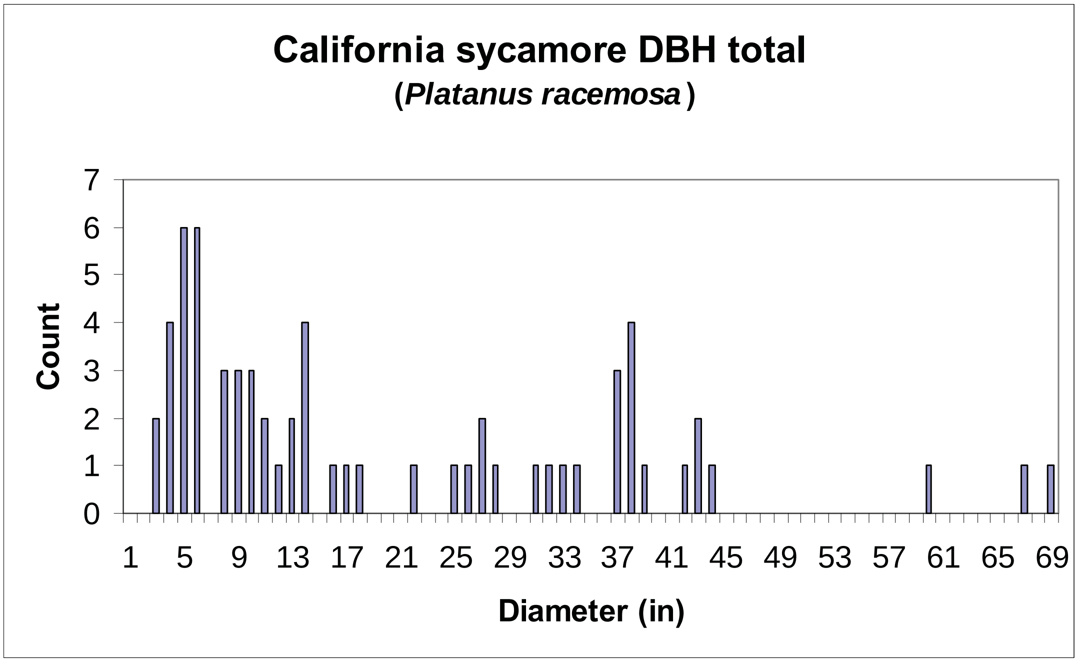


Figure 8: California buckeye DBH measurements and total count

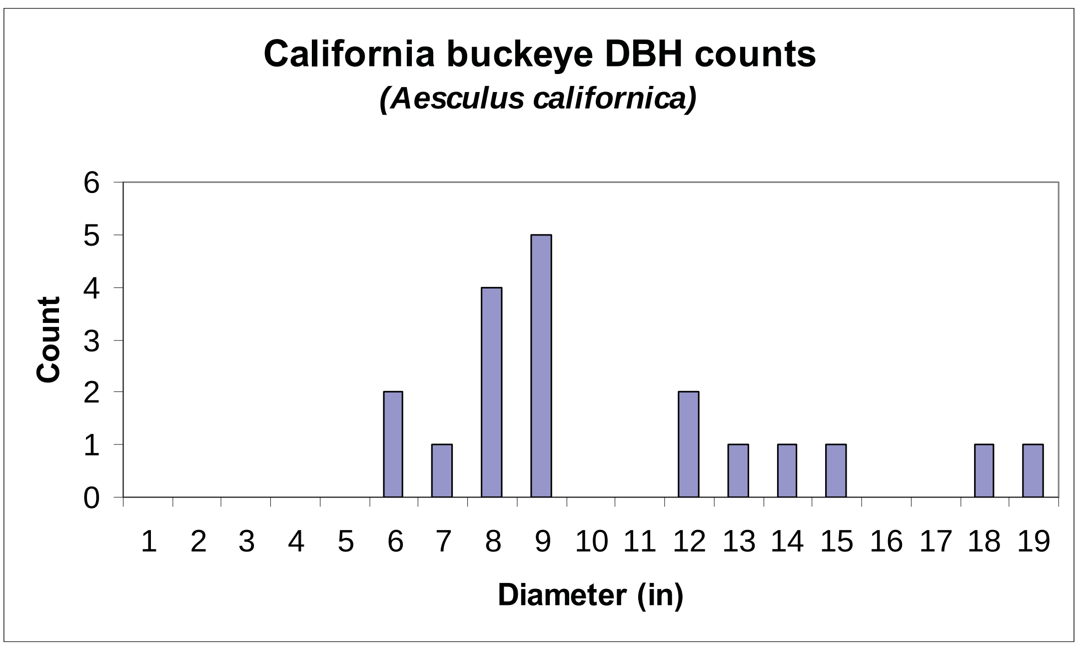


Figure 9: Valley oak DBH measurements and total count

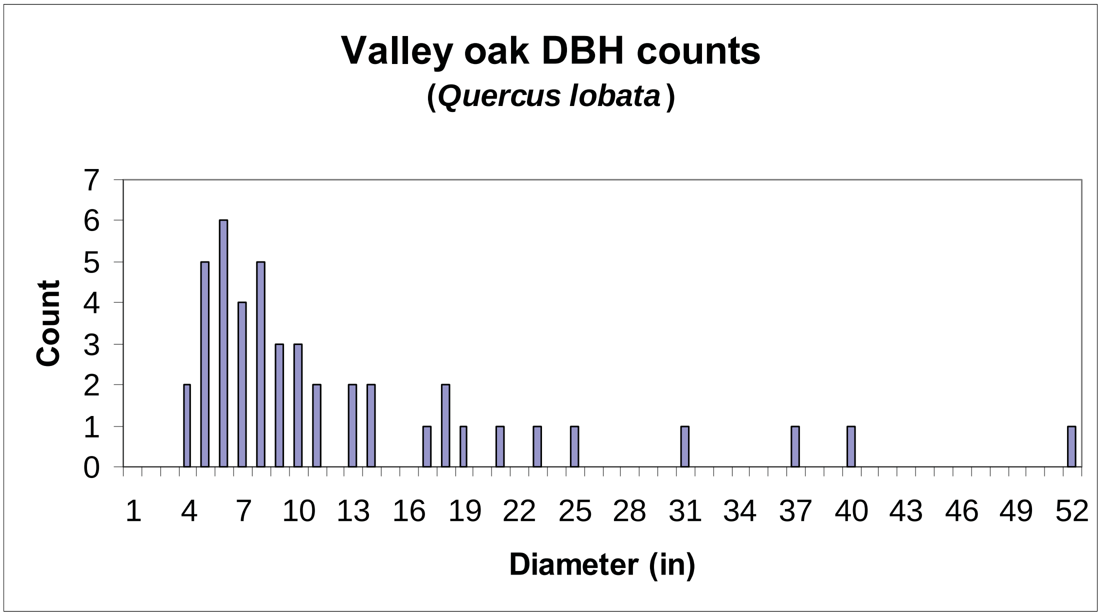
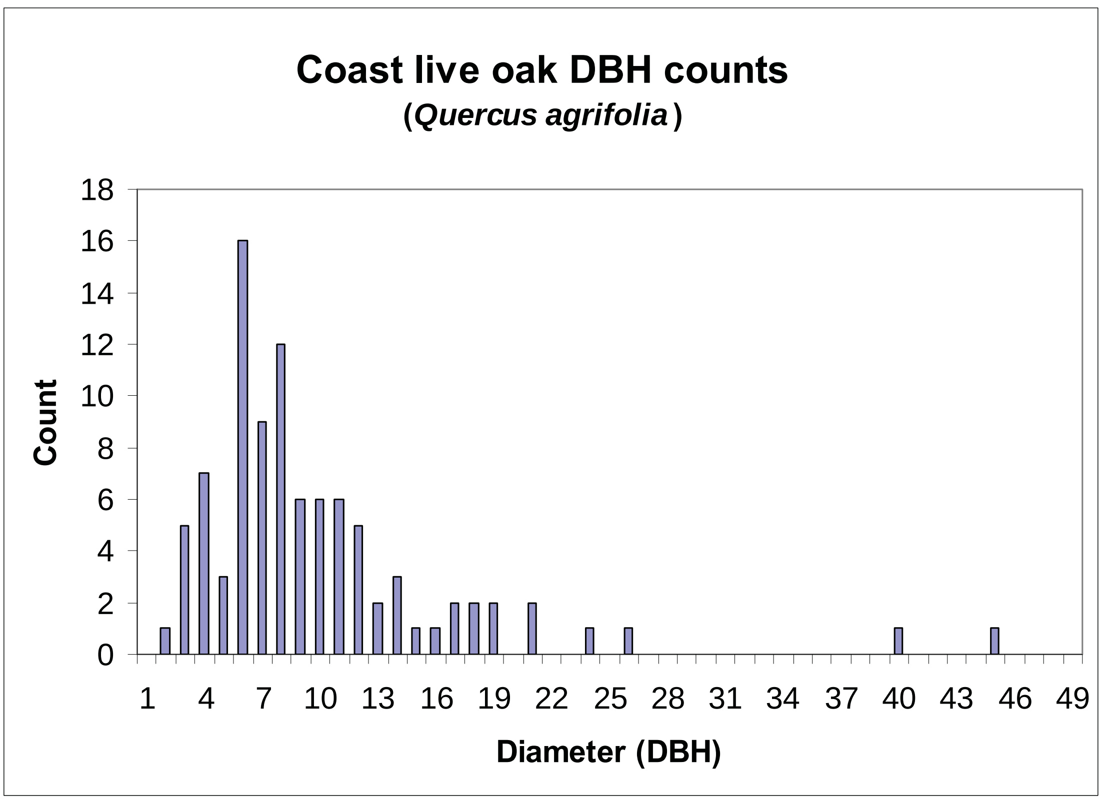


Figure 10: Coast live oak DBH measurements and total count



Appendix 1: Tree Survey Data

APPENDIX 1: Tree Survey Data

This is a complete inventory list of all trees surveyed.
Trees in **bold** are species native to the state of California.

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Abies sp	133	Fur Species	13	2	30	Fair	
Abies sp	134	Fur Species	15	1	30	Fair	
Abies sp	135	Fur Species	17	1	30	Fair	
Acacia melanoxylon	581	Blackwood Acacia	12	1	20	Good	
Aesculus californica	**15**	**California Buckeye**	25	2	33	Good	
Aesculus californica	**192**	**California Buckeye**	12	1	16	Fair	
Aesculus californica	**198**	**California Buckeye**	9	6	30	Good	
Aesculus californica	**410**	**California Buckeye**	19	3	33	Good	
Aesculus californica	**417**	**California Buckeye**	9	7	20	Good	
Aesculus californica	**421**	**California Buckeye**	8	6	30	Good	
Aesculus californica	**422**	**California Buckeye**	9	9	35	Good	
Aesculus californica	**427**	**California Buckeye**	15	3	33	Good	
Aesculus californica	**428**	**California Buckeye**	9	4	30	Good	
Aesculus californica	**436**	**California Buckeye**	7	6	20	Good	
Aesculus californica	**456**	**California Buckeye**	9	8	25	Good	
Aesculus californica	**458**	**California Buckeye**	13	7	20	Good	
Aesculus californica	**459**	**California Buckeye**	6	8	20	Good	
Aesculus californica	**461**	**California Buckeye**	12	7	20	Good	
Aesculus californica	**462**	**California Buckeye**	8	7	24	Good	
Aesculus californica	**464**	**California Buckeye**	18	6	20	Good	
Aesculus californica	**465**	**California Buckeye**	8	9	20	Good	
Aesculus californica	**466**	**California Buckeye**	14	4	30	Good	
Aesculus californica	**467**	**California Buckeye**	8	5	20	Good	
Aesculus californica	**637**	**California Buckeye**	6	9	20	Good	
Chamaecyparis lawsoniana	**51**	**Port Orford Cedar**	28	1	30	Good	
Juglans hindsii	**67**	**California walnut**	8	1	10	Good	
Juglans hindsii	**68**	**California walnut**	6	1	10	Good	
Juglans hindsii	**69**	**California walnut**	9	1	12	Good	
Juglans hindsii	**70**	**California walnut**	5	1	8	Good	
Juglans hindsii	**71**	**California walnut**	6	1	8	Good	
Juglans hindsii	**72**	**California**	6	1	10	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
		walnut					
Juglans hindsii	**73**	**California walnut**	6	1	10	Good	
Juglans hindsii	**74**	**California walnut**	6	1	10	Good	
Juglans hindsii	**75**	**California walnut**	6	1	10	Good	
Juglans hindsii	**76**	**California walnut**	7	1	20	Good	
Juglans hindsii	**77**	**California walnut**	8	1	25	Good	
Juglans hindsii	**78**	**California walnut**	5	1	20	Good	
Juglans hindsii	**79**	**California walnut**	8	1	30	Good	
Juglans hindsii	**80**	**California walnut**	8	1	30	Good	
Juglans hindsii	**81**	**California walnut**	10	1	20	Good	
Juglans hindsii	**82**	**California walnut**	3	1	20	Good	
Juglans hindsii	**83**	**California walnut**	5	1	15	Good	
Juglans hindsii	**85**	**California walnut**	4	1	10	Good	
Juglans hindsii	**86**	**California walnut**	6	1	20	Good	
Juglans hindsii	**87**	**California walnut**	6	1	20	Good	
Juglans hindsii	**88**	**California walnut**	4	1	10	Good	
Juglans hindsii	**89**	**California walnut**	4	1	10	Good	
Juglans hindsii	**90**	**California walnut**	3	1	10	Good	
Juglans hindsii	**91**	**California walnut**	3	1	9	Good	
Juglans hindsii	**93**	**California walnut**	3	1	8	Good	
Juglans hindsii	**94**	**California walnut**	3	1	15	Good	
Juglans hindsii	**95**	**California walnut**	3	1	8	Good	
Juglans hindsii	**96**	**California walnut**	5	1	20	Good	
Juglans hindsii	**97**	**California walnut**	4	1	8	Good	
Juglans hindsii	**98**	**California walnut**	3	1	8	Good	
Juglans hindsii	**99**	**California walnut**	6	1	20	Good	
Juglans hindsii	**101**	**California walnut**	3	1	15	Good	
Juglans hindsii	**102**	**California walnut**	6	1	20	Good	
Juglans hindsii	**103**	**California walnut**	4	1	15	Good	
Juglans hindsii	**104**	**California walnut**	3	1	8	Good	
Juglans hindsii	**105**	**California walnut**	4	1	12	Good	
Juglans hindsii	**106**	**California walnut**	4	1	10	Good	
Juglans hindsii	**107**	**California walnut**	3	1	8	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Juglans hindsii	**108**	**California walnut**	6	1	15	Good	
Juglans hindsii	**109**	**California walnut**	4	1	12	Good	
Juglans hindsii	**110**	**California walnut**	6	1	20	Good	
Juglans hindsii	**111**	**California walnut**	8	1	20	Good	
Juglans hindsii	**112**	**California walnut**	2	1	6	Fair	
Juglans hindsii	**113**	**California walnut**	5	1	14	Good	
Juglans hindsii	**480**	**California walnut**	4	1	10	Good	
Juglans hindsii	**481**	**California walnut**	4	1	20	Good	
Juglans hindsii	**482**	**California walnut**	4	1	10	Good	
Juglans hindsii	**483**	**California walnut**	4	1	10	Good	
Juglans hindsii	**484**	**California walnut**	4	1	10	Good	
Juglans hindsii	**485**	**California walnut**	4	1	10	Good	
Juglans hindsii	**486**	**California walnut**	4	1	10	Good	
Juglans hindsii	**488**	**California walnut**	4	1	10	Good	
Juglans hindsii	**489**	**California walnut**	4	1	10	Good	
Juglans hindsii	**490**	**California walnut**	4	1	10	Good	
Juglans hindsii	**491**	**California walnut**	3	1	10	Good	
Juglans hindsii	**492**	**California walnut**	2	1	8	Good	
Juglans hindsii	**493**	**California walnut**	4	1	10	Good	
Juglans hindsii	**494**	**California walnut**	3	1	10	Good	
Juglans hindsii	**495**	**California walnut**	2	1	8	Fair	
Juglans hindsii	**496**	**California walnut**	4	1	10	Good	
Juglans hindsii	**497**	**California walnut**	3	1	8	Fair	trunk split
Juglans hindsii	**502**	**California walnut**	3	1	8	Good	
Juglans hindsii	**504**	**California walnut**	2	1	8	Good	
Juglans hindsii	**505**	**California walnut**	3	1	8	Fair	
Juglans hindsii	**506**	**California walnut**	2	1	8	Fair	
Juglans hindsii	**508**	**California walnut**	3	1	8	Good	
Juglans hindsii	**509**	**California walnut**	4	1	8	Good	
Juglans hindsii	**510**	**California walnut**	3	1	8	Good	
Juglans hindsii	**511**	**California walnut**	3	1	8	Good	
Juglans hindsii	**512**	**California walnut**	3	1	8	Good	
Juglans hindsii	**513**	**California**	3	1	8	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
		walnut					
Juglans hindsii	**516**	**California walnut**	2	1	8	Good	
Juglans hindsii	**519**	**California walnut**	3	1	8	Good	
Juglans hindsii	**520**	**California walnut**	3	1	8	Good	
Juglans hindsii	**521**	**California walnut**	3	1	8	Good	
Juglans hindsii	**522**	**California walnut**	3	1	8	Good	
Juglans hindsii	**524**	**California walnut**	3	1	8	Good	
Juglans hindsii	**525**	**California walnut**	5	1	10	Good	
Juglans hindsii	**526**	**California walnut**	6	1	10	Good	
Juglans hindsii	**527**	**California walnut**	5	1	8	Good	
Juglans hindsii	**529**	**California walnut**	4	1	8	Good	
Juglans hindsii	**530**	**California walnut**	3	1	8	Good	
Juglans hindsii	**531**	**California walnut**	3	1	8	Good	
Juglans hindsii	**532**	**California walnut**	3	1	8	Good	
Juglans hindsii	**535**	**California walnut**	6	1	8	Good	
Juglans hindsii	**536**	**California walnut**	3	1	8	Good	
Juglans hindsii	**537**	**California walnut**	3	1	8	Good	
Juglans hindsii	**538**	**California walnut**	3	1	8	Good	
Juglans hindsii	**539**	**California walnut**	5	1	8	Good	
Juglans hindsii	**555**	**California walnut**	3	1	12	Good	
Olea europaea	170	Olive	9	4	30	Good	Invasive ornamental species
Olea europaea	172	Olive	6	2	20	Good	Invasive ornamental species
Olea europaea	582	Olive	6	7	20	Good	Invasive ornamental species
Olea europaea	629	Olive	6	9	20	Good	Invasive ornamental species
Pinus ponderosa	**123**	**Ponderosa Pine**	15	1	20	Fair	
Pinus ponderosa	**141**	**Ponderosa Pine**	36	1	60	Poor	Dead
Pinus ponderosa	**144**	**Ponderosa Pine**	38	1	60	Poor	Almost dead
Platanus racemosa	**3**	**California sycamore**	37	1	38	Good	
Platanus racemosa	**4**	**California sycamore**	34	1	34	Good	
Platanus racemosa	**13**	**California sycamore**	42	3	56	Good	
Platanus racemosa	**14**	**California sycamore**	38	2	66	Good	
Platanus racemosa	**16**	**California sycamore**	37	1	38	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Platanus racemosa	**17**	**California sycamore**	25	1	31	Good	
Platanus racemosa	**18**	**California sycamore**	37	4	38	Good	
Platanus racemosa	**19**	**California sycamore**	60	1	44	Good	
Platanus racemosa	**20**	**California sycamore**	11	1	12	Good	
Platanus racemosa	**24**	**California sycamore**	38	1	50	Good	
Platanus racemosa	**30**	**California sycamore**	31	1	55	Good	
Platanus racemosa	**34**	**California sycamore**	13	1	25	Good	part of a small grove
Platanus racemosa	**35**	**California sycamore**	9	1	20	Good	part of a small grove
Platanus racemosa	**37**	**California sycamore**	14	2	30	Good	part of a small grove
Platanus racemosa	**38**	**California sycamore**	12	1	20	Good	part of a small grove
Platanus racemosa	**39**	**California sycamore**	10	1	20	Good	part of a small grove
Platanus racemosa	**40**	**California sycamore**	18	6	50	Good	part of a small grove
Platanus racemosa	**41**	**California sycamore**	10	2	30	Good	part of a small grove
Platanus racemosa	**42**	**California sycamore**	14	2	35	Good	part of a small grove
Platanus racemosa	**43**	**California sycamore**	32	1	35	Good	
Platanus racemosa	**52**	**California sycamore**	44	4	75	Good	
Platanus racemosa	**53**	**California sycamore**	39	1	20	Good	
Platanus racemosa	**114**	**California sycamore**	38	2	95	Good	
Platanus racemosa	**142**	**California sycamore**	22	1	40	Good	
Platanus racemosa	**143**	**California sycamore**	26	1	45	Good	
Platanus racemosa	**193**	**California sycamore**	27	7	44	Good	
Platanus racemosa	**194**	**California sycamore**	38	2	52	Good	
Platanus racemosa	**195**	**California sycamore**	27	1	44	Good	
Platanus racemosa	**196**	**California sycamore**	33	2	42	Fair	
Platanus racemosa	**197**	**California sycamore**	16	1	20	Good	
Platanus racemosa	**408**	**California sycamore**	69	1	55	Good	
Platanus racemosa	**409**	**California sycamore**	43	3	46	Fair	
Platanus racemosa	**411**	**California sycamore**	8	1	8	Good	
Platanus racemosa	**418**	**California sycamore**	6	1	15	Good	
Platanus racemosa	**419**	**California sycamore**	6	1	10	Good	
Platanus racemosa	**429**	**California sycamore**	6	1	10	Good	
Platanus racemosa	**431**	**California sycamore**	8	1	14	Good	
Platanus racemosa	**437**	**California**	5	1	15	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
		sycamore					
Platanus racemosa	**440**	**California sycamore**	10	1	20	Good	
Platanus racemosa	**443**	**California sycamore**	6	1	20	Good	
Platanus racemosa	**445**	**California sycamore**	6	1	20	Good	
Platanus racemosa	**447**	**California sycamore**	9	1	16	Good	
Platanus racemosa	**448**	**California sycamore**	9	1	18	Good	
Platanus racemosa	**450**	**California sycamore**	11	1	20	Good	
Platanus racemosa	**451**	**California sycamore**	5	1	15	Good	
Platanus racemosa	**452**	**California sycamore**	5	1	8	Fair	
Platanus racemosa	**541**	**California sycamore**	8	1	20	Good	
Platanus racemosa	**542**	**California sycamore**	14	1	25	Good	
Platanus racemosa	**544**	**California sycamore**	14	3	30	Good	
Platanus racemosa	**545**	**California sycamore**	5	1	20	Good	
Platanus racemosa	**546**	**California sycamore**	3	1	10	Poor	
Platanus racemosa	**547**	**California sycamore**	5	1	20	Good	
Platanus racemosa	**548**	**California sycamore**	4	1	20	Good	
Platanus racemosa	**549**	**California sycamore**	5	1	20	Good	
Platanus racemosa	**550**	**California sycamore**	3	1	10	Good	
Platanus racemosa	**551**	**California sycamore**	4	1	15	Fair	
Platanus racemosa	**552**	**California sycamore**	4	1	15	Good	
Platanus racemosa	**553**	**California sycamore**	4	1	20	Good	
Platanus racemosa	**554**	**California sycamore**	6	1	20	Good	
Platanus racemosa	**572**	**California sycamore**	28	1	45	Good	
Platanus racemosa	**573**	**California sycamore**	43	1	50	Good	
Platanus racemosa	**579**	**California sycamore**	13	1	20	Fair	
Platanus racemosa	**639**	**California sycamore**	67	1	80	Good	active red-tailed hawk nest
Platanus racemosa	**640**	**California sycamore**	17	1	20	Good	
Populus trichocarpa	**5**	**Black Cottonwood**	6	8	4	Good	
Populus trichocarpa	**6**	**Black Cottonwood**	12	4	13	Good	
Populus trichocarpa	**7**	**Black Cottonwood**	13	2	6	Good	
Populus trichocarpa	**8**	**Black Cottonwood**	7	2	10	Good	
Populus trichocarpa	**9**	**Black Cottonwood**	13	9	20	Good	
Populus trichocarpa	**10**	**Black**	8	2	9	Fair	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
		Cottonwood					
Populus trichocarpa	11	Black Cottonwood	12	1	14	Good	
Populus trichocarpa	21	Black Cottonwood	22	1	28	Good	
Populus trichocarpa	22	Black Cottonwood	21	1	26	Good	
Populus trichocarpa	49	Black Cottonwood	6	4	60	Good	
Populus trichocarpa	50	Black Cottonwood	12	2	50	Good	
Populus trichocarpa	57	Black Cottonwood	6	2	10	Fair	
Populus trichocarpa	58	Black Cottonwood	9	1	20	Fair	
Populus trichocarpa	59	Black Cottonwood	17	1	10	Fair	
Populus trichocarpa	60	Black Cottonwood	13	3	10	Good	
Populus trichocarpa	61	Black Cottonwood	7	2	10	Fair	
Populus trichocarpa	63	Black Cottonwood	11	2	10	Poor	
Populus trichocarpa	64	Black Cottonwood	7	1	10	Fair	
Populus trichocarpa	65	Black Cottonwood	6	1	10	Poor	
Populus trichocarpa	413	Black Cottonwood	13	1	17	Good	
Populus trichocarpa	414	Black Cottonwood	15	1	20	Good	
Populus trichocarpa	420	Black Cottonwood	8	1	20	Good	
Populus trichocarpa	424	Black Cottonwood	6	0	20	Good	
Populus trichocarpa	425	Black Cottonwood	12	1	20	Good	
Populus trichocarpa	426	Black Cottonwood	14	1	20	Good	
Populus trichocarpa	432	Black Cottonwood	6	1	12	Good	
Populus trichocarpa	433	Black Cottonwood	13	1	8	Good	
Populus trichocarpa	434	Black Cottonwood	12	1	20	Good	
Populus trichocarpa	441	Black Cottonwood	16	1	25	Good	
Populus trichocarpa	442	Black Cottonwood	9	1	20	Good	
Populus trichocarpa	453	Black Cottonwood	9	1	12	Good	
Populus trichocarpa	454	Black Cottonwood	8	1	20	Good	
Populus trichocarpa	455	Black Cottonwood	7	1	10	Good	
Populus trichocarpa	627	Black Cottonwood	9	4	10	Fair	
Quercus agrifolia	2	Coast Live oak	17	1	10	Good	
Quercus agrifolia	27	Coast Live oak	15	1	25	Good	
Quercus agrifolia	31	Coast Live oak	16	1	30	Good	
Quercus agrifolia	32	Coast Live oak	14	1	25	Good	
Quercus agrifolia	44	Coast Live oak	9	1	20	Fair	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Quercus agrifolia	**48**	**Coast Live oak**	24	2	30	Fair	
Quercus agrifolia	**84**	**Coast Live oak**	10	3	20	Good	
Quercus agrifolia	**92**	**Coast Live oak**	26	1	35	Good	
Quercus agrifolia	**115**	**Coast Live oak**	11	1	30	Good	
Quercus agrifolia	**116**	**Coast Live oak**	10	1	25	Good	
Quercus agrifolia	**117**	**Coast Live oak**	7	1	20	Good	
Quercus agrifolia	**118**	**Coast Live oak**	6	1	20	Good	
Quercus agrifolia	**119**	**Coast Live oak**	8	1	20	Good	
Quercus agrifolia	**120**	**Coast Live oak**	9	2	20	Good	
Quercus agrifolia	**121**	**Coast Live oak**	4	2	10	Good	
Quercus agrifolia	**125**	**Coast Live oak**	14	1	28	Good	
Quercus agrifolia	**126**	**Coast Live oak**	9	1	20	Good	
Quercus agrifolia	**127**	**Coast Live oak**	10	1	25	Good	
Quercus agrifolia	**128**	**Coast Live oak**	12	1	25	Good	
Quercus agrifolia	**129**	**Coast Live oak**	6	1	20	Good	
Quercus agrifolia	**130**	**Coast Live oak**	8	1	20	Good	
Quercus agrifolia	**131**	**Coast Live oak**	11	1	20	Good	
Quercus agrifolia	**136**	**Coast Live oak**	7	1	20	Good	
Quercus agrifolia	**137**	**Coast Live oak**	9	1	25	Good	
Quercus agrifolia	**138**	**Coast Live oak**	8	1	20	Good	
Quercus agrifolia	**140**	**Coast Live oak**	11	1	25	Good	
Quercus agrifolia	**145**	**Coast Live oak**	7	2	20	Good	
Quercus agrifolia	**156**	**Coast Live oak**	3	1	5	Good	
Quercus agrifolia	**157**	**Coast Live oak**	10	1	15	Good	
Quercus agrifolia	**158**	**Coast Live oak**	3	6	6	Good	
Quercus agrifolia	**160**	**Coast Live oak**	4	1	8	Good	
Quercus agrifolia	**161**	**Coast Live oak**	6	1	20	Good	
Quercus agrifolia	**162**	**Coast Live oak**	6	4	15	Good	
Quercus agrifolia	**165**	**Coast Live oak**	19	1	30	Good	
Quercus agrifolia	**168**	**Coast Live oak**	5	2	20	Good	
Quercus agrifolia	**169**	**Coast Live oak**	4	2	20	Good	
Quercus agrifolia	**171**	**Coast Live oak**	7	2	20	Good	
Quercus agrifolia	**173**	**Coast Live oak**	6	3	12	Good	
Quercus agrifolia	**174**	**Coast Live oak**	9	2	20	Good	
Quercus agrifolia	**175**	**Coast Live oak**	8	3	20	Good	
Quercus agrifolia	**176**	**Coast Live oak**	8	1	20	Good	
Quercus agrifolia	**178**	**Coast Live oak**	6	7	20	Good	
Quercus agrifolia	**180**	**Coast Live oak**	7	2	20	Good	
Quercus agrifolia	**181**	**Coast Live oak**	7	4	25	Good	
Quercus agrifolia	**186**	**Coast Live oak**	5	1	6	Good	
Quercus agrifolia	**189**	**Coast Live oak**	3	1	4	Good	
Quercus agrifolia	**191**	**Coast Live oak**	5	1	7	Good	
Quercus agrifolia	**468**	**Coast Live oak**	19	1	30	Good	
Quercus agrifolia	**473**	**Coast Live oak**	6	6	20	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Quercus agrifolia	**501**	**Coast Live oak**	2	1	6	Good	
Quercus agrifolia	**514**	**Coast Live oak**	6	1	30	Good	
Quercus agrifolia	**523**	**Coast Live oak**	4	2	10	Good	
Quercus agrifolia	**528**	**Coast Live oak**	3	1	10	Good	
Quercus agrifolia	**556**	**Coast Live oak**	6	2	20	Good	
Quercus agrifolia	**557**	**Coast Live oak**	8	3	20	Good	
Quercus agrifolia	**558**	**Coast Live oak**	7	1	20	Good	
Quercus agrifolia	**559**	**Coast Live oak**	7	1	20	Good	
Quercus agrifolia	**561**	**Coast Live oak**	12	1	30	Good	
Quercus agrifolia	**566**	**Coast Live oak**	8	3	20	Good	
Quercus agrifolia	**571**	**Coast Live oak**	10	2	25	Good	
Quercus agrifolia	**574**	**Coast Live oak**	45	1	60	Good	
Quercus agrifolia	**575**	**Coast Live oak**	8	1	20	Good	
Quercus agrifolia	**576**	**Coast Live oak**	8	1	20	Poor	
Quercus agrifolia	**580**	**Coast Live oak**	17	3	30	Good	
Quercus agrifolia	**584**	**Coast Live oak**	6	2	20	Good	
Quercus agrifolia	**585**	**Coast Live oak**	6	6	20	Good	
Quercus agrifolia	**586**	**Coast Live oak**	18	4	30	Good	
Quercus agrifolia	**587**	**Coast Live oak**	8	3	20	Good	
Quercus agrifolia	**588**	**Coast Live oak**	6	3	20	Good	
Quercus agrifolia	**589**	**Coast Live oak**	7	3	20	Good	
Quercus agrifolia	**592**	**Coast Live oak**	11	2	20	Good	
Quercus agrifolia	**593**	**Coast Live oak**	12	2	30	Good	
Quercus agrifolia	**594**	**Coast Live oak**	4	3	5	Good	
Quercus agrifolia	**595**	**Coast Live oak**	6	1	9	Good	
Quercus agrifolia	**596**	**Coast Live oak**	11	5	20	Good	
Quercus agrifolia	**597**	**Coast Live oak**	4	4	9	Good	
Quercus agrifolia	**598**	**Coast Live oak**	9	2	15	Good	
Quercus agrifolia	**599**	**Coast Live oak**	10	3	20	Good	
Quercus agrifolia	**601**	**Coast Live oak**	12	6	30	Good	
Quercus agrifolia	**605**	**Coast Live oak**	6	2	20	Good	
Quercus agrifolia	**610**	**Coast Live oak**	8	5	25	Good	
Quercus agrifolia	**613**	**Coast Live oak**	6	2	15	Good	
Quercus agrifolia	**615**	**Coast Live oak**	14	1	20	Good	
Quercus agrifolia	**619**	**Coast Live oak**	8	1	20	Good	
Quercus agrifolia	**628**	**Coast Live oak**	4	1	15	Good	
Quercus agrifolia	**630**	**Coast Live oak**	6	3	20	Good	
Quercus agrifolia	**632**	**Coast Live oak**	3	1	9	Good	
Quercus agrifolia	**636**	**Coast Live oak**	11	4	25	Good	
Quercus lobata	**1**	**Valley Oak**	31	1	34	Good	
Quercus lobata	**23**	**Valley Oak**	40	1	44	Good	
Quercus lobata	**25**	**Valley Oak**	52	1	60	Good	
Quercus lobata	**47**	**Valley Oak**	8	1	20	Good	
Quercus lobata	**48**	**Valley Oak**	7	3	20	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Quercus lobata	**48**	**Valley Oak**	13	2	20	Good	
Quercus lobata	**54**	**Valley Oak**	54	1	80	Good	
Quercus lobata	**56**	**Valley Oak**	17	1	30	Good	
Quercus lobata	**136**	**Valley Oak**	37	1	55	Good	
Quercus lobata	**163**	**Valley Oak**	23	1	35	Good	
Quercus lobata	**164**	**Valley Oak**	10	1	20	Good	
Quercus lobata	**167**	**Valley Oak**	7	1	20	Good	
Quercus lobata	**179**	**Valley Oak**	14	1	30	Good	
Quercus lobata	**185**	**Valley Oak**	8	1	13	Fair	
Quercus lobata	**187**	**Valley Oak**	7	1	9	Good	
Quercus lobata	**190**	**Valley Oak**	6	1	4	Fair	
Quercus lobata	**472**	**Valley Oak**	10	1	20	Fair	
Quercus lobata	**479**	**Valley Oak**	4	1	6	Fair	
Quercus lobata	**497**	**Valley Oak**	6	1	20	Good	
Quercus lobata	**515**	**Valley Oak**	5	1	15	Good	
Quercus lobata	**533**	**Valley Oak**	8	1	20	Good	
Quercus lobata	**560**	**Valley Oak**	6	1	20	Good	
Quercus lobata	**565**	**Valley Oak**	8	1	20	Fair	
Quercus lobata	**577**	**Valley Oak**	11	1	20	Poor	
Quercus lobata	**578**	**Valley Oak**	14	1	20	Fair	
Quercus lobata	**600**	**Valley Oak**	21	2	30	Good	
Quercus lobata	**604**	**Valley Oak**	8	2	20	Good	
Quercus lobata	**606**	**Valley Oak**	7	1	20	Fair	
Quercus lobata	**607**	**Valley Oak**	6	4	20	Fair	
Quercus lobata	**608**	**Valley Oak**	4	2	10	Good	
Quercus lobata	**609**	**Valley Oak**	10	2	20	Good	
Quercus lobata	**611**	**Valley Oak**	5	1	20	Good	
Quercus lobata	**612**	**Valley Oak**	5	1	10	Fair	
Quercus lobata	**614**	**Valley Oak**	5	2	20	Fair	
Quercus lobata	**616**	**Valley Oak**	9	3	20	Fair	
Quercus lobata	**617**	**Valley Oak**	6	2	10	Fair	
Quercus lobata	**618**	**Valley Oak**	11	1	20	Good	
Quercus lobata	**620**	**Valley Oak**	9	1	25	Fair	
Quercus lobata	**621**	**Valley Oak**	13	2	30	Fair	
Quercus lobata	**622**	**Valley Oak**	6	1	10	Fair	
Quercus lobata	**623**	**Valley Oak**	5	2	10	Good	
Quercus lobata	**624**	**Valley Oak**	18	1	35	Good	
Quercus lobata	**625**	**Valley Oak**	9	1	20	Good	
Quercus lobata	**626**	**Valley Oak**	25	1	40	Good	
Quercus lobata	**633**	**Valley Oak**	18	5	35	Good	
Quercus lobata	**634**	**Valley Oak**	19	3	30	Good	
Quercus lobata	**696**	**Valley Oak**	5	1	10	Good	
Quercus suber	12	Cork Oak	31	1	23	Good	
Quercus suber	184	Cork Oak	22	1	27	Good	
Quercus suber	188	Cork Oak	26	1	33	Good	

Species name	Tag	Common name	DBH	Trunks	Dripline	Condition	Comments
Quercus suber	478	Cork Oak	13	1	20	Good	
Quercus suber	503	Cork Oak	28	1	33	Good	
Quercus suber	507	Cork Oak	21	1	30	Good	
Quercus suber	517	Cork Oak	21	1	30	Good	
Quercus suber	518	Cork Oak	40	2	30	Good	
Quercus suber	534	Cork Oak	24	2	25	Good	
Quercus suber	562	Cork Oak	22	1	40	Good	
Quercus suber	563	Cork Oak	12	3	35	Good	
Quercus suber	564	Cork Oak	13	4	30	Good	
Quercus suber	567	Cork Oak	18	1	30	Good	
Quercus suber	603	Cork Oak	24	1	35	Good	
Salix goodingii	**199**	**Goodings willow**	15	3	30	Fair	
Salix goodingii	**407**	**Goodings willow**	11	1	21	Good	
Salix goodingii	**430**	**Goodings willow**	9	1	20	Poor	1/2 of tree is dead
Salix goodingii	**439**	**Goodings willow**	10	1	20	Good	
Salix goodingii	**440**	**Goodings willow**	6	1	20	Poor	possibly dead
Salix goodingii	**444**	**Goodings willow**	8	1	20	Fair	
Salix goodingii	**446**	**Goodings willow**	6	1	20	Good	
Salix goodingii	**449**	**Goodings willow**	7	1	20	Good	
Salix goodingii	**469**	**Goodings willow**	9	4	25	Fair	
Sambucus mexica	**100**	**Blue Elderberry**	9	6	35	Good	
Sambucus mexica	**412**	**Blue Elderberry**	6	9	20	Good	
Sambucus mexica	**415**	**Blue Elderberry**	11	2	20	Fair	
Sambucus mexica	**416**	**Blue Elderberry**	8	2	20	Fair	
Sambucus mexica	**423**	**Blue Elderberry**	8	5	25	Fair	
Sambucus mexica	**438**	**Blue Elderberry**	31	3	20	Good	
Sambucus mexica	**457**	**Blue Elderberry**	15	2	20	Fair	
Sambucus mexica	**470**	**Blue Elderberry**	9	1	20	Good	
Sambucus mexica	**471**	**Blue Elderberry**	6	2	20	Fair	
Sambucus mexica	**487**	**Blue Elderberry**	9	5	20	Good	growing into power pole
Sambucus mexica	**543**	**Blue Elderberry**	13	4	25	Good	with 3 other smaller S. mex
Sambucus mexica	**561**	**Blue Elderberry**	7	2	20	Good	
Schinus molle	26	California pepper	38	1	55	Good	

Notes:

a. See Figures 2, 3, and 4 for locations of trees listed.
b. DBH = Diameter at Breast Height. DBH = diameter measurement of the largest trunk or major branch of the tree at 4.5 feet above ground level.
c. Bold = A native species.

SOURCE: EMPSi, 2009

Appendix 11: Representative Photos

Photo 1: California walnut (*Juglans hindsii*) on the east side of Calaveras Road near San Antonio Creek.

Photo 2: Looking south down Calaveras Road from just south of San Antonio Creek.

Photo 3: Looking northwest down San Antonio– several sycamores (*Platanus racemosa*) are visible.

Photo 3: Looking southwest down Calaveras Road– numerous small coast live oak (*Quercus agrifolia*) and valley oak (*Q. lobata*) line the road.

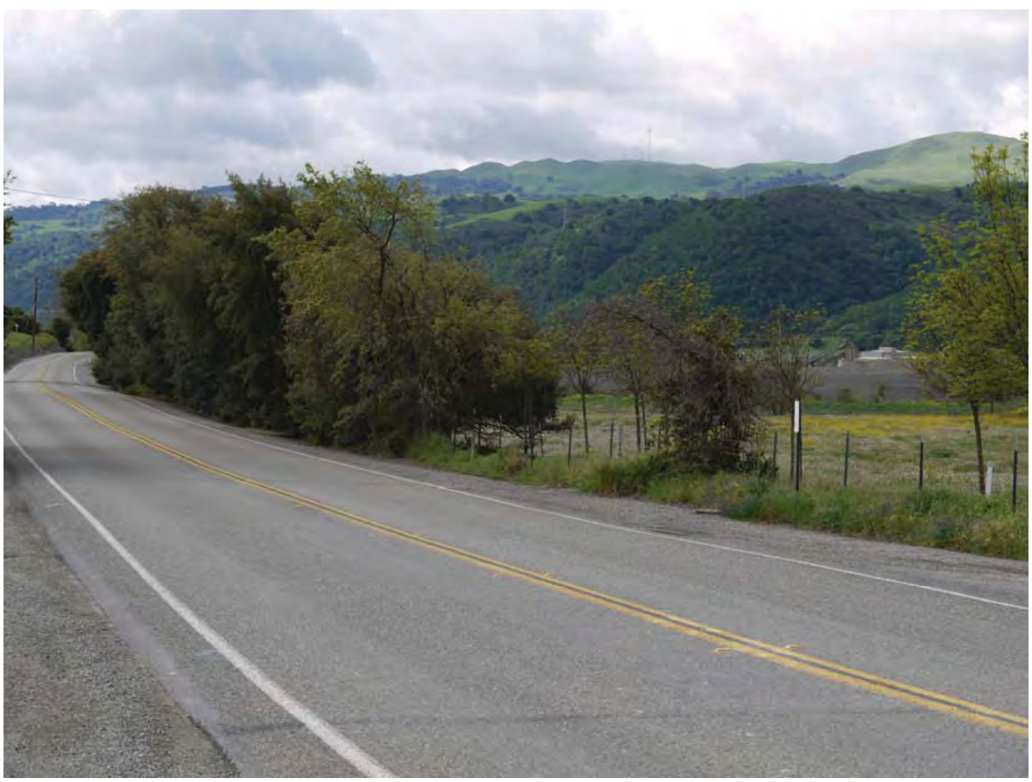


Photo 5: Looking west from the staging area just west of Alameda siphons at two large sycamores.

Photo 6: Looking west to the edge of the southern staging area at several black cottonwoods (*Populus trichocarpa*).

APPENDIX J

Rare Plant Survey

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memorandum

to: Kelly White, ESA

from: Barbara Malloch Leitner, Orion; Martha Lowe, ESA

date: November 23, 2010

subject: 2009 and 2010 Special-status Plant Surveys for San Antonio Backup Pipeline Project

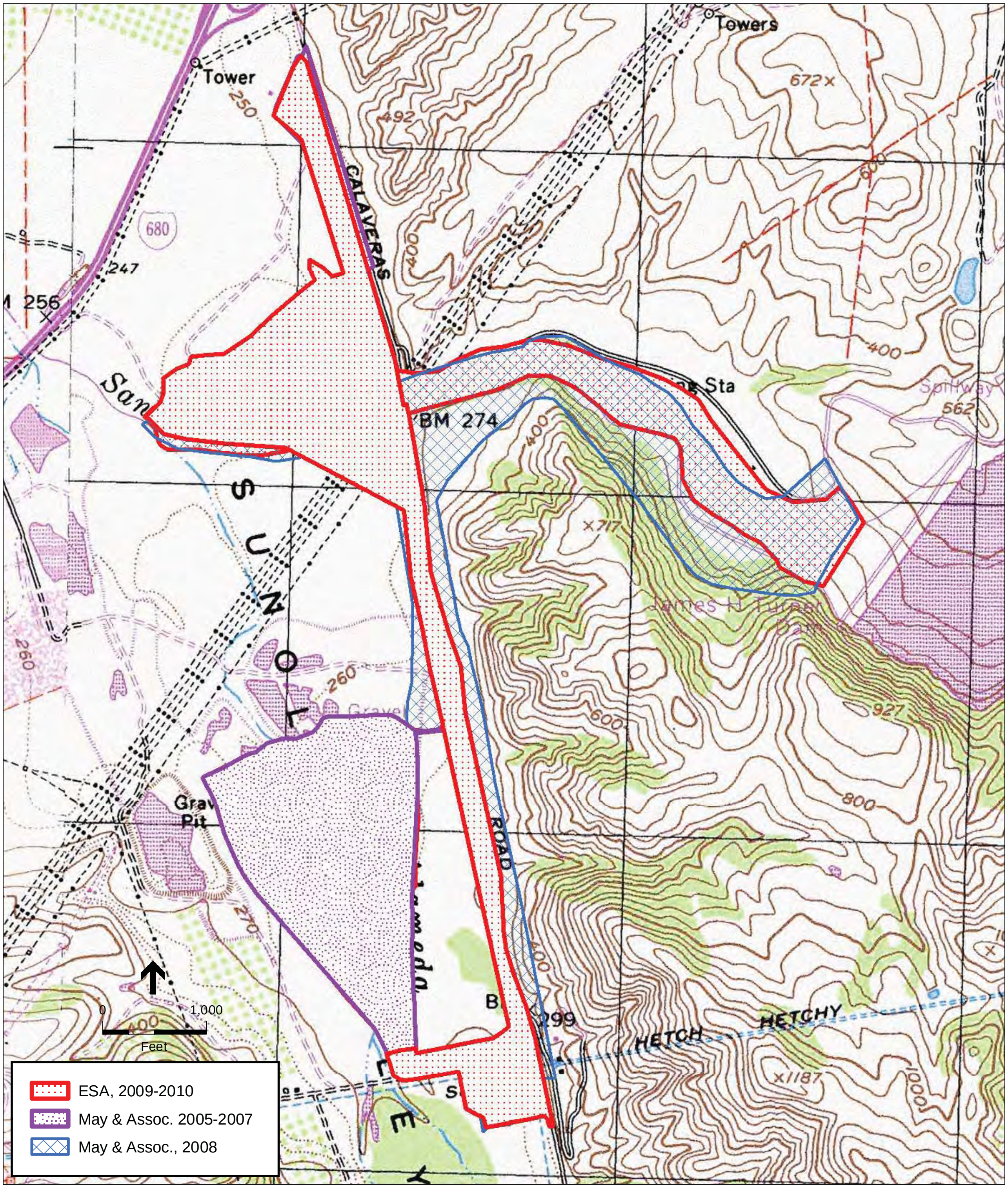
Summary

On March 11 and 17, April 21 and May 4, 2009 and November 17, 2010, ESA+Orion carried out follow-up special-status plant surveys for the San Antonio Backup Pipeline Project. These included focused surveys in areas previously covered by May and Associates (2008)[1], and focused surveys and a habitat assessment in expanded project areas not previously surveyed. Of the 16 special-status species May and Associates identified as potentially occurring in the original SABPL project area, potential presence of three California Native Plant Society (CNPS) listed species (fragrant fritillary (*Fritillaria liliacea*), stink bells (*F. agrestis*), and western leatherwood (*Dirca occidentalis*)) could not be conclusively assessed in 2008 due to seasonal timing. Appropriately-timed focused surveys were carried out for these species, in areas identified as potential habitat by May and Associates and within the updated project footprint, in March, 2009. No special-status plant species were identified within the areas surveyed at this time or during additional field work in April and May 2009. Additionally, no suitable habitat was found for special-status plant species within the updated project footprint. No further botanical surveys are recommended for the project as the combined results of the various field investigations are considered sufficient to determine all potentially occurring special-status plant species absent from the updated project footprint.

Area Surveyed

The March 2009 special-status plant surveys covered the project footprint, as defined at that time. The project area was expanded since the May and Associates 2008 surveys for the SABPL project. Since March of 2009, the project footprint changed again, to exclude all areas east of Calaveras Road. ESA+Orion's March 2009 surveys included these deleted areas east of Calaveras Road and the results from the deleted areas have been included in this report for informational purposes. The updated project footprint includes: 1) the Hanson Aggregates quarry pits F3-East and F3-West within the Surface Mining Permit (SMP) 24 area; 2) the North Spoils Site located just west of Calaveras Road to the north of Pits F3-East and F3-West; 3) areas in and around SMP-30 to the south (which were surveyed by May and Associates in 2005-2007 in conjunction with the New Irvington Tunnel and Alameda Siphons Projects); and 4) additional areas to the west of Calaveras Road between approximately San Antonio Creek and the San Antonio Pump Station. (see **Figure 1**).

[1] May and Associates, 2008, Botanical Survey Report, San Antonio Backup Pipeline Project, prepared for San Francisco Public Utilities Commission, San Francisco, CA.



SOURCE: SFPUC, 2009; ESA+Orion, 2009

SFPUC San Antonio Backup Pipeline Project

Figure 1
SABPL Project Rare Plant Study Area

The 2009 survey area included several natural communities, which are characterized in this memorandum based on the nomenclature and classification used by Holland[2]. Natural communities present in the larger survey area include non-native annual grassland, mulefat scrub, coast live oak woodland, sycamore alluvial woodland, mixed riparian woodland, and ruderal. The majority of the area west of Calaveras Road and within the project footprint supports non-native annual grassland and ruderal vegetation. Herbaceous vegetation in this area is dense and dominated by a variety of non-native annual grasses, as well as large stands of non-native weedy species, such as wild mustard (*Brassica nigra*), yellow star-thistle (*Centaurea solstitialis*) and poison hemlock (*Conium maculatum*). Side slopes of the quarry pits and the roads and laydown areas around them are highly disturbed and primarily barren or support a sparse cover of non-native annual grasses and ruderal species. There are also two areas of freshwater marsh and one seasonal wetland in the southern portion of the project footprint and areas of mixed riparian woodland along San Antonio Creek west of Calaveras Road and along the southern edge of SMP-30. Wetland and riparian communities are generally considered sensitive by federal, state, and most local agencies.

The 2010 surveys demonstrated that most of the project area previously mapped as non-native annual grassland had been cleared as part of site preparation for the New Irvington Tunnel Project and the Alameda Siphons Seismic Reliability Upgrade Project, leaving only small areas of mulefat scrub and mixed riparian woodland along the steep streambank and channel of San Antonio Creek, and very small areas of seasonal wetlands at the southern end of the SABPL project area near the chloramination building. Large mature trees such as valley oak (*Quercus lobata*), California sycamore (*Platanus racemosa*) and coast live oak (*Quercus agrifolia*) were retained and protected in areas that were otherwise scraped and graded for use as part of these projects.

Methods

ESA+Orion reviewed the May and Associates 2008 report, which identified 16 target species for focused surveys and areas of potential habitat for three target plant species whose presence they were unable to confirm. ESA+Orion also reviewed California Native Plant Society (CNPS) Electronic Inventory and updated U.S. Fish and Wildlife Service (USFWS) and CNDDB records for the La Costa Valley US Geologic Survey 7.5-minute topographic quadrangle, in which the project area is located, and the eight surrounding quadrangles. ESA+Orion compared the updated lists with those produced by May and Associates and found no additional species that warranted inclusion as target species for rare plant surveys. Focused early season field surveys were carried out by Orion botanist B. Leitner on March 11 and 17, 2009 for all but the North Spoils Site and SMP-30 pit, which had been surveyed previously in conjunction with the SFPUC's Alameda Siphons and New Irvington Tunnel projects. ESA biologist M. Lowe carried out a mid-season focused floristic survey and late-blooming special-status plant habitat assessment of the current project footprint (exclusive of the North Spoils Site and SMP-30 pit) on April 21 and May 4, 2009. Together on November 17, 2010, B. Leitner and M. Lowe visited those small additional portions of the project area near San Antonio Creek. All parts of the project footprint surveyed were covered on foot. All plant species observed were noted and identified to a level sufficient to determine their rarity.

2 Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game, Natural Heritage Division, Sacramento, CA 1986.

Results and Conclusion

Attachment 1 lists all plant species observed during ESA+Orion's 2009 and 2010 site surveys. Attachment 2 presents results of the updated CNPS, CNDDB and USFWS database queries. No fragrant fritillary, stinkbells, or western leatherwood were found within the updated project footprint, nor were they found in areas identified by May and Associates as potentially suitable habitat. In addition, although johnny jump-up (*Viola pedunculata*) populations[3] were found east of Calaveras Road by May and Associates, none were found within the updated project footprint. ESA+Orion's early season surveys were carried out at a time when these species would be readily observable and it was concluded that they were not present. No other special-status plant species were observed during either the early or mid-season surveys. Results of the previous surveys by May and Associates for the SABPL, Alameda Siphons, and New Irvington Tunnel projects were negative within areas included in the updated project footprint. ESA+Orion's 2009 early and mid-season plant surveys and 2010 late-season plant surveys within the project footprint were also negative. In addition, ESA determined that no suitable habitat exists for late-blooming special-status plants in the newer portions of the project footprint due to the highly disturbed conditions there. Therefore, since no special-status plants or suitable habitat for special-status plants were documented within the updated project footprint, no further special-status plant surveys are recommended.

3 Johnny jump-up serve as the host plant for the endangered callippe silverspot butterfly.

ATTACHMENT 1

Plant Species Observed
San Antonio Backup Pipeline Project Focused Surveys
March 11 and 17, April 21, and May 4, 2009 and November 17, 2010

Scientific Name	Common Name
ANACARDIACEAE	SUMAC OR CASHEW FAMILY
Toxicodendron diversilobum	Pacific poisonoak
APIACEAE	CARROT FAMILY
Conium maculatum	Poison hemlock
Foeniculum vulgare	Sweet fennel
Oenanthe sarmentosa	Oenanthe
Torilis nodosa	Knotted hedge-parsley
ASCLEPIADACEAE	MILKWEED FAMILY
Asclepias fascicularis	Narrowleaf milkweed
ASTERACEAE	SUNFLOWER FAMILY
Achillea millefolium	Common yarrow
Artemisia douglasiana	Douglas' mugwort
Baccharis pilularis	Coyotebrush
Baccharis salicifolia	Mule's fat; seepwillow
Carduus pycnocephalus	Italian thistle
Centaurea solstitialis	Yellow star thistle
Cirsium vulgare	Bull thistle
Dittrichia graveolens	Stinkwort
Hypochaeris glabra	Smooth catsear
Matricaria discoidea (=Chamomilla suaveolens)	Disc mayweed; pineapple weed
Picris echioides	Bristly oxtongue
Senecio vulgaris	Common groundsel
Silybum marianum	Milk thistle
Sonchus asper ssp. *asper*	Spiny sowthistle; prickly sow thistle
Taraxacum officinale	Dandelion
AZOLLACEAE	MOSQUITO FERN FAMILY
Azolla filiculoides	Pacific mosquitofern
BORAGINACEAE	FORGET-ME-NOT FAMILY
Amsinckia menziesii var. *intermedia*	Common fiddleneck, intermediate fiddleneck
Plagiobothrys nothofulvus	Rusty popcornflower
BRASSICACEAE	MUSTARD FAMILY
Barbarea orthoceras	American yellowrocket; wintercress
Cardamine oligosperma	Idaho bittercress
Hirschfeldia incana	Shortpod mustard
Raphanus sativus	Wild radish
Rorippa curvisiliqua	Curvepod yellowcress
Rorippa nasturtium-aquaticum	Watercress
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY
Sambucus nigra ssp. *canadensis (=S. mexicana)*	Blue elder, ccommon elderberry, Mexican elderberry
Symphoricarpos albus var. *laevigatus*	Common snowberry
Symphoricarpos mollis	Creeping snowberry
CARYOPHYLLACEAE	PINK FAMILY
Cerastium glomeratum	Sticky chickweed
Stellaria media	Common chickweed
CUCURBITACEAE	MELON FAMILY
Marah fabaceus	California manroot

Scientific Name	Common Name
CYPERACEAE	SEDGE FAMILY
Carex sp.	Sedge
Cyperus eragrosis	Tall flatsedge
Eleocharis palustris (=E. macrostachya)	Common spikerush
Schoenoplectus acutus var. *occidentalis (=Scirpus a.* var. *o.)*	Tule
FABACEAE	PEA FAMILY
Lotus corniculatus	Birdfoot deervetch; birdsfoot trefoil
Lupinus bicolor	Dove lupine
Medicago polymorpha	California burclover
Melilotus indica	Sourclover
Trifolium fucatum	Bull clover
Trifolium repens	White clover
Trifolium subterraneum	Subterranean clover
Vicia americana var. *americana*	American vetch
Vicia sativa var. *sativa*	Spring vetch
Vicia villosa var. villosa	Winter vetch
FAGACEAE	OAK FAMILY
Quercus agrifolia	Coast live oak
Quercus lobata	Valley oak
Quercus suber	Cork oak
GERANIACEAE	GERANIUM FAMILY
Erodium brachycarpum	Shortfruit stork's bill
Erodium cicutarium	Redstem stork's bill
Erodium moschatum	Musky stork's bill
Geranium dissectum	Cutleaf geranium
Geranium molle	Awnless geranium; dovefoot geranium
HIPPOCASTANACEAE	HORSE-CHESTNUT FAMILY
Aesculus californica	California buckeye
JUNCACEAE	RUSH FAMILY
Juncus bufonius var. *bufonius*	Toad rush
Juncus effusus var. *brunneus*	Soft rush
Juncus phaeocephalus var. *paniculatus*	Brownhead rush
Juncus xiphioides	Irisleaf rush
LAMIACEAE	MINT FAMILY
Lamium amplexicaule	Common henbit
Marrubium vulgare	Horehound
Mentha pulegium	Pennyroyal
Stachys rigida var. *rigida (=S. ajugoides* var. *r.)*	Rough hedgenettle
LAURACEAE	LAUREL FAMILY
Umbellularia californica	California bay
LEMNACEAE	DUCKWEED FAMILY
Lemna sp.	Duckweed
LILIACEAE	LILY FAMILY
Chlorogalum pomeridianum	Wavyleaf soap plant
ONAGRACEAE	EVENING PRIMROSE FAMILY
Epilobium brachycarpum	Autumn willowherb
PAPAVERACEAE	POPPY FAMILY
Eschscholzia californica	California poppy
PLANTAGINACEAE	PLANTAIN FAMILY
Plantago coronopus	Buckhorn plantain
Plantago lanceolata	English plantain
Plantago major	Common plantain

Scientific Name	**Common Name**
PLATANACEAE	PLANE TREE FAMILY
Platanus racemosa	California sycamore
POACEAE	GRASS FAMILY
Avena barbata	Slender oats
Avena fatua	Wild oats
Briza minor	Little quakinggrass
Bromus carinatus var. *carinatus*	California brome
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft brome; soft chess
Bromus madritensis ssp. *rubens*	Red brome
Cortaderia sp.	Pampas grass
Cynodon dactylon	Bermudagrass
Elymus glaucus	Blue wildrye
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley
Hordeum murinum ssp. *leporinum*	Leporinum barley
Leymus triticoides	Creeping wildrye
Lolium multiflorum	Italian ryegrass
Piptatherum miliaceum	Smilo grass
Poa annua	Annual bluegrass
Polypogon monspeliensis	Annual rabbitsfoot grass
Vulpia microstachys var. *ciliata*	Nuttall's fescue
Vulpia myuros	Rat-tail fescue
POLYGONACEAE	BUCKWHEAT FAMILY
Polygonum arenastrum	Common knotweed
Rumex crispus	Curly dock
PORTULACACEAE	PURSLANE FAMILY
Claytonia perfoliata	Miner's lettuce
PRIMULACEAE	PRIMROSE FAMILY
Anagallis arvensis	Scarlet pimpernel
RHAMNACEAE	BUCKTHORN FAMILY
Ceanothus sp.	Ceanothus
Frangula californica ssp. *californica (=Rhamnus c.* ssp. *c)*	California buckthorn; California coffeeberry
ROSACEAE	ROSE FAMILY
Aphanes arvensis (=A. occidentalis)	Field parsley piert
Rosa californica	California wildrose
Rubus ursinus	California blackberry
RUBIACEAE	MADDER FAMILY
Galium aparine	Bedstraw; cleavers
SALICACEAE	WILLOW FAMILY
Populus fremontii	Fremont cottonwood
Salix gooddingii	Gooding's black willow
Salix lasiolepis	Arroyo willow
SCROPHULARIACEAE	FIGWORT FAMILY
Scrophularia californica	California figwort; California beeplant
Veronica americana	American brooklime
SOLANACEAE	TOMATO FAMILY
Nicotiana glauca	Tree tobacco
Solanum umbelliferum var. *incanum*	Bluewitch
TYPHACEAE	CATTAIL FAMILY
Typha angustifolia	Narrowleaf cattail
Typha sp.	Cattail
URTICACEAE	NETTLE FAMILY
Urtica dioica ssp. *holosericea*	Hoary stinging nettle

ATTACHMENT 2

Results of California Native Plant Society, California Natural Diversity Database and US Fish and Wildlife Service Database Queries

San Antonio Backup Pipeline Project

Scientific name	Family	Life form	Blooming	Communities	Elevation	CNPS
Acanthomintha lanceolata	Lamiaceae	annual herb	Mar-Jun	•Chaparral (Chprl)(often serpentinite) •Cismontane woodland (CmWld) •Coastal scrub (CoScr)/rocky	80 - 1200 meters	List 4.2
Amsinckia lunaris	Boraginaceae	annual herb	Mar-Jun	•Coastal bluff scrub (CBScr) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)	3 - 500 meters	List 1B.2
Androsace elongata ssp. acuta	Primulaceae	annual herb	Mar-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Meadows and seeps (Medws) •Pinyon and juniper woodland (PJWld) •Valley and foothill grassland (VFGrs)	150 - 1200 meters	List 4.2
Aspidotis carlotta-halliae	Pteridaceae	perennial rhizomatous herb	Jan-Dec	•Chaparral (Chprl) •Cismontane woodland (CmWld)/generally serpentinite	100 - 1400 meters	List 4.2
Astragalus nuttallii var. nuttallii	Fabaceae	perennial herb	Jan-Nov	•Coastal bluff scrub (CBScr) •Coastal dunes (CoDns)	3 - 120 meters	List 4.2
Astragalus tener var. tener	Fabaceae	annual herb	Mar-Jun	•Playas (Plyas) •Valley and foothill grassland (VFGrs)(adobe clay) •Vernal pools (VnPls)/alkaline	1 - 60 meters	List 1B.2
Atriplex cordulata	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Valley and foothill grassland (VFGrs)(sandy)/saline or alkaline	1 - 375 meters	List 1B.2
Atriplex coronata var. coronata	Chenopodiaceae	annual herb	Mar-Oct	•Chenopod scrub (ChScr) •Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)/alkaline	1 - 590 meters	List 4.2
Atriplex depressa	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Playas (Plyas) •Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)/alkaline, clay	1 - 320 meters	List 1B.2
Atriplex joaquiniana	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Playas (Plyas) •Valley and foothill grassland (VFGrs)/alkaline	1 - 835 meters	List 1B.2
Balsamorhiza macrolepis var. macrolepis	Asteraceae	perennial herb	Mar-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/sometimes serpentinite	90 - 1555 meters	List 1B.2
Blepharizonia plumosa	Asteraceae	annual herb	Jul-Oct	•Valley and foothill grassland (VFGrs)	30 - 505 meters	List 1B.1
California macrophylla	Geraniaceae	annual herb	Mar-May	•Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/clay	15 - 1200 meters	List 1B.1

J-11

Scientific name	Family	Life form	Blooming	Communities	Elevation	CNPS
Calochortus umbellatus	Liliaceae	perennial bulbiferous herb	Mar-May	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs) •Valley and foothill grassland (VFGrs)/often serpentinite	100 - 700 meters	List 4.2
Campanula exigua	Campanulaceae	annual herb	May-Jun	•Chaparral (Chprl)(rocky, usually serpentinite)	275 - 1250 meters	List 1B.2
Castilleja ambigua ssp. ambigua	Scrophulariaceae	annual herb	Mar-Aug	•Coastal bluff scrub (CBScr) •Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Marshes and swamps (MshSw) •Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)margins	0 - 435 meters	List 4.2
Centromadia parryi ssp. congdonii	Asteraceae	annual herb	May-Oct(Nov), Months in parentheses are uncommon.	•Valley and foothill grassland (VFGrs)(alkaline)	1 - 230 meters	List 1B.2
Clarkia breweri	Onagraceae	annual herb	Apr-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr)/often serpentinite	215 - 1000 meters	List 4.2
Clarkia concinna ssp. automixa	Onagraceae	annual herb	(Apr),May-Jun(Jul), Months in parentheses are uncommon.	•Chaparral (Chprl) •Cismontane woodland (CmWld)	90 - 1500 meters	List 4.3
Cordylanthus maritimus ssp. palustris	Scrophulariaceae	annual herb hemiparasitic	Jun-Oct	•Marshes and swamps (MshSw)(coastal salt)	0 - 10 meters	List 1B.2
Cordylanthus mollis ssp. hispidus	Scrophulariaceae	annual herb hemiparasitic	Jun-Sep	•Meadows and seeps (Medws) •Playas (Plyas) •Valley and foothill grassland (VFGrs)/alkaline	1 - 155 meters	List 1B.1
Cordylanthus palmatus	Scrophulariaceae	annual herb hemiparasitic	May-Oct	•Chenopod scrub (ChScr) •Valley and foothill grassland (VFGrs)/alkaline	5 - 155 meters	List 1B.1
Deinandra bacigalupii	Asteraceae	annual herb	Jun-Oct	•Meadows and seeps (Medws)(alkaline)	150 - 185 meters	List 1B.2
Delphinium californicum ssp. interius	Ranunculaceae	perennial herb	Apr-Jun	•Chaparral (Chprl)(openings) •Cismontane woodland (CmWld)(mesic)	230 - 1095 meters	List 1B.2
Delphinium gypsophilum ssp. gypsophilum	Ranunculaceae	perennial herb	Feb-May	•Chenopod scrub (ChScr) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)	100 - 825 meters	List 4.2

Scientific name	Family	Life form	Blooming	Communities	Elevation	CNPS
Eriogonum nudum var. decurrens	Polygonaceae	perennial herb	Jun-Oct	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)(maritime ponderosa pine sandhills)/sandy	50 - 800 meters	List 1B.1
Eriogonum umbellatum var. bahiiforme	Polygonaceae	perennial herb	Jul-Sep	•Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)/rocky, often serpentinite	700 - 2200 meters	List 4.2
Eriophyllum jepsonii	Asteraceae	perennial herb	Apr-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr)/sometimes serpentinite	200 - 1025 meters	List 4.3
Eryngium aristulatum var. hooveri	Apiaceae	annual/perennial herb	Jul	•Vernal pools (VnPls)	3 - 45 meters	List 1B.1
Fritillaria agrestis	Liliaceae	perennial bulbiferous herb	Mar-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Pinyon and juniper woodland (PJWld) •Valley and foothill grassland (VFGrs)/clay, sometimes serpentinite	10 - 1555 meters	List 4.2
Fritillaria liliacea	Liliaceae	perennial bulbiferous herb	Feb-Apr	•Cismontane woodland (CmWld) •Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)/often serpentinite	3 - 410 meters	List 1B.2
Galium andrewsii ssp. gatense	Rubiaceae	perennial herb	Apr-Jul	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)/serpentinite, rocky	150 - 1450 meters	List 4.2
Helianthella castanea	Asteraceae	perennial herb	Mar-Jun	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Riparian woodland (RpWld) •Valley and foothill grassland (VFGrs)	60 - 1300 meters	List 1B.2
Hesperevax caulescens	Asteraceae	annual herb	Mar-Jun	•Valley and foothill grassland (VFGrs)(mesic, clay) •Vernal pools (VnPls)(shallow)	0 - 505 meters	List 4.2
Iris longipetala	Iridaceae	perennial rhizomatous herb	Mar-May	•Coastal prairie (CoPrr) •Lower montane coniferous forest (LCFrs) •Meadows and seeps (Medws)/mesic	0 - 600 meters	List 4.2
Lasthenia conjugens	Asteraceae	annual herb	Mar-Jun	•Cismontane woodland (CmWld) •Playas (Plyas)(alkaline) •Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)/mesic	0 - 470 meters	List 1B.1

Scientific name	Family	Life form	Blooming	Communities	Elevation	CNPS
Lasthenia ferrisiae	Asteraceae	annual herb	Feb-May	•Vernal pools (VnPls)(alkaline, clay)	20 - 700 meters	List 4.2
Legenere limosa	Campanulaceae	annual herb	Apr-Jun	•Vernal pools (VnPls)	1 - 880 meters	List 1B.1
Leptosiphon acicularis	Polemoniaceae	annual herb	Apr-Jul	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal prairie (CoPrr) •Valley and foothill grassland (VFGrs)	55 - 1500 meters	List 4.2
Leptosiphon ambiguus	Polemoniaceae	annual herb	Mar-Jun	•Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)/usually serpentinite	120 - 1130 meters	List 4.2
Leptosiphon grandiflorus	Polemoniaceae	annual herb	Apr-Aug	•Coastal bluff scrub (CBScr) •Closed-cone coniferous forest (CCFrs) •Cismontane woodland (CmWld) •Coastal dunes (CoDns) •Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)/usually sandy	5 - 1220 meters	List 4.2
Leptosyne hamiltonii	Asteraceae	annual herb	Mar-May	•Cismontane woodland (CmWld)(rocky)	550 - 1300 meters	List 1B.2
Lessingia hololeuca	Asteraceae	annual herb	Jun-Oct	•Broadleafed upland forest (BUFrs) •Coastal scrub (CoScr) •Lower montane coniferous forest (LCFrs) •Valley and foothill grassland (VFGrs)/clay, serpentinite	15 - 305 meters	List 3
Lessingia tenuis	Asteraceae	annual herb	May-Jul	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)/openings	300 - 2150 meters	List 4.3
Malacothamnus arcuatus	Malvaceae	perennial evergreen shrub	Apr-Sep	•Chaparral (Chprl) •Cismontane woodland (CmWld)	15 - 355 meters	List 1B.2
Malacothamnus hallii	Malvaceae	perennial evergreen shrub	May-Sep(Oct), Months in parentheses are uncommon.	•Chaparral (Chprl) •Coastal scrub (CoScr)	10 - 760 meters	List 1B.2
Microseris sylvatica	Asteraceae	perennial herb	Mar-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Great Basin scrub (GBScr) •Pinyon and juniper woodland (PJWld) •Valley and foothill grassland (VFGrs)(serpentinite)	45 - 1500 meters	List 4.2
Monardella antonina ssp. antonina	Lamiaceae	perennial rhizomatous herb	Jun-Aug	•Chaparral (Chprl) •Cismontane woodland (CmWld)	500 - 1000 meters	List 3

Scientific name	Family	Life form	Blooming	Communities	Elevation	CNPS
Monardella villosa ssp. globosa	Lamiaceae	perennial rhizomatous herb	Jun-Jul(Aug), Months in parentheses are uncommon.	•Broadleafed upland forest (BUFrs)(openings) •Chaparral (Chprl)(openings) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)	100 - 915 meters	List 1B.2
Myosurus minimus ssp. apus	Ranunculaceae	annual herb	Mar-Jun	•Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)(alkaline)	20 - 640 meters	List 3.1
Navarretia cotulifolia	Polemoniaceae	annual herb	May-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/adobe	4 - 1830 meters	List 4.2
Navarretia nigelliformis ssp. nigelliformis	Polemoniaceae	annual herb	Apr-Jun	•Valley and foothill grassland (VFGrs)vernally mesic •Vernal pools (VnPls)sometimes/clay, sometimes serpentinite	100 - 1000 meters	List 4.2
Navarretia prostrata	Polemoniaceae	annual herb	Apr-Jul	•Coastal scrub (CoScr) •Meadows and seeps (Medws) •Valley and foothill grassland (VFGrs)(alkaline) •Vernal pools (VnPls)/mesic	15 - 700 meters	List 1B.1
Piperia michaelii	Orchidaceae	perennial herb	Apr-Aug	•Coastal bluff scrub (CBScr) •Closed-cone coniferous forest (CCFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Lower montane coniferous forest (LCFrs)	3 - 915 meters	List 4.2
Plagiobothrys glaber	Boraginaceae	annual herb	Mar-May	•Meadows and seeps (Medws)(alkaline) •Marshes and swamps (MshSw)(coastal salt)	15 - 180 meters	List 1A
Polemonium carneum	Polemoniaceae	perennial herb	Apr-Sep	•Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Lower montane coniferous forest (LCFrs)	0 - 1830 meters	List 2.2
Psilocarphus brevissimus var. multiflorus	Asteraceae	annual herb	May-Jun	•Vernal pools (VnPls)	10 - 500 meters	List 4.2
Ranunculus lobbii	Ranunculaceae	annual herb aquatic	Feb-May	•Cismontane woodland (CmWld) •North Coast coniferous forest (NCFrs) •Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)/mesic	15 - 470 meters	List 4.2

Scientific name	Family	Life form	Blooming	Communities	Elevation	CNPS
Streptanthus albidus ssp. peramoenus	Brassicaceae	annual herb	(Mar),Apr-Sep(Oct), Months in parentheses are uncommon.	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/serpentinite	94 - 1000 meters	List 1B.2
Stuckenia filiformis	Potamogetonaceae	perennial rhizomatous herb aquatic	May-Jul	•Marshes and swamps (MshSw)(assorted shallow freshwater)	300 - 2150 meters	List 2.2
Suaeda californica	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	•Marshes and swamps (MshSw)(coastal salt)	0 - 15 meters	List 1B.1
Trifolium hydrophilum	Fabaceae	annual herb	Apr-Jun	•Marshes and swamps (MshSw) •Valley and foothill grassland (VFGrs)(mesic, alkaline) •Vernal pools (VnPls)	0 - 300 meters	List 1B.2
Tropidocarpum capparideum	Brassicaceae	annual herb	Mar-Apr	•Valley and foothill grassland (VFGrs)(alkaline hills)	1 - 455 meters	List 1B.1

California Department of Fish and Game
Natural Diversity Database
CNDDB Data Request
For La Costa Valley and eight surrounding USGS 7.5 minute topo quads

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	***Amsinckia lunaris*** bent-flowered fiddleneck	PDBOR01070			G2	S2.2	1B.2
2	***Astragalus tener var. tener*** alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2
3	***Atriplex cordulata*** heartscale	PDCHE040B0			G2?	S2.2?	1B.2
4	***Atriplex depressa*** brittlescale	PDCHE042L0			G2Q	S2.2	1B.2
5	***Atriplex joaquiniana*** San Joaquin spearscale	PDCHE041F3			G2	S2	1B.2
6	***Balsamorhiza macrolepis var. macrolepis*** big-scale balsamroot	PDAST11061			G3G4T2	S2	1B.2
7	***Blepharizonia plumosa*** big tarplant	PDAST1C011			G1	S1	1B.1
8	***California macrophylla*** round-leaved filaree	PDGER01070			G2	S2	1B.1
9	***Campanula exigua*** chaparral harebell	PDCAM020A0			G2	S2.2	1B.2
10	***Centromadia parryi ssp. congdonii*** Congdon's tarplant	PDAST4R0P1			G4T2	S2	1B.2
11	***Chorizanthe robusta var. robusta*** robust spineflower	PDPGN040Q2	Endangered		G2T1	S1.1	1B.1
12	***Clarkia concinna ssp. automixa*** Santa Clara red ribbons	PDONA050A1			G5?T3	S3.3	4.3
13	***Cordylanthus maritimus ssp. palustris*** Point Reyes bird's-beak	PDSCR0J0C3			G4?T2	S2.2	1B.2
14	***Cordylanthus mollis ssp. hispidus*** hispid bird's-beak	PDSCR0J0D1			G2T2	S2.1	1B.1
15	***Cordylanthus palmatus*** palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1.1	1B.1
16	***Deinandra bacigalupii*** Livermore tarplant	PDAST4R0V0			G1	S1.2	1B.2
17	***Delphinium californicum ssp. interius*** Hospital Canyon larkspur	PDRAN0B0A2			G3T2?	S2?	1B.2
18	***Eryngium aristulatum var. hooveri*** Hoover's button-celery	PDAPI0Z043			G5T2	S2.1	1B.1
19	***Eschscholzia rhombipetala*** diamond-petaled California poppy	PDPAP0A0D0			G1	S1.1	1B.1
20	***Fritillaria agrestis*** stinkbells	PMLIL0V010			G3	S3.2	4.2
21	***Fritillaria liliacea*** fragrant fritillary	PMLIL0V0C0			G2	S2.2	1B.2
22	***Helianthella castanea*** Diablo helianthella	PDAST4M020			G2	S2	1B.2
23	***Lasthenia conjugens*** Contra Costa goldfields	PDAST5L040	Endangered		G1	S1.1	1B.1

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	***Legenere limosa*** legenere	PDCAM0C010			G2	S2.2	1B.1
25	***Leptosyne hamiltonii*** Mt. Hamilton coreopsis	PDAST2L0C0			G2	S2.2	1B.2
26	***Malacothamnus arcuatus*** arcuate bush-mallow	PDMAL0Q0E0			G2Q	S2.2	1B.2
27	***Malacothamnus hallii*** Hall's bush-mallow	PDMAL0Q0F0			G2Q	S2	1B.2
28	***Monardella villosa ssp. globosa*** robust monardella	PDLAM180P7			G5T2	S2.2	1B.2
29	***Navarretia prostrata*** prostrate vernal pool navarretia	PDPLM0C0Q0			G2?	S2.1?	1B.1
30	***Plagiobothrys glaber*** hairless popcorn-flower	PDBOR0V0B0			GH	SH	1A
31	***Polemonium carneum*** Oregon polemonium	PDPLM0E050			G4	S1	2.2
32	***Sidalcea malachroides*** maple-leaved checkerbloom	PDMAL110E0			G3G4	S3S4.2	4.2
33	***Streptanthus albidus ssp. peramoenus*** most beautiful jewel-flower	PDBRA2G012			G2T2	S2.2	1B.2
34	***Stuckenia filiformis*** slender-leaved pondweed	PMPOT03090			G5	S1S2	2.2
35	***Suaeda californica*** California seablite	PDCHE0P020	Endangered		G1	S1.1	1B.1
36	***Trifolium hydrophilum*** saline clover	PDFAB400R5			G2?	S2.2?	1B.2
37	***Tropidocarpum capparideum*** caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B.1

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

November 23, 2010

Document Number: 101123102533

Martha Lowe
ESA
350 Frank H. Ogawa Plaza
Suite 300
Oakland, CA 94610

Subject: Species List for San Antonio Backup Pipeline

Dear: Ms. Lowe

We are sending this official species list in response to your November 23, 2010 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be February 21, 2011.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 101123102533

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)

Branchinecta longiantenna

longhorn fairy shrimp (E)

Branchinecta lynchi

Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)

Euphydryas editha bayensis

bay checkerspot butterfly (T)

Lepidurus packardi

Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central California Coastal steelhead (T) (NMFS)
Central Valley steelhead (T) (NMFS)
Critical habitat, Central California coastal steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

Rana draytonii

California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Reptiles

Masticophis lateralis euryxanthus

Alameda whipsnake [=striped racer] (T)
Critical habitat, Alameda whipsnake (X)

Birds

Charadrius alexandrinus nivosus
western snowy plover (T)

Pelecanus occidentalis californicus
California brown pelican (E)

Rallus longirostris obsoletus
California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni
California least tern (E)

Mammals

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Plants

Cordylanthus palmatus
palmate-bracted bird's-beak (E)

Lasthenia conjugens
Contra Costa goldfields (E)
Critical habitat, Contra Costa goldfields (X)

Suaeda californica
California sea blite (E)

Proposed Species

Amphibians

Rana draytonii
Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

MT. DAY (426B)

CALAVERAS RESERVOIR (427A)

MILPITAS (427B)

ALTAMONT (445B)

MENDENHALL SPRINGS (445C)

LIVERMORE (446A)

DUBLIN (446B)

NILES (446C)

LA COSTA VALLEY (446D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
Critical Habitat - Area essential to the conservation of a species.
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
(C) *Candidate* - Candidate to become a proposed species.
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be February 21, 2011.

APPENDIX K

Air Quality Technical Report

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Air Quality Technical Report – Final Draft

To: Kelly White, ESA

From: Valerie Geier and Hans Giroux, Orion Environmental Associates

Date: June 22, 2011, revised July 11, 2011 and August 16, 2011, finalized September 12, 2011

Subject: SFPUC San Antonio Backup Pipeline Project (CS-954A)

This technical report presents the results of the air quality assessment conducted for the San Francisco Public Utilities Commission (SFPUC) San Antonio Backup Pipeline (SABPL) project as required by the San Francisco Planning Department, Environmental Planning Division (formerly the Major Environmental Analysis Division [MEA]) guidelines for compliance with California Environmental Quality Act (CEQA) documentation and consistent with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines (BAAQMD, 2011a). The scope of work for this technical report was approved by Environmental Planning on March 23, 2011 and is included in Appendix A.

Project Description

The proposed SABPL project is located in the Sunol Valley, an unincorporated area of Alameda County. The project area extends roughly 2 miles along the west side of Calaveras Road from the Alameda Siphons in the south to the Interstate 680 (I-680)/State Route 84 (SR 84) interchange in the north. Existing land uses in the immediate vicinity of the proposed project include gravel mining operations, water supply infrastructure and facilities, private residences, grazing land, and regional open space. One commercial nursery exists just north of the project area near the I-680/SR 84 interchange. Two commercial gravel quarries operated by Hanson Aggregates under Surface Mining Permit 24 (SMP-24) and Oliver De Silva, Inc. (formerly CEMEX Construction Materials Pacific) under Surface Mining Permit 30 (SMP-30) are located partially within the project area, along Alameda Creek between the Alameda Siphons and I-680. Other active mining operations in the immediate vicinity include the SMP-32 area north of I-680 and west of SR 84, and the SMP-33 area just north of the Alameda West Portal on the west side of Alameda Creek. The nearest community is the town of Sunol, approximately 1 mile northwest of the project area.

Project Components

The SABPL project would include the following components (and auxiliary facilities):

- 7,000-foot-long, 66-inch-diameter San Antonio Backup Pipeline (SABPL or backup pipeline) along the west side of Calaveras Road;

- Discharge facility at quarry Pit F3-East (including a discharge valve vault, electrical control building, baffled outfall, reinforced concrete splash pad, and 550-foot-long overhead powerline between the electrical control building and the Hetch Hetchy Water & Power [HHWP] Calaveras Substation);
- New chemical facility near the San Antonio Pump Station (including an emergency backup generator);
- Cutoff wall around quarry Pits F3-East and F3-West;
- Dewatering facilities at Pits F3-East and F3-West (including two low-pressure submersible pumps adjacent to the new discharge facility at Pit F3-East, a pump mounted on a floating platform in Pit F3-West, and a dewatering pipeline along the southern boundary of the two quarry pits);
- Alameda Creek Pump Station, wet well, and electrical control building at the western corner of Pit F3-West (including electrical transformer and 1,650-foot-long overhead powerline between the electrical control building and the HHWP Calaveras Substation);
- Transfer pipeline connecting the Alameda Creek Pump Station to other existing pipelines; and
- Other improvements, including Supervisory Control and Data Acquisition (SCADA) transmitters, corrosion control, and a replacement of a 5,700-foot-long section of 12-inch-diameter water pipeline to the town of Sunol parallel to the proposed backup pipeline alignment.

New Hetch Hetchy overhead powerlines would provide electrical power to the Alameda Creek Pump Station and control building, and the electrical control building associated with the new discharge facility at Pit F3-East. The SCADA and security equipment at the Alameda Creek Pump Station and the discharge facility at Pit F3-East would each be powered with an uninterruptible battery power supply. Emergency backup power for the discharge facility at Pit F3-East would be comprised of an uninterruptible battery power supply with sufficient power for one full discharge. No permanent emergency backup power is proposed for the Alameda Creek Pump Station.

SFPUC facility operators would use the proposed dewatering facilities at Pits F3-East and F3-West to pump Hetch Hetchy water that is discharged into Pit F3-East (and potentially seeps into Pit F3-West) to the Alameda Creek Pump Station. The proposed facilities at the Alameda Creek Pump Station include four 274-horsepower vertical submersible pumps (three active and one on standby). Power for operation of the Alameda Creek Pump Station would be hydroelectric power provided by the HHWP Calaveras Substation. No emergency backup power is proposed for the dewatering facilities or the Alameda Creek Pump Station.

Electrical power for the new chemical facility at San Antonio Pump Station would also be hydroelectric power that would be provided by the HHWP Calaveras Substation via new underground powerlines between the existing Sunol Valley Chloramination Facility and the new chemical facility. A portable liquid propane gas (LPG)-powered emergency generator (150-kilowatt [kW]) at the Sunol Valley Chloramination Facility would provide backup power for the new chemical facility.

Project Construction

Project construction is anticipated to occur between October 2012 and June 2014, resulting in an overall construction period of approximately 21 months. **Table 1** presents a summary of the project construction phases, construction equipment to be utilized, duration of each construction phase, construction work hours, and nighttime construction activities. **Table 2** presents the tentative schedule for construction phasing.

Construction Activities Along Calaveras Road

The proposed 7,000-foot-long backup pipeline and the 5,700-foot-long water pipeline to the town of Sunol would be installed along the west side of Calaveras Road from the San Antonio Pump Station to approximately 1,000 feet south of the San Antonio Creek crossing. The section of water pipeline to the town of Sunol would terminate here; the backup pipeline would continue to the northwest, beneath the San Antonio Creek channel, to a new discharge facility on the southern slope of quarry Pit F3-East. Air gaps, vaults, manhole risers, cathodic protection, and other components such as SCADA transmitters would be installed as part of pipeline installation activities along the backup pipeline alignment.

Construction and installation of pipelines and associated components would be performed using traditional open-trench construction methods and would include clearing and grading the ground surface along the alignment, excavating the trenches, preparing and installing the pipeline sections, backfilling the trenches, and revegetating or paving the area, as needed. Open-trench construction for the backup pipeline and the pipeline to the town of Sunol would generally proceed at a rate of about 100 to 150 feet per day over a 15-month period and approximately 29,000 cubic yards of excess spoils would be generated from construction activities along Calaveras Road.

Two construction staging areas (Staging Areas B and C) would border the Calaveras Road right-of-way just south and north of the San Antonio Creek crossing, respectively. Construction workers would use these staging areas throughout the approximately 21-month project construction duration. In general, Staging Areas B and C, and all other staging areas, would be used to store equipment, vehicles, pipe, and other construction materials throughout the construction period.

Construction Activities in the Vicinity of the San Antonio Pump Station

The new chemical facility would be constructed northwest of the existing San Antonio Pump Station, approximately 200 feet west of the existing chemical facility. The facility would be constructed with a concrete foundation, structural frame, and a pre-engineered weather canopy with a metal roof. Maximum excavation depth for construction of the facility would be 20 feet. Chemical feed lines would be installed between the new chemical facility and the new chemical injection stations. Construction of the new chemical facility would take approximately 5 months and generate 800 cubic yards of excess spoils. Once the new chemical facility is brought online, the existing chemical facility would be decommissioned and the building retained for storage.

Staging Area A would be located south of the proposed chemical facility and immediately west of the existing fluoride facility and Sunol Valley Chloramination Facility, on a flat area. This staging area would be used throughout the 21-month construction duration for parking of equipment and vehicles, stockpiling of construction materials, and field office space for contractor(s) and SFPUC staff.

Construction Activities in the Vicinity of Pits F3-East and F3-West

Construction activities in the vicinity of Pits F3-East and F3-West would be associated with the following facilities: discharge facility, cutoff wall, Alameda Creek Pump Station, wet well, electrical control building, transfer pipeline, dewatering facilities, and a new electrical transformer and overhead powerline. In general, all construction activities in the vicinity of Pits F3-East and F3-West would include vegetation removal, grading and excavation, and backfilling. Large equipment such as long-reach excavators, backhoes, generators, cranes, and bulldozers would be required for the various project components in this area.

The discharge facility would be comprised of a baffled outfall at the northern terminus of the backup pipeline and a 175-foot-long reinforced concrete splash pad over the southern slope of quarry Pit F3-East. The slope surface would be prepared by removing loose/weak material, organic soils, and vegetation. Ground anchors would be constructed to secure the splash pad to the quarry slope, and would require drilling holes, installing steel rods or tendons into the slope, and then grouting the anchors in place. Steel bars would be positioned and tied together to provide permanent reinforcement. The concrete slab would be poured in batches from a concrete pump truck at the top of the slope. The baffled outfall would then be mounted onto a pile foundation at the top of the slope. Construction of the discharge facility would take 6 months and generate 13,700 cubic yards of excess spoils.

Construction of the cutoff wall would require a long-reach excavator, which would be used to excavate an approximately 5,000-foot-long and 80-foot-deep trench along the perimeter of Pits F3-East and F3-West. The trench would be kept full of bentonite slurry to stabilize the trench walls and prevent collapse during excavation. A bulldozer or excavator would be used to backfill the trench with the slurry mixture. The proposed cutoff wall would require an approximately 125-foot-wide work platform around the two quarry pits and along the cutoff wall alignment. Construction of the cutoff wall would take approximately 16 months and generate 9,000 cubic yards of excess spoils.

The Alameda Creek Pump Station would consist of pumps, pipelines, a wet well, and a control building that would house electrical equipment. Minor grading would be required for the Alameda Creek Pump Station, parking area, and driveway. The wet well would be constructed underground and would require excavation of a pit approximately 55 feet by 25 feet to a depth of 45 feet below grade using sheet piles and a clam-shell excavator. Construction of the Alameda Creek Pump Station and control building would take 5 months and generate 10,300 cubic yards of excess spoils.

Installation of the transfer pipeline and dewatering pipeline would require pipeline cutting, pipeline installation, and backfilling. Open trench construction methods would be used for installation of both the approximately 1,260-foot-long transfer pipeline and the approximately 1,400-foot-long dewatering pipeline. Construction of the transfer pipeline and dewatering pipeline would take approximately 3 months and generate approximately 5,200 cubic yards of excess spoils.

TABLE 1
SUMMARY OF CONSTRUCTION ACTIVITIES AND EQUIPMENT

Construction Phase	Excess Spoils (cubic yards)	Construction Equipment	Construction Durations	Construction Work Hours	List of Construction Equipment that would be Operated during Nighttime and Weekend Construction Work	Does this phase involve nighttime hauling or truck deliveries?
Installation of SABPL and 12-inch Water Pipeline to Town of Sunol (Installation of Pipelines, Vaults, Manhole Risers, Air Gap Systems, and Cathodic Protection)	29,000	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment • Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Drill rig • Skip loader • Pavers and rollers	15 months	Mon-Sat, 7am-7pm, except during installation of air gaps, which would result in 2 weeks and 4 weeks of 24-hr construction (total 6 weeks 24-hr construction)	• Welding equipment • Generators • Air compressors	Hauling would occur Monday through Friday during daytime hours. No hauling at night or on weekends.
Construction of Discharge Facility at Pit F3-East (Outfall, Concrete Splash Pad, Electrical Control Building, and Overhead Powerline)	13,700	• Sheet pile driver • Flatbed trucks • Excavators • Backhoe • Boom truck • Air compressors • Baker tank(s) • Drill rig • Generators • Arch welders • Timber crane mats • Trucks for materials delivery • Dump trucks • Pickup trucks • Concrete transport trucks • Concrete pump truck • Water trucks • Pavers and rollers • Work platform	6 months	Mon-Sat, 7am-7pm	None	Hauling would occur Monday through Friday during daytime hours. No hauling at night or on weekends.
Construction of Cutoff Wall around Pits F3-East and F3-West	9,000	• Long reach excavators • Regular excavators • Bulldozers • Desander plant • Haul trucks for spoils transport • Slurry mixing plant • Forklift • Dump trucks • Slurry pumps • Timber crane mats	16 months	Mon-Sat, 7am-7pm	None	Hauling would occur Monday through Friday during daytime hours. No hauling occur at night, no hauling on weekends.
Construction of Transfer Pipeline and Dewatering Pipeline	5,200	• Flatbed trucks • Excavators • Backhoes • Pipe cutting and welding equipment • Pickup trucks • Trucks for materials delivery • Generators • Air compressors • Haul trucks for spoils transport • Compaction equipment • Backer tank(s) • Arc welding machine • Crane • Drill rig • Skip loader	3 months	Mon-Sat, 7am-7pm	None	Hauling would occur Monday through Friday during daytime hours. No hauling at night or on weekends.
Construction of Alameda Creek Pump Station and Wet Well (including Electrical Control Building, Electrical Transformer, and Overhead Powerline)	10,300	• Excavators • Bulldozers • Concrete truck • Flatbed truck • Mobile crane • Graders • Dump trucks • Welding equipment • Haul trucks for spoils transport	5 months	Mon-Sat, 7am-7pm	None	Hauling would occur Monday through Friday during daytime hours. No hauling at night or on weekends.
Construction of New Chemical Facility (Chemical Facility Building and Chemical Feed Lines)	800	• Excavator • Backhoe • Air compressors • Loader • Boom truck or small crane • Pavers and rollers • Concrete transport trucks • Concrete pump truck • Flatbed truck • Generators • Pickup trucks • Trucks for materials delivery	5 months	Mon-Sat, 7am-7pm	None	Hauling would occur Monday through Friday during daytime hours. No hauling at night or on weekends.
Spoils Disposal	Project Total = 68,000	• Backhoes • Haul trucks • Water trucks	November 2012 through June 2014 – 20 months	Mon-Fri, 7am-5pm	None	Hauling would occur Monday through Friday during daytime hours. No hauling occur at night, no hauling on weekends.

TABLE 2
CONSTRUCTION PHASING

	Construction Phasing																				
	2012			2013												2014					
SABPL Project Construction Durations and Work Hours	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Total Construction Duration (21 months, October 2012 through June 2014)																					
SABPL and Water Pipeline to Town of Sunol (15 months)																					
**Mon-Sat, 7am-7pm, except during installation of air gaps, which would result in 2 weeks and 4 weeks of 24-hr construction (total 6 weeks 24-hr construction)																					
Discharge Facility at Pit F3-East (6 months)																					
**Mon-Sat, 7am-7pm																					
Cutoff Wall (16 months)																					
**Mon-Sat, 7am-7pm																					
Transfer Pipeline, Dewatering Pipeline (3 months)																					
**Mon-Sat, 7am-7pm																					
Alameda Creek Pump Station (5 dry months)																					
**Mon-Sat, 7am-7pm																					
New Chemical Facility (5 months)																					
**Mon-Sat, 7am-7pm																					
Spoils Hauling / Disposal / Placement (20 months)																					
**Mon-Fri, 7am-7pm																					

NOTES:
No spoils hauling Saturdays or Sundays.
Generally only one shift per day (7am to 5pm)
Traffic will assume 20-month total duration to be most conservative.
Total excess spoils = 68,000 cubic yards
Assume 25% of excess spoils (17,000 cubic yards) will be hauled to landfill, the rest will be permanently placed at North Spoils Site or temporarily placed in SMP-30 for subsequent resale and reuse.

The HHWP Calaveras Substation on the west side of Calaveras Road, just south of the San Antonio Creek crossing, would provide power to the Alameda Creek Pump Station. 1,650 linear feet of new overhead powerlines would be constructed from the HHWP Calaveras Substation to a new electrical transformer adjacent to the Alameda Creek Pump Station, and an additional 550 linear feet of new overhead powerlines would extend between the HHWP Calaveras Substation and the electrical control building for the discharge facility at Pit F3-East. Installation of the new powerlines would generally require excavation of up to 10 feet deep, placing the power pole in the hole, and backfilling.

Staging Area D, located just north of Pit F3-West, would be used to store equipment, vehicles, pipe, and other construction materials throughout the 21-month construction period.

Spoils Management and Disposal

Excess soil and rock material would be generated as part of excavation and construction activities. The total volume of excess spoils generated during project construction would be approximately 68,000 cubic yards. Strategies for managing excess excavated material generated during construction would include: (a) placing spoils in a temporary location, which might include quarry Pit F6 or the aggregate processing facility located immediately north of Pit F6, both of which are operated under SMP-30, for subsequent processing, resale, and reuse; (b) permanently placing the spoils in an earthen berm parallel to and west of Calaveras Road at the North Spoils Site; or (c) hauling the spoils offsite to an appropriate landfill facility. The North Spoils Site covers 12 acres and is located immediately south of the I-680 / SR 84 interchange on the west side of Calaveras Road. Because soils in the project area are generally considered to be of good quality, the SFPUC estimates that 25 percent of the excess spoils would be hauled to a landfill, and the remaining 75 percent of the excess spoils would be permanently placed at the North Spoils Site and/or sold for subsequent reuse (e.g., temporarily placed in Pit F6 or the SMP-30 aggregate processing facility during project construction).

Project Operations and Maintenance

Once construction of the SABPL project is complete, the SFPUC would continue to use an existing pipeline (e.g., the existing San Antonio Pipeline) to transfer water to and from San Antonio Reservoir. Discharges of reservoir water to San Antonio Creek would continue unmodified through the existing outlet structure and discharge facility at the base of Turner Dam.

With the proposed project, planned and emergency discharges from the Hetch Hetchy system that are currently routed to San Antonio Creek via the existing San Antonio Pipeline and outlet works at the base of Turner Dam would instead be routed via the proposed backup pipeline to the new discharge facility at Pit F3-East. The SFPUC would work cooperatively with the existing quarry operator to manage water levels in Pits F3-East and F3-West and maintain sufficient capacity for subsequent discharges from the project. After a discharge event from the backup pipeline that raises water levels in the quarry pits above 195 feet msl, the SFPUC would pump the discharged water from the quarry pits to San Antonio Reservoir or the SVWTP via two-step pumping process: (Step 1) The SFPUC would use the dewatering equipment (submersible pumps, pump on floating platform, flexible hoses, and the dewatering pipeline) to pump water from Pits F3-East and F3-West to the Alameda Creek Pump Station. (Step 2) From the Alameda Creek Pump Station, the recovered water would be pumped via the proposed transfer pipeline and other existing pipelines to San Antonio Reservoir for storage or to the SVWTP for treatment and delivery to customers. The inlet pipe for the submersible pumps at the new discharge facility would be at 190 feet msl. Thus, SFPUC could only recover the discharged water to 190 feet msl; any discharged water below 190 feet msl would remain in the quarry pits. However, as part of their mining operations, Hanson Aggregates would continue to pump water into and out of Pits F3-East and F3-West provided that water levels in the quarry pits remain at or below 195 feet msl.

As necessary, to protect water quality in San Antonio Creek, Alameda Creek, and San Antonio Reservoir, the planned and emergency discharges from the Hetch Hetchy system could be dechlorinated and pH-adjusted at the new chemical facility before being discharged to Pit F3-East. However, because Pits F3-East and F3-West are part of active mining operations and are not currently under state or federal jurisdiction, the SFPUC is not required to dechlorinate and pH-adjust prior to discharging to Pit F3-East provided that the chlorine either dissipates or is removed prior to conveying the discharged water to the creeks or the reservoir. The proposed chemical facility would use calcium thiosulfate for dechlorination. Calcium thiosulfate is not a listed air contaminant. Underground chemical feed lines would extend from the existing fluoride facility located just south of the Sunol Valley Chloramination Facility to the new chemical facility. The proposed chemical facility would use fluoride (in the form of hydrofluorosilic acid) for pH adjustment. The Office of Environmental Health Hazard Assessment (OEHHA) indicates hydrogen fluoride (which is the same as hydrofluorosilic acid except hydrofluorosilic acid is in liquid form) is a toxic air contaminant and provides chronic reference exposure levels for this chemical. Although it is unlikely that the fluoride used to pH-adjust water prior to discharge would generate hazardous levels of toxic air contaminants (TACs), the health risk screening for operational emissions addresses this chemical.

The proposed project would provide the SFPUC with the operational flexibility to simultaneously discharge Hetch Hetchy flows to Pit F3-East via the backup pipeline while accessing water stored in San Antonio Reservoir and conveying the stored water to the SVWTP via the existing San Antonio Pipeline.

The proposed facilities would require periodic operations review and maintenance. The number of vehicle trips for operations review and maintenance would be similar to the vehicle trips associated with the existing San Antonio Pipeline and the existing chemical facility. Project implementation would not generate a significant number of new vehicle trips for maintenance activities.

Pumping Variants for Dewatering Pits F3-East and F3-West

Two variations of the proposed project are under consideration by the SFPUC. The two variants address two different pumping scenarios (one-step vs. two-step pumping) for dewatering Pits F3-East and F3-West after discharges of quality-impaired Hetch Hetchy water from the backup pipeline, and provide the SFPUC with flexibility in the event the SFPUC elects not to construct the Alameda Creek Pump Station.

Pumping Variant 1

Under Pumping Variant 1, dewatering of Pit F3-East after a discharge from the backup pipeline would occur via a one-step pumping process. Pumping Variant 1 would construct two submersible high-pressure pumps adjacent to the new discharge facility at Pit F3-East (as opposed to the two submersible low-pressure pumps that would be constructed under the proposed project). The submersible high-pressure pumps, dewatering pipeline, and existing pipelines would be used to pump water directly from Pit F3-East to San Antonio Reservoir or the Sunol Valley Water Treatment Plant (SVWTP). Like the proposed project, the SFPUC would use the submersible high-pressure pumps adjacent to the new discharge facility to dewater Pit F3-East. The water would be pumped into the dewatering pipeline and subsequently pumped by the high-pressure submersible pumps to other existing pipelines. Pumping Variant 1 would not construct the Alameda Creek Pump Station, wet well, electrical control building for the pump station, electrical transformer, or transfer pipeline. Unlike the proposed project, Pumping Variant 1 would not include dewatering facilities for Pit F3-West; this variant would only construct the facilities to dewater Pit F3-East. All other facilities and improvements proposed under the proposed project would be constructed under Pumping Variant 1.

Pumping Variant 2

Under Pumping Variant 2, dewatering of Pits F3-East and F3-West after a discharge from the backup pipeline could occur using either a one-step or two-step pumping process. Pumping Variant 2 would construct one new submersible high-pressure pump and one new submersible low-pressure pump adjacent to the new discharge facility at Pit F3-East. All other project components would be constructed as proposed under the proposed project. Like the proposed project, the SFPUC would use a portable pump mounted on a floating platform to pump water from Pit F3-West into the dewatering pipeline. After a discharge from the proposed project, the SFPUC would have the option to pump water directly to San Antonio Reservoir or SVWTP via the submersible high-pressure pump, dewatering pipeline, and existing pipelines (one-step pumping process), or use the submersible low-pressure pump to pump water through the dewatering pipeline to the Alameda Creek Pump Station, and the Alameda Creek Pump Station to pump water through the transfer pipeline and existing pipelines to San Antonio Reservoir or SVWTP (two-step pumping process).

Project Setting

Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive than the general population to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. People engaged in strenuous work or exercise are also more sensitive to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses or parks are also considered moderately sensitive due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.

No schools, childcare centers, churches, hospitals, or nursing homes are located in the vicinity of the proposed project. **Figure 1** shows the project area and identifies sensitive receptors within 0.5 mile of the project area. There is one sensitive receptor within the 1,000-foot zone of influence for potential health risk impacts: the SFPUC watershed keeper's residence located approximately 225 feet east of the project area and Calaveras Road, just north of the Alameda East Portal. Although the SFPUC watershed keeper's residence is currently unoccupied, the analysis of human health risks and hazards conservatively assumes that this residence will be occupied during project-related construction activities and operations. The second-closest sensitive receptor to the project area is a private ranch residence (Garcia residence) located approximately 1,300 feet southwest of the project area. However, this receptor is located beyond the 1,000 foot of the zone of influence for potential health risk impacts.

Permitted Stationary Sources and Mobile Sources in Project Vicinity

Stationary sources emissions permitted by the BAAQMD, and major roadway sources with greater than 10,000 vehicles per day that are within 1,000 feet of the project area are listed in **Table 3** and shown in **Figure 1**. Locations of these sources in relation to the project area are indicated in Figure 1. No major non-permitted sources (e.g., train yards, distribution facilities, and high volume fueling stations) are located within 1,000 feet of the project area. Calaveras Road in the vicinity of the SFPUC watershed keeper's residence near Alameda East Portal carries less than 10,000 vehicles per day (LCW Consulting, 2006, 2011).

The CEMEX Construction Materials Pacific facility (Site 16195) is located on land owned by the City and County of San Francisco (CCSF) that is currently leased to Oliver De Silva, Inc. and operated under Surface Mining Permit 30 (SMP-30). This facility, which is commonly referred to as the SMP-30 aggregate processing facility, is a sand and gravel processing plant containing 13 identified specific sources of particulate emissions. Emission sources include 4 rock crushers, 6 vibratory screens, a feed hopper, sand and gravel conveyors and stockpiles and haul roads. The facility also includes a non-retail gasoline dispensing facility that generates very small amounts of volatile organic compounds (VOCs). BAAQMD staff have reported that the screening level $PM_{2.5}$ concentration at the fence line of Site 16195 is 119.0 $\mu g/m^3$ (presumably for 24 hours) (BAAQMD, 2011d). However, these emissions are almost entirely attributable to fugitive dust emissions. The BAAQMD's health risk thresholds apply to exhaust emissions, and not fugitive dust. Furthermore, although this facility may include on-site sources of other TACs associated with the gasoline dispensing facility, this facility is more than 3,000 feet from the SFPUC watershed keeper's residence. Given these distances, the small amounts of VOCs emitted by the gas dispensing operations, and because the majority of this facility's emissions are from fugitive dust and not exhaust, this facility is not considered a source of cumulative risk or hazards for nearby sensitive receptors. Thus, no additional discussion regarding emissions from this facility is provided below.

TABLE 3
EXISTING PERMITTED STATIONARY AND MOBILE EMISSIONS SOURCES IN THE PROJECT VICINITY

Site	Facility Name	Street Address	City	Excess Cancer Risk (Cancer Cases in a Million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ (µg/m³)
15592	SPFUC (Source Type: 100 kW emergency generator)	5555 Calaveras Road	Sunol	20.93	0.007	-	0.038
16195	CEMEX Construction Materials Pacific (Source Type: crushers, screens, conveyors, feed hopper, stockpiles, haul roads, non-retail gasoline dispensing facility)	6527 Calaveras Road	Sunol	0.02	0.00	-	119.000
I-680 at a distance of 10 feet to the east			Sunol	131.784	0.118	0.073	0.815
Combined Cancer Risk and Hazards[a]				**152.734**	**0.125**	**0.073**	**119.853**

[a] This would be the risk level if the closest sensitive receptor were exposed for the next 70 years at the point of maximum risk for all three sources.

SOURCE: BAAQMD, 2011b, 2011d, 2011e.

Criteria Air Pollutants

The SABPL project would construct several new water system facilities and improvements to provide reliable conveyance capacity and increased flexibility for managing planned and emergency discharges of quality-impaired water from the Hetch Hetchy system. Construction equipment, trucks, worker vehicles, and ground-disturbing activities would generate direct emissions of criteria air pollutants and ozone precursors. Operation of the proposed facilities would also generate criteria pollutants and ozone precursors related to one LPG-powered emergency generator at the SFPUC Sunol Valley Chloramination Facility that would provide backup power for the new chemical facility). Vehicle trips associated with facility maintenance and periodic inspections would be similar to the existing condition and are not expected to result in an increase in criteria pollutant and precursor emissions.

The air quality impact analysis considers construction and operational impacts associated with the proposed project. Under the project, the backup pipeline would be used only infrequently for emergency and planned maintenance events requiring discharges of quality-impaired Hetch Hetchy water out of the regional water system. The new chemical facility would replace the existing chemical facility but the frequency of use associated with this facility would remain essentially unchanged. Thus, the principal air emissions would occur during construction. Construction-related air emissions are evaluated in accordance with the BAAQMD CEQA Guidelines for assessing and mitigating air quality impacts (BAAQMD, 2011a).

Construction-related Criteria Air Pollutant Emissions

Project construction would generate fugitive dust (including PM_{10} and $PM_{2.5}$) during various activities, including excavation, grading, demolition, and vehicle travel on both paved and unpaved surfaces. Other criteria pollutants would also be generated from the exhaust emissions of construction equipment and vehicles. Without controls, emissions of these criteria pollutants could affect the Bay Area Air Basin's attainment status relative to state and federal air quality standards. This impact would be temporary, spanning over the approximately 21-month duration of planned construction.

Construction-related emissions would be generated during construction of all project components. As previously discussed, construction is planned to occur over approximately 21 months, from October 2012 through June 2014.

Construction-related off-road vehicle exhaust emissions were calculated using the OFFROAD2007 emissions module from the California Air Resources Board's (CARB) URBEMIS2007 computer model. The CARB no longer supports use of the OFFROAD2007 module because it over predicts both criteria pollutants and diesel particulate matter (DPM) (Sax, 2011). A replacement model to URBEMIS2007 has been developed (CalEEMod) but no formal replacement to OFFROAD2007 has been released. Because CalEEMod still contains the same construction equipment algorithms as URBEMIS2007, and since URBEMIS is the model specified in the BAAQMD CEQA Guidelines the URBEMIS2007 model was used in the following analysis with the understanding that findings are likely over-predictive.

The BAAQMD CEQA Guidelines require quantification of construction-related equipment exhaust emissions. The BAAQMD's daily criteria pollutant emissions significance thresholds for construction activities are presented in **Table 4**.

TABLE 4
BAAQMD DAILY CRITERIA POLLUTANT EMISSIONS
SIGNIFICANCE THRESHOLDS FOR CONSTRUCTION ACTIVITIES

Pollutant	Significance Thresholds for Average Daily Emissions
ROG	54 pounds per day (lbs/day)
NO_X	54 lbs/day
PM_{10} (exhaust)	82 lbs/day
$PM_{2.5}$ (exhaust)	54 lbs/day
PM_{10}/$PM_{2.5}$ (fugitive)	Best Management Practices

For all proposed projects, the BAAQMD recommends implementation of all BAAQMD *Basic Construction Mitigation Measures*, and these measures are included as Mitigation Measure M-AQ-1a. If the above thresholds of significance are exceeded prior to implementing the *Basic Construction Mitigation Measures*, the BAAQMD recommends that additional construction mitigation measures be implemented. The *Basic Construction Mitigation Measures* and the URBEMIS mitigation options are worded slightly differently. However, Appendix B of the BAAQMD CEQA Guidelines consider

SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 1

Existing Emissions Sources and Sensitive Receptors

several URBEMIS measures to be functionally equivalent to the BAAQMD's *Basic Construction Mitigation Measures* in terms of efficiency and performance, even if they are not worded identically. Thus, the URBEMIS fugitive dust mitigation options that are functionally equivalent to those the BAAQMD were used to model emissions with mitigation implementation.

Emissions from the SABPL project's construction equipment and vehicles would be generated from multiple sources, including heavy mobile equipment and delivery/haul trucks, worker vehicles, and semi-stationary sources such as air compressors and generators. Construction-related air pollution emissions were calculated for the SABPL project as a function of construction activity, construction duration, average haul truck mileage, and worker trips (auto/light-truck mileage). The CARB's computer model URBEMIS2007 was used to calculate construction activity emissions based the equipment list and workforce estimates shown in Table 1, but adjusted to reflect average daily conditions (see Appendix B for average daily construction assumptions and model output data). **Table 5** summarizes the SABPL project's estimated average daily construction emissions for years 2012 (averaged over 26 days), 2013 (averaged over 320 days), and 2014 (averaged over 157 days).[1]

Average daily emissions were calculated by combining the URBEMIS output for a peak activity, by phase, with a normalizing correction from peak to average as follows (assuming the average work day is 50 percent of a peak day):

> On-Site equipment + workers = peak day x 0.5 x 6/7
> (6 work days – URBEMIS output)
>
> On-road + on-site trucks = peak day x 5/7
> (5 hauling days – EMFAC2007 manual calculation)

The URBEMIS output distinguishes between "summer" and "winter" emissions. On-and off-road diesel exhaust is seasonally independent as to emission factor. Use of daily summer or winter emissions estimates form URBEMIS produces identical average day emissions.

Because each construction phase has different numbers of work days and overlap, average daily emissions must first be calculated per phase before a maximum annual average day can be calculated. As noted above, peak phase activities predicted by the URBEMIS model must be adjusted for peak to mean ratios and by variable work days to establish an average per phase. The maximum average daily emissions occur in 2013, the year when most project construction activities would occur. The estimated daily average construction emissions for 2012 and 2014 are lower than for 2013 because less construction would occur during these years. Because of the large anticipated heavy equipment fleet and the worst-case assumption that maximum daily construction activity could involve overlapping construction activities for up to four project elements, the model results indicate average daily NO_X emissions would substantially exceed the BAAQMD CEQA thresholds under the proposed project as well as under Pumping Variants 1 and 2, a significant impact. Although

1 See Table B-1 of Appendix B for the number of days assumed under each construction phase for 2012, 2013, and 2014.

TABLE 5
AVERAGE DAILY EMISSIONS OF CRITERIA POLLUTANTS DURING CONSTRUCTION

Construction Phase	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Average Daily Emissions in 2012 (lbs/day)				
Unmitigated	5.7	48.5	2.4	2.2
Mitigated	5.7	32.7	1.8	1.7
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Thresholds Without Mitigation?	No	No	No	No
Exceeds Thresholds With Mitigation?	No	No	No	No
Average Daily Emissions in 2013 (lbs/day)				
Unmitigated	17.8	156.2	7.5	6.9
Mitigated	17.8	101.7	5.3	4.9
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Thresholds Without Mitigation?	No	Yes	No	No
Exceeds Thresholds With Mitigation?	No	Yes	No	No
Average Daily Emissions in 2014 (lbs/day)				
Unmitigated	12.6	104.8	5.3	4.8
Mitigated	12.6	69.9	3.9	3
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Thresholds Without Mitigation?	No	Yes	No	No
Exceeds Thresholds With Mitigation?	No	Yes	No	No

NOTE: Average daily emissions were estimated based on the total number of construction days in each construction year (2012, 2013, and 2014), then averaged over the total number of days in each specified year that every piece of equipment would operate assuming it would operate 50 percent of the time during construction hours on any given day. Emissions associated with spoils hauling, disposal, and placement are included under each construction phase. They are not called out separately so as not to double-count these emissions.

SOURCE: URBEMIS2007 Computer Model (see Appendix B for model output).

implementation of Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction) would reduce the project's NO_X emissions, mitigated average daily NO_X emissions would still exceed the BAAQMD significance thresholds. Therefore, even with implementation of mitigation, the project's construction-related criteria pollutant emissions would remain significant and unavoidable.

Mitigation Measures

Mitigation Measure M-AQ-1a: BAAQMD Basic Construction Measures.

The SFPUC shall post one or more publicly-visible signs with the telephone number and person to contact at the San Francisco Planning Department regarding complaints related to excessive dust or vehicle idling. This person shall respond to complaints and, if necessary, take corrective action within 48 hours. The telephone number and person to contact at the BAAQMD's Compliance and Enforcement Division shall also be provided on the sign(s) in the event that the complainant also wishes to contact the applicable air district.

In addition, to limit dust, criteria pollutants, and precursor emissions associated with project construction, the following BAAQMD-recommended Basic Construction Measures shall be included in all construction contract specifications for the proposed project:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- Vehicle speeds on unpaved areas shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times for construction equipment (including vehicles) shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 2 minutes.[2] Clear signage of this requirement shall be provided for construction workers at all access points to construction areas.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

Mitigation Measure M-AQ-1b: BAAQMD Additional Construction Measures for NO_X Reduction.[3]

To reduce NO_X emissions during construction, the following provisions shall be included in all construction contractor specifications for the proposed project:

a. To reduce NO_X during construction, 40 percent of the total horsepower-hours from diesel-powered off-road equipment with engines greater than 50 horsepower shall be from equipment that satisfies United States Environmental Protection Agency (USEPA) Tier 3 NO_X emission standards. The SFPUC shall demonstrate this to the San Francisco Planning Department by presenting an inventory of all equipment with engines over 50 horsepower that will be used and an estimate of the number of hours each piece of equipment will operate to calculate the total number of horsepower-hours for project construction (equipment horsepower multiplied by the hours of operation). The inventory shall also identify which equipment meets Tier 3 NO_X emissions and demonstrate that they constitute 40 percent of the total horsepower-hours. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-market products, and/or other options as they become available.

2 Idling is limited to 5 minutes in Title 13, Section 2485, but the limit has been further reduced to 2 minutes as recommended in the BAAQMD's Additional Control Measures for projects with construction emissions above the threshold.

3 BAAQMD CEQA Guidelines, May 2011, page 8-5.

b. All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NO_X, including all generators meeting Tier 4 standards.

c. All contractors shall use equipment that meets CARBs most recent certification standard for off-road heavy duty diesel engines for a given model year engine.

Cumulative Construction-related Criteria Air Pollutant Analysis

To address cumulative impacts on regional air quality, the BAAQMD has established thresholds of significance for construction-related criteria pollutants and precursor emissions. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to San Francisco Bay Area Air Basin's existing air quality conditions. If daily average or annual emissions exceed these thresholds, the project would result in a cumulatively significant impact. As indicated in Table 5 above, construction-related criteria pollutant and precursor emissions associated with the proposed project would exceed the BAAQMD significance threshold for NO_X. With implementation of Mitigation Measures M-AQ1a (BAAQMD Basic Construction Measures) and M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction), the SABPL project's emissions would be reduced, but not to a less-than-significant level. Therefore, even with implementation of mitigation, the SABPL project's contribution (including Pumping Variants 1 and 2) to cumulative air quality impacts related to criteria pollutants and precursor emissions would remain cumulatively considerable (significant and unavoidable).

Operational Criteria Air Pollutant Analysis

Once the proposed improvements are completed, the SFPUC would continue to use the existing San Antonio Pipeline to move water into and out of San Antonio Reservoir; discharges from the reservoir to San Antonio Creek would occur solely through the existing outlet structure and discharge facility at the base of Turner Dam. With the proposed project, planned and emergency discharges from the Hetch Hetchy system that are currently routed to San Antonio Creek would be routed to Pit F3-East via the backup pipeline. Like the existing condition, the SFPUC would continue to use the existing San Antonio Pump Station to pump quality-impaired Hetch Hetchy water to San Antonio Reservoir (when flows are less than 160 mgd) and to pump water from the reservoir to the SVWTP. Unlike the existing condition, the SFPUC would operate new pumping facilities at the discharge facility at Pit F3-East, in Pit F3-West, and at the Alameda Creek Pump Station, and a LPG-powered portable emergency generator (150 kW) would be used to power the new chemical facility during power outages. The emergency generator would be a new direct source of emissions and would require a permit to operate from the BAAQMD. Based on an assumed one-hour test per week, direct operational emissions have been estimated and are presented in **Table 6** assuming full power (150 kW) operations during each generator test. The estimated fuel consumption rate for a 150 kW LPG-powered generator was obtained from a generator supplier and is based on the consumption rate of the Generac Guardian Elite Model VIRQT15068LPV generator (see specifications sheet in Appendix B). Other suppliers reported almost identical consumption rates. Fuel use is reported to be 11.72 gallons per hour (431.3 cubic feet per hour) at half power and 22.57 gallons per hour (830.6 cubic feet per hour) at full power or load for a 150 kW LPG-powered generator.

TABLE 6
PROJECT OPERATIONAL CRITERIA POLLUTANT EMISSIONS

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Emission Factor (grams/kW hour)	0.10	0.12	0.08	0.08
	Average Daily Emissions (lbs/day)			
LPG-Powered (150 kW) Emergency Generator (one hour per week)[a]	0.033	0.040	0.026	0.026
BAAQMD CEQA Significance Thresholds	54	54	82	54
	Average Annual Emissions (tons/year)			
LPG-Powered (150 kW) Emergency Generator (52 hours per year)	0.0009	0.0010	0.0007	0.0007
BAAQMD CEQA Significance Thresholds	10	10	15	10

NOTE:
[a] Average daily emissions = one-hour test emissions per week, divided by 7 days per week

SOURCE: SCAQMD, Default Emission Factors for Propane Engines, 2007 (see Appendix B).

To evaluate worst-case conditions, the weekly one-hour test was assumed to be at 100 percent load. Emissions associated with generator testing were calculated as follows:

- Emissions (pounds per test day) = EMFAC (pounds per gallon) x 22.57 gallons per hour x 1 hour per day
- Average Daily Emissions = Emissions (pounds per test day) / 7 (once per week)

Emission factors for propane combustion in the above Model QT150A generator were obtained from Generac. The specifications did not include a particulate matter emissions factor. Exhaust particulate emissions for LPG combustion are stated in the EPA NONROAD computer model to be 0.06 grams/brake-power-hour. Anticipated operational emissions for generator testing are shown in **Table 6**. Hourly and annual emissions would be well below BAAQMD CEQA thresholds. Since the proposed LPG generator would replace an existing 100-kW diesel generator, net increases in criteria pollutants associated with testing and operation would be even less than indicated in this table.

After completion of construction activities, the proposed facilities and improvements would require periodic operations review and maintenance, similar to existing conditions, and would not generate a significant number of new vehicle trips. The number of trips related to supply deliveries with the project would be the same or similar when compared to existing conditions. Thus, impacts related to criteria pollutant emissions from vehicle trips during operation would be less than significant.

Operation of the proposed pumping facilities would not be a new source of indirect air emissions as a result of increased electricity demand because the primary source of electrical energy for the proposed facilities would be hydroelectric power. Therefore, no regional increase in combustion-related criteria air pollutants is expected to result from project implementation (or implementation of

Pumping Variants 1 and 2) due to increased electrical demand associated with operation of project facilities, and no impact would result.

Except for the emissions associated with maintenance of the LPG-powered emergency generator and the infrequent use of this generator during power outages, the proposed operation would not result in increased air quality emissions. The backup pipeline, new chemical facility, discharge facility at Pit F3-East, and the Alameda Creek Pump Station would require periodic operations review and maintenance, similar to existing conditions, and would not generate a significant number of new vehicle trips. With the proposed project, the number of trips related to supply deliveries would be the same or similar to existing conditions. Therefore, air pollutant emissions associated with vehicle trips for the proposed project as well as Pumping Variants 1 and 2 would remain the same as under existing conditions.

Cumulative Operational Criteria Air Pollutant Analysis

To address cumulative impacts on regional air quality, the BAAQMD has established thresholds of significance for operational criteria pollutants and precursor emissions. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to San Francisco Bay Area Air Basin's existing air quality conditions. If daily average or annual emissions exceed these thresholds, the project would result in a cumulatively significant impact. As indicated in Table 6 above, operational criteria pollutant and precursor emissions associated with the proposed project would not exceed the BAAQMD's significance thresholds. Therefore, the SABPL project's contribution to cumulative air quality impacts related to emissions of ozone, PM_{10}, and $PM_{2.5}$ would not be cumulatively considerable (less than significant). This conclusion is also applicable to Pumping Variants 1 and 2.

Health Risk Analysis

The SABPL project would construct several new water system facilities and improvements to provide reliable conveyance capacity and increased flexibility for managing planned and emergency discharges of water from the Hetch Hetchy system. Construction equipment, trucks, worker vehicles, and ground-disturbing activities would generate direct emissions of criteria air pollutants and precursors, and diesel-operated equipment/vehicles/generators would result in emissions of diesel particulate matter (DPM), a toxic air contaminant (TAC). Operation of the proposed facilities would also generate TAC emissions related to the proposed 150-kW LPG-powered emergency generator for the new chemical facility, and possibly from the use of fluoride at the new chemical facility. Vehicle trips associated with facility maintenance and periodic inspections would be similar to the existing condition and are not anticipated to result in an increase in TAC emissions.

Screening Level Construction-related Health Risk Analysis

Combustion emissions from construction equipment and vehicles (i.e., heavy equipment and delivery/haul trucks, worker commute vehicles, air compressors, and generators) would be generated during project construction and could expose sensitive receptors to DPM and other TACs.

Offsite DPM and other TAC emissions include those generated by construction worker vehicles and by diesel haul/delivery trucks used during construction, particularly trucks used to transport excavated materials from the project area and clean fill and other materials to the project area. TAC emissions from construction worker commute trips would be minor compared to the emissions generated by construction equipment and haul/delivery trucks. In addition to these offsite emissions, diesel-powered equipment would release DPM along the internal construction site access routes. Combustion and exhaust contain a number of different TACs and a speciation list with associated risk factors is listed in Appendix C. DPM exhaust emissions from off-road heavy equipment and from on-road haul trucks operating within the project area were calculated using currently accepted calculation protocols.[4] BAAQMD CEQA Guidelines currently specify use of the OFFROAD2007 computer module to estimate off-road equipment exhaust, and the EMFAC2007 module for on-road trucking. As discussed above in Section III, Criteria Pollutants, the CARB no longer supports use of the OFFROAD module because the module is known to be over-predictive, but no replacement module has been released. Thus, consistent with the BAAQMD CEQA Guidelines, the OFFROAD module in the URBEMIS computer model was used to estimate carcinogenic DPM emissions during project construction. The BAAQMD has developed screening tables, the most recent of which are dated May 2011, for air toxics evaluation during construction to determine if a proposed project is sufficiently limited and setbacks are adequate to ensure that impacts to sensitive receptors from exposure to carcinogenic DPM emissions during project construction are less than significant. The screening tables, however, were developed primarily for residential, commercial, and industrial park development and do not correlate well with the proposed construction activities for the SABPL project. In addition, the screening tables indicate that, even for a small non-residential development project, a setback distance of 100 meters (328 feet) is needed to ensure impacts associated with excess cancer risk are less than significant. The SFPUC watershed keeper's residence is less than 225 feet from the project area and Calaveras Road, and less than 300 feet from the access road leading to the new chemical facility site, Staging Area A, and the southern terminus of the backup pipeline. Therefore, the potential health risk at this receptor cannot be screened out without further analysis and a more detailed health risk screening analysis is required and presented below.

The BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* (BAAQMD, 2011c) were used to complete this screening-level health risk assessment. The BAAQMD recommends a two-tiered approach for screening-level health risk assessments: a screening-level dispersion model is initially applied to project emissions using generally over-predictive assumptions and if the predicted health risk is not within acceptable levels, then a more sophisticated dispersion modeling is necessary.

A screening-level individual cancer analysis was conducted using the U.S. EPA SCREEN3 computer model to determine the maximum inhalation cancer risk from project-related construction activities at the closest sensitive receptor (the SFPUC watershed keeper's residence located 225 feet east of the project area). The model output for this analysis is included in Appendix B. Emissions within each source area were assumed uniformly distributed by off-road equipment and truck mobility. The

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4 Haul truck travel assumptions used in this analysis: 25 percent of trucks would travel offsite to either Vasco or Altamont Landfills with average trip lengths of 25 miles (50 miles round trip), while 75 percent of trucks would remain onsite traveling an average of one-half mile (one mile roundtrip) within the site.

BAAQMD's recommended methodology notes that the U.S. EPA SCREEN3 model output is a peak one-hour concentration and that a screening-level conversion factor of 0.1 is typically applied to convert the peak hour to an annual average. The recommended methodology uses the "full meteorology" option to make this conversion. However, the model predicts that area source maxima for near-ground level releases occur at night with near calm winds. Nighttime project construction would occur for a total of six weeks. During this time, there would be very limited equipment operations during the nighttime hours due to mitigation that would be implemented to minimize noise impacts at nearby receptors (Mitigation Measure M-NO-1 [Administrative and Source Controls] under Impact NO-1 in Section 5.7, Noise and Vibration of the SABPL project EIR). The BAAQMD's recommended methodology (specifically Table 8 in the referenced document) only allows stability ranging from neutral (Pasquill "D") to very unstable (Pasquill "A") for daytime dispersion conditions. Atmospheric conditions for dispersion of construction–related DPM emissions were therefore assumed to be best characterized by slightly unstable (Pasquill "C") and light winds (2 to 3 meters per second) with the model searching for the direction that produces the maximum impact.

The dose estimation for the DPM exposure pathway for DPM inhalation depends upon the daily breathing rate, the exposure frequency, and the exposure duration. That dose is then compared to the acute or chronic inhalation health risk:

Dose = BR x EF x ED / AT

Where BR= breathing rate
EF = exposure frequency
ED= exposure duration
AT= averaging time

The excess cancer risk associated with DPM inhalation is expressed as follows:

Risk = DPM Concentration x Dose x CPF x ASF

Where the DPM concentration is the concentration predicted by SCREEN3, the dose is the adjusted inhalation factor, CPF is the cancer potency factor for DPM and ASF is the age-specific sensitivity factor. Within the limits of screening level accuracy, the equation above reduces to:

Risk = [(Conc. X 300 x 10^{-6}) x T1 + 0 x T2] / 70

Where T1 = construction duration in years
T2 = 70 - T1 (no construction), and
Conc. = annual average exposure during construction

If infants are presumed exposed to DPM for the approximately 21-month construction duration, their ASF factor is 10. Ages 2-16 have an ASF of 3, and adults have an ASF of 1. In the absence of information to the contrary, an ASF of 10 was assumed for the maximally exposed individual (MEI). Equipment exhaust pollution also contains contaminants that may have non-cancer health effects. Such effects may occur from long-term exposure (chronic) or short-term effects (acute). The standard non-cancer risk representation from exhaust pollutants is in terms of a "health index" (HI). HI is calculated by comparing peak concentrations (acute or chronic) to a reference exposure level (REL). RELs are published by the California Office of Environmental Health Hazard and Environmental Assessment (OEHHA). HI is thus calculated by:

HI = Conc. / REL

An HI of less than 1.0 is considered less-than-significant. The chronic REL for DPM is 5.0 $\mu g/m^3$. However, there is no acute REL for DPM. The acute HI for diesel is therefore evaluated relative to the total organic compounds (TOCs) in diesel exhaust for which there are RELs.

Construction activities relative to the closest sensitive receptor were allocated to three primary source areas:[5]

- *Pits F3-East and F3-West Vicinity* – Includes construction of the new discharge facility at Pit F3-East, cutoff wall around Pits F3-East and F3-West, Alameda Creek Pump Station, transfer pipeline, and dewatering facilities, and use of Staging Area D.
- *Calaveras Road Vicinity* – Includes installation of the backup pipeline and the 12-inch-diameter water pipeline to the town of Sunol, spoils placement at the North Spoils Site, and use of Staging Areas B and C.
- *San Antonio Pump Station Vicinity* – Includes construction of the new chemical facility and use of Staging Area A.

Emissions within each source area were assumed uniformly distributed by off-road equipment and truck mobility. The incremental contribution from each source area was summed to calculate a peak one-hour DPM exposure. The annual DPM exposure was estimated using a conservative estimate that the annual average equals one-tenth of the peak hour. Estimated incremental emissions contributions from each source area are presented in **Table 7**. As indicated in Table 7, the SABPL project's construction-related DPM exposure and associated health risks at the closest receptor, the SFPUC watershed keeper's residence east of Calaveras Road, would not exceed the BAAQMD's cancer and chronic non-cancer risk thresholds, and therefore, this impact would be less than significant. This same significance determination applies to Pumping Variants 1 and 2.

Acute exposure health risk derives from the total organic compounds (TOCs) contained in the total organic fraction of diesel exhaust. One-hour TOC exposures at the nearest sensitive receptor (SFPUC watershed keeper's residence) were calculated from the ratio of TOC to $PM_{2.5}$ in the BAAQMD emission inventory for off-road heavy equipment. In the latest published inventory (2008), the average daily emissions were as follows:

TOC: 43.23 tons/day

$PM_{2.5}$: 5.60 tons/day

5 The primary source areas identified as Pits F3-East and F3-West Vicinity, Calaveras Road Vicinity, and San Antonio Pump Station Vicinity, correlate to Source Areas 3, 2, and 1, respectively, in Appendix B.

TABLE 7
CONSTRUCTION-RELATED CANCER RISK AND CHRONIC NON-CANCER HEALTH RISK AT THE CLOSEST SENSITIVE RECEPTOR OR MEI (SFPUC WATERSHED KEEPER'S RESIDENCE 225 FEET EAST OF CALAVERAS ROAD)

Source Area	Estimated Peak Hour Emission Contribution
Pits F3-East and F3-West Vicinity	0.03614 μg/m³
Calaveras Road Vicinity	0.06317 μg/m³
San Antonio Pump Station Vicinity	0.10660 μg/m³
Parameter	**$PM_{2.5}$ Exposure, Cancer Risk, and Non-Cancer Chronic Hazard Index from Project Construction Activities**
One-Hour $PM_{2.5}$	0.20591 μg/m³
Annual Average $PM_{2.5}$	0.02059 μg/m³
BAAQMD Annual Average $PM_{2.5}$ Significance Threshold	0.3 μg/m³
Exceeds Threshold?	No
ASF Weighted Concentration (Annual x 10)	0.20591 μg/m³
70-year Weighted Average (Annual Weighted x 1.75 / 70)	0.00051475 μg/m³
Infant Cancer Risk[a] (ASF = 10)	1.54×10^{-6}
Youth Cancer Risk[a] (ASF = 3)	0.46×10^{-6}
Adult Cancer Risk[a] (ASF = 1)	0.15×10^{-6}
BAAQMD Cancer Risk Significance Threshold	Excess Cancer Risk >10×10^{-6}
Exceeds Threshold?	No
Chronic Non-Cancer Hazard Index (0.02059 (Annual) / 5)	0.004
BAAQMD Chronic Non-Cancer Significance Threshold	Hazard Index >1.0
Exceeds Threshold?	No
Acute Non-Cancer Hazard Index	0.0233
BAAQMD Acute Non-Cancer Significance Threshold	Hazard Index >1.0
Exceeds Threshold?	No

NOTES:
$PM_{2.5}$ represents combustion $PM_{2.5}$ from DPM and does not include fugitive dust.
μg/m³ = microgram per cubic meter
[a] When age-sensitivity factors are included, the cancer risk would vary depending on whether there are infants, youths, or only adults at the SFPUC watershed keeper's residence.

SOURCE: U.S. EPASCREEN3 Computer Model (see Appendix B for model output).

Ambient TOC exposure was calculated as follows:

Hourly TOC = 43.23 / 5.60 (= 7.72) x Hourly $PM_{2.5}$

The SCREEN3 model predicted a maximum one-hour $PM_{2.5}$ concentration of 0.20591 μg/m³ at the SFPUC watershed keeper's residence. The maximum TOC is:

Hourly TOC = 7.72 x 0.20591 μg/m³ = 1.59 μg/m³

To provide a conservative analysis, all equipment TOCs were assumed to be air contaminants (whether acute, chronic or both).

Table 8 lists specific organic gases comprising TOC exposure (using the speciation table in Appendix C) and corresponding acute reference exposure levels (RELs). Acrolein and formaldehyde create very small acute inhalation health risks, the contribution from all other TOCs would be negligible. As indicated in this table, the project's construction-related TOC exposure and associated health risks at the closest occupied receptor, the SFPUC watershed keeper's residence, would not exceed the BAAQMD's acute non-cancer risk threshold and therefore would be less than significant. This same significance determination applies to Pumping Variants 1 and 2.

TABLE 8
CONSTRUCTION-RELATED SPECIATED ACUTE NON-CANCER HEALTH RISK AT SFPUC WATERSHED KEEPER'S RESIDENCE EAST OF CALAVERAS ROAD

Organic Gas	TOC Fraction[a]	Concentration (μg/m³)	Acute REL (μg/m³)	Hazard Index
Acetaldehyde	0.2457	0.3911	470	0.00084
Acrolein	0.0106	0.0169	2.5	0.00678
Benzene	0.0584	0.0929	1,300	0.00007
1,3 Butadiene	0.0682	0.1085	–	–
Ethylbenzene	0.0034	0.0054	–	–
Formaldehyde	0.541	0.8619	55	0.01568
Hexane	0.0084	0.0135	–	–
Naphthalene	0.0062	0.0098	–	–
PAHs (no Naph)	0.0114	0.0181	–	–
Toluene	0.0331	0.0527	37,000	<0.00002
Xylene	0.0331	0.0212	22,000	<0.00002
Total				**0.02336**
BAAQMD Acute Non-cancer CEQA Significance Threshold				Hazard Index >1.0

NOTES: "–" = chronic REL only; acute REL does not apply. PAHs = polycyclic aromatic hydrocarbons.
[a] Assumes conservatively that all TOCs are toxic air contaminants (acute or chronic).
SOURCE: SCAQMD, 2010.

Cumulative Screening Level Construction-related Health Risk Screening Analysis

To address cumulative impacts on local air quality conditions due to toxic air contaminant (TAC) emissions during project construction, the BAAQMD recommends assessing impacts within 1,000 feet of the proposed project, taking into account both individual and nearby cumulative sources (i.e., proposed project plus existing and foreseeable future projects). The BAAQMD has established the following cumulative thresholds of significance that should be applied to the project in combination with all identified sources within this 1,000-foot radius zone of influence: 100 excess cancer cases in a million; 1.0 chronic and acute non-cancer hazard index; and 0.8 μg/m³ of $PM_{2.5}$ annual average from all local sources.

The SABPL project would result in an increase in emissions of $PM_{2.5}$ during construction from haul and delivery trucks. Although project-related health risks associated with DPM exposure would be less than significant (as indicated in Table 7 for $PM_{2.5}$), it is possible that cumulative increases in DPM emissions could occur due to concurrent implementation of a number of planned construction projects. The maximum exposed individual (MEI) for this project is located at the SFPUC watershed keeper's residence located on the east side of Calaveras Road near the Alameda East Portal. This analysis conservatively assumes this residence would be occupied during project construction activities.

Cumulative health risks could result from the SABPL project's construction activities, simultaneous construction of other projects in the vicinity, plus any existing identified risk sources within the project vicinity. Cumulative risk and hazard impacts at the MEI from cumulative construction projects in the Sunol Valley are shown in **Table 9**.

TABLE 9
CUMULATIVE CONSTRUCTION ACTIVITY RISK AND HAZARD AT MAXIMALLY EXPOSED INDIVIDUALS

Risk and Source	SFPUC Watershed Keeper East of Calaveras Road (cases in a million)	BAAQMD Threshold (cases in a million)
***Excess Cancer Risk*:**		
Existing SFPUC Generator (100-kW)	1.67	
I-680 Traffic at a Distance of 8,300 feet to the North	6.40	
SABPL Project Construction (ASF = 10)	1.54	
Other SFPUC Construction Projects	90.50	
Cumulative or Combined Cancer Risk	100.11	100
***Chronic Hazard Index*:**		
Existing SFPUC Generator (100-kW)	0.0056	
I-680 Traffic at a Distance of 8,300 feet to the North	0.0046	
SABPL Project Construction	0.0040	
Other SFPUC Construction Projects	0.11	
Cumulative Chronic Hazard Risk	0.1242	10
***$PM_{2.5}$ Increment ($\mu g/m^3$)*:**		
Existing SFPUC Generator (100-kW)	0.0030	
I-680 Traffic at a Distance of 8,300 feet to the North	0.0410	
SABPL Project Construction	0.0206	
Cumulative	0.0646	0.8 $\mu g/m^3$

NOTE: Derivations of risks are described in text above.

Potentially concurrent construction projects include the SFPUC Calaveras Dam Replacement project (construction is anticipated to begin in late 2011), the SFPUC New Irvington Tunnel (NIT) project (currently under construction), and the SFPUC Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir (SVWTP Expansion) project (currently under construction). The estimated project-specific excess cancer risks and chronic non-cancer hazard index for these three approved cumulative projects are presented below. In addition, it is possible that construction of the proposed SFPUC Upper Alameda Creek Filter Gallery (Filter Gallery) project would also overlap with construction of the SABPL project. However, this project is located more than 1,000 feet from the

SFPUC watershed keeper's residence and would not contribute to cumulative construction risk and hazard impacts. Environmental review for the Filter Gallery project is currently underway.

- Based on the prior analysis conducted for the Calaveras Dam Replacement project (San Francisco Planning Department, 2011) and BAAQMD guidance, the excess cancer risk would be 52 in a million for an infant and chronic non-cancer hazard index would be 0.06 at the SFPUC watershed keeper's residence on the east side of Calaveras Road, the closest sensitive receptor to project-related construction vehicle and truck traffic.

- Based on the prior analysis conducted for the NIT project (San Francisco Planning Department, 2009a) and BAAQMD guidance, the excess cancer risk would be 36 in a million for an infant and the chronic non-cancer hazard index would be 0.05 at the Maximally Exposed Individual (not specified) due to project-related construction vehicle and truck traffic.

- Based on prior analysis conducted for the SVWTP Expansion project (San Francisco Planning Department, 2009b) and BAAQMD guidance, the excess cancer risk would be 2.5 in a million for an infant at the SFPUC watershed keeper's residence on the east side of Calaveras Road due to project-related construction vehicle and truck traffic.

The combined excess cancer risk for infants associated with simultaneous construction of these three SFPUC projects on the Maximally Exposed Individual for the SABPL project (the SFPUC watershed keeper's residence on the east side of Calaveras Road) would be 90.5 cases in a million. The combined chronic hazard index would be 0.11.

In addition to construction emissions associated with the proposed project and other cumulative projects in the Sunol Valley, the BAAQMD also requires that existing stationary and mobile emissions sources within 1,000 feet of the project area (identified in Table 3, above) also be considered. Any potential cumulative health risk would, therefore, derive from project activities plus any existing identified risk sources within the project vicinity. Existing stationary and mobile cumulative emissions sources within 1,000 feet of the project area are identified in Table 3, above. These include the SFPUC's existing diesel-gas-powered emergency generator (Site 15592) and traffic on the I-680 freeway. The BAAQMD has developed risk estimates from each source, but these estimates reflect the maximum health risks at the point of maximum impact. Application of a distance adjustment factor is needed to estimate risks at the MEI location (SFPUC watershed keeper's residence on the east side of Calaveras Road) based on the distance from the source. The distance-adjusted risk values are summarized in Table 9.

The SFPUC operates a 100 kW emergency generator, an emergency standby generator set, and three emergency water pumps at 5555 Calaveras Road (Site 15592). Average daily emissions from these sources (BAAQMD, 2011f) are as follows:

Pollutant	Average Daily Emissions
Benzene	0.0515 lbs/day
Carbon Dioxide	599 lbs/day
Carbon Monoxide	2.51 lbs/day
Diesel Particulate Matter	0.736 lbs/day
Formaldehyde	0.004 lbs/day
Methane	0.020 lbs/day

Pollutant	Average Daily Emissions
Nitrogen Oxides	10.7 lbs/day
Other Organic Compounds	0.841 lbs/day
Other Particulates	0.008 lbs/day
Sulfur Dioxide	0.066 lbs/day
All Others	<0.001 lbs/day

The BAAQMD has conducted a screening-level health risk assessment for these emissions at the point of maximum impact. The BAAQMD has also developed a distance adjustment multiplier (BAAQMD, 2011g, provided in Appendix D) for the screening level cancer risk and chronic hazard index for stationary diesel sources. For the one identified sensitive receptor within 1,000 feet of project-related construction activities (the SFPUC watershed keeper's residence east of Calaveras Road), the following contribution to cumulative impacts may result from Site 15592 (located approximately 200 meters from the SFPUC watershed keeper's residence):

	Maximum Screening Level	Distance Adjustment Factor	Background Levels at MEI (SFPUC Watershed Keeper's Residence)
Excess Cancer Risk (cases per 10^6)	20.93	0.08	1.67
Chronic Hazard Index	0.007	0.08	0.00056
Screening Level PM2.5 ($\mu g/m^3$)	0.038	0.08	0.00304

Roadway risks and hazards cannot be extrapolated using distance adjustment multipliers as for stationary sources used above. The most current BAAQMD exposure risk data from freeway traffic emissions shows the following data at the segment of I-680 closest to the project area (Link 208, south side, 1,000 feet to centerline):

Excess Cancer Risk (per 10^6)	14.0
Chronic Hazard Index	0.01
Acute Hazard Index	0.02
$PM_{2.5}$ ($\mu g/m^3$)	0.089

Inspection of the drop-off curve from as close as 200 meters to 1,000 meters shows a decrease with distance that can be approximated by $14 / (x / 1000)^{0.85}$ (where x is the setback distance). The use of this formula matches the risk value almost exactly as follows (excess risk per one million):

Distance (meters)	Excess Lifetime Cancer Risk (cases per million)	
	BAAQMD Risk Table	Extrapolation Formula
200	52	55
300	39	39
500	26	25
1,000	14	14
Extrapolated to 2,500 meters for SFPUC Watershed Keeper's Residence	-	6.4

Application of the same decay curve to the other health risk parameters at the closest potential sensitive receptor at 8,300 feet (2,500 meters) away produces the following cumulative baseline emissions for the I-680 traffic:

Excess Cancer Risk	6.4 in a million
Chronic Hazard Index	0.01 x 0.459* = 0.0046
$PM_{2.5}$ (μg/m^3)	0.089 x 0.459* = 0.0041

*= $1/(2500/1000)^{0.85}$ distance adjustment

As indicated in Table 9 and the above-described derivations, the combined health risks from all existing sources and potential construction sources within 1,000 feet of the project are 100.11 excess cancer risks per one million; a chronic hazard index of 0.12; and $PM_{2.5}$ concentrations of 0.06. Cumulative health risks at the SFPUC watershed keeper's residence would slightly exceed the BAAQMD's CEQA cumulative significance thresholds of 100 excess cancer cases in a million if emissions from all identified sources occurred simultaneously, but would not exceed the 1.0 chronic and acute non-cancer hazard index and 0.8 μg/m^3 of $PM_{2.5}$ annual average emissions thresholds. Cumulative health risks at this residence could further exceed the cumulative cancer risk threshold of 100 if mobile equipment associated with on-going mining/quarry activities at Pit F6 (associated with the processing operation at Site 16195) is operated during project construction and if other cumulative construction projects occur within the Sunol Valley that are not identified above. However, since the SABPL project's contribution to cumulative health risks would be well below the project-level health risk thresholds of 10 excess cancer cases in a million identified in the BAAQMD CEQA Guidelines, the SABPL project would not contribute considerably to potentially significant cumulative health risks.

Screening Level Operational Health Risk Screening Analysis

The only source of TAC emissions associated with operation of the proposed facilities would be the LPG-powered emergency generator (150 kW portable generator), which would be located at the Sunol Valley Chloramination Facility to provide backup power to new chemical facility during power outages. TACs associated with exhaust emissions from LPG-powered generators would include very small amounts of a variety of TACs. The principal LPG-combustion TACs are formaldehyde, ammonia, and benzene, which have acute non-cancer health risks. Fuel consumption for maximum power output for a one-hour test per week is 22.6 gallons. The BAAQMD has developed TAC emissions-based trigger levels for stationary sources. These trigger levels have been applied in this analysis as screening criteria for the proposed emergency generator. If the trigger levels are not exceeded, the proposed LPG – powered emergency generator would not be expected to result in a significant health risk. If the trigger levels are exceeded, additional refined modeling would be required to determine the resulting health risk to nearby sensitive receptors.

The South Coast Air Quality Management District (SCAQMD, 2010) has published TAC emission factors for LPG combustion in emergency generators. Table B-3 of the SCAQMD's reporting protocols lists 22 TACs that may be released from a 4-stroke, 22 rich-burn LPG-powered generator (see Appendix C). Of those 22 compounds, the BAAQMD has adopted trigger levels for 20 of them.

Table 10 lists the hourly and annual emission levels of those TACs from generator testing compared to the applicable trigger levels. No acute or chronic trigger levels would be exceeded by generator exhaust. Therefore, health risks associated with testing and maintenance of the proposed generator would pose a less-than-significant health risk.

For all TACS to be released from a permitted source, the BAAQMD has developed guidelines to determine whether estimated emissions represent a significant health risk and these guidelines are contained in Regulation 2, Rule 5, New Source Review for TACs. The BAAQMD has developed emissions-based trigger levels, and if these levels are exceeded, a more detailed impact analysis is required. **Table 10** shows that TAC emissions associated with testing of the LPG-powered emergency generator would reach or exceed applicable trigger levels. Therefore, no further analysis of operational TAC emissions resulting from project implementation is required.

TABLE 10
EMERGENCY GENERATOR OPERATIONAL TAC EMISSIONS

TAC	Emission Factors (lbs/ 1,000 gallons)	Hourly Emissions (lbs)	BAAQMD Acute Trigger Level (lbs/hour)	Annual Emissions (lbs)	BAAQMD Chronic Trigger Level (lbs/year)
Acetaldehyde	0.252	0.006	1.0	0.296	3.8
Acrolein	0.238	0.005	0.0055	0.280	14.0
Ammonia	0.300	0.007	7.1	0.352	7,700
Benzene	0.143	0.003	2.9	0.168	3.8
Carbon Tetrachloride	0.0016	<0.001	4.2	0.002	2.5
Chloroform	0.00124	<0.001	0.33	0.001	2.0
Ethylbenzene	0.00224	<0.001	-	0.003	43.0
Ethylene Dibromide	0.00193	<0.001	-	0.002	1.5
Ethylene Dichloride	0.00102	<0.001	-	0.001	5.3
Formaldehyde	1.86	0.042	0.12	2.186	18.0
Methanol	0.277	0.006	62.0	0.326	150,000
Methylene Chloride	0.00373	<0.001	31.0	0.004	110.0
Naphthalene	0.00879	<0.001	-	0.103	3.2
Styrene	0.00108	<0.001	46.0	0.001	35,000
1,1,2,2-Tetrachloroethane	0.00229	<0.001	-	0.003	1.9
Toluene	0.0505	0.001	52.0	0.059	12,000
1,1,2-Trichloroethane	0.00138	<0.001	-	0.002	6.6
Vinyl Chloride	0.00065	<0.001	400.0	0.001	1.4
Xylene	0.0176	<0.001	49.0	0.021	27,000

NOTE: The BAAQMD's Regulation 2, Rule 5, *New Source Review of Toxic Air Contaminants*, and BAAQMD *CEQA Guidelines and Significance Thresholds* specify that a cancer risk greater than 10 in a million or acute/chronic hazard index greater than 1.0 is a significant impact.

SOURCE: SCAQMD, 2010 for LPG speciation for TACs subject to BAAQMD Trigger Levels; BAAQMD, Regulation 2 Permits, Rule 5, New Source Review of TACs, Table 2-5-1, for Trigger Levels.

Source parameters for the proposed standby generator (exhaust velocity, stack height, stack temperature, etc.) were obtained from a portable emergency generator supplier (see Appendix B). A screening level dispersion analysis for generator exhaust was conducted consistent with BAAQMD risk assessment guidelines (BAAQMD, 2011c). As a worst-case assumption, LPG particulate emissions were assumed to have the same inhalation risk factor as DPM.[6] Small risk contributions from gaseous pollutants with detectable emissions and established unit risk factors (acetaldehyde, benzene, and formaldehyde) were estimated as follows:

RISK(i) = RISK (PM) x EMIS(i) / EMIS(PM) x URF(i) / 300

Where EMIS is the emission rate and URF(i) is the unit risk factor of the "i" species

The screening level dispersion model (U.S. EPA SCREEN3) was run for one hour of generator testing using the reported particulate emission factor for LPG combustion. Calculated levels of gaseous pollutants were determined from the speciated mass risk ratio of gaseous to particulate emissions.

Annual average exhaust $PM_{2.5}$ exposure is calculated at the SFPUC watershed keeper's residence as follows:

Peak Hour = 1.039 $\mu g/m^3$
Peak to Annual = 0.1 x Peak = 0.1039 $\mu g/m^3$
Testing to Total = 52 / 8760 x 0.1039
Annual Average = 0.00062 $\mu g/m^3$

The annual average $PM_{2.5}$ impact would be well below the BAAQMD CEQA significance threshold of 0.3 $\mu g/m^3$. The $PM_{2.5}$ dispersion calculation result was then applied to all gaseous exhaust pollutants that have published unit risk factors. The results of the risk screening modeling are shown in **Table 11**.

TABLE 11
EXCESS INDIVIDUAL CANCER RISK FROM WEEKLY GENERATOR TESTING (CASES PER MILLION)

Source	SFPUC Watershed Keeper's Residence
Particulate Matter	0.315
Acetaldehyde	0.004
Benzene	0.017
Formaldehyde	0.054
Total	0.390
BAAQMD Cancer Risk Significance Threshold	10.0

6 LPG is considered a much cleaner fuel than diesel. It does, however, emit small amounts of toxic air contaminants such as benzene and 1,3-butadiene when burned. Since particulate emissions from LPG combustion are very small and toxicity data from LPG-related particulates is very limited, a conservative assumption that LPG toxicity is equivalent to DPM toxicity is used in this analysis.

Hydrogen fluoride is stored at the existing fluoride facility at the south end of the Sunol Valley Chloramination Facility. The fluoride is conveyed to existing water facilities through underground chemical feed lines. The proposed new chemical feed line that would extend between the existing fluoride facility to the new chemical facility would not increase the potential exposure of workers or nearby residents to health risks associated with this chemical. In addition, current operational and maintenance practices for the system would continue at the same levels following completion of the proposed project, including regularly scheduled maintenance of project facilities. Therefore, air pollutant emissions associated with maintenance traffic would remain the same as under existing conditions.

Cumulative Screening Level Operational Health Risks

The SABPL project would result in an increase in emissions of TOC and particulate matter when the LPG-powered emergency generator at the new chemical facility is operated. Two sensitive receptors in the Sunol Valley, the Garcia residence and SFPUC watershed keeper's residence east of Calaveras Road, could be affected as described above. However, since the SFPUC watershed keeper's residence is closer to Calaveras Road and operational sources of emissions, it would be the maximally-exposed individual (MEI). It is possible that significant cumulative increases in DPM emissions could occur from operation of the LPG-powered emergency generator in combination with other emissions sources located within 1,000 feet of the project area or MEI. The only other cumulative project within 1,000 feet of the SABPL project area and the MEI is the proposed Filter Gallery project, which would share the Alameda Creek Pump Station with the SABPL project. Despite the potential for facilities to be shared between the two projects, the SFPUC has not made a decision regarding the primary source of power for the Filter Gallery project. Power for the Filter Gallery project would either be from: (a) the HHWP Calaveras Substation at Calaveras Road, just south of San Antonio Creek, or (b) the PG&E Sunol Substation at Calaveras Road, just south of I-680. If SFPUC decides to connect to the HHWP Calaveras Substation for power supplies, which draws from hydroelectric power, no increase in combustion-related criteria air pollutants is expected to result from Filter Gallery project operations. If the SFPUC decides to connect to the PG&E Sunol Substation for power supplies, Filter Gallery project operations could result in an increase in combustion-related criteria air pollutants. However, because PG&E power is drawn from a regional grid, it is not possible to ascribe the electrical energy consumption emissions to any particular air basin (or to accurately quantify them because the grid draws from a variety of resources such as coal, natural gas, wood/agricultural waste, etc., each of which has different emission levels per megawatt).

When operational emissions associated with the SABPL project are considered with other existing permitted and roadway emissions sources within 1,000 feet of the project (listed in Table 3), the cumulative operational emissions at the maximally-exposed individual (MEI) would be well below the BAAQMD cumulative significance thresholds for cancer and non-cancer risks, as shown in **Table 12**. Cumulative operational emissions would be even lower when the existing SFPUC 100-kW diesel generator is replaced with the proposed 150-kW LPG generator, as indicated in Table 12. Operation of the SABPL project's LPG-powered emergency generator would result in very small amounts of LPG-combustion TACs. The SABPL project and other cumulative sources shown in Table 12 would not

TABLE 12
RISK AND HAZARDS FROM CUMULATIVE SOURCES
AT THE MAXIMALLY EXPOSED INDIVIDUAL (SFPUC WATERSHED KEEPER'S RESIDENCE)

Site	Facility Name	Street Address	City	Excess Cancer Risk (Cancer Cases in a Million)	Chronic Hazard Index	PM2.5 (μ/m³)
-	Proposed LPG-powered Emergency Generator (Source Type: 150 kW Emergency Generator)	5555 Calaveras Road	Sunol	0.32	<0.01	0.00062
15592	Existing Diesel-powered Emergency Generator (Source Type: 100 kW Emergency Generator)	5555 Calaveras Road	Sunol	1.67	0.0056	0.00304
I-680 at a Distance of 8,300 Feet to the North			Sunol	6.4	0.0046	0.0041
Combined Risks from Permitted Stationary Sources and Mobile Sources				8.39	0.0202	0.008
Adjusted Combined Risks with Removal of the 100-kW Diesel Emergency Generator (Site 15592) after Installation of 150-kW LPG Generator				6.72	0.0146	0.005
BAAQMD Cumulative Significance Thresholds				100	10	0.8

SOURCES: BAAQMD, 2011a, 2011b, 2011d, 2011e, 2001g.

exceed the BAAQMD risk thresholds; therefore, the cumulative operational risk and hazards at the MEI would be less than significant. This same conclusion applies to Pumping Variants 1 and 2.

Conclusions

Criteria Air Pollutants

The SABPL project's estimated peak daily NO_X emissions would substantially exceed BAAQMD CEQA thresholds, a significant impact for the proposed project as well as Pumping Variants 1 and 2. Implementation of **Mitigation Measures M-AQ-1a (BAAQMD Basic Construction Measures)** and **M-AQ-1b (BAAQMD Additional Construction Measures for NO_X Reduction)**, would reduce the project's NO_X emissions, but mitigated peak daily emissions would still exceed the BAAQMD significance thresholds. Therefore, even with implementation of mitigation, the SABPL project's construction-related criteria pollutant emissions would remain significant and unavoidable. Since the SABPL project's NO_X emissions could not be reduced to less-than-significant levels, the SABPL project's contribution to cumulative air quality impacts related to criteria pollutant and precursor emissions would also be cumulatively considerable (significant and unavoidable).

The SABPL project would add pumping facilities and an LPG-powered emergency generator, but estimated operational emissions associated with these new facilities for the proposed project as well as Pumping Variants 1 and 2 were determined to be less than significant when compared to BAAQMD significance thresholds. The SABPL project's emissions associated with maintenance and operation of other project facilities would remain the same as under existing conditions.

Health Risk Screening Analysis

The project's construction-related DPM exposure and associated health risks at the closest sensitive receptor (maximally-exposed individual, MEI) for the proposed project, as well as for Pumping Variants 1 and 2, would not exceed the BAAQMD's adopted excess cancer risk threshold as well as the chronic and acute non-cancer risk thresholds, and therefore, would be less than significant. Cumulative increases in DPM emissions could result from simultaneous construction of several SFPUC projects in the Sunol Valley in conjunction with emissions generated by existing permitted stationary sources, but the project's contribution to cumulative increases in risks and hazards at the MEI were determined to be less than cumulatively considerable (less than significant) since the project's contribution would be well below the BAAQMD's project-level health risk thresholds.

The only source of TAC emissions associated with operation of the proposed facilities would be the LPG-powered emergency generator, and cancer and non-cancer health risks associated with generator operation would remain well below the BAAQMD thresholds. Therefore, health risks associated with testing and maintenance of the proposed generator would pose a less-than-significant health risk. Cumulative operational emissions from the SABPL project in addition to other existing permitted and roadway emissions sources would be well below the BAAQMD cumulative significance thresholds for cancer and non-cancer risks at the MEI. Therefore, cumulative operational risk and hazards at the project MEI would be less than significant.

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APPENDIX A
Approved Scope of Work

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Memorandum

To: Kelly White, ESA

From: Joyce Hsiao, Valerie Geier, and Hans Giroux, Orion Environmental Associates

Date: January 10, 2011, revised February 25, 2011, revised March 7, 2011, revised March 8, 2011, revised March 23, 2011

Subject: Scope of Work for CEQA Air Quality Technical Report – SFPUC San Antonio Backup Pipeline Project (CS-954A)

This memorandum presents the proposed scope of work for preparation of the Air Quality Technical Report for the San Francisco Public Utilities Commission's (SFPUC) San Antonio Backup Pipeline Project (SABPL) as required by the San Francisco Planning Department, Major Environmental Analysis (MEA) department's guidelines for compliance with California Environmental Quality Act (CEQA) documentation and consistent with the 2010 Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines (BAAQMD, 2010a). This scope of work is broken down into the following sections:

1. Project Description Assumptions
2. Project Setting Assumptions (including project area map showing sensitive receptors and existing major emissions sources in the project area)
3. Proposed Methodology and Level of Analysis
4. Contents of the Air Quality Technical Report
5. Assumptions for Reviewing and Finalizing the Technical Report

1. Project Description Assumptions

The proposed San Antonio Backup Pipeline (SABPL) project is located in an unincorporated area of Alameda County, extending roughly 2 miles along the west side of Calaveras Road, south of the intersection of Interstate 680 and State Route 84. The SABPL project would construct several new water system facilities and improvements to provide reliable conveyance capacity and increased flexibility for managing planned and emergency discharges of water from the Hetch Hetchy system. Construction equipment, trucks, worker vehicles, and ground-disturbing activities would generate direct emissions of criteria air pollutants and precursors, and diesel-operated equipment/vehicles/generators would result in emissions of diesel particulate matter, a toxic air contaminant (TAC). Operation of the proposed facilities would also generate TACs emissions related to one liquid propane-powered backup generator for the new chemical facility), and possibly from the use of fluoride at the new chemical facility. Vehicle trips associated with facility maintenance and periodic inspections would be similar to the existing condition and are not anticipated to result in an increase in TAC emissions.

Thus, based on the project description assumptions as described further below, the air quality analysis will include an assessment of criteria air pollutants for construction and operational emissions, and health risk screenings for both construction and operation phase emissions.

The SABPL proposed project is described below, followed by a description of two project variants that provide alternate means by which to dewater Pit F3-East after a discharge from the project.

SABPL Proposed Project

The SABPL project would include the following components (and auxiliary facilities):

- 7,000-foot-long, 66-inch-diameter San Antonio Backup Pipeline (SABPL);
- Discharge Facility at quarry Pit F3-East (including discharge valve vault, electrical control building, baffled outfall, and reinforced concrete apron);
- Chemical facility (including emergency backup generator);
- Cutoff wall around quarry Pits F3-East and F3-West;
- Dewatering facilities at Pit F3-East (including two low-pressure submersible pumps and Dewatering Pipeline);
- Alameda Creek Pump Station, wet well, and control building (including electrical transformer);
- Transfer Pipeline; and
- Other improvements, including Supervisory Control and Data Acquisition (SCADA) transmitters, corrosion control, and a replacement of a 5,700-foot-long section of 12-inch-diameter water pipeline to the town of Sunol.

Construction activities associated with project components are described in more detail below.

Construction Activities Along Calaveras Road

The proposed 7,000-foot-long SABPL and the 5,700-foot-long water pipeline to the town of Sunol would be installed along the west side of Calaveras Road from the San Antonio Pump Station to approximately 1,000 feet south of the San Antonio Creek crossing. The section of water pipeline to the town of Sunol would terminate here; the SABPL would continue to the northwest, beneath the San Antonio Creek channel, to a new discharge facility on the southern slope of quarry Pit F3-East. Air gaps, vaults, manhole risers, cathodic protection, and other components such as SCADA transmitters would be installed as part of pipeline installation activities along the pipeline alignment. Construction and installation of these pipelines and associated components would be performed using traditional open-trench construction methods and would include clearing and grading the ground surface along the alignment, excavating the trenches, preparing and installing the pipeline sections, backfilling the trenches, and revegetating or paving the area, as needed. Open-trench construction for the SABPL and the pipeline to the town of Sunol would generally proceed at a rate of about 100 to 150 feet per day over a 15-month period and approximately 29,000 cubic yards of excess spoils would be generated from construction activities along Calaveras Road.

Two construction staging areas (Staging Areas B and C) would border Calaveras Road right-of-way just south and north of the San Antonio Creek crossing, respectively. It is anticipated that these staging areas would be used for the full 20- to 24-month project construction duration. In general, Staging Areas B and C, and all other staging areas, would be used to store equipment, vehicles, pipe, and other construction materials throughout the construction period.

Construction Activities in the Vicinity of the San Antonio Pump Station

The new chemical facility would be constructed northwest of the existing San Antonio Pump Station, approximately 200 feet west of the existing chemical facility. The facility would be constructed with a concrete foundation, structural frame, and a pre-engineered weather canopy with a metal roof. Maximum excavation depth for construction of the facility would be 20 feet. Chemical feed lines would be installed between the facility and the new chemical injection stations. Construction of the new chemical facility would take approximately 5 months and generate 800 cubic yards of excess spoils. Once the new chemical facility is brought online, the existing chemical facility would be decommissioned.

Staging Area A would be located south of the proposed chemical facility and immediately west of the existing fluoride facility and Sunol Valley Chloramination Facility, on a flat and gravel area. This staging area would be used for parking of equipment and vehicles, stockpiling of construction materials, and field office space for contractor(s) and SFPUC staff.

Construction Activities in the Vicinity of Pits F3-East and F3-West

Construction activities in the vicinity of Pits F3-East and F3-West would be associated with the following facilities: discharge facility, cutoff wall, Alameda Creek Pump Station and control building, Transfer Pipeline, dewatering facilities, and a new electrical transformer and overhead powerlines. In general, all construction activities in the vicinity of Pits F3-East and F3-West would include vegetation removal, grading and excavation, and backfilling. Large equipment such as long-reach excavators, backhoes, generators, cranes, and bulldozers would be required for the various project components in this area.

The discharge facility would be comprised of a baffled outfall at the northern terminus of the SABPL and a 175-foot-long reinforced concrete splash pad over the southern slope of quarry Pit F3-East. The slope surface would be prepared by removing loose/weak material, organic soils, and vegetation. Ground anchors would be constructed to secure the splash pad to the quarry slope, and would require drilling holes, installing steel rods or tendons into the slope, and then grouting the anchors in place. Steel bars would be positioned and tied together to provide permanent reinforcement. The concrete slab would be poured in batches from a concrete pump truck at the top of the slope. The baffled outfall would then be mounted onto a pile foundation at the top of the slope. Construction of the discharge facility would take 6 months and generate 13,700 cubic yards of excess spoils.

Construction of the cutoff wall would require a long-reach excavator, which would be used to excavate an approximately 5,000-foot-long and 80-foot-deep trench along the perimeter of Pits F3-East and F3-West. The trench would be kept full of bentonite slurry to stabilize the trench walls and prevent collapse during excavation. A bulldozer or excavator would be used to backfill the trench with the slurry mixture. The proposed cutoff wall would require an approximately 125-foot-wide work platform along the cutoff wall alignment. Construction of the cutoff wall would take approximately 16 months and generate 9,000 cubic yards of excess spoils.

The Alameda Creek Pump Station would consist of pumps, pipelines, a wet well, and a control building that would house electrical equipment. Minor grading would be required for the Alameda Creek Pump Station, parking area, and driveway. The wet well would be constructed underground and would require excavation of a pit approximately 55 feet by 25 feet to a depth of 45 feet below grade using sheet piles and a clam-shell excavator. Construction of the Alameda Creek Pump Station and control building would take 5 months and generate 10,300 cubic yards of excess spoils.

Installation of the Transfer Pipeline and Dewatering Pipeline would require pipeline cutting, pipeline installation, and backfilling. Open trench construction methods would be used for installation of both the approximately 1,260-foot-long Transfer Pipeline and the approximately 1,400-foot-long Dewatering Pipeline. Construction of the Transfer Pipeline and Dewatering Pipeline would take approximately 3 months and generate approximately 5,200 cubic yards of excess spoils.

The Hetch Hetchy Water & Power (HHWP) Calaveras Substation on the west side of Calaveras Road, just south of the San Antonio Creek crossing would provide power to the Alameda Creek Pump Station. 1,650 linear feet of new overhead powerlines would be constructed from the HHWP Calaveras Substation to a new electrical transformer adjacent to the Alameda Creek Pump Station, and an additional 550 linear feet of new overhead powerlines would extend between the HHWP Calaveras Substation and the electrical control building for the discharge facility at Pit F3-East. Installation of the new powerlines would generally require excavation of up to 10 feet deep, placing the pole in the hole, and backfilling.

Staging Area D, located just north of Pit F3-West, would be used to store equipment, vehicles, pipe, and other construction materials throughout the construction period.

Spoils Management and Disposal

Excess soil and rock material would be generated as part of excavation and construction activities. The total volume of excess spoils generated during project construction would be approximately 68,000 cubic yards. Strategies for managing excess excavated material generated during construction would include: (a) placing spoils in a temporary location, which might include quarry Pit F6 or the aggregate processing facility located immediately north of Pit F6, both of which are operated under SMP-30, for subsequent processing, resale, and reuse; (b) permanently placing the spoils in an earthen berm parallel to and west of Calaveras Road at the North Spoils Site; or (c) hauling the spoils offsite to an appropriate landfill facility (SFPUC, 2010b). The North Spoils Site covers 12 acres and is located immediately south of the I-680 / SR 84 interchange on the west side of Calaveras Road.

Power Supplies

New Hetch Hetchy overhead powerlines would provide electrical power to the Alameda Creek Pump Station and control building, and the valves and equipment associated with the new discharge facility at Pit F3-East. SCADA and security equipment for the Alameda Creek Pump Station and the discharge facility at Pit F3-East will each be powered with an uninterruptible battery power supply. Emergency backup power for the discharge facility at Pit F3-East will be comprised of an uninterruptible battery power supply with sufficient power for one full discharge. No permanent emergency backup power is proposed for the Alameda Creek Pump Station.

The dewatering facilities at Pit F3-East would be used to pump water from Pit F3-East to the Alameda Creek Pump Station. These facilities include submersible hoses and up to three submersible pumps (two active and one on standby). Electrical power for operation of the submersible pumps woould be provided by the Hetch Hetchy Water & Power Calaveras Substation. No emergency backup power is proposed for the dewatering facilities.

Electrical power for the new chemical facility at San Antonio Pump Station would be provided by HHWP via new underground powerlines between the Sunol Valley Chloramination Facility and the new chemical facility. The new chemical facility would also be equipped with a portable liquid propane-powered emergency generator (150-horsepower).

Operations and Maintenance

Once construction of the SABPL project is complete, the SFPUC would continue to use the SAPL to transfer water to and from San Antonio Reservoir. Discharges of reservoir water to San Antonio Creek would continue unmodified through the existing outlet structure and discharge facility at the base of Turner Dam.

With the proposed project, planned and emergency discharges from the Hetch Hetchy system that are currently routed to San Antonio Creek via the existing SAPL and outlet works at the base of Turner Dam would instead be routed via the SABPL to the new discharge facility at Pit F3-East. The SFPUC would work cooperatively with the existing quarry operator to manage water levels in Pit F3-East and maintain sufficient capacity for subsequent discharges from the project. After a discharge event from the SABPL, water would be pumped from Pit F3-East to San Antonio Reservoir or the SVWTP via two-step pumping process: (Step 1) The SFPUC would use the dewatering equipment (submersible pumps, hoses, and the Dewatering Pipeline) to pump water from Pit F3-East to the Alameda Creek Pump Station. (Step 2) From the Alameda Creek Pump Station, the recovered water would be pumped via the proposed Transfer Pipeline and other existing pipelines to San Antonio Reservoir for storage or to the SVWTP for treatment and delivery to customers.

The planned and emergency discharges from the Hetch Hetchy system could be dechlorinated and pH-adjusted at the new proposed chemical facility before being discharged to Pit F3-East. The proposed chemical facility would use calcium thiosulfate for dechlorination. Calcium thiosulfate is not a listed air contaminant. Underground chemical feed lines would extend from the existing fluoride facility located just south of the Sunol Valley Chloramination Facility to the new chemical facility. The proposed chemical facility would use fluoride for pH adjustment. Office of Environmental Health Hazard Assessment (OEHHA) indicates hydrogen fluoride is a toxic air contaminant and provides chronic reference exposure levels for this chemical. Although it is unlikely that the fluoride used to pH-adjust water prior to discharge would generate hazardous levels of TACs, the health risk screening for operational emissions will address this chemical.

The proposed project would provide the SFPUC with the operational flexibility to simultaneously discharge Hetch Hetchy flows to Pit F3-East via the SABPL while accessing water stored in San Antonio Reservoir and conveying the stored water to the SVWTP via the existing SAPL.

The proposed facilities would require periodic operations review and maintenance. The number of vehicle trips for operations review and maintenance would be similar to the vehicle trips associated with the existing San Antonio Pipeline and the existing chemical facility. Project implementation would not generate a significant number of new vehicle trips for maintenance activities.

TABLE 1
SUMMARY OF CONSTRUCTION ACTIVITIES AND EQUIPMENT

Construction Phase	Excess Spoils (cubic yards)	Construction Equipment		Schedule / Duration
Installation of SABPL and 12-inch Water Pipeline to Town of Sunol (Installation of Pipelines, Vaults, Manhole Risers, Air Gap Systems, and Cathodic Protection)	29,000	□ Flatbed trucks □ Backhoes □ Excavators □ Pipe cutting and welding equipment □ Haul trucks for spoils transport □ Trucks for materials delivery □ Compaction equipment	□ Baker tank(s) □ Pickup trucks □ Arch welding machine □ Generators □ Air compressors □ 80-ton crane □ Drill rig □ Skip loader □ Pavers and rollers	15 months
Construction of Discharge Facility at Pit F3-East (Outfall, Concrete Splash Pad, Electrical Control Building)	13,700	□ Sheet pile driver □ Flatbed trucks □ Excavators □ Backhoe □ Boom truck □ Air compressors □ Baker tank(s) □ Drill rig □ Generators □ Arch welders □ Timer crane mats	□ Trucks for materials delivery □ Dump trucks □ Pickup trucks □ Concrete transport trucks □ Concrete pump truck □ Water trucks □ Pavers and rollers □ Work platform	6 months
Construction of Cutoff Wall around Pits F3-East and F3-West	9,000	□ Long reach excavators □ Regular excavators □ Bulldozers □ Desander plant □ Haul trucks for spoils transport	□ Slurry mixing plant □ Forklift □ Dump trucks □ Slurry pumps □ Timber crane mats	16 months
Construction of Transfer Pipeline and Dewatering Pipeline	5,200	□ Flatbed trucks □ Excavators □ Backhoes □ Pipe cutting and welding equipment □ Pickup trucks □ Trucks for material delivery	□ Generators □ Air compressors □ Haul trucks for spoils transport □ Compaction equipment □ Backer tank(s) □ Arch welding machine □ Crane □ Drill rig □ Skip loader	3 months

Construction Phase	Excess Spoils (cubic yards)	Construction Equipment		Schedule / Duration
Construction of Alameda Creek Pump Station and Wet Well (including Electrical Control Building)	10,300	☐ Excavators ☐ Bulldozers ☐ Concrete truck ☐ Flatbed truck ☐ Mobile crane	☐ Graders ☐ Dump trucks ☐ Welding equipment ☐ Haul trucks for spoils transport	5 months
Construction of New Chemical Facility (Chemical Facility Building and Chemical Feed Lines)	800	☐ Excavator ☐ Backhoe ☐ Air compressors ☐ Loader ☐ Boom truck or small crane ☐ Pavers and rollers ☐ Concrete transport trucks	☐ Concrete pump truck ☐ Flatbed truck ☐ Generators ☐ Pickup trucks ☐ Trucks for materials delivery	5 months
Spoils Disposal	Project Total = 68,000	☐ Backhoes ☐ Haul trucks ☐ Water trucks		20 months between November 2012 and June 2014

Table 2

Construction Phasing

SABPL Construction Durations and Work Hours	2012					2013												2014											
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Total Construction Duration (20-24 months, between November 2012 and October 2014)																													
SABPL and 12-Inch PL to town of Sunol (15 months)																													
**Mon-Sat, 7am-7pm, except during installation of air gaps, which would result in 2 weeks and 4 weeks of 24-hr construction (total 6 weeks 24-hr construction)																													
Discharge facility at Pit F3-East (6 months)																													
**Mon-Sat, 7am-7pm																													
Cutoff wall (16 months)																													
**Mon-Sat, 7am-7pm																													
Transfer PL, Dewatering PL (3 months)																													
**Mon-Sat, 7am-7pm																													
Alameda Creek Pump Station (5 dry months)																													
**Mon-Sat, 7am-7pm																													
Chemical Facility (5 months)																													
**Mon-Sat, 7am-7pm																													
Spoils Hauling / Disposal / Placement																													
**Mon-Fri, 7am-7pm (18-24 months)																													

SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project

Figure 1

SABPL Project Area and 1,000-Foot Buffer

SABPL Variant 1

Under Variant 1, dewatering of Pit F3-East after a discharge from the project would occur via a one-step pumping process. Variant 1 would construct only one submersible high-pressure pump adjacent to the new discharge facility at Pit F3-East (as opposed to the two submersible low-pressure pumps that would be constructed under the proposed project) to pump water directly from the quarry pit to San Antonio Reservoir or SVWTP. Variant 1 would not construct the Alameda Creek Pump Station, wet well, electrical transformer, or Transfer Pipeline. All other facilities and improvements proposed under the proposed project would be constructed under Variant 1. The Air Quality TM will assess if Variant 1 would result in greater or lower TAC emissions when compared to the proposed project.

SABPL Variant 2

Under Variant 2, dewatering of Pit F3-East after a discharge from the project could occur using either a one-step or two-step pumping process. Variant 2 would construct one new submersible high-pressure pump and one new submersible low-pressure pump adjacent to the new discharge facility at Pit F3-East. All other project components would be constructed as proposed under the proposed project. After a discharge from the proposed project, the SFPUC would have the option to pump water directly to San Antonio Reservoir or SVWTP via the submersible high-pressure pump, Dewatering Pipeline, and existing pipelines (one-step pumping process), or use the submersible low-pressure pump to pump water to the Alameda Creek Pump Station, and subsequently through the Transfer Pipeline and existing pipelines to San Antonio Reservoir or SVWTP (two-step pumping process). The Air Quality Technical Report will assess if Variant 2 would result in greater or lower TAC emissions when compared to the proposed project.

2. Project Setting Assumptions

The area of the Sunol Valley where the proposed facilities would be located is developed primarily with quarry and nursery operations and water facilities, or is undeveloped. **Figure 1** shows the project area, along with one identified sensitive receptor—a currently unoccupied SFPUC watershed keeper's residence—located within 1,000 feet of the project area. If the SFPUC can assure that this residence will remain vacant during construction, then no health risk assessment for construction activities will be conducted. However, to be consistent with assumptions used in the Calaveras Dam Replacement Project (CDRP) EIR and, we will assume that this residence may become occupied during construction of the SABPL project. Another private residence (Garcia residence) is located to the southwest of the project area, but it is located just beyond the 1,000-foot buffer area.

Stationary sources permitted by the BAAQMD and major roadway sources (>10,000 ADT) that are within 1,000 feet of the project area are listed in **Table 3**; ESA+Orion will contact the BAAQMD for information on these sources. Locations of these sources in relation to the project area are indicated in Figure 1. No major non-permitted sources (e.g., train yards, distribution facilities, and high volume fueling stations) are located within 1,000 feet of the project area. Vehicle volumes for Calaveras Road in the vicinity of the SFPUC watershed keeper's residence are less than 10,000 vehicles per day.

TABLE 3
BAAQMD SCREENING-LEVEL RISKS AND HAZARDS FROM EXISTING PERMITTED STATIONARY SOURCES AND ROADWAYS, SABPL PROJECT VICINITY

Site #[1]	Facility Name	Street Address	City	Excess Cancer Risk in Millions	Chronic Hazard Index	Acute Hazard Index	PM2.5 (μ/m^3)
15592	SPFUC (Source Type: 100 kW Standby Generator)	5555 Calaveras Road	Sunol	Contact District Staff	Contact District Staff	Contact District Staff	Contact District Staff
16195	CEMEX Construction Materials Pacific (Source Type: Non-Retail Gas Dispensing)	6527 Calaveras Road	Sunol	Contact District Staff	Contact District Staff	Contact District Staff	Contact District Staff
I-680 at 1,000 Feet			Sunol	99	0.0	0.0	0.38
BAAQMD Individual Project Significance Thresholds				10	1	1	0.3
BAAQMD Cumulative Significance Thresholds				100	10	10	0.8

[1] See Figure 1 for locations of these sites.
SOURCE: BAAQMD (2010)

3. Proposed Methodology and Level of Analysis

During construction, use of construction equipment, trucks, worker vehicles, and ground disturbing activities would generate direct emissions of criteria air pollutants and precursors emissions. Diesel-operated equipment/vehicles/generators would likely be used during construction, resulting in diesel emissions, a TAC. Therefore, construction-related criteria air pollutants will be evaluated in addition to health risks associated with $PM_{2.5}$ and the particulate and gaseous components of diesel emissions (including acrolein).

Operational emissions would be associated primarily with vehicle-generated criteria pollutants emissions during facility maintenance and inspection activities, but there would be a negligible increase in TAC emissions from these vehicles due to the limited number needed for operation and maintenance. TACs could also be emitted during operation of proposed facilities due to use of one liquid propane-powered generator[1] and use of fluoride at the new chemical facility. The Air Quality TM will evaluate both criteria air pollutant emissions associated with project operations and health risks associated with project operations.[2]

Criteria Air Pollutants

Construction-related Criteria Air Pollutant Analysis

Criteria air pollutant emissions associated with project-related construction equipment operations will be estimated using the OFFROAD2007 model and EMFAC2007 (Version 2.3) emission factors.[3] This model and these factors will also be used to estimate any increase in emissions associated with project-related vehicle operations during maintenance and inspection of project facilities.

The analysis of construction impacts will derive model inputs using appropriate references to estimate assumptions for how identified construction equipment would be operated, including the traffic study for truck operations (to calculate on-road emissions from trucking of construction materials and employee commuting) and information from SFPUC project engineers for equipment mix, equipment operational characteristics, grading volume assumptions, and construction-phase durations contained in the project description. Model inputs (including model defaults) used in this analysis will be outlined. However, since the California Air Resources Board (CARB) has indicated that the current version of the OFFROAD2007 model overpredicts emissions (CARB, 2010), some adjustments to model outputs will need to be made if the results are over the thresholds. If needed, the adjustments will be in accordance with protocol approved by MEA. Adjustments to the model will be based on CARB published factors for age of fleet, load factor while running, and hours per day of operations. This methodology will be clearly detailed in the Air Quality Technical Report.

These criteria pollutant emissions estimates will be compared to the BAAQMD-adopted CEQA thresholds of significance for daily construction emissions and, if appropriate, for annual emissions due to the extended duration of construction. This comparison will serve as the basis for determining if the project would result in a significant adverse impact when compared to the BAAQMD-adopted significance criteria, and whether BAAQMD Basic and Additional

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1 An emergency backup generator would be used at the new chemical facility in the event of a power outage.

2 While there would be indirect emissions associated with electricity generation for operation of pumping equipment, the operational impact analysis will focus on direct emissions within the San Francisco Bay Area Air Basin (SFBAAB) per the BAAQMD CEQA Guidelines. Because indirect emissions would likely occur outside the SFBAAB, air quality analysis of these indirect emissions is more appropriately addressed in the greenhouse gas analysis.

3 Particulate matter emissions from exhaust will be estimated separately from fugitive dust emissions.

Construction Mitigation Measures or any additional measures would be adequate to reduce impacts to below significance thresholds.

Cumulative Construction-related Criteria Air Pollutant Analysis

Cumulative increases in construction-related emissions would result from the simultaneous construction of the proposed project in combination with other SFPUC projects in the Sunol Valley area. Based on input from the SFPUC regarding phasing of overlapping projects and air quality emissions estimates from the EIRs for these projects, cumulative increases in criteria pollutant emissions will be presented. Significance will be determined by comparing cumulative emissions to the BAAQMD construction-related significance thresholds for criteria pollutants and determining whether the project's contribution to cumulative regional increases is cumulatively considerable both without and with mitigation

Operational Criteria Air Pollutant Analysis

The project's operational emissions would be limited to operation of one liquid propane-powered emergency generator (150 horsepower portable generator). Since this generator is for "emergency" use only, the intermittent and unpredictable use of this generator as well as the portable nature of one of this generator preclude accurate estimation of potential criteria pollutant emissions. However, health risks could be estimated if the SFPUC can provide a defensible estimate of operating hours for testing and emergency conditions. If the SFPUC can provide estimated operating hours for the one generator, criteria air pollutant emissions associated with project-related equipment operations will be estimated using the OFFROAD2007 model. If this information is not available, the operational analysis will implement a similar approach to the one used in the Baden-San Pedro Valve Lots MND, which is presented as follows:

> "BAAQMD permits to construct and operate the replacement generator would be required because the generator would be over 50 horsepower. Although issuance of these permits cannot be the sole factor in determining that a potentially significant impact is mitigated to a less-than-significant level, the BAAQMD would be prohibited from issuing such a permit unless the generator met the following requirements: it is equipped with the best available control technology; no ambient air quality standards are violated or made measurably worse; public health risks have been determined in a health risk screening analysis to be less than significant (if applicable); appropriate public notification occurs if the generator would be located within 1,000 feet of a school; and any increase in emissions is offset if emissions exceed applicable BAAQMD threshold levels. Therefore, existing rules and regulations are designed to ensure that the air quality impacts of new facilities are less than significant."

Cumulative Operational Criteria Air Pollutant Analysis

Cumulative increases in operational emissions would result from the simultaneous operation of the proposed project in combination with other SFPUC projects in the Sunol Valley area. Significance of the project's contribution to cumulative degradation of regional air quality will be determined by comparing the project's emissions to BAAQMD operational-related significance thresholds for criteria pollutants under unmitigated and mitigated conditions. This comparison will determine whether the project's contribution to cumulative increases in the region would be cumulatively considerable both without and with mitigation.

Risks and Hazards

Construction-related Health Risk Analysis

The health risks impact evaluation will require converting project emissions into ambient concentrations, which involves application of a dispersion analysis to project scenarios, followed by a determination of the ambient air toxics levels as a human health risk using adopted Office of Environmental Health Hazard Assessment (OEHHA) guidance.

The construction health risk analysis will utilize methodologies outlined in the BAAQMD's document entitled, *Recommended Methods for Screening and Modeling Local Risks and Hazards* (May 2010; BAAQMD, 2010c) as necessary to determine a project's health risk impacts. For the health risk analysis, BAAQMD recommends using EMFAC and OFFROAD directly (not through UREBEMIS modeling). The SCREEN3 dispersion model will be utilized to estimate PM2.5 levels at the closest sensitive receptors (i.e., maximally exposed individual), then OEHHA guidance will be used to determine associated cancer and non-cancer risks. These estimated levels will be compared to the BAAQMD's adopted project-level risks and hazards significance thresholds for cancer risk, non-cancer risk, and ambient PM2.5 concentrations. Consistent with the BAAQMD's methodology, if a more detailed analysis is warranted, the Industrial Source Complex (ISC) model will be utilized to estimate project-related emissions,[4] while the CAL3QHCR model will be utilized as necessary to estimate on-road health risks. A menu of mitigation measures that must be implemented to support project impact findings will be developed.

Cumulative Construction-related Health Risk Analysis

The project-level analysis will then be used as a basis for the cumulative impact analysis to determine the project's contribution to significant, cumulative impacts associated with TAC emissions from project construction and from other stationary and mobile sources and other known construction projects, including the New Irvington Tunnel, SVWTP Expansion and Treated Water Reservoirs, Calaveras Dam Replacement, and various pipeline inspection projects. The cumulative impact analysis will consider all existing permitted and roadway emissions sources as well as potential future emissions sources within 1,000 feet of the proposed project (as identified in Table 3). The cumulative impact on identified sensitive receptors will be determined by comparing cumulative emissions from project construction plus any other concurrent

[4] ISC is 8760 SCREEN3 runs using actual meteorology rather than artificial screening level data that is used in a single SCREEN3 run.

construction activities and known stationary and mobile sources to BAAQMD-adopted cumulative risks and hazards significance criteria. BAAQMD-approved mitigation measures that can be feasibly implemented by the SFPUC will be identified for any significant cumulative impacts. Any determination of a cumulatively considerable contribution to health risks will be subject to approval from MEA.

Operational Health Risk Analysis

As noted above, the project's operational emissions would be limited to operation of one liquid propane-powered emergency generator (one 150 horsepower portable generator). Since this generator is for "emergency" use only, the intermittent and unpredictable use of this generator as well as the portable nature of one of this generator preclude accurate estimation of these potential emissions and the associated health risks. Nevertheless, health risks could be estimated based on operational time limit that will be specified in the BAAQMD permit to operate. The health risks impact evaluation will require converting project emissions into ambient concentrations, which involves application of a dispersion analysis to project scenarios, followed by a determination of the ambient air toxics levels as a human health risk using adopted Office of Environmental Health Hazard Assessment (OEHHA) guidance.

Cumulative Operational Health Risks

Cumulative increases in operational emissions would result from the simultaneous operation of the proposed project in combination with other SFPUC projects in the Sunol Valley area. Risks and hazards impact evaluations completed for other SFPUC projects in Sunol Valley (CDRP, SVWTP, NIT, Alameda Siphons, Alameda Creek Filter Galley, etc.) will be compiled and adjusted as necessary to account for age sensitivity, and then added to the project's estimated cancer and non-cancer risk factors. Significance of the project's contribution to cumulative degradation of regional air quality will be determined by comparing the project's emissions to BAAQMD cumulative operational-related significance thresholds for risks and hazards under unmitigated and mitigated conditions. This comparison will determine whether the project's contribution to cumulative increases in the region would be cumulatively considerable both without and with mitigation.

4. Contents of the Air Quality Technical Report

The technical report will include the following sections, consistent with MEA and BAAQMD CEQA 2010 Guidelines:

- **Project Description**
- **Project Setting**
- **Criteria Air Pollutants**

- **Health Risk Analysis**

- **Conclusion**

- **Approved Scope of Work**: The approved scope of work will be included as an appendix to the Air Quality Technical Report

- **Technical Appendices**: Copies of model outputs and any permits obtained from BAAQMD or other regulatory entity (if applicable) will be included as technical appendices.

5. Assumptions for Reviewing and Finalizing the Technical Report

Based on ongoing discussions between the ESA+Orion team and the SFPUC in December 2010 and January 2011 regarding construction working assumptions, it is assumed that the project description and associated assumptions for construction and operation are correct. It is assumed that there will be no further changes in the project description. During preparation of the first draft Air Quality Technical Report, the ESA+Orion team will work with the SFPUC as needed to ensure that proposed mitigation measures are feasible.

ESA+Orion will prepare two rounds of the Air Quality Technical Report on the proposed SABPL project as described above for review by MEA, and ESA+Orion will respond to comments and incorporate edits by the reviewers in each subsequent submittal. It is assumed that MEA will provide one set of non-conflicting comments on each draft submittal, and that resolution of any outstanding issues will be conducted through conference calls or meetings as needed. ESA+Orion will then prepare a Final Air Quality Technical Report that will serve as the basis for the CEQA air quality analysis in the form of either a reference document or an appendix included as part of the CEQA document.

References

Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act Air Quality Guidelines*, June 2010a.

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Bay Area Air Quality Management District (BAAQMD), *Stationary Source Risk & Hazards Analysis Tool, San Francisco Permitted Sources,* May 3, 2010. Available online at: http://www.baaqmd.gov/Home/Divisions/Planning%20and%20Research/CEQA%20GUIDELINES/Tools%20and%20Methodology.aspx. Records Accessed on December 21, 2010c.

California Air Resources Board (CARB), Workshops on Information Regarding the Off-Road, Truck and Bus and Drayage Truck Regulations, September 3, 2010.

APPENDIX B

Model Outputs and Assumptions

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TABLE B-1
SABPL AVERAGE CONSTRUCTION EQUIPMENT USAGE FOR 2012
Overall Construction Schedule: 21 months, October 2012 through June 2014

		Total # of Work Days
SABPL and 12-Inch PL to town of Sunol (15 months)	2 Flatbed trucks	
	2 Backhoes	
	2 Excavators	
	2 Pipe cutting and welding equipment	
	4 Haul trucks for spoils transport	
	2 Trucks for materials delivery	
	1 Compaction equipment	
	1 Baker tank(s)	
	2 Pickup trucks	
	1 Arch welding machine	
	2 Generators	
	2 Air compressors	
	1 80-ton crane	
	1 Drill rig	
	1 Skip loader	
	2 Pavers and rollers	
Total Equipment #	**29**	
Full Schedule:	1-Dec 2012 to 28-Feb 2014	392
2012 Schedule:	2 Mos. In 2012	**26**
	Total Equip for Average of 52 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2012	
	Mon-Sat, 7 a.m. to 7 p.m.	
Spoils Hauling / Disposal / Placement (20 months)	2 Backhoes	
	4 Haul trucks	
	2 Water trucks	
Total Equipment #	18	
Full Schedule:	1-Nov 2012 to 30-Jun 2014	522
2012 Schedule:	2 Mos. In 2012	**26**
	Total Equip for Average of 52 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2012	
	Mon-Sat, 7 a.m. to 7 p.m.	

* Not an emission source, not included in total

No spoils hauling Saturdays or Sundays.
Generally only one shift per day (7am to 5pm)
Traffic will assume 20-month total duration to be most conservative.
Total excess spoils = 68,000 cubic yards
Assume 25% of excess spoils (17,000 cu yds) will be hauled to landfill, the rest will be permanently placed at North Spoils Site or temporarily placed in SMP-30 for subsequent resale.

TABLE B-2
SABPL AVERAGE CONSTRUCTION EQUIPMENT USAGE FOR 2013
Overall Construction Schedule: 21 months, October 2012 through June 2014

ALL CONSTRUCTION PHASES OVERLAP TO SOME EXTENT DURING 2013:

Construction Phase	Construction	Total # of Days
SABPL and 12-Inch PL to town of Sunol (15 months)	2 Flatbed trucks	
	2 Backhoes	
	2 Excavators	
	2 Pipe cutting and welding equipment	
	4 Haul trucks for spoils transport	
	2 Trucks for materials delivery	
	1 Compaction equipment	
	1 Baker tank(s)	
	2 Pickup trucks	
	1 Arch welding machine	
	2 Generators	
	2 Air compressors	
	1 80-ton crane	
	1 Drill rig	
	1 Skip loader	
	2 Pavers and rollers	
	Total Pieces of Equipment =	28
Full Schedule =	Dec 2012 thru Feb 2014 =	392 days
2013 Schedule =	12 months in 2012 =	**320 days**

NOTES: 1. Assume all equipment operating 320 days for 4 hrs/day (operating 50% of 8-hr day), 6 days/wk for 2013.
2. 6 weeks of 24-hour construction in 2013

Construction Phase	Equipment	Total # of Days
Discharge facility at Pit F3-East (6 months)	1 Sheet pile driver	
	2 Flatbed trucks	
	2 Excavators	
	1 Backhoe	
	1 Boom truck	
	2 Air compressors	
	2 Baker tank(s)	
	1 Drill rig	
	2 Generators	
	2 Arch welders	
	2 Timber crane mats	
	2 Trucks for materials delivery	
	2 Dump trucks	
	2 Pickup trucks	
	2 Concrete transport trucks	
	1 Concrete pump truck	
	2 Water trucks	
	2 Pavers and rollers	
	Work platform*	
	Total Pieces of Equipment =	31
Full Schedule =	Oct 2013 thru Mar 2014 =	157 days
2013 Schedule =	3 months in 2013 =	**78 days**

NOTES: 1. Assume all equipment operating 78 days for 4 hrs/day (operating 50% of 8-hr day), 6 days/wk for 2013.

Construction Phase	Equipment	Total # of Days
Construction of Slurry Cutoff Wall around Pits F3-East and F3-West (16 months)	2 Long reach excavators	
	2 Regular excavators	
	2 Bulldozers	
	1 Desander plant	
	2 Haul trucks for spoils transport	
	1 Slurry mixing plant	
	1 Forklift	
	2 Dump trucks	
	2 Slurry pumps	
	2 Timber crane mats	
	Total Pieces of Equipment =	17
Full Schedule =	Jan 2013 thru Apr 2014 =	418 days
2013 Schedule =	12 months in 2013 =	**313 days**
NOTES: 1. Assume all equipment operating for 313 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2013		

Construction Phase	Equipment	Total # of Days
Transfer PL, Dewatering PL (3 months)	2 Flatbed trucks	
	2 Excavators	
	2 Backhoes	
	1 Pipe cutting and welding equipment	
	2 Pickup trucks	
	2 Trucks for materials delivery	
	2 Generators	
	2 Air compressors	
	4 Haul trucks for spoils transport	
	1 Compaction equipment	
	1 Backer tank(s)	
	1 Arch welding machine	
	1 Crane	
	1 Drill rig	
	1 Skip loader	
	Total Pieces of Equipment =	25
Full Schedule =	Oct 2013 thru Dec 2013 =	78 days
2013 Schedule =	3 months in 2013 =	**78 days**
NOTES: 1. Assume all equipment operating for 78 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2013		

Construction Phase	Equipment	Total # of Days
Alameda Creek Pump Station (5 dry months)	2 Excavators	
	2 Bulldozers	
	1 Concrete truck	
	1 Flatbed truck	
	1 Mobile crane	
	2 Graders	
	2 Dump trucks	
	1 Welding equipment	
	4 Haul trucks for spoils transport	
	Total Pieces of Equipment =	16
Full Schedule =	Apr 2013 thru Aug 2013 =	131
2013 Schedule =	5 months in 2013	131
NOTES: 1. Assume all equipment operating for 131 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2013		

Construction Phase	Equipment	Total # of Days
Construction of New Chemical Facility (5 months)	1 Excavator	
	1 Backhoe	
	2 Air compressors	
	1 Loader	
	1 Boom truck or small crane	
	2 Pavers and rollers	
	2 Concrete transport trucks	
	1 Concrete pump truck	
	1 Flatbed truck	
	2 Generators	
	2 Pickup trucks	
	2 Trucks for materials delivery	
	Total Pieces of Equipment =	18
Full Schedule =	Apr 2013 thru Aug 2013 =	131 days
2013 Schedule =	5 months in 2013	**131 days**
NOTES: 1. Assume all equipment operating for 131 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2013		
	Mon-Sat, 7 a.m. to 7 p.m.	

Construction Phase	Equipment	Total # of Days
Spoils Hauling / Disposal / Placement (20 months)	2 Backhoes	
	4 Haul trucks	
	2 Water trucks	
	Total Pieces of Equipment =	18
Full Schedule =	**Nov 2012 thru June 2014 =**	522 days
2013 Schedule =	12 months in 2013 =	**313 days**
NOTES: 1. Assume all equipment operating for313 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2013		

* Not an emission source, not included in total

NOTES:

1. No spoils hauling Saturdays or Sundays.
2. Generally only one shift per day (7am to 5pm)
3. Total excess spoils = 68,000 cubic yards
4. Assume 25% of excess spoils (17,000 cu yds) will be hauled to landfill, the rest will be permanently placed at North Spoils Site or temporarily placed in SMP-30 for subsequent resale.

TABLE B-3
SABPL AVERAGE CONSTRUCTION EQUIPMENT USAGE FOR 2014
Overall Construction Schedule: 21 months, October 2012 through June 2014

		Total # of Work Days
SABPL and 12-Inch PL to town of Sunol (15 months)	2 Flatbed trucks	
	2 Backhoes	
	2 Excavators	
	2 Pipe cutting and welding equipment	
	4 Haul trucks for spoils transport	
	2 Trucks for materials delivery	
	1 Compaction equipment	
	1 Baker tank(s)	
	2 Pickup trucks	
	1 Arch welding machine	
	2 Generators	
	2 Air compressors	
	1 80-ton crane	
	1 Drill rig	
	1 Skip loader	
	2 Pavers and rollers	
Total Equipment #	**29**	
Full Schedule:	1-Dec 2012 to 28-Feb 2014	392
2014 Schedule:	2 Mos. In 2014	**52**
	Total Equip for Average of 52 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2014	
	Mon-Sat, 7 a.m. to 7 p.m.	
Discharge facility at Pit F3-East (6 months)	1 Sheet pile driver	
	2 Flatbed trucks	
	2 Excavators	
	1 Backhoe	
	1 Boom truck	
	2 Air compressors	
	2 Baker tank(s)	
	1 Drill rig	
	2 Generators	
	2 Arch welders	
	2 Timber crane mats	
	2 Trucks for materials delivery	
	2 Dump trucks	
	2 Pickup trucks	
	2 Concrete transport trucks	
	1 Concrete pump truck	
	2 Water trucks	
	2 Pavers and rollers	
	Work platform*	
Total Equipment #	**31**	
Full Schedule:	1-Oct 2013 to 31 Mar 2014	157
2014 Schedule:	3 Mos. In 2014	**78**
	Total Equip for Average of 78 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2014	
	Mon-Sat, 7 a.m. to 7 p.m.	

		Total # of Work Days
Construction of Slurry Cutoff Wall around Pits F3-East and F3-West (16 months)	2 Long reach excavators	
	2 Regular excavators	
	2 Bulldozers	
	1 Desander plant	
	2 Haul trucks for spoils transport	
	1 Slurry mixing plant	
	1 Forklift	
	2 Dump trucks	
	2 Slurry pumps	
	2 Timber crane mats	
Total Equipment #	**17**	
Full Schedule:	1-Jan 2013 to 30 Apr 2014	418
2014 Schedule:	4 Mos. In 2014	**104**
	Total Equip for Average of 104 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2014	
	Mon-Sat, 7 a.m. to 7 p.m.	
Spoils Hauling / Disposal / Placement (20 months)	2 Backhoes	
	4 Haul trucks	
	2 Water trucks	
Total Equipment #	**18**	
Full Schedule:	1-Nov 2012 to 30-Jun 2014	522
2014 Schedule:	6 Mos. In 2014	**157**
	Total Equip for Average of 157 days, 4 hrs/day (operating 50% of 8-hour day), 6 days/wk for 2014	
	Mon-Sat, 7 a.m. to 7 p.m.	

Appendix B URBEMIS Output and Construction Modeling

URBEMIS Off Road Construction Equipment-Peak Day (Not Average)

2012

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Pipeline to Sunol											
Unmitigated Equipment	12.3	101.5	51.4	0.0	2.5	5.1	7.6	0.5	4.7	5.2	12838.2
Mitigated Equipment	12.3	64.7	51.4	0.0	1.2	3.7	4.9	0.3	3.4	3.7	12838.2
Discharge Facility											
Unmitigated Equipment	12.2	105.9	49.8	0.0	2.5	4.9	7.5	0.5	4.6	5.1	14242
Mitigated Equipment	12.2	65.8	49.8	0.0	1.2	3.6	4.8	0.3	3.3	3.5	14242
Slurry Wall Cutoff											
Unmitigated Equipment	7.1	55.1	36.2	0.0	2.5	3.0	5.5	0.5	2.7	3.3	5947.3
Mitigated Equipment	7.1	31.3	36.2	0.0	1.2	1.8	3.0	0.3	1.6	1.9	5947.3
Transfer PL											
Unmitigated Equipment	9.2	84.0	39.3	0.0	2.5	3.6	6.1	0.5	3.3	3.8	11251.5
Mitigated Equipment	9.2	47.2	39.3	0.0	1.2	2.2	3.4	0.3	2.0	2.3	11251.5
Alameda Creek Pump Station											
Unmitigated Equipment	5.9	46.3	28.3	0.0	2.5	2.2	4.8	0.5	2.1	2.6	4970.8
Mitigated Equipment	5.9	23.7	28.3	0.0	2.3	1.2	1.2	2.4	0.3	1.1	4970.8
New Chem Facility											
Unmitigated Equipment	10.2	91.1	43.0	0.0	2.5	4.5	7.1	0.5	4.2	4.7	10672.7
Mitigated Equipment	10.2	59.0	43.0	0.0	1.2	3.4	4.6	0.3	3.1	3.4	10672.7

2013 URBEMIS Off Road Construction Equipment-Peak Day (Not Average)

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Pipeline to Sunol											
Unmitigated Equipment	11.4	94.5	50.0	0.0	2.5	4.8	7.3	0.5	4.4	4.9	12838.4
Mitigated Equipment	11.4	60.4	50.0	0.0	1.2	3.5	4.7	0.3	3.2	3.5	12838.4
Discharge Facility											
Unmitigated Equipment	11.3	98.1	48.6	0.0	2.5	4.7	7.2	0.5	4.3	4.8	14242.3
Mitigated Equipment	11.3	61.2	48.6	0.0	1.2	3.3	4.5	0.3	3.1	3.3	14242.3
Slurry Wall Cutoff											
Unmitigated Equipment	6.7	51.6	32.5	0.0	2.5	2.8	5.3	0.5	2.6	3.1	5947.5
Mitigated Equipment	6.7	29.3	32.5	0.0	1.2	1.6	2.8	0.3	1.5	1.7	5947.5
Transfer PL											
Unmitigated Equipment	8.5	77.8	38.2	0.0	2.5	3.3	5.9	0.5	3.1	3.6	11251.7
Mitigated Equipment	8.5	43.8	38.2	0.0	1.2	2.0	3.2	0.3	1.9	2.1	11251.7
Alameda Creek Pump Station											
Unmitigated Equipment	5.6	43.6	27.3	0.0	2.5	2.1	4.6	0.5	1.9	2.5	4971
Mitigated Equipment	5.6	22.3	27.3	0.0	1.2	1.1	2.3	0.3	1.0	1.3	4971
New Chem Facility											
Unmitigated Equipment	9.5	85.0	41.9	0.0	2.5	4.3	6.8	0.5	3.9	4.5	10672.7
Mitigated Equipment	9.5	55.2	41.9	0.0	1.2	3.2	4.4	0.3	2.9	3.2	10672.7

2014 URBEMIS Off Road Construction Equipment-Peak Day (Not Average)

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Pipeline to Sunol											
Unmitigated Equipment	10.5	83.3	48.6	0	2.5	4.3	6.8	0.5	3.9	4.5	12838.7
Mitigated Equipment	10.5	55.6	48.6	0	1.2	3.2	4.4	0.3	2	3.2	12838.7
Discharge Facility											
Unmitigated Equipment	10.5	88.7	47.4	0	2.5	4.2	6.7	0.5	3.8	4.4	14242.5
Mitigated Equipment	10.5	55.8	47.4	0	1.2	3.0	4.2	0.3	2.8	3.0	14242.5
Slurry Wall Cutoff											
Unmitigated Equipment	6.3	48.2	34.3	0	2.5	2.5	5.0	0.5	2.3	2.8	5937.6
Mitigated Equipment	6.3	27.4	34.3	0	1.2	1.5	2.7	0.3	1.3	1.6	5937.6
Transfer PL											
Unmitigated Equipment	7.8	70.6	37	0	2.52	3.0	5.5	0.5	2.7	3.2	11251.9
Mitigated Equipment	7.8	39.87	37	0	1.2	1.8	3.0	0.3	1.7	1.9	11251.9
Alameda Creek Pump Station											
Unmitigated Equipment	5.3	40.7	26.3	0	2.51	1.9	4.4	0.5	1.7	2.3	4971.1
Mitigated Equipment	5.3	21.19	26.3	0	1.19	1.0	2.2	0.3	0.1	1.2	4971.1
New Chemical Facility											
Unmitigated Equipment	8.9	78.2	40.7	0	2.52	3.9	6.4	0.5	3.6	4.1	10673.1
Mitigated Equipment	8.9	51.15	40.7	0	1.2	2.9	4.1	0.3	2.7	2.9	10673.1

Average Daily Normalized Emissions-Half of URBEMIS Calculated Off-Road Equipment Emissions Normalized for Truck Haul Miles 5/7 days per week –Off-Road Equipment 6/7 days week

2012

1 Pipeline to Sunol (lbs/day)

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	5.3	43.5	22.0	0.0	1.1	2.2	3.3	0.2	2.0	2.2	5501.8
Mitigated Equipment	5.3	27.7	22.0	0.0	0.5	1.6	2.1	0.1	1.5	1.6	5501.8
On-road haul miles	0.4	4.9	1.6	0.0	0.0	0.2	0.0	0.0	0.2	0.0	674.6
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	5.7	48.5	23.7	0.0	1.1	2.4	3.3	0.2	2.2	2.2	6182.4
Total mitigated	5.7	32.7	23.7	0.0	0.5	1.8	2.1	0.1	1.7	1.6	6182.4

2 Discharge Facility (lbs/day)

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	5.2	45.4	21.3	0.0	1.1	2.1	3.2	0.2	2.0	2.2	6103.4
Mitigated Equipment	5.2	28.2	21.3	0.0	0.5	1.5	2.1	0.1	1.4	1.5	6103.4
On-road haul miles	0.6	6.9	2.3	0.0	0.0	0.4	0.0	0.0	0.3	0.0	939.6
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total unmitigated	5.8	52.2	23.6	0.0	1.1	2.5	3.2	0.2	2.3	2.2	7046.0
Total mitigated	5.8	35.1	23.6	0.0	0.5	1.9	2.1	0.1	1.7	1.5	7046.0

3 Slurry Cutoff (lbs/day)

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	3.0	23.6	15.5	0.0	1.1	1.3	2.4	0.2	1.2	1.4	2548.7
Mitigated Equipment	3.0	13.4	15.5	0.0	0.5	0.7	1.3	0.1	0.7	0.8	2548.7
On-road haul miles	0.1	1.4	0.4	0.0	0.0	0.1	0.0	0.0	0.1	0.0	186.7
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total unmitigated	3.2	25.0	15.9	0.0	1.1	1.3	2.4	0.2	1.2	1.4	2738.4

Total mitigated	3.2	14.8	15.9	0.0	0.5	0.8	1.3	0.1	0.8	0.8	2738.4

4 Transfer Pipeline lbs/day

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	3.9	36.0	16.8	0.0	1.1	1.5	2.6	0.2	1.4	1.6	4821.8
Mitigated Equipment	3.9	20.2	16.8	0.0	0.5	0.9	1.4	0.1	0.9	1.0	4821.8
On-road haul miles	0.4	4.9	1.6	0.0	0.0	0.2	0.0	0.0	0.2	0.0	674.6
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	4.4	41.0	18.5	0.0	1.1	1.7	2.6	0.2	1.6	1.6	5502.4
Total mitigated	4.4	25.2	18.5	0.0	0.5	1.1	1.4	0.1	1.1	1.0	5502.4

5 Alameda Creek Pump Station

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	2.5	19.8	12.1	0.0	1.1	1.0	2.0	0.2	0.9	1.1	2130.2
Mitigated Equipment	2.5	10.2	12.1	0.0	1.0	0.5	0.5	1.0	0.1	0.5	0.6
On-road haul miles	0.2	2.7	0.9	0.0	0.0	0.1	0.0	0.0	0.1	0.0	373.4
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	2.7	22.6	13.1	0.0	1.1	1.1	2.0	0.2	1.0	1.1	2509.7
Total mitigated	2.7	12.9	13.1	0.0	1.0	0.7	0.5	1.0	0.2	0.5	380.0

6 New Chemical Facility

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	4.4	39.0	18.4	0.0	1.1	1.9	3.0	0.2	1.8	2.0	4573.8
Mitigated Equipment	4.4	25.3	18.4	0.0	0.5	1.5	2.0	0.1	1.3	1.4	4573.8
On-road haul miles	0.5	5.5	1.9	0.0	0.0	0.3	0.0	0.0	0.2	0.0	752.9
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total unmitigated	4.9	44.5	20.3	0.0	1.1	2.2	3.0	0.2	2.0	2.0	5326.7
Total mitigated	4.9	30.8	20.3	0.0	0.5	1.7	2.0	0.1	1.6	1.4	5326.7

2013 daily (lbs/day)

1 Pipeline to Sunol

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	4.9	40.5	21.4	0.0	1.1	2.1	3.1	0.2	1.9	2.1	5501.9
Mitigated Equipment	4.9	25.9	21.4	0.0	0.5	1.5	2.0	0.1	1.4	1.5	5501.9
On-road haul miles	0.4	4.9	1.6	0.0	0.0	0.2	0.0	0.0	0.2	0.0	674.6
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	5.3	45.5	23.1	0.0	1.1	2.3	3.1	0.2	2.1	2.1	6182.5
Total mitigated	5.3	30.9	23.1	0.0	0.5	1.7	2.0	0.1	1.6	1.5	6182.5

2 Discharge Facility

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	4.8	42.0	20.8	0.0	1.1	2.0	3.1	0.2	1.8	2.1	6103.5
Mitigated Equipment	4.8	26.2	20.8	0.0	0.5	1.4	1.9	0.1	1.3	1.4	6103.5
On-road haul miles	0.6	6.9	2.3	0.0	0.0	0.4	0.0	0.0	0.3	0.0	939.6
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total unmitigated	5.4	48.9	23.1	0.0	1.1	2.3	3.1	0.2	2.1	2.1	7046.1
Total mitigated	5.4	33.1	23.1	0.0	0.5	1.8	1.9	0.1	1.6	1.4	7046.1

3 Slurry Cutoff

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	2.9	22.1	13.9	0.0	1.1	1.2	2.3	0.2	1.1	1.3	2548.8
Mitigated Equipment	2.9	12.6	13.9	0.0	0.5	0.7	1.2	0.1	0.6	0.7	2548.8
On-road haul miles	0.1	1.4	0.4	0.0	0.0	0.1	0.0	0.0	0.1	0.0	186.7
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total unmitigated	3.0	23.5	14.4	0.0	1.1	1.3	2.3	0.2	1.2	1.3	2738.5

Total mitigated	3.0	13.9	14.4	0.0	0.5	0.8	1.2	0.1	0.7	0.7	2738.5

4 Transfer Pipeline

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	3.6	33.3	16.4	0.0	1.1	1.4	2.5	0.2	1.3	1.5	4821.9
Mitigated Equipment	3.6	18.8	16.4	0.0	0.5	0.9	1.4	0.1	0.8	0.9	4821.9
On-road haul miles	0.4	4.9	1.6	0.0	0.0	0.2	0.0	0.0	0.2	0.0	674.6
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	4.1	38.3	18.0	0.0	1.1	1.6	2.5	0.2	1.5	1.5	5502.5
Total mitigated	4.1	23.8	18.0	0.0	0.5	1.1	1.4	0.1	1.0	0.9	5502.5

5 Alameda Creek Pump Station

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	2.4	18.7	11.7	0.0	1.1	0.9	2.0	0.2	0.8	1.0	2130.3
Mitigated Equipment	2.4	9.6	11.7	0.0	0.5	0.5	1.0	0.1	0.4	0.5	2130.3
On-road haul miles	0.2	2.7	0.9	0.0	0.0	0.1	0.0	0.0	0.1	0.0	373.4
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	2.6	21.5	12.6	0.0	1.1	1.0	2.0	0.2	1.0	1.0	2509.8
Total mitigated	2.6	12.3	12.6	0.0	0.5	0.6	1.0	0.1	0.6	0.5	2509.8

6 New Chemical Facility

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	4.1	36.4	18.0	0.0	1.1	1.8	2.9	0.2	1.7	1.9	4573.8
Mitigated Equipment	4.1	23.7	18.0	0.0	0.5	1.4	1.9	0.1	1.3	1.4	4573.8
On-road haul miles	0.5	5.5	1.9	0.0	0.0	0.3	0.0	0.0	0.2	0.0	752.9
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total unmitigated	4.6	41.9	19.8	0.0	1.1	2.1	2.9	0.2	1.9	1.9	5326.7
Total mitigated	4.6	29.2	19.8	0.0	0.5	1.6	1.9	0.1	1.5	1.4	5326.7

2014 (lbs/day)

1 Pipeline to Sunol

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	4.5	35.7	20.8	0.0	1.1	1.8	2.9	0.2	1.7	1.9	5502.0
Mitigated Equipment	4.5	23.8	20.8	0.0	0.5	1.4	1.9	0.1	0.9	1.4	5502.0
On-road haul miles	0.4	3.9	1.4	0.0	0.0	0.2	0.0	0.0	0.1	0.0	674.1
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	4.9	39.6	22.2	0.0	1.1	2.1	2.9	0.2	1.8	1.9	6182.1
Total mitigated	4.9	27.7	22.2	0.0	0.5	1.6	1.9	0.1	1.0	1.4	6182.1

2 Discharge Facility

ctivity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	4.5	38.0	20.3	0.0	1.1	1.8	2.9	0.2	1.6	1.9	6103.6
Mitigated Equipment	4.5	23.9	20.3	0.0	0.5	1.3	1.8	0.1	1.2	1.3	6103.6
On-road haul miles	0.4	5.5	1.9	0.0	0.0	0.3	0.0	0.0	0.2	0.0	938.9
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total unmitigated	4.9	43.5	22.2	0.0	1.1	2.1	2.9	0.2	1.9	1.9	7045.5
Total mitigated	4.9	29.4	22.2	0.0	0.5	1.6	1.8	0.1	1.4	1.3	7045.5

3 Slurry Cutoff

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	2.7	20.7	14.7	0.0	1.1	1.1	2.1	0.2	1.0	1.2	2544.6
Mitigated Equipment	2.7	11.7	14.7	0.0	0.5	0.6	1.1	0.1	0.6	0.7	2544.6
On-road haul miles	0.1	1.1	0.4	0.0	0.0	0.1	0.0	0.0	0.1	0.0	186.7
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total unmitigated	2.8	21.7	15.1	0.0	1.1	1.1	2.1	0.2	1.1	1.2	2734.3
Total mitigated	2.8	12.8	15.1	0.0	0.5	0.7	1.1	0.1	0.6	0.7	2734.3

4 Transfer Pipeline

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	3.3	30.3	15.9	0.0	1.1	1.3	2.3	0.2	1.2	1.4	4822.0
Mitigated Equipment	3.3	17.1	15.9	0.0	0.5	0.8	1.3	0.1	0.7	0.8	4822.0
On-road haul miles	0.4	3.9	1.4	0.0	0.0	0.2	0.0	0.0	0.1	0.0	674.1
Onsite haul miles	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	3.7	34.2	17.2	0.0	1.1	1.5	2.3	0.2	1.3	1.4	5502.1
Total mitigated	3.7	21.0	17.2	0.0	0.5	1.0	1.3	0.1	0.9	0.8	5502.1

5 Alameda Creek Pump Station

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	2.3	17.4	11.3	0.0	1.1	0.8	1.9	0.2	0.7	1.0	2130.4
Mitigated Equipment	2.3	9.1	11.3	0.0	0.5	0.4	0.9	0.1	0.0	0.5	2130.4
On-road haul miles	0.1	0.2	0.7	0.0	0.0	0.1	0.0	0.0	0.1	0.0	674.1
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Total unmitigated	2.4	17.7	12.0	0.0	1.1	0.9	1.9	0.2	0.8	1.0	2810.4
Total mitigated	2.4	9.3	12.0	0.0	0.5	0.5	0.9	0.1	0.1	0.5	2810.4

6 New Chemical Facility

Activity	ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Unmitigated Equipment	3.8	33.5	17.4	0.0	1.1	1.7	2.7	0.2	1.5	1.8	4574.0
Mitigated Equipment	3.8	21.9	17.4	0.0	0.5	1.2	1.8	0.1	1.1	1.3	4574.0
On-road haul miles	0.4	4.3	1.5	0.0	0.0	0.2	0.0	0.0	0.2	0.0	752.3
Onsite haul miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total unmitigated	4.2	37.8	18.9	0.0	1.1	1.9	2.7	0.2	1.7	1.8	5326.3
Total mitigated	4.2	26.2	18.9	0.0	0.5	1.5	1.8	0.1	1.4	1.3	5326.3

Annual Construction Emissions (short tons per year) –Daily times indicated number of days/2000 lbs/ton

Days are total days in phase. Daily emissions have already been averaged for number of work days per week (6/7 for equipment and 5/7 for haul)

1. Pipeline To Sunol (short tons/year)

Activity		ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Calendar Days[1]												
2012	30.4											
unmit		0.09	0.74	0.36	0.00	0.02	0.04	0.05	0.00	0.03	0.03	94.0
mit		0.09	0.50	0.36	0.00	0.01	0.03	0.03	0.00	0.03	0.02	94.0
2013	365											
unmit		1.0	8.3	4.2	0.0	0.2	0.4	0.6	0.0	0.4	0.4	1128.3
mit		1.0	5.6	4.2	0.0	0.1	0.3	0.4	0.0	0.3	0.3	1128.3
2014	60.9											
unmit		0.1	1.2	0.7	0.0	0.0	0.1	0.1	0.0	0.1	0.1	188.2
mit		0.1	0.8	0.7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	188.2

[1] Daily emissions already account for six days per week of construction and five days per week of hauling. So calendar days are used to calculate annual emissions.

2. Discharge Facility (short tons/year)

Activity		ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Calendar Days[1]												
2013	91.3											
unmit		0.2	2.2	1.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	321.3
mit		0.2	1.5	1.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	321.3
2014	91.3											
unmit		0.2	2.0	1.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	321.3
mit		0.2	1.3	1.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	321.3

[1] Daily emissions already account for six days per week of construction and five days per week of hauling. So calendar days are used to calculate annual emissions.

3. Slurry Cuttoff (short tons/year)

Activity		ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Calendar Days[1]												
2013	365											
unmit		0.6	4.3	2.6	0.0	0.2	0.2	0.4	0.0	0.2	0.2	499.8
mit		0.6	2.5	2.6	0.0	0.1	0.1	0.2	0.0	0.1	0.1	499.8
2014	121.7											
unmit												
mit		0.2	1.3	0.9	0.0	0.1	0.1	0.1	0.0	0.1	0.1	166.4

[1] Daily emissions already account for six days per week of construction and five days per week of hauling. So calendar days are used to calculate annual emissions.

4. Transfer Pipeline (short tons/year)

Activity		ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Calendar Days[1]												
2013	91.3											
unmit		0.2	1.8	0.8	0.0	0.0	0.1	0.1	0.0	0.1	0.1	251.2
mit		0.2	1.1	0.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	251.2

[1] Daily emissions already account for six days per week of construction and five days per week of hauling. So calendar days are used to calculate annual emissions.

5. Alameda Creek Pump Station (short tons/year)

Activity		ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Calendar Days[1]												
2013	152.2											
unmit		0.2	1.6	1.0	0.0	0.1	0.1	0.2	0.0	0.1	0.1	191.0
mit		0.2	0.9	1.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	191.0

[1] Daily emissions already account for six days per week of construction and five days per week of hauling. So calendar days are used to calculate annual emissions.

6. New Chemical Facility (tons per year)

Activity		ROG	NOx	CO	SO_2	PM10 Dust	PM-10 Exhaust	PM10 Total	PM2.5 Dust	PM-2.5 Exhaust	PM2.5 Total	CO_2
Calendar Days[1]												
2013	152.2											
unmit		0.3	3.2	1.5	0.0	0.1	0.2	0.2	0.0	0.1	0.1	405.4
mit		0.3	2.2	1.5	0.0	0.0	0.1	0.1	0.0	0.1	0.1	405.4

[1] Daily emissions already account for six days per week of construction and five days per week of hauling. So calendar days are used to calculate annual emissions.

Form B2

PERMITTED EMISSIONS

FROM FUEL COMBUSTION - INTERNAL COMBUSTION ENGINES & TURBINES

Emissions Report

July 1, 2007 - December 31, 2007

- Read instructions on the back before completing form.
- Carry all emission calculations to 2 decimal places.
- Record each row on Form ES.

FACILITY NAME

FACILITY I.D. NUMBER

EQUIP. CODE (a)	FUEL CODE (b)	Fuel Usage (c)	Organic Gases (d)	Methane (e)	Nitrogen Oxides (f)	Sulfur Oxides (g)	Carbon Monoxide (h)	Particulate Matter (i)
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
1. SUBTOTAL EMISSIONS (lbs)			.	.	.	.	.	.
2. SUM OF SUBTOTALS (lbs) from all B2 forms (including this one)*			.	.	.	.	.	.
3. Divide Line 2 by 2000 then transfer to Form C, Line 2 (tons)*			.	.	.	.	.	.

*If you have more than one page,complete Lines 2 and 3 ONLY ON THE FINAL PAGE.

PAGE # ☐☐ OF ☐☐ TOTAL PAGES IN FORM B2

S.C.A.Q.M.D. reserves the right to audit the reported emissions. All records and calculations used in completing this summary are recommended to be retained for a minimum of five years.

South Coast Air Quality Management District
Form B2 7/1/08

Form B2 - Permitted Emissions From Fuel Combustion - Internal Combustion Engines & Turbines

Note 1: DO NOT report fuel and emissions from on-road, off-road, or in-plant mobile source vehicles (i.e., self-propelled vehicles) such as forklifts.

Note 2: DO NOT report RECLAIM NOx and SOx emissions on this form. Instead use Form CR. Please refer to the General Instruction Book under Frequently Asked Questions for guidance on reporting either RECLAIM or non-RECLAIM emissions. Report all permitted cogeneration or resource recovery fuel usage on Form E1.

Note 3: Emissions from SCAQMD-permitted portable equipment currently registered with the Statewide Portable Equipment Registration Program should be reported on this form only for the period prior to the issuance of the registration certificate by the California Air Resources Board. Refer to the General Instruction Book under Frequently Asked Questions for more details. Please provide a copy of the registration certificate.

Note 4: Fuel combustion results in toxics emissions. These toxics emissions must be reported on Form TAC.

Facility Name and ID No.: Please fill in your facility name and facility ID number in the designated spaces, exactly as indicated on Form X (Signature Sheet) in your package.

Equipment (Eq.), Fuel Codes and Fuel Usage: Fill in the appropriate equipment code in column (a), fuel code in column (b), and the fuel usage (for six-month: 7/1/07-12/31/07) in column (c). **Please use a separate row for each fuel/equipment combination and emission factor**. Select equipment code based on the size of your equipment. If you do not know the size of your equipment, use 10c for portable ICE and 11c for stationary ICE as defaults. If fuel usage is not measured separately (i.e., one common fuel meter for several equipments), use the equipment sizes or ratings (e.g., horse power, HP) to distribute fuel usage for each equipment type (see example for Form B2U in Appendix O of the General Instruction Book). **Please use proper units (i.e., mmscf for gaseous fuels and 1000 gallons for liquid fuels** Do not report the fuel usage in hours. If the fuel usage is tracked by hours of operation, convert to fuel usage in requested units using manufacturer's data.

Eq. Code	Equipment Type-Portable Internal Combustion Engines (ICE)
10a	Portable ICE, 2 Stroke-Lean Burn
10b	Portable ICE, 2 Stroke-Lean Burn, with Catalyst
10c	Portable ICE, 4 Stroke-Lean Burn
10d	Portable ICE, 4 Stroke-Lean Burn, with Catalyst
10e	Portable ICE, 4 Stroke-Rich Burn
10f	Portable ICE, 4 Stroke-Rich Burn, with Catalyst

Eq. Code	Equipment Type-Stationary Internal Combustion Engines (ICE)
11a	Stationary ICE, 2 Stroke-Lean Burn
11b	Stationary ICE, 2 Stroke-Lean Burn, with Catalyst
11c	Stationary ICE, 4 Stroke-Lean Burn
11d	Stationary ICE, 4 Stroke-Lean Burn, with Catalyst
11e	Stationary ICE, 4 Stroke-Rich Burn
11f	Stationary ICE, 4 Stroke-Rich Burn, with Catalyst

Eq. Code	Equipment Type
12	Turbines
14	Micro Turbine

Fuel Code	Fuel Type
1	Natural Gas (mmscf)
2	LPG, Propane, Butane (1000 gals)
3	Diesel / Distillate Oil (1000 gals)
4	Gasoline (10 RVP) (1000 gals)
5	Landfill Gas (mmscf)
6	Digester Gas (mmscf)

Fuel Code	Fuel Type
7	Residual Fuel Oil (1000 gals)
8	Fuel Oil [0.05% S] (1000 gals)
9	Refinery Gas/Refinery Mixed Gas/Petroleum Process Gas (mmscf)
10	Jet Fuel (Jet-A and Jet-B) (1000 gals)
11	Compressed Natural Gas [CNG] (1000 gals)
12	Coal (tons)

Fuel Code	Fuel Type
13	Coke (tons)
14	Tire (tons)
15	Wood (tons)
16	Bio-Diesel (1000 gals)
17	Biomass Derived Gas (mmscf)
18	Methanol (1000 gals)

Fuel Code	Fuel Type
19	Kerosene (1000 gals)
20	Process Associated Gas (mmscf)
21	Municipal Solid Waste (tons)
22	Lignite (tons)
23	Bark (tons)
24	Spent Solvent (1000 gals)

Emission Factors: Write the appropriate emission factors for each fuel/equipment combination in the small box in the upper right-hand corner of every cell. Please use correct units for each of the factors (i.e., the emission factor for gaseous fuels should be in lbs/mmscf and for liquid fuels in lbs/1000 gallons). Use emission factors which most accurately reflect emissions from your equipment. You must use the available equipment-specific emission factors even if these factors are higher than the default emission factors, listed in Table 1 below. All emission factors (except default emission factors listed in Table 1) must be supported with documentation which should be attached to the completed report. Preference for use of emission factors should be in the following order:

a) Continuous emissions monitoring (CEMS) data (if applicable). You must submit CEMS summary data.
b) Source tests pre-approved by AQMD (if applicable). You must submit a copy of the source test results and supporting data.
c) Rule or permit emission factors or Best Available Control Technologies (BACT) emission levels (if applicable). You must submit a list of equipment by rule and by permit number that comply with the rule or permit limit, or with the BACT levels. NOx emission factors for stationary IC engines subject to Rule 1110.2 are listed in Table 2, below.
d) Other available data (e.g., manufacturer's data) with supporting documentation. Default emission factors that represent uncontrolled emissions are listed in Table 1, below. For emissions from turbines, use data from the Continuous Emission Monitoring System (CEMS), if available. Otherwise, use source test data or refer to EPA Document AP-42, Supplement F, Section 3.1 for appropriate emission factors. Default emission factors should only be used if no other emission factors are available.

Emissions: Calculate the emissions for each pollutant by multiplying the fuel usage by the emission factor for each pollutant using the appropriate units. Enter the calculated emissions in the corresponding cell for each pollutant.

Subtotal Emissions: If you use more than one Form B2, in the space provided indicate the page number and the total number of B2 Forms. For example, if you use 4 forms, indicate in the boxes - page 1 of 4, page 2 of 4, etc. Total the emissions for each column (on each page) and place the total on Line 1, Subtotal Emissions (lbs).

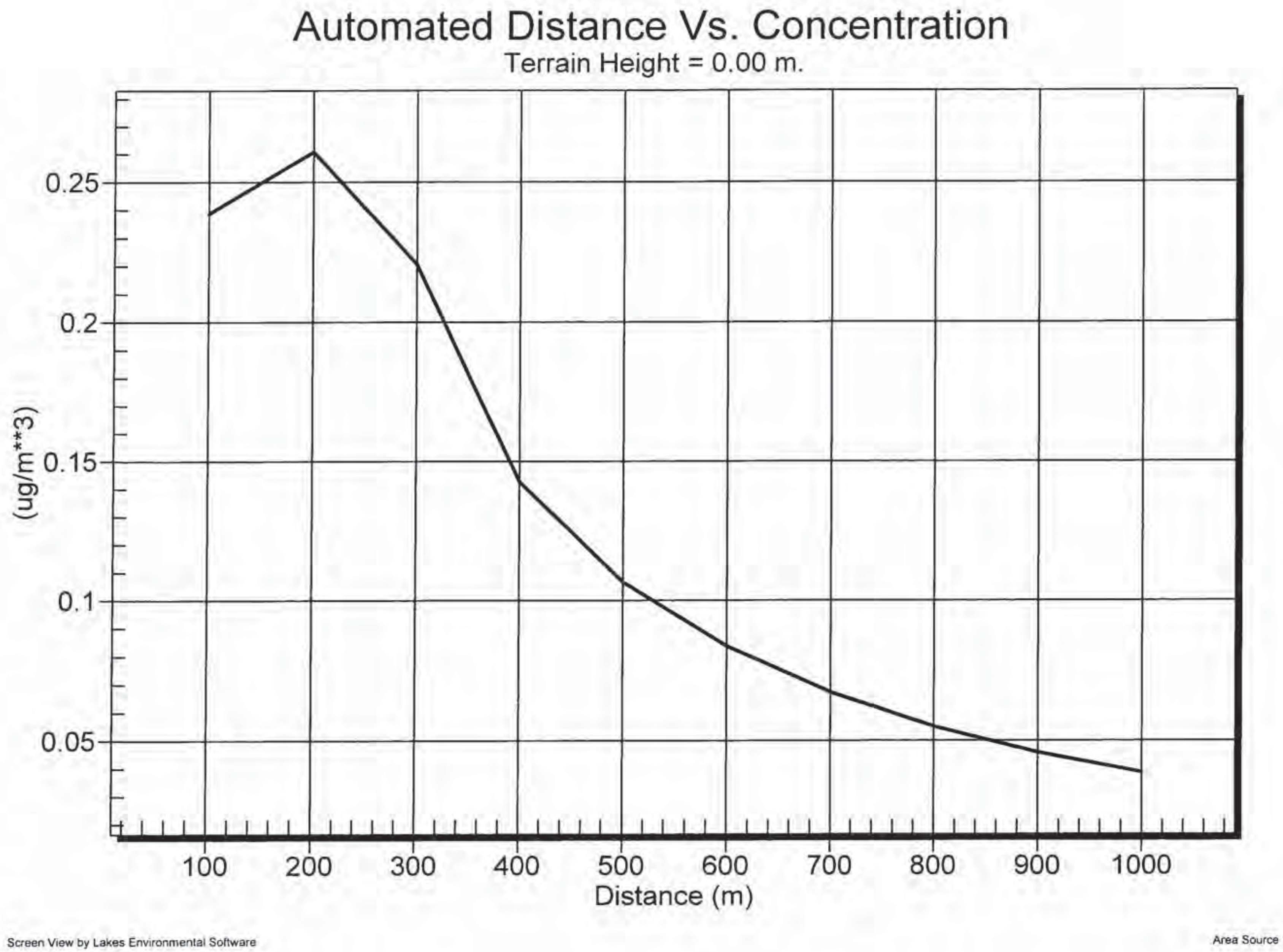
Sum of Subtotals: Complete Lines 2 and 3 only on the last page of Form B2. On Line 2 enter the sum of the subtotals from Line 1 of all B2 forms. To convert the totals to tons, divide the total in pounds by 2000, round to two (2) decimal places and enter the total emissions (tons) on Line 3. Transfer the totals (tons) to Form C, Line 2 in the respective columns.

Table 1: Default emission factors For Internal Combustion Engines (ICE) and Micro Turbines

Fuel	Organic Gases	Methane	Nitrogen Oxides	Sulfur Oxides	Carbon Monoxide	Particulate Matter
Natural gas (mmscf)-2 Stroke (Lean-Burn) ICE	122.00	1,479.00	3,233.00	0.60	394.00	39.00
Natural gas (mmscf)-4 Stroke (Lean-Burn) ICE & micro turbine	120.00	1,275.00	4,162.00	0.60	323.00	----
Natural gas (mmscf)-4 Stroke (Rich-Burn) ICE	30.00	235.00	2,254.00	0.60	3,794.00	10.00
LPG, Propane, Butane (1000 gallons) All size ICE and Micro Turbine	83.00	-----	139.00	0.35	129.00	5.00
Diesel / Distillate Oil (1000 gallons) All size ICE and Micro Turbine	37.50	-----	469.00	7.10	102.00	33.50
Gasoline (1000 gallons) All size ICE and Micro Turbine	206.00	-----	102.00	5.30	3,940.00	6.50

Table 2: Rule 1110.2 Compliant Emission Factors (Stationary ICE)

Fuel	Nitrogen Oxides
Natural gas (mmscf)	238.70
LPG, Propane, Butane (1000 gallons)	15.30
Diesel / Distillate Oil (1000 gallons)	33.40
Gasoline (1000 gallons)	21.50


Automated Distance Vs. Concentration
Terrain Height = 0.00 m.
0.25
0.2
0.15
0.1
0.05
(ug/m**3)
100
200
300
400
500
600
700
800
900
1000
Distance (m)
Screen View by Lakes Environmental Software
Area Source 1

06/17/11

11:23:11

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Area Source 1

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	AREA
EMISSION RATE (G/(S-M**2))	=	0.239560E-07
SOURCE HEIGHT (M)	=	3.0000
LENGTH OF LARGER SIDE (M)	=	457.0000
LENGTH OF SMALLER SIDE (M)	=	195.0000
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** STABILITY CLASS 3 ONLY ***
*** ANEMOMETER HEIGHT WIND SPEED OF 2.50 M/S ONLY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
100.	0.2387	3	2.5	2.5	800.0	3.00	3.
200.	0.2608	3	2.5	2.5	800.0	3.00	0.
300.	0.2206	3	2.5	2.5	800.0	3.00	21.
400.	0.1426	3	2.5	2.5	800.0	3.00	14.
500.	0.1066	3	2.5	2.5	800.0	3.00	1.
600.	0.8369E-01	3	2.5	2.5	800.0	3.00	0.
700.	0.6725E-01	3	2.5	2.5	800.0	3.00	0.
800.	0.5503E-01	3	2.5	2.5	800.0	3.00	0.
900.	0.4578E-01	3	2.5	2.5	800.0	3.00	0.
1000.	0.3864E-01	3	2.5	2.5	800.0	3.00	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 100. M:

240.	0.2710	3	2.5	2.5	800.0	3.00	1.

```
*********************************
*** SCREEN DISCRETE DISTANCES ***
*********************************
```

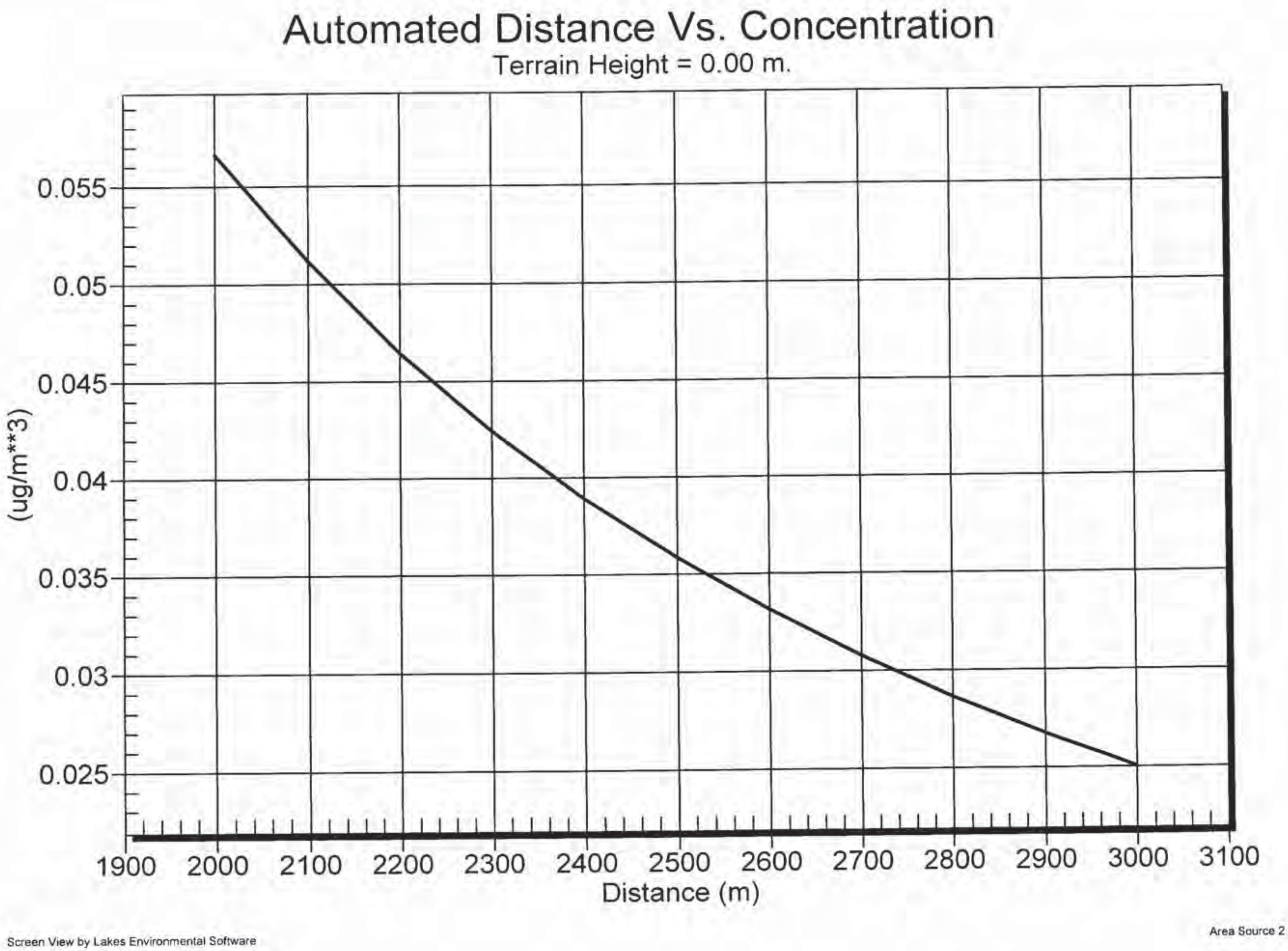
*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
500.	0.1066	3	2.5	2.5	800.0	3.00	1.
740.	0.6193E-01	3	2.5	2.5	800.0	3.00	0.

```
***************************************
*** SUMMARY OF SCREEN MODEL RESULTS ***
***************************************
```

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.2710	240.	0.

```
***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************
```


Automated Distance Vs. Concentration
Terrain Height = 0.00 m.
(ug/m**3)
0.055
0.05
0.045
0.04
0.035
0.03
0.025
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
Distance (m)
Screen View by Lakes Environmental Software
Area Source 2

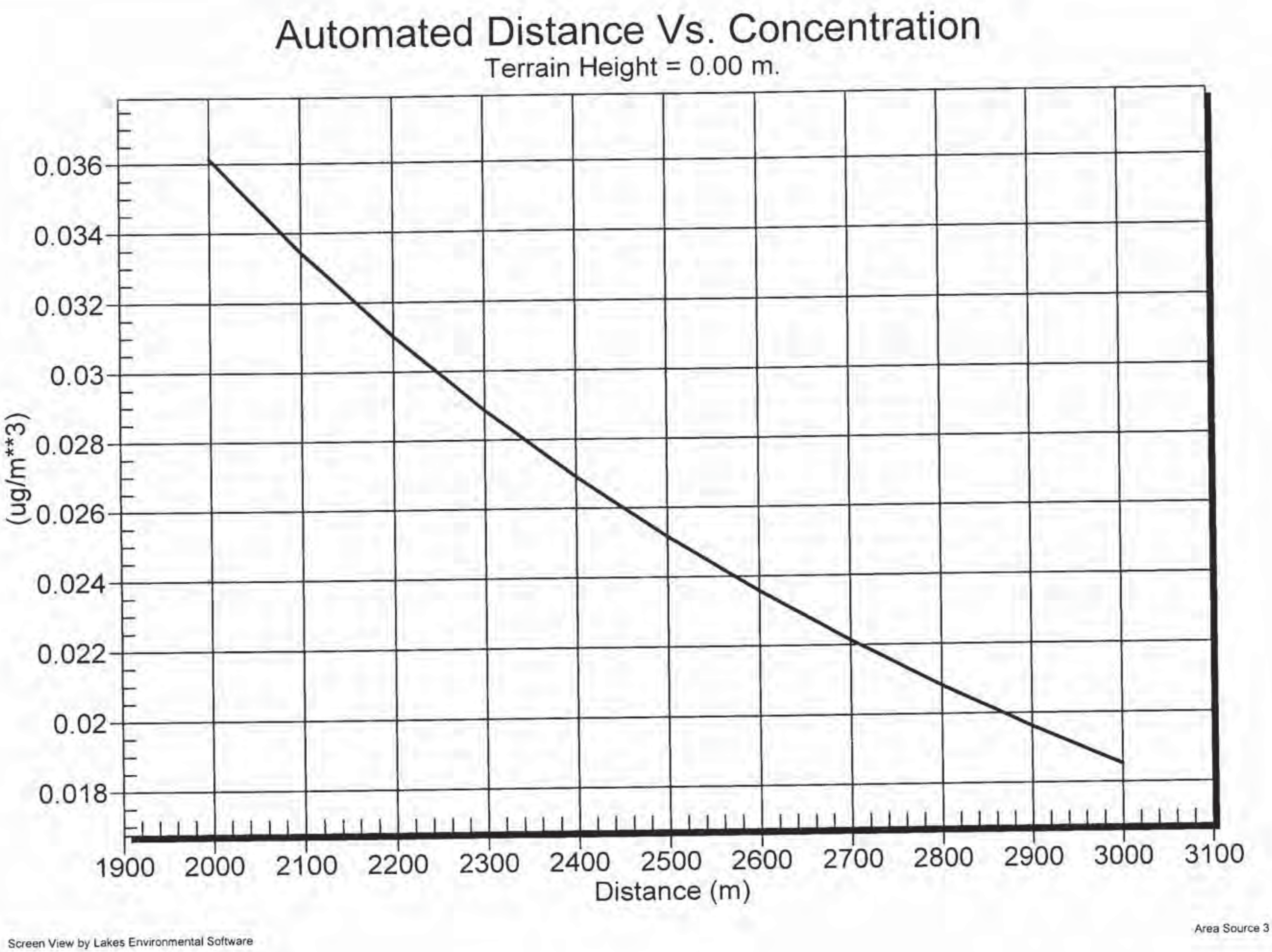
06/16/11

14:59:52

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Area Source 2

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                  =        AREA
   EMISSION RATE (G/(S-M**2))   =    0.239560E-07
   SOURCE HEIGHT (M)            =       3.0000
   LENGTH OF LARGER SIDE (M)    =    1847.0000
   LENGTH OF SMALLER SIDE (M)   =     195.0000
   RECEPTOR HEIGHT (M)          =       0.0000
   URBAN/RURAL OPTION           =        RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS
ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =    0.000 M**4/S**3;  MOM. FLUX =    0.000 M**4/S**
2.

*** STABILITY CLASS  3 ONLY ***
*** ANEMOMETER HEIGHT WIND SPEED OF   2.50 M/S ONLY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
2000.	0.5663E-01	3	2.5	2.5	800.0	3.00	0.
2100.	0.5115E-01	3	2.5	2.5	800.0	3.00	0.
2200.	0.4644E-01	3	2.5	2.5	800.0	3.00	0.
2300.	0.4242E-01	3	2.5	2.5	800.0	3.00	0.
2400.	0.3891E-01	3	2.5	2.5	800.0	3.00	0.
2500.	0.3584E-01	3	2.5	2.5	800.0	3.00	0.
2600.	0.3315E-01	3	2.5	2.5	800.0	3.00	0.
2700.	0.3077E-01	3	2.5	2.5	800.0	3.00	0.
2800.	0.2864E-01	3	2.5	2.5	800.0	3.00	0.
2900.	0.2674E-01	3	2.5	2.5	800.0	3.00	0.
3000.	0.2503E-01	3	2.5	2.5	800.0	3.00	0.

```
 MAXIMUM 1-HR CONCENTRATION AT OR BEYOND  2000. M:
   2000.  0.5663E-01    3     2.5    2.5   800.0    3.00       0.

 **********************************
 *** SCREEN DISCRETE DISTANCES ***
 **********************************

 *** TERRAIN HEIGHT OF     0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***

   DIST     CONC              U10M   USTK  MIX HT   PLUME  MAX DIR
    (M)    (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
 -------  ----------  ----  -----  -----  ------  ------  -------
   1900.  0.6317E-01    3     2.5    2.5   800.0    3.00       0.
   2323.  0.4157E-01    3     2.5    2.5   800.0    3.00       0.

     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

  CALCULATION         MAX CONC     DIST TO   TERRAIN
   PROCEDURE         (UG/M**3)     MAX (M)    HT (M)
 --------------    -----------    -------   -------
 SIMPLE TERRAIN     0.6317E-01      1900.        0.

 ***************************************************
 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
 ***************************************************
```



Automated Distance Vs. Concentration
Terrain Height = 0.00 m.
(ug/m**3)
0.036
0.034
0.032
0.03
0.028
0.026
0.024
0.022
0.02
0.018
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
Distance (m)
Screen View by Lakes Environmental Software
Area Source 3

06/16/11

14:52:34

```
  ***  SCREEN3 MODEL RUN  ***
  *** VERSION DATED 96043 ***

 Area Source 3

 SIMPLE TERRAIN INPUTS:
    SOURCE TYPE                  =         AREA
    EMISSION RATE (G/(S-M**2))   =     0.239560E-07
    SOURCE HEIGHT (M)            =       3.0000
    LENGTH OF LARGER SIDE (M)    =     778.0000
    LENGTH OF SMALLER SIDE (M)   =     389.0000
    RECEPTOR HEIGHT (M)          =       0.0000
    URBAN/RURAL OPTION           =        RURAL
 THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS
ENTERED.

    MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


 BUOY. FLUX =     0.000 M**4/S**3;  MOM. FLUX =     0.000 M**4/S**
2.

 *** STABILITY CLASS  3 ONLY ***
 *** ANEMOMETER HEIGHT WIND SPEED OF   2.50 M/S ONLY ***

 **********************************
 *** SCREEN AUTOMATED DISTANCES ***
 **********************************

 *** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
2000.	0.3614E-01	3	2.5	2.5	800.0	3.00	0.
2100.	0.3344E-01	3	2.5	2.5	800.0	3.00	0.
2200.	0.3102E-01	3	2.5	2.5	800.0	3.00	0.
2300.	0.2886E-01	3	2.5	2.5	800.0	3.00	0.
2400.	0.2691E-01	3	2.5	2.5	800.0	3.00	0.
2500.	0.2516E-01	3	2.5	2.5	800.0	3.00	0.
2600.	0.2357E-01	3	2.5	2.5	800.0	3.00	0.
2700.	0.2213E-01	3	2.5	2.5	800.0	3.00	0.
2800.	0.2081E-01	3	2.5	2.5	800.0	3.00	0.
2900.	0.1962E-01	3	2.5	2.5	800.0	3.00	0.
3000.	0.1852E-01	3	2.5	2.5	800.0	3.00	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 2000. M:

2000.	0.3614E-01	3	2.5	2.5	800.0	3.00	0.

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
2000.	0.3614E-01	3	2.5	2.5	800.0	3.00	0.
2713.	0.2195E-01	3	2.5	2.5	800.0	3.00	0.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

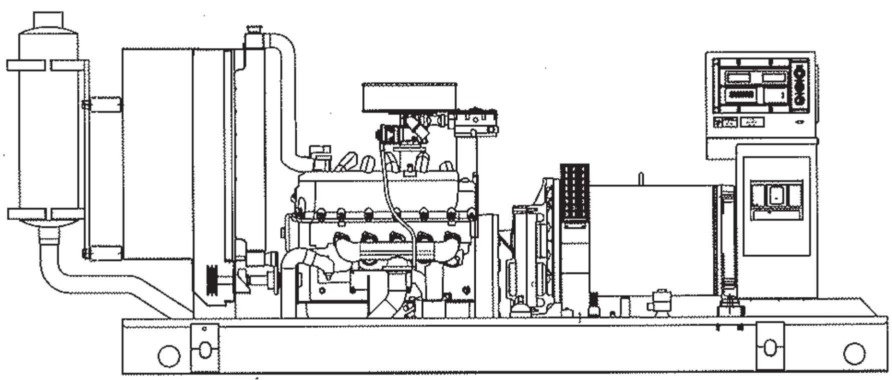
CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.3614E-01	2000.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

SG150

Liquid Cooled Gas Engine Generator Sets

Standby Power Rating
150KW 60 Hz / 150KVA 50 Hz



Power Matched
GENERAC 6.8GN ENGINE
Naturally Aspirated - Gear Driven
Meets EPA Emission Regulations

FEATURES

- **INNOVATIVE DESIGN & PROTOTYPE TESTING** are key components of GENERAC'S success in "IMPROVING POWER BY DESIGN." But it doesn't stop there. Total commitment to component testing, reliability testing, environmental testing, destruction and life testing, plus testing to applicable CSA, NEMA, EGSA, and other standards, allows you to choose GENERAC POWER SYSTEMS with the confidence that these systems will provide superior performance.

- **TEST CRITERIA:**
  - ✓ PROTOTYPE TESTED
  - ✓ SYSTEM TORSIONAL TESTED
  - ✓ ELECTRO-MAGNETIC INTERFERENCE
  - ✓ NEMA MG1 EVALUATION
  - ✓ MOTOR STARTING ABILITY
  - ✓ SHORT CIRCUIT TESTING
  - ✓ UL2200 COMPLIANCE AVAILABLE

- **SOLID-STATE, DIGITAL, FREQUENCY COMPENSATED VOLTAGE REGULATION.** This state-of-the-art power maximizing regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine.

- **SINGLE SOURCE SERVICE RESPONSE** from Generac's dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component. You are never on your own when you own a GENERAC POWER SYSTEM.

- **GENERAC TRANSFER SWITCHES, SWITCHGEAR AND ACCESSORIES.** Long life and reliability is synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line includes its own transfer systems, accessories, switchgear and controls for total system compatibility.

GENERAC®

APPLICATION & ENGINEERING DATA

GENERATOR SPECIFICATIONS

TYPE	Synchronous
ROTOR INSULATION	Class H
STATOR INSULATION	Class H
TOTAL HARMONIC DISTORTION	<3.5%
TELEPHONE INTERFERENCE FACTOR (TIF)	<50
ALTERNATOR OUTPUT LEADS 3 PHASE	4 wire
BEARINGS	Sealed Ball
COUPLING	Gear Drive
LOAD CAPACITY (STANDBY RATING)	150 kW
EXCITATION SYSTEM	PMG or Brushless

NOTE: Emergency loading in compliance with NFPA 99, NFPA 110. Generator rating and performance in accordance with ISO8528-5, BS5514, SAE J1349, ISO3046, and DIN6271 standards.

VOLTAGE REGULATOR

TYPE	Full Digital
SENSING	3 Phase
REGULATION	± 1/4%
FEATURES	Built into H-100 Control Panel V/F Adjustable Adjustable Voltage and Gain

GENERATOR FEATURES

- ❒ Revolving field heavy duty generator
- ❒ Quiet drive coupling
- ❒ Operating temperature rise 120 °C above a 40 °C ambient
- ❒ Insulation is Class H rated at 150 °C rise
- ❒ All prototype models have passed three phase short circuit testing

CONTROL PANEL FEATURES

❒ TWO FOUR LINE LCD DISPLAYS READ:

- Voltage (all phases)
- Power factor
- kVAR
- Engine speed
- Run hours
- Fault history
- Coolant temperature
- Low oil pressure shutdown
- Overvoltage
- Low coolant level
- Not in auto position (flashing light)
- ATS selection
- Current (all phases)
- kW
- Transfer switch status
- Low fuel pressure
- Service reminders
- Oil pressure
- Time and date
- High coolant temperature shutdown
- Overspeed
- Low coolant level
- Exercise speed

❒ INTERNAL FUNCTIONS:

- I^2T function for alternator protection from line to neutral and line to line short circuits
- Emergency stop
- Programmable auto crank function
- 2 wire start for any transfer switch
- Communicates with the Generac HTS transfer switch
- Built-in 7 day exerciser
- Adjustable engine speed at exerciser
- RS232 port for GenLink* control
- RS485 port remote communication
- Canbus addressable
- Governor controller and voltage regulator are built into the master control board
- Temperature range -40 °C to 70 °C

ENGINE SPECIFICATIONS

MAKE	Generac
MODEL	V Type
CYLINDERS	10
DISPLACEMENT	6.8 Liter
BORE	3.55
STROKE	4.17
COMPRESSION RATIO	9:1
INTAKE AIR SYSTEM	Naturally Aspirated
VALVE SEATS	Hardened
LIFTER TYPE	Hydraulic

GOVERNOR SPECIFICATIONS

TYPE	Electronic
FREQUENCY REGULATION	Isochronous
STEADY STATE REGULATION	± 0.25%

All functions are factory preset.
Individual parameter adjustments can be made via GenLink*.

ENGINE LUBRICATION SYSTEM

OIL PUMP	Gear
OIL FILTER	Full flow spin-on cartridge
CRANKCASE CAPACITY	6 Quarts

ENGINE COOLING SYSTEM

TYPE	Closed
WATER PUMP	Belt driven
NUMBER OF FAN BLADES	7
FAN DIAMETER	23 inches
FAN MODE	Puller
COOLANT HEATER	1500W 120V

FUEL SYSTEM

FUEL TYPE	Natural gas, propane vapor
CARBURETOR	Down Draft
SECONDARY FUEL REGULATOR	Standard
FUEL SHUT OFF SOLENOID	Standard
OPERATING FUEL PRESSURE	11" - 14" H_2O

ELECTRICAL SYSTEM

BATTERY CHARGE ALTERNATOR	12V 30 Amp
STATIC BATTERY CHARGER	12V 2 Amp
RECOMMENDED BATTERY	Group 24F, 525CCA
SYSTEM VOLTAGE	12 Volts

Rating definitions - Standby: Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. (All ratings in accordance with BS5514, ISO3046 and DIN6271). (All ratings in accordance with BS5514, ISO3046, ISO8528 and DIN6271).

OPERATING DATA

	STANDBY			
GENERATOR OUTPUT VOLTAGE/KW-60Hz	N.G.	AMP	LP	AMP
120/240V, 1-phase, 1.0 pf	136	567	144	600
120/208V, 3-phase, 0.8 pf	142	493	150	520
120/240V, 3-phase, 0.8 pf	142	427	150	451
277/480V, 3-phase, 0.8 pf	142	214	150	225
600V, 3-phase, 0.8 pf	142	171	150	180
NOTE: Consult your Generac dealer for additional voltages.				
GENERATOR OUTPUT VOLTAGE/KVA-50Hz	N.G.	AMP	LP	AMP
110/220V, 1-phase, 1.0 pf	114	518	120	545
115/200V, 3-phase, 0.8 pf	142	512	150	433
100/200V, 3-phase, 0.8 pf	142	512	150	433
231/400V, 3-phase, 0.8 pf	142	256	150	216
NOTE: Consult your Generac dealer for additional voltages.				
MOTOR STARTING	240V		480V	
Maximum at 35% instantaneous voltage dip with standard alternator—50/60 Hz	290/348 KVA		387/464 KVA	
FUEL	N.G. ft³/hr		Propane gal/hr	
Fuel consumption—60 Hz—100% Load*	2061		22.57	
Fuel consumption—50 Hz—100% Load*	1711		18.73	

COOLING		
Coolant capacity	System lit. (US gal.)	23.7 (6.3)
	Engine lit. (US gal.)	12.3 (3.3)
	Radiator lit. (US gal.)	11.4 (3.0)
Coolant flow/min.	60 Hz lit. (US gal.)	262 (69)
Heat rejection to coolant	BTU/hr.	450,000
Inlet air	60 Hz m³/min. (cfm)	170 (6000)
Maximum operating air temperature***	°C (°F)	50 (122)
Maximum air temperature onto radiator***	°C (°F)	60 (140)
COMBUSTION AIR REQUIREMENTS		
Flow at rated power	60 Hz m³/min. (cfm)	12.7 (447)
EXHAUST		
Exhaust flow at rated output	60 Hz m³/min. (cfm)	43 (1507)
Max. recommended back pressure	Kpa (Hg)	10 (2.9)
Exhaust temp. at rated output	°C (°F)	768 (1350)
Exhaust outlet size	(flange)	2.5 I.D.
ENGINE		
Rated RPM	60/50 Hz	3600/3000
HP at rated KW**	60/50 Hz	224/186
Piston speed	60 Hz m/min. (ft./min.)	761 (2499)
	50 Hz m/min. (ft./min.)	634 (2081)
BMEP	60 Hz	118.5
DERATION FACTORS		
Temperature		
	0.3% for every 10°C above - °C	25
	1.65% for every 10°F above - °F	77
Altitude		
	1.0% for every 100 m above - m	183
	3.0% for every 1000 ft. above - ft.	600

* Refer to "Emissions Data Sheets" for maximum fuel flow for EPA and SCAQMD permitting purposes.
** Refer to "Emissions Data Sheets" for maximum bHP for EPA and SCAQMD permitting purposes.
*** Values given are maximum temperatures to which power adjustments can be applied. Consult your Generac Power Systems representative if operating conditions exceed these maximums.

STANDARD ENGINE & SAFETY FEATURES

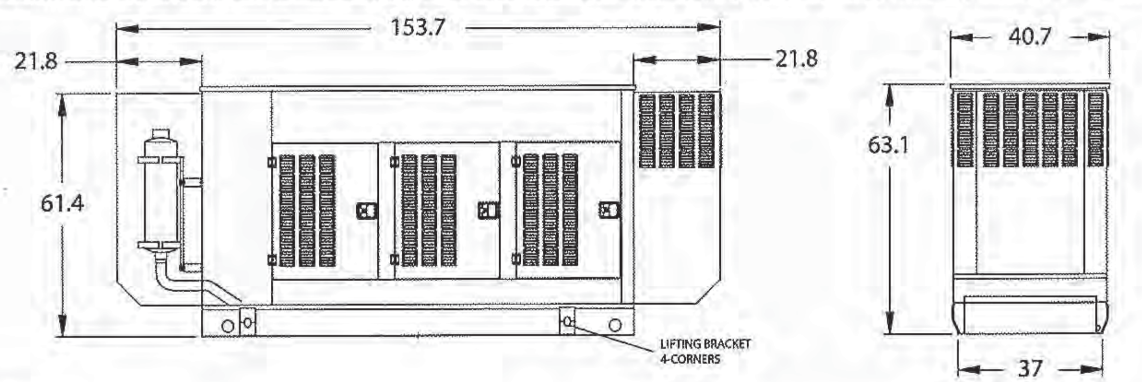
- High Coolant Temperature Automatic Shutdown
- Low Coolant Level Automatic Shutdown
- Low Oil Pressure Automatic Shutdown
- Overspeed Automatic Shutdown (Solid-state)
- Crank Limiter (Solid-state)
- Oil Drain Extension
- Radiator Drain Extension
- Factory-Installed Cool Flow Radiator
- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Rubber-Booted Engine Electrical Connections
- Isochronous Governor
- Fuel Lockoff Solenoid
- Secondary Fuel Regulator (N.G. and L.P.)
- Stainless Steel Flexible Exhaust Connection
- Battery Charge Alternator
- Battery Cables
- Battery Tray
- Vibration Isolation of Unit to Mounting Base
- 24 Volt, Solenoid-Activated Starter Motor
- Air Cleaner
- Fan Guard
- Control Console

OPTIONS

- **OPTIONAL COOLING SYSTEM ACCESSORIES**
  - Radiator Duct Adapter
- **OPTIONAL FUEL ACCESSORIES**
  - Flexible Fuel Lines
  - Liquid Withdrawal LPG
- **OPTIONAL ELECTRICAL ACCESSORIES**
  - Battery, (2) - 12 Volt, 135 A.H., 4DLT
  - Battery, (2) - 12 Volt, 225 A.H., 8D
  - Battery Heater
  - 2A Battery Charger
  - 10A Dual Rate Battery Charger
- **OPTIONAL ALTERNATOR ACCESSORIES**
  - Alternator Upsizing
  - Alternator Strip Heater
  - Alternator Tropicalization
  - Main Line Circuit Breaker
- **CONTROL CONSOLE OPTIONS**
  - Digital Controller H100 *see specification 0172110SBY*
- **ADDITIONAL OPTIONAL EQUIPMENT**
  - Automatic Transfer Switch (GTS or HTS)
  - 21 Light Remote Annunciator
  - Remote Relay Panels
  - Unit Vibration Isolators
  - Oil Make-Up System
  - Oil Heater
  - 5 Year Warranties
  - Export Boxing
  - GenLink® Communications Software
- **OPTIONAL ENCLOSURES**
  - Weather Protective
  - Sound Attenuated
  - Aluminum and Stainless Steel
  - Enclosed Muffler

Distributed by:

Design and specifications subject to change without notice. Dimensions shown are approximate. Contact your Generac dealer for certified drawings. DO NOT USE THESE DIMENSIONS FOR INSTALLATION PURPOSES.



UNITS: INCHES

GENERAC

Generac Power Systems, Inc. • S45 W29290 HWY. 59, Waukesha, WI 53189 • generac.com

GENERAC®
POWER SYSTEMS, INC.

STATEMENT OF EXHAUST EMISSIONS
CATALYST-EQUIPPED GASEOUS FUELED GENERATOR

The measured emission values provided here are proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc. The data provided shall not be meant to include information made public by Generac.

Generator Model:	**QT150A**	kW_e Rating:	**150**
Engine Size:	**6.8L**	HP at Rated kW_e:	**254**
Aspiration:	**Naturally Aspirated**	Engine Speed:	**3600**
Fuel Type:	**LP Vapor**	SCAQMD CEP#:	**483767**

Unit equipped with Generac 3-way catalyst and air/fuel ratio control system.

Emissions based on Rated kW_e of specific models.

CO	HC	NOx	NOx + HC	
0.80	**0.10**	**0.12**	**0.22**	Grams/kW-hr
0.60	**0.08**	**0.09**	**0.17**	Grams/bhp-hr

- The stated values are actual exhaust emission test measurements obtained from a unit representative of the generator type and engine described above.
- Values are official data of record as submitted to regulatory agencies for certification purposes. Testing was conducted in accordance with prevailing EPA & CARB protocols, which are typically accepted by SCAQMD and other regional authorities.
- Data may be based on testing performed by either the engine supplier or Generac Power Systems.
- No emission values provided above are to be construed as guarantees of emission levels for any given Generac generator unit.
- Generac Power Systems reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emission performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems cannot be construed as a guarantee of installability of the generating set.

INDUSTRIAL SALES
P.O. BOX 8 WAUKESHA, WI 53187 262-544-4800 FAX 262-544-4854

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APPENDIX C
Speciation Tables for DPM and LPG

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South Coast Air Quality Management District

Supplemental Instructions

Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory

Annual Emissions Reporting Program

January 2010

Table B-2: DEFAULT EF FOR DIESEL / DISTILLATE OIL FUEL COMBUSTION (LB / 1000 GAL)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.0044
4	1,3-Butadiene	106990	0.0148
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	0.3506
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Total PAHs (excluding Naphthalene)	1151	0.0445
19	Naphthalene	91203	0.0053
29	Acetaldehyde	75070	0.3506
30	Acrolein	107028	0.3506
32	Ammonia*	7664417	2.9000
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0002
44	Hexane	110543	0.0035
46	Hydrogen chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.0020
64	Selenium	7782492	0.0022
68	Toluene	108883	0.0044
70	Xylenes	1330207	0.0016

SOURCE: Stationary and Portable Internal Combustion Engines (ICE)

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.1863
4	1,3-Butadiene	106990	0.2174
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	1.7261
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Naphthalene	91203	0.0197
19	PAHs (excluding Naphthalene)	1151	0.0362
29	Acetaldehyde	75070	0.7833
30	Acrolein	107028	0.0339
32	Ammonia*	7664417	2.9000
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0109
44	Hexane	110543	0.0269
46	Hydrogen Chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.0020
64	Selenium	7782492	0.0022
68	Toluene	108883	0.1054
70	Xylenes	1330207	0.0424
72	Diesel exhaust particulates	9901	33.5000

SOURCE: Turbines

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.1863
4	1,3-Butadiene	106990	0.2174
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	1.7261
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Naphthalene	91203	0.0197
19	PAHs (excluding Naphthalene)	1151	0.0362
29	Acetaldehyde	75070	0.7833
30	Acrolein	107028	0.0339
32	Ammonia*	7664417	2.9000
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0109
44	Hexane	110543	0.0269
46	Hydrogen Chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.0020
64	Selenium	7782492	0.0022
68	Toluene	108883	0.1054
70	Xylenes	1330207	0.0424

***This value corresponds to equipment with SNCR, for equipment with SCR substitute listed value by 1.4 lbs/1000 gal, and for equipment without SNCR or SCR by 0.8 lbs/1000 gal.**

Table B-3: DEFAULT EF FOR LPG, BUTANE, OR PROPANE COMBUSTION (LB / 1000 GAL)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	<10 MMBTU/HR	10-100 MMBTU/HR	>100 MMBTU/HR
2	Benzene	71432	0.00071	0.00051	0.00015
12	Formaldehyde	50000	0.00151	0.00109	0.00032
19	PAHs (excluding Naphthalene)	1151	0.00001	0.00001	0.00001
19	Naphthalene	91203	0.00003	0.00003	0.00003
29	Acetaldehyde	75070	0.00038	0.00028	0.00008
30	Acrolein	107028	0.00024	0.00024	0.00007
32	Ammonia	7664417	0.30000	0.30000	0.30000
40	Ethyl benzene	100414	0.00084	0.00061	0.00018
44	Hexane	110543	0.00056	0.00041	0.00012
68	Toluene	108883	0.00325	0.00235	0.00069
70	Xylene	1330207	0.00241	0.00175	0.00051

SOURCE: Turbine

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.00109
4	1,3-Butadiene	106990	0.0000389
12	Formaldehyde	50000	0.0643
19	Naphthalene	91203	0.000118
19	PAHs (excluding Naphthalene)	1151	0.0000815
29	Acetaldehyde	75070	0.00362
30	Acrolein	107028	0.000579
32	Ammonia	7664417	0.30000
40	Ethylbenzene	100414	0.00290
62	Propylene oxide	75569	0.00262
68	Toluene	108883	0.0118
70	Xylene	1330207	0.00579

(Continued)

Table B-3: DEFAULT EF FOR LPG, BUTANE, OR PROPANE COMBUSTION (LB / 1000 GAL) (continued)

SOURCE: Stationary and Portable Internal Combustion Engines (ICE)

TAC Code	POLLUTANT	CAS NO.	2 Stroke-Lean Burn	4 Stroke-Lean Burn	4 Stroke-Rich Burn
2	Benzene	71432	0.17757	0.0398	0.143
4	1,3-Butadiene	106990	0.0742	0.0242	0.06
6	Carbon Tetrachloride	56235	0.00549	0.00332	0.0016
9	Ethylene Dibromide	106934	0.00664	0.00401	0.00193
10	1,2-Dichloroethane	107062	0.00382	0.00214	0.00102
12	Formaldehyde	50000	5.00	4.78	1.86
16	Methylene Chloride	75092	0.0133	0.00181	0.00373
19	2-Methylnaphthalene	91576	0.00194	0.003	0
19	Acenaphthene	83329	0.000120	0.000113	0
19	Acenaphthylene	208968	0.000287	0.0005	0
19	Anthracene	120127	0.0000650	0	0
19	Benz(a)anthracene	56553	0.0000304	0	0
19	Benzo(a)pyrene	50328	0.000000514	0	0
19	Benzo(b)fluoranthene	205992	0.000000770	0.000015	0
19	Benzo(e)pyrene	192972	0.00000212	0.0000376	0
19	Benzo(g,h,i)perylene	191242	0.00000224	0.0000375	0
19	Benzo(k)fluoranthene	207089	0.000000386	0	0
19	Chrysene	218019	0.0000608	0.0000627	0
19	Fluoranthene	206440	0.0000327	0.0001	0
19	Fluorene	86737	0.000153	0.000513	0
19	Indeno(1,2,3-c,d)pyrene	193395	0.000000899	0	0
19	Naphthalene	91203	0.00872	0.00673	0.00879
19	Perylene	198550	0.00000045	0	0
19	Phenanthrene	85018	0.000319	0.000941	0
19	Pyrene	129000	0.0000529	0.000123	0
21	Vinyl Chloride	75014	0.00224	0.00135	0.00065
24	1,1,2,2-Tetrachloroethane	79345	0.006	0.00362	0.00229
25	1,1,2-Trichloroethane	79005	0.00477	0.00288	0.00138
26	1,2,4-Trimethylbenzene	95636	0.01	0.00129	0
27	1,2-Dichloropropane	78875	0.00404	0.00243	0.00118
28	1,3-Dichloropropene	542756	0.00396	0.00239	0.00115
29	Acetaldehyde	75070	0.702	0.757	0.252
30	Acrolein	107028	0.704	0.465	0.238
32	Ammonia	7664417	0.30	0.30	0.30
35	Chloroform	67663	0.00426	0.00258	0.00124
40	Ethylbenzene	100414	0.00977	0.00359	0.00224
44	n-Hexane	110543	0.0403	0.10	0
51	Methanol	67561	0.224	0.226	0.277
66	Styrene	100425	0.00496	0.00214	0.00108
68	Toluene	108883	0.0872	0.0369	0.0505
70	Xylene	1330207	0.0243	0.0167	0.0176

APPENDIX D

BAAQMD Diesel Risk and Hazard Distance Adjustment Multiplier Table

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Cancer Risk and Chronic Hazard Index Distance Adjustment Multiplier for Diesel IC Engines

Distance, meters	Distance Adjustment Multiplier
25	0.85
30	0.73
35	0.64
40	0.58
50	0.50
60	0.41
70	0.31
80	0.28
90	0.25
100	0.22
110	0.18
120	0.16
130	0.15
140	0.14
150	0.12
160	0.10
180	0.09
200	0.08
220	0.07
240	0.06
260	0.05
280	0.04

How to Use the Cancer Risk and Chronic Hazard Index Distance Adjustment Multiplier for Diesel Internal Combustion (IC) Engines

1. Get the facility diesel IC engine cancer risk or chronic hazard index from table only for facilities where the HRA source is listed as "diesel engine screening value." If the distance to the nearest receptor is less than 25 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk or chronic hazard index estimate.

2. Determine the shortest distance from each diesel IC engine to the nearest receptor. Select the shortest distance to receptor found.

3. From the table, locate the shortest distance to the receptor. If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 280 meters use the multiplier 0.04.

4. Multiply the cancer risk or the chronic hazard index (found in step 1) by the multiplier found in step 3. The resulting product is the adjusted cancer risk in a million or adjusted chronic hazard index for the diesel IC engines at the facility.

5. If facility has sources other than diesel IC engines, add the result from step 4 to the facility cancer risk or chronic hazard index, excluding DICE from the health risk table (kml file). The final value is the health risk for the facility.

Notes on creation of the chart:

1. Ground-level concentrations for a unit emission rate were determined using the AERMOD model
2. Meteorological data sets used include Concord, Hunters Point, Oakland, Petaluma, UC Richmond and San Jose.
3. Land use based on Auer Analysis around met station.
4. Assumed no complex terrain and no flagpole receptors.
5. Assumed the exhaust exits vertically and does not have a fixed cap.
6. Stack exhaust parameters used: 6-feet high, 3-inch diameter, 50 m/s exit velocity, 620°K (656 °F).
7. Over two dozen building configurations were modeled to address building downwash.
8. 4104 receptors modeled, located along 72 radials, 5 degrees apart and 57 rings spaced 5 meters apart.
9. Cancer Risk calculation includes the following parameters:

   Breathing Rate of 302 L/kg-day

   Inhalation Cancer Potency Factor of 1.1 $(mg/kg\text{-}day)^{-1}$

   Residential Receptor Adjustment Factor (age sensitivity) of 1.7

10. For each meteorological data set, the highest results for each building dimension and distance to receptor combination was used to calculate the cancer risk.
11. The table results above represent the highest calculated cancer risk from each of the six meteorological data sets.

APPENDIX E

Personal Communications with BAAQMD and CARB Regarding Methodology and Approach

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Bay Area Air Quality Management District

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD. This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

For guidance on conducting a risk & hazard screening, including for roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Also see the District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.

Table A: Requestor Contact Information	
Contact Name:	Valerie Chew Geier
Affiliation:	Orion Environmental Associates
Phone:	510.644.2535
Email:	valerie@orionenvironment.com
Project Name:	San Antonio Backup Pipeline
Address:	Extends along Calaveras Road for 2.2
City:	Sunol
County:	Alameda
Type (residential, commercial, mixed use, industrial, etc.):	Infrastructure - Water Pipeline, Pump Station
Project size (# of units, or building square feet):	7,000-foot long pipeline; discharge facility, chemical facility (incl. emergency generator); slurry cut-off wall, pump station, dewatering
Comments:	

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in Table A. Incomplete forms will not be processed. Please include a project site map.
2. Download and install the free program Google Earth, http://www.google.com/earth/download/ge/, and then download the county specific Google Earth stationary source application files (dated 1/27/2011) from the District's website, http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx. The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.
3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.
4. Using the Google Earth ruler function, measure the distance in feet between the project's fenceline and the stationary source's fenceline for all the sources that are within 1,000 feet of the project's fenceline. Verify that the location of the source on the map matches with the source's address in the information table, by using the Google Earth address search box to confirm that the source is within 1,000 feet of the project. Please report any mapping errors to the District (District contact information in Step 8).
5. If the stationary source is within 1,000 feet of the project's fenceline and the stationary source's information table does not list the cancer risk, hazard index, and PM2.5 concentration, and instead says to "Contact District Staff", list the stationary source information in Table B Section 1 below.
6. Email this completed form to District staff (Step 8). District staff will provide the most recent risk, hazard, and/or PM2.5 data that is available for the source(s). If this information or data is not available, a public records request may be required if the requestor needs source specific emissions data. Staff will notify you if this is necessary. Staff will respond to inquiries within three weeks.
7. Notify staff if you have previously submitted a public information records request for any sources listed in Table B Section 1.
8. **Submit forms, maps, and questions to Alison Kirk at 415-749-5169, or akirk@baaqmd.gov**

Map A: Snapshot of Google Earth with Plant Source 20248 Information Table Selected

Table B: Stationary Sources within 1,000 feet of Receptor that say "Contact District Staff"

Table B Section 1: Requestor fills out these columns based on Google Earth data				Table B Section 2: BAAQMD returns form with additional information in these columns as needed															
Distance from Receptor (feet)	**Plant # or Gas Dispensary #**	**Facility Name**	**Street Address**	**Screening Level Cancer Risk (1)**	**Screening Level Hazard Index (1)**	**Screening Level PM2.5 (1)**	**Permit #s (2)**	**Source #s (2)**	**Fuel Code (3)**	**Type of Source(s) (4)**	**HRSA Ap # (5)**	**HRSA Date (6)**	**HRSA Engineer (7)**	**HRSA Cancer Risk in a million**	**Age Sensitivity Factor (8)**	**HRSA Adjusted Cancer Risk**	**HRSA Chronic Health (9)**	**HRSA PM2.5 Risk**	**Status/Comments**
1.94 miles to closest receptor (600 feet from northern project	15592	City and County of San Francisco-PUC	5555 Calaveras Road	Contact District Staff	Contact District Staff	Contact District Staff		FID: 506		100 kW Standby Generator					1.7	0		0	
0.58 mile to receptor (within project site)	16195	Construction Materials Pacific, LL	6527 Calaveras Road	Contact District Staff	Contact District Staff	Contact District Staff		FID: 447		Non-Retail Gas Dispensing					1.7	0		0	
				Contact District Staff	Contact District Staff	Contact District Staff									1.7	0		0	
				Contact District Staff	Contact District Staff	Contact District Staff									1.7	0		0	
				Contact District Staff	Contact District Staff	Contact District Staff									1.7	0		0	
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				Contact District Staff	Contact District Staff	Contact District Staff									1.7	0		0	
				Contact District Staff	Contact District Staff	Contact District Staff									1.7	0		0	
				Contact District Staff	Contact District Staff	Contact District Staff									1.7	0		0	

Footnotes:

1. These Cancer Risk, Hazard Index, and PM2.5 columns represent the rows in the Google Earth Plant Information Table that say "Contact District Staff" (Map A above). BAAQMD will return this form to you with this screening level information entered in these columns.
2. Each plant may have multiple permits and sources.
3. Fuel codes: 98 = diesel, 198 = Natural Gas.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
6. The date that the HRSA was completed.
7. Engineer who completed HRSA. For District purposes only.
8. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
9. The HRSA "Chronic Health" number represents the Hazard Index.
10. Further information about common sources:
    a. Sources that only include diesel engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of 0.003 or less. To be conservative, requestor should assume the cancer risk is 1 in a million and the hazard index is 0.003 for these sources.
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but instead should reflect the number of years perc use will continue after the project's residents or other sensitive receptors (such as students, patients, etc) take occupancy.
    e. Non-retail gas stations are considered insignificant.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.

SOURCE: ESA+Orion, 2011; Date of aerial photo is 2006.

SFPUC San Antonio Backup Pipeline Project
Figure 1
SABPL Project Area and 1,000-Foot Buffer

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
DETAIL POLLUTANTS - ABATED
MOST RECENT P/O APPROVED (2011)

Printed: MAY 31, 2011

City and County of San Francisco-PUC (P# 15592)

S#	SOURCE NAME / MATERIAL THROUGHPUT	SOURCE CODE DATE	POLLUTANT	CODE	LBS/DAY
1	Standby Generator 100 kW				
		C2260160			
			Benzene	41	5.85E-05
			Formaldehyde	124	2.47E-03
			Organics (part not spec el	990	5.07E-02
			Particulates (portion of t	1990	7.92E-03
			Nitrous Oxide (N2O)	2030	1.71E-04
			Nitrogen Oxides (part not	2990	3.99E-01
			Sulfur Dioxide (SO2)	3990	6.10E-02
			Carbon Monoxide (CO) pollu	4990	2.68E-01
			Carbon Dioxide, non-biogen	6960	1.08E+02
			Methane (CH4)	6970	8.14E-04
2	Emergency Standby Generator Set				
		C22AG098			
			Benzene	41	2.54E-03
			Formaldehyde	124	2.10E-04
			Organics (part not spec el	990	1.22E-01
			Arsenic (all)	1030	2.21E-06
			Beryllium (all) pollutant	1040	1.29E-06
			Cadmium	1070	5.52E-06
			Chromium (hexavalent)	1095	1.14E-07
			Lead (all) pollutant	1140	4.68E-06
			Manganese	1160	7.35E-06
			Nickel pollutant	1180	8.93E-05
			Mercury (all) pollutant	1190	1.56E-06
			Diesel Engine Exhaust Part	1350	1.28E-01
			PAH's (non-speciated)	1840	1.17E-05
			Nitrous Oxide (N2O)	2030	6.79E-04
			Nitrogen Oxides (part not	2990	1.79E+00
			Sulfur Dioxide (SO2)	3990	8.28E-04
			Carbon Monoxide (CO) pollu	4990	3.88E-01
			Carbon Dioxide, non-biogen	6960	8.50E+01
			Methane (CH4)	6970	3.40E-03
3	Emergency Water Pump 1				
		C24BH098			
			Benzene	41	3.77E-03
			Formaldehyde	124	3.08E-04
			Organics (part not spec el	990	2.06E-01
			Arsenic (all)	1030	3.24E-06
			Beryllium (all) pollutant	1040	1.90E-06
			Cadmium	1070	8.10E-06
			Chromium (hexavalent)	1095	1.68E-07
			Lead (all) pollutant	1140	6.87E-06
			Manganese	1160	1.08E-05
			Nickel pollutant	1180	1.31E-04
			Mercury (all) pollutant	1190	2.29E-06
			Diesel Engine Exhaust Part	1350	1.87E-01
			PAH's (non-speciated)	1840	1.71E-05
			Nitrous Oxide (N2O)	2030	9.97E-04

		Nitrogen Oxides (part not	2990	2.62E+00
		Sulfur Dioxide (SO2)	3990	1.22E-03
		Carbon Monoxide (CO) pollu	4990	5.70E-01
		Carbon Dioxide, non-biogen	6960	1.25E+02
		Methane (CH4)	6970	4.99E-03
4	Emergency Water Pump 2			
	C24BH098			
		Benzene	41	4.17E-03
		Formaldehyde	124	3.40E-04
		Organics (part not spec el	990	2.27E-01
		Arsenic (all)	1030	3.58E-06
		Beryllium (all) pollutant	1040	2.10E-06
		Cadmium	1070	8.95E-06
		Chromium (hexavalent)	1095	1.85E-07
		Lead (all) pollutant	1140	7.60E-06
		Manganese	1160	1.19E-05
		Nickel pollutant	1180	1.45E-04
		Mercury (all) pollutant	1190	2.53E-06
		Diesel Engine Exhaust Part	1350	2.07E-01
		PAH's (non-speciated)	1840	1.89E-05
		Nitrous Oxide (N2O)	2030	1.10E-03
		Nitrogen Oxides (part not	2990	2.90E+00
		Sulfur Dioxide (SO2)	3990	1.34E-03
		Carbon Monoxide (CO) pollu	4990	6.30E-01
		Carbon Dioxide, non-biogen	6960	1.38E+02
		Methane (CH4)	6970	5.51E-03
5	Emergency Water Pump 3			
	C24BH098			
		Benzene	41	4.33E-03
		Formaldehyde	124	3.53E-04
		Organics (part not spec el	990	2.36E-01
		Arsenic (all)	1030	3.72E-06
		Beryllium (all) pollutant	1040	2.18E-06
		Cadmium	1070	9.30E-06
		Chromium (hexavalent)	1095	1.92E-07
		Lead (all) pollutant	1140	7.89E-06
		Manganese	1160	1.24E-05
		Nickel pollutant	1180	1.50E-04
		Mercury (all) pollutant	1190	2.63E-06
		Diesel Engine Exhaust Part	1350	2.15E-01
		PAH's (non-speciated)	1840	1.96E-05
		Nitrous Oxide (N2O)	2030	1.14E-03
		Nitrogen Oxides (part not	2990	3.01E+00
		Sulfur Dioxide (SO2)	3990	1.39E-03
		Carbon Monoxide (CO) pollu	4990	6.54E-01
		Carbon Dioxide, non-biogen	6960	1.43E+02
		Methane (CH4)	6970	5.72E-03

PLANT TOTAL:

lbs/day	Pollutant
1.28E-05	Arsenic (all) (1030)
1.49E-02	Benzene (41)
7.47E-06	Beryllium (all) pollutant (1040)
3.19E-05	Cadmium (1070)
5.99E+02	Carbon Dioxide, non-biogenic CO2 (6960)
2.51E+00	Carbon Monoxide (CO) pollutant (4990)
6.60E-07	Chromium (hexavalent) (1095)
7.36E-01	Diesel Engine Exhaust Particulate Matter (1350)
3.68E-03	Formaldehyde (124)

2.70E-05	Lead (all) pollutant (1140)
4.24E-05	Manganese (1160)
9.01E-06	Mercury (all) pollutant (1190)
2.04E-02	Methane (CH4) (6970)
5.16E-04	Nickel pollutant (1180)
1.07E+01	Nitrogen Oxides (part not spec elsewhere) (2990)
4.09E-03	Nitrous Oxide (N2O) (2030)
8.41E-01	Organics (part not spec elsewhere) -- including Methane (990)
6.73E-05	PAH's (non-speciated) (1840)
7.92E-03	Particulates (portion of total not spec elsewhere) (1990)
6.58E-02	Sulfur Dioxide (SO2) (3990)

print this search?: [L]ocal or s[Y]stem printer (6th flr), [N]o, [E]xit:

BAY AREA AIR QUALITY MANAGEMENT DISTRICT   Printed: MAY 31, 2011
DETAIL POLLUTANTS - ABATED
MOST RECENT P/O APPROVED (2010)

CEMEX Construction Materials Pacific, LLC (P# 16195)

S#	SOURCE NAME / MATERIAL THROUGHPUT	SOURCE CODE DATE	POLLUTANT	CODE	LBS/DAY
1	CRUSHER SAND & GRAVEL	G4032244			
			Particulates (portion of t	1990	5.33E-02
3	CRUSHER SECONDARY	G4032244			
			Particulates (portion of t	1990	8.55E-02
7	SCREEN	G4099244			
			Particulates (portion of t	1990	4.60E+00
8	SCREEN	G4099244			
			Particulates (portion of t	1990	4.60E+00
9	SCREEN	G4099244			
			Particulates (portion of t	1990	2.07E+00
10	CONVEYORS ROCK SAND & GRAVEL	G4030244			
			Particulates (portion of t	1990	0.00E+00
12	Screen	G4099244			
			Particulates (portion of t	1990	7.89E-01
17	Feed Hopper	G4061262			
			Particulates (portion of t	1990	1.18E+01
18	Stockpiles and Haul Roads	G7014262			
			Particulates (portion of t	1990	7.78E+00
24	Crusher	G4032262			
			Particulates (portion of t	1990	9.70E-02
27	Screening (3-05-020-02, 03): crushed rock	G4064244			
			Particulates (portion of t	1990	1.10E-02
28	Aggregate Screening (Controlled) SCC 3-05-020-03	G4064244			
			Particulates (portion of t	1990	1.08E-01
29	Aggregate Crushing - Secondary	G4064244			
			Organics (part not spec el	990	0.00E+00
			Particulates (portion of t	1990	2.91E-02
			Nitrogen Oxides (part not	2990	0.00E+00
			Sulfur Dioxide (SO2)	3990	0.00E+00
			Carbon Monoxide (CO) pollu	4990	0.00E+00
100	Non Retail Gasoline Dispensing Facility	TC000000			
			Benzene	41	2.04E-04
			Toluene	293	6.93E-04
			Xylene	307	8.15E-05
			Ethylbenzene	333	4.76E-05
			Gasoline - unleaded	551	6.69E-02

P# 16195 Pg. 2

PLANT TOTAL:

lbs/day	Pollutant
2.04E-04	Benzene (41)
0.00E+00	Carbon Monoxide (CO) pollutant (4990)
4.76E-05	Ethylbenzene (333)
6.69E-02	Gasoline - unleaded (551)
0.00E+00	Nitrogen Oxides (part not spec elsewhere) (2990)
0.00E+00	Organics (part not spec elsewhere) -- including Methane (990)
3.21E+01	Particulates (portion of total not spec elsewhere) (1990)
0.00E+00	Sulfur Dioxide (SO2) (3990)
6.93E-04	Toluene (293)
8.15E-05	Xylene (307)

print this search?: [L]ocal or s[Y]stem printer (6th flr), [N]o, [E]xit:

From: Hans Giroux <hgiroux@att.net>
Subject: **Fw: Inquiry Form**
Date: June 21, 2011 3:10:39 PM PDT
To: Valerie Geier <valerie@orionenvironment.com>

Giroux & Associates
1820 E. Garry St. #211
Santa Ana, CA 92705
949-387-5477

----- Forwarded Message ----
From: Hans Giroux <hgiroux@att.net>
To: Andrea Gordon <AGordon@baaqmd.gov>
Sent: Thu, May 26, 2011 4:41:03 PM
Subject: RE: Inquiry Form

I did submit the stationary source inquiry form in my initial e-mail. It is difficult to perform our own dilution calculation because we don't know the input parameters for the given source and we don't know the location where the maximum occurs as a basis for calculating further dispersion from that point. I do very much appreciate your incredibly rapid response to my questions, we are in a bit of a time crunch and you have been very helpful in a hurry. Hans Giroux

Giroux & Associates
1820 E. Garry St. #211
Santa Ana, CA 92705
949-387-5477

--- On **Thu, 5/26/11, Andrea Gordon <*AGordon@baaqmd.gov*>** wrote:

> From: Andrea Gordon <AGordon@baaqmd.gov>
> Subject: RE: Inquiry Form
> To: "Hans Giroux" <hgiroux@att.net>
> Date: Thursday, May 26, 2011, 3:28 PM
>
> Hans,
>
> A possibility to account for the distance is to dilute the emissions from these sources to the receptor based on the distance by using a multiplier or by doing a similar SCREEN3 run. You can also fill out a Stationary Source Inquiry Form located on the BAAQMD website and submit it to us to possibly receive risk assessment information from these sources.
>
> Andrea
>
> **From:** Hans Giroux [mailto:hgiroux@att.net]
> **Sent:** Thursday, May 26, 2011 1:47 PM
> **To:** Andrea Gordon
> **Subject:** RE: Inquiry Form
>
> Thanks, what kind of distance decay factor can we use, the emergency generator is a point source, CEMEX is an area or volume source? Hans
>
> Giroux & Associates
> 1820 E. Garry St. #211
> Santa Ana, CA 92705
> 949-387-5477
>
> --- On **Thu, 5/26/11, Andrea Gordon <*AGordon@baaqmd.gov*>** wrote:
>
> From: Andrea Gordon <AGordon@baaqmd.gov>
> Subject: RE: Inquiry Form
> To: "Hans Giroux" <hgiroux@att.net>
> Date: Thursday, May 26, 2011, 11:58 AM
>
> Hello Hans –
>
> The response to your question below is yes, however these sources are significantly far away from the receptor and you should account for this distance.

Andrea

From: Hans Giroux [mailto:hgiroux@att.net]
Sent: Thursday, May 26, 2011 10:20 AM
To: Andrea Gordon; Kelly White
Subject: Inquiry Form

We are preparing a health risk screening and cumulative impact analysis for an SFPUC construction project along Calaveras Road in Alameda County. We have one residence within our potential; impact zone that is almost a mile away from Sources 15592 or 16195, but these sources are within 1000 feet of our construction boundary. Since they are more than 1000 feet from our sole sensitive receptor, do we need to include them in our cumulative analysis? I'm concerned that 16195 has a huge PM-2.5 impact, which I would think is mainly due to fugitive dust. I'll have Kelly White from ESA send you a site plan/map under separate cover. Thank you in advance for any guidance.

Hans Giroux

Geier & Geier
1820 E. Garry St. #211
Santa Ana, CA 92705
949-387-5477

From: Alison Kirk <AKirk@baaqmd.gov>
Subject: **RE: Stationary Source Data Request**
Date: March 24, 2011 9:00:18 AM PDT
To: Valerie Geier <valerie@orionenvironment.com>

We removed the acute hazard index from all sources because we found that virtually none of the sources in our inventory exceeded the thresholds.

Yes, 15592 is chronic

[illegible]
[illegible]

From: Valerie Geier [mailto:valerie@orionenvironment.com]
Sent: Thursday, March 24, 2011 8:56 AM
To: Alison Kirk
Subject: Re: Stationary Source Data Request

Thanks! Just want to confirm that there is no acute hazard for this site, correct?

The other site in the vicinity, 15592, lists the hazard index at 0.007. Since it is a standby generator, can I assume this hazard index relates to chronic and not to any acute hazard?

Thanks, Valerie
--
Valerie Geier
Senior Associate
Orion Environmental Associates
211 Sutter Street, #803
San Francisco, CA 94108
Direct Phone (510) 644-2535
valerie@orionenvironment.com

On Mar 24, 2011, at 8:30 AM, Alison Kirk wrote:

So sorry! Thought I had included it earlier…

Plant Cancer Risk (in a million)	Plant Chronic Hazard	Plant PM2.5 Concentration (ug/m3)
[illegible]	[illegible]	[illegible]

[illegible]
[illegible]

From: Valerie Geier [mailto:valerie@orionenvironment.com]
Sent: Wednesday, March 23, 2011 7:03 PM
To: Alison Kirk
Subject: Re: Stationary Source Data Request

I don't see the cancer and non-cancer risks. There is no attachment and they are not indicated in your email (below). I highlighted my request in red.

Thanks, Valerie
--
Valerie Geier
Senior Associate
Orion Environmental Associates
211 Sutter Street, #803
San Francisco, CA 94108
Direct Phone (510) 644-2535
valerie@orionenvironment.com

On Mar 23, 2011, at 10:29 AM, Alison Kirk wrote:

Hello,

I confirmed the cancer and non-cancer risk, and PM concentration for this site.

Apparently source 16195 is much more than a gas station, and this explains the PM concentration. Here are the sources associated with this number:

Plant# 16195
CEMEX Construction Materials Pacific, LLC
6527 Calaveras Rd
Sunol, CA 94586

[C]urrent, [A]rchive, or [F]uture? c

CURRENT Sources:
1 CRUSHER SAND & GRAVEL
3 CRUSHER SECONDARY
7 SCREEN
8 SCREEN
9 SCREEN
10 CONVEYORS ROCK SAND & GRAVEL
12 Screen
17 Feed Hopper
18 Stockpiles and Haul Roads
25 Fine Screening (3-05-025-23)
26 Secondaty Crusing [Cone]: crushed stone
27 Screening (3-05-020-02, 03): crushed rock
28 Aggregate Screening (Controlled) SCC 3-05-020-03
29 Aggregate Crushing - Secondary
100 Non Retail Gasoline Dispensing Facility

CURRENT Abatement Devices:
1 WATER SPRAY SYSTEM
17 Water Spray Nozzles
18 Water Spray Bars

Please let me know if you have any additional questions.

Alison Kirk
415-749-5169

From: Valerie Geier [mailto:valerie@orionenvironment.com]
Sent: Tuesday, March 22, 2011 4:59 PM
To: Alison Kirk
Subject: Re: Stationary Source Data Request

Thank you for your quick response regarding these two emission sources. However, I spoke with Jessica Range at San Francisco MEA and she has requested that we present and consider Source 16195, the CEMEX non-retail gas station, which is 0.58 mile from the closest sensitive receptor. According to BAAQMD records (provided to SF MEA by the BAAQMD), this source emits 119 µg/m3 of PM2.5, which she felt was high enough to be a consideration in our cumulative risks and hazards analysis. I am also perplexed why a gas station would have such high PM2.5 emissions when such particulate emissions are more typically associated with diesel exhaust.

Could you please verify this PM2.5 emissions rate from Source 16195 and also provide the cancer risk and non-cancer hazard index for this site?

Thanks, Valerie

--
Valerie Geier
Senior Associate
Orion Environmental Associates
211 Sutter Street, #803
San Francisco, CA 94108
Direct Phone (510) 644-2535
valerie@orionenvironment.com

On Mar 18, 2011, at 9:26 AM, Alison Kirk wrote:

Hello,

I agree that in this case, because it is more than 1,000 feet to the closest sensitive receptor, you don't need to consider these sources in your cumulative risk and hazards analysis.

I base this on Page 5-2 and 5-3 of the 2010 BAAQMD CEQA Guidelines, section 5.1.3. It says that "A lead agency should enlarge the 1,000 foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius."

In this case, according to the info you provided, the sources are a backup generator (15592) and a non-retail gas station (16195). Neither of these would qualify as an unusually large source.

Regarding the speciation table, I have been told that OEHAA developed the table and you should contact them.

Alison Kirk
415-749-5169

From: Valerie Geier [mailto:valerie@orionenvironment.com]
Sent: Thursday, March 17, 2011 5:36 PM
To: Alison Kirk
Subject: Stationary Source Data Request

Alison - I am working on an air quality analysis for a pipeline project being prepared for the San Francisco PUC, located in Sunol Valley. Attached is the table with two stationary sources identified in your records as being located within 1,000 feet of our project site. However, it is more than 1,000 feet from the closest sensitive receptor. So I'm not sure we need to consider these two sources in our cumulative risks and hazards analysis. Please advise.

Also, San Francisco MEA has asked us to contact the BAAQMD to obtain a speciation table of cancer and non-cancer health risks for DPM. They want us to include this in the appendix of our report. Can you provide this or refer me to the BAAQMD staff member who has such a table?

Thanks, Valerie

--

Valerie Geier
Senior Associate
Orion Environmental Associates
211 Sutter Street, #803
San Francisco, CA 94108
Direct Phone (510) 644-2535
valerie@orionenvironment.com

ESA

225 Bush Street
Suite 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

telephone notes

project	SFPUC San Antonio Backup Pipeline Project	project no.	MEA Case No. 2007.0039E
date	April 1, 2011	time	~10 AM
present	Hans Giroux		
route to	Kelly White		
contact	Todd Sax		
title			
agency	California Air Resources Board		
phone	916.322.5474		
subject	OFFROAD 2007 Model		
action required	FYI – to be included in admin record		

Todd indicated that because of the serious over-prediction problem with OFFROAD2007, the CARB is no longer supporting the use of the model for off-road diesel equipment. They have a new model that is MS Access-based and strongly recommend not using OFFROAD.

APPENDIX L

Waste Discharge Requirements for the SFPUC Drinking Water Transmission System

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Waste Discharge Requirements for the SFPUC Drinking Water Transmission System

RWQCB Order No. R2-2008-0102 (the Order) regulates discharges of altered water from the SFPUC Drinking Water Transmission System (SF Bay RWQCB, 2008). It regulates planned discharges resulting from routine operations and maintenance that can be scheduled in advance, as well as unplanned and emergency discharges resulting from system failures or natural disasters. Planned discharges includes draining pipelines and tunnels to allow for inspection, repair, and/or replacement; and flushing of disinfection water from the pipelines and tunnels when bringing them back online. The Order has been issued by the RWQCB – pursuant to Section 402 of the Clean Water Act, and Chapter 5.5, Division 7 of the California Water Code (commencing with section 13370) – to serve as an NPDES permit for point source discharges from the SFPUC water transmission system to surface waters. The Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with section 13260).

For planned discharges, the Order mandates effluent and receiving water discharge limitations. Specific effluent limitations, shown in **Table 1**, require removal of all chlorine[1] and establish specific limitations for pH, nickel, and trihalomethanes. Receiving water limitations set forth in the Order require that the discharges do not cause any of the following conditions in the receiving water:

- Floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses
- Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses
- Alteration of temperature from ambient levels unless it can be demonstrated to the satisfaction of the RWQCB that such alteration of temperature does not affect adversely beneficial uses
- Oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses
- Toxic or other deleterious substances in concentrations or quantities that will cause deleterious effects on aquatic biota, wildlife, or waterfowl; or that render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration
- Changes in turbidity that cause nuisance or adversely affect beneficial uses. In non-tidal receiving waters, where background turbidity is greater than 50 NTU, the discharges shall also not cause an increase in more than 10 percent above upstream background turbidity

1 The State Water Resources Control Board is considering a statewide policy on chlorine residual, and the NDPES permit limitations on residual chlorine may be changed to reflect the statewide policy, when established.

TABLE 1
EFFLUENT LIMITATIONS FOR PLANNED DISCHARGES

		Effluent Limitations			
Parameter	**Units**	**Average Monthly**	**Maximum Daily**	**Instantaneous Minimum**	**Instantaneous Maximum**
Total Residual Chlorine	mg/L[a]	--	--	--	0.0[b]
pH[c]	Standard Units	--	--	6.5	8.5
Nickel	ug/L[d]	4.2	7.2	--	--
Total Trihalomethanes	mg/L	0.10	--	--	--

[a] mg/L = milligrams per liter
[b] This limit is defined as the analytical detection limit of 0.05 mg/L.
[c] Exceedance of the effluent limitation for pH would not constitute a violation of the permit if it does not cause the pH of the receiving water to be depressed below 6.5 or raised above 8.5, or if it does not cause more than a 0.5 standard unit change in the receiving water pH if the receiving water pH is outside of this range.
[d] ug/L = micrograms per liter

SOURCE: RWQCB, 2008.

In accordance with the Monitoring and Reporting Program of the Order, the SFPUC is required to conduct sampling to demonstrate compliance with permit requirements during all planned discharges. For discharges to creeks, monitoring is required at a minimum of the following four locations:

1. a point in the discharge line immediately following treatment and before it joins or is diluted by any other waste stream, body of water, or substance

2. a location in the receiving water located upstream of the discharge point where conditions are not expected to be influenced by the discharge,

3. a location within 50 feet downstream from the point of discharge into the receiving water, or if access is limited, at the first accessible point downstream

4. a location at least 10 times the channel width downstream from the point of discharge (referred to as the erosion monitoring location)

Effluent monitoring requirements are summarized in **Table 3**, and receiving water requirements are summarized in **Table 4**. In addition to demonstrating permit compliance, the monitoring information is used to facilitate self-policing by the waste discharger to prevent and abate pollution resulting from the discharge; develop or assist in the development of effluent or other limitations, discharge prohibitions, and water quality standards; and prepare water and wastewater quality inventories.

Compliance with the shear stress, soil texture, and channel geomorphology monitoring requirements for the receiving waters includes determination of sheer stress and soil texture of the stream banks at the erosion monitoring location as well as cross-sectional surveys and a longitudinal profile starting at the point of discharge and ending at the erosion control monitoring

TABLE 3
EFFLUENT MONITORING REQUIREMENTS

Parameter	Units	Sample Type[a]	Minimum Sampling Frequency
Flow rate	MGD[b]	Continuous	Hourly on each occurrence
Volume	MG[c]	Continuous	Daily on each occurrence
pH	standard units	Grab	Hourly on each occurrence
Total residual chlorine	mg/L[d]	Grab	Hourly on each occurrence
Copper	ug/L[e]	Grab	One discharge per quarter
Nickel	ug/L	Grab	One discharge per quarter
Total trihalomethanes	mg/L	Grab	One discharge per quarter
All other priority pollutants not listed above	ug/L	Grab	Any one discharge per 5 years

[a] A continuous sample is one that is measured continuously and recorded and reported in accordance with the minimum sampling frequency. A grab sample is a discrete sample of effluent collected during periods of peak flow.
[b] MGD = million gallons per day
[c] MG = million gallons
[d] mg/L = milligrams per liter
[e] ug/L = micrograms per liter

SOURCE: RWQCB, 2008

TABLE 4
RECEIVING WATER MONITORING REQUIREMENTS

Parameter	Units	Sample Type	Minimum Sampling Frequency
Turbidity	NTU[a]	Grab	One discharge per quarter
pH	Standard units	Grab	Hourly on one discharge per quarter
Hardness	mg/L[b] as $CaCO_3$[c]	Grab	One discharge per quarter
Nickel	ug/L[d]	Grab	One discharge per quarter
Standard Observation[e]	--	--	Once per occurrence
All other priority pollutants not listed above	ug/L	Grab	Any one discharge per 5 years
Shear stress	lb/ft^2 [f]	NA	One discharge per quarter
Soil texture	--	Grab	One discharge per quarter
Channel geomorphology	Ft[g]	NA	One discharge per quarter

[a] NTU = nephelometric turbidity units
[b] mg/L = milligrams per liter
[c] $CaCO_3$ = calcium carbonate
[d] ug/L = micrograms per liter
[e] Standard observations for receiving waters include discoloration and turbidity, including a description of the color, source, and size of affected area; depth of water column and sampling depth; and weather conditions, including air temperatures, total precipitation during the last five days and on the day of observation; and location of meteorological station accessed to collect weather conditions and distance of this station from the discharge location
[f] lb/ft^2 = pounds per square foot
[g] ft = foot

SOURCE: RWQCB, 2008

location. In addition, the SFPUC would be required to photographically document conditions at the erosion monitoring location by collecting photographs of the stream alignment, channel banks, and any vegetation present on the banks both upstream and downstream of the erosion monitoring location before and after the discharge. In accordance with the Order, the SFPUC is required to monitor and report all discharges greater than 25 gallons per minute, and shall also report all discharges to creeks providing habitat for salmonids, regardless of flow rate.

In addition, the Order requires the SFPUC to develop and implement standard operating procedures (SOPs) for dechlorination of discharges and erosion control plan. These SOPs have been prepared for the SFPUC and are discussed below.

SFPUC Dechlorination Procedures

The SFPUC requires dechlorination of all pipeline discharges as addressed in the *Manual of Procedures – Disinfection/Dechlorination and Related Tasks* (SFPUC, 2005). In accordance with these procedures, the SFPUC would generally be responsible for performing the original gravity drain of the pipeline, and prior to discharge, would prepare a dewater and discharge plan including the date, volume, and location of the discharge as well as a dechlorination plan including a piping diagram for the dechlorination system. A construction contractor would be responsible for conducting the discharge following the initial gravity drain by the SFPUC. The *Draining, Dechlorination, and Monitoring Plan* would include an estimate of the water volume and time period for the discharge, and would describe how the discharge would comply with regulatory requirements. Information on personnel, equipment, instrumentation and calibration requirements, chemicals, sampling locations, monitoring, regulatory notifications, and record keeping would also be included. Methods for dechlorination of the discharge could include using a drip feed or metering pump to inject a 25 percent sodium bisulfite solution or other suitable method approved by the SFPUC.

SFPUC Erosion Control Standard Operating Procedure

In accordance with the requirements of RWQCB Order No. R2-2008-0102, described above, the SFPUC has prepared a standard operating procedure (SOP) that specifies erosion control practices for discharges to streams as well as SFPUC organizational responsibilities for implementing the SOP and coordination with the RWQCB, local agencies, and other users of the affected surface water (RMC, 2008). In accordance with this SOP, most discharges would occur using gravity flow and the discharge rate would be controlled with valves and/or by restricting the size of the discharge pipe. Typical discharge rates would be 800 to 1,000 gpm (1.8 to 2.2 cubic feet per second (cfs)), but in accordance with the requirements of the Order, could be as high as 3,500 gpm (7.9 cfs).

Discharge would be accomplished through piping connected to the transmission system piping or to the tail end of the dechlorination piping, and extending to the riparian zone at the point of discharge. To reduce flow rates at the discharge point to 2 to 3 feet per second and diffuse the discharge, the piping would be connected by a tee to a larger diameter perforated pipe, and discharge would occur along the stream bed through the perforations. To facilitate discharge and protect riparian resources, the discharge pipeline could be placed on planks above the stream bed. The erosion control SOP specifies that where possible, the discharge pipe should also be located above hardened sections of the stream to further reduce the potential for erosional effects.

Initially, the discharge rate would be restricted to 40-200 gpm (0.1-0.4 cfs) to soak unhardened sections of the channel and reduce the potential for scouring. Over the first 30 minutes of the discharge, the flow rate would be gradually increased until the permitted discharge flow rate is achieved and the discharge would be monitored as described below. Within the last 30 to 60 minutes of discharge, the flow rates would be gradually reduced. When pumping is needed to complete the discharge, there is likely to be a short interval (generally less than one hour) between the gravity flow discharge and the pumped discharge, and the two events would be treated as two separate discharge events. For the pumped discharge, the pumping rate would be gradually increased within the first 30 to 60 minutes of pumping and gradually decreased during the final 30 to 60 minutes of pumping, as practicable.

Monitoring for erosional effects during discharge include visual observation of the receiving water, and turbidity monitoring in the receiving water. If visible signs of erosion are observed downstream of the discharge, the flow rate would be decreased until such effects are no longer visible. Allowable changes in turbidity depend on the ambient turbidity of the receiving water and are summarized in **Table 4**. The SOP requires collection of turbidity measurements twice during the first hour of the discharge event, and two additional times during the daylight hours. If turbidity measurements indicate that turbidity limitations specified in Table 4 are exceeded, then the flow rate of the discharge would be adjusted to maintain appropriate turbidity levels.

TABLE 4
TURBIDITY COMPLIANCE STANDARDS FOR CONSTRUCTION DISCHARGES

Ambient Stream Turbidity	Compliance Standard
≤50 NTU[a]	≤ ambient turbidity + 5 NTU
50 – 100 NTU	≤ ambient turbidity + 10 NTU
> 100 NTU	≤ 1.1 x ambient turbidity
No upstream flow	1,000 NTU

[a] NTU = nephelometric turbidity units

SOURCE: RMC, 2008

APPENDIX M

Soil Sampling Results

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North Spoils Site and the Former Valley Crest Tree Company Nursery Site

In 2010, the SFPUC conducted surface soil sampling within the North Spoils Site and the former Valley Crest Tree Company nursery site located between Pit F6 and Calaveras Road to evaluate residual concentrations of pesticides and metals in the soils from historical agricultural activities (Baseline, 2010). Sampling within the former nursery site included the collection and analysis of soil samples along the proposed SABPL alignment between pipeline stations 12+00 and 32+00. A total of five composite soil samples[1] from the North Spoils Site and two composite soil samples from the former nursery site were analyzed for organochloride pesticides. Five discrete soil samples from the North Spoils Site and two discrete soil samples from the former nursery site were analyzed for Title 22 metals.[2] **Table M-1** compares the maximum concentration of each constituent identified in the soil samples from each site to the federal, state, and regional hazardous waste criteria, including the (a) federal Toxicity Characteristic Leaching Procedure (TCLP) regulatory level, (b) the state total threshold limit concentration (TTLC) and soluble threshold limit concentration (STLC), and (c) the San Francisco Bay RWQCB Environmental Screening Levels (ESLs) for residential land uses and for construction workers (RWQCB, 2008). These waste classification criteria and ESLs are in EIR Section 5.17.2.

The TTLC, STLC, and federal TCLP regulatory level are used to evaluate whether the soil, if excavated, would require disposal as a hazardous or regulated waste. The RWQCB ESLs are used to evaluate potential health risks to construction workers and the need for health and safety measures during construction, as well as the suitability of any excavated materials for offsite reuse. In general, if chemical concentrations are below residential screening levels, the soil is considered suitable for unrestricted offsite reuse. If chemical concentrations exceed residential ESLs but are below hazardous waste criteria, then some restrictions could be imposed for offsite reuse to ensure that the soil does not cause adverse health or environmental effects.

North Spoils Site

As shown in Table M-1, 11 pesticides were detected in composite soil samples and 13 metals were detected in discrete soil samples from the North Spoils Site. However, with the exception of chromium, none of the detected concentrations were greater than the TTLC, 10 times the STLC,[3] or 20 times the federal TCLP regulatory level.[4] The maximum detected concentration of chromium in soil samples from the North Spoils Site was 57 milligrams per killigram (mg/kg),

1 A composite soil sample is a sample comprised of equal portions of individual soil samples collected from different locations combined into one soil sample for laboratory analysis. Analysis of composite soil samples is useful for evaluating average concentrations of the constituents of concern over the area covered by the discrete soil samples.

2 Title 22 metals are 18 metals for which the State of California has established regulatory levels for waste classification.

3 The California Waste Extraction Test, used to determine the soluble concentration of a substance under state regulations, involves a 10-to-1 dilution of the sample. Therefore, the total concentration of a substance would need to exceed 10 times the STLC for the soluble concentration to possibly exceed the STLC in the extract.

4 Because the TCLP involves a 20-to-1 dilution of the sample, the total concentration of a substance in the soil would need to exceed 20 times the regulatory level for the soluble concentration to possibly be greater than the regulatory level in the extract.

which is 10 times greater than the STLC of 5.0 milligrams per liter (mg/L). A waste extraction test (WET) was conducted to evaluate the soluble levels of hexavalent chromium in the soil sample with the highest total chromium concentration. Hexavalent chromium was not detected in this sample. Based on these analytical results, any soils excavated at the North Spoils Site would not be classified as a hazardous waste.

None of the detected concentrations of metals or pesticides in the soil samples from the North Spoils Site were greater than the RWQCB ESL for construction workers, indicating that the constituents detected would not present an unacceptable risk to construction workers during preparation of the North Spoils Site. However, the maximum concentration of dieldrin was 0.093 mg/kg, in excess of the 0.0023 mg/kg RWQCB ESL for residential land uses; the maximum concentration of endrin was 0.0036 mg/kg, in excess of the 0.00065 mg/kg RWQCB ESL for residential land uses; the maximum concentration of arsenic was 7.7 mg/kg, in excess of the 0.39 mg/kg RWQCB ESL for residential land uses; and the maximum concentration of vanadium was 36 mg/kg, in excess of the 16 mg/kg RWQCB ESL for residential land uses. However, while these analytical results indicate that while any excavated soil would not be classified as a hazardous waste, it would not necessarily be suitable for unrestricted land uses, and further analysis would be required to identify the appropriate disposal of any excavated soil from the North Spoils Site.

Former Valley Crest Tree Company Nursery Site Between Pit F6 and Calaveras Road

As shown in **Table M-1**, pesticides were not detected in composite soil samples from the former nursery site, and 12 metals were detected in the discrete soil samples from this site. However, with the exception of chromium, none of the detected concentrations were greater than the TTLC, 10 times the STLC, or 20 times the federal TCLP regulatory level. The maximum detected concentration of chromium in soil samples from the former nursery site was 92 mg/kg, which is 10 times greater than the STLC of 5.0 mg/L. A WET analysis was conducted to evaluate the soluble levels of hexavalent chromium in the soil sample with the highest total chromium concentration. Hexavalent chromium was not detected in this sample. Based on these analytical results, any soil excavated from the former nursery site would not be classified as a hazardous waste.

None of the detected concentrations of metals in soil samples from the former nursery site were greater than the RWQCB ESL for construction workers, indicating that the constituents detected would not present an unacceptable risk to construction workers during excavation and construction of the SABPL and ancillary features. However, the maximum concentration of arsenic was 6.2 mg/kg, in excess of the 0.39 mg/kg RWQCB ESL for residential land uses; and the maximum concentration of vanadium was 36 mg/kg, in excess of the 16 mg/kg RWQCB ESL for residential land uses. These analytical results indicate that while any excavated soil would not be classified as a hazardous waste, it would not necessarily be suitable for unrestricted land uses, and further analysis would be required to identify the appropriate disposal of any soil excavated from the former nursery site.

References

Baseline Environmental Consulting, *Soil Quality Investigation Report, New Irvington Tunnel Project, Alameda County, California*. August 2010.

San Francisco Bay Regional Water Quality Control Board (RWQCB), *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Interim Final – November 2007*. Revised May 2008.

TABLE M-1
SOIL ANALYTICAL RESULTS, SCREENING LEVELS, AND HAZARDOUS WASTE CRITERIA

Parameter	Maximum Concentration Detected, Former Nursery Site (mg/kg)	Maximum Concentration Detected, North Spoils Site (mg/kg)	Residential Environmental Screening Level (mg/kg)	Construction Environmental Screening Level (mg/kg)	Regulatory Level for Waste Classification		
					TCLP (mg/L)	TTLC (mg/kg)	STLC (mg/L)
Pesticides							
Beta-BHC	<0.0021	0.002	–	–	–	–	–
Alpha Chlordane	<0.0021	0.0023	0.44	21	0.03	2.5	0.25
Dieldrin	<0.00050	0.093*	0.0023	1.6	–	8.0	0.8
Dichlorodiphenyldichloroethane (4,4-DDD)	<0.0041	0.026	2.4	120	–	1.0	0.1
Dichlorodiphenyldichloroethylene (4,4'-DDE)	<0.0041	0.099	1.7	87	–	1.0	0.1
Dichlorodiphenyltrichloroethane (4,4'-DDT)	<0.0041	0.15	1.7	87	–	1.0	0.1
Endosulfan I	<0.0021	0.0028	0.0046	3,100	–	–	–
Endosulfan II	<0.0041	0.0058	0.0046	3,100	–	–	–
Endosulfan sulfate	<0.0041	0.0067	–	–	–	–	–
Endrin	<0.0007	0.0036*	0.00065	160	0.02	0.2	0.02
Endrin aldehyde	<0.0041	0.0037	–	–	–	–	–
Metals							
Antimony	0.52	1.3	6.3	310	–	500	15
Arsenic	6.2*	7.7*	0.39	15	5.0	500	5.0
Barium	150	260	750	2,600	100.0	10,000	100
Beryllium	0.51	0.41	4.0	98	–	75	0.75
Chromium (trivalent)	92	57	750	1,200,000	5.0	2,500	5
Soluble Chromium (hexavalent), mg/L	<0.45	<0.43	–	–	–	–	5
Cobalt	15	10	40	94	–	8,000	80
Copper	14	14	230	310,000	–	2,500	25
Lead	13	15	200	750	5.0	1,000	5
Mercury	0.037	0.049	1.3	58	0.2	20	0.2
Molybdenum	<0.30	0.74	40	3,900	–	3,500	350
Nickel	120	50	150	260	–	2,000	20
Vanadium	36*	36*	16	770	–	2,400	24
Zinc	72	64	600	230,000	–	5,000	250

NOTES: TCLP = Toxicity Characteristic Leaching Procedure. Because the TCLP involves a 20-to-1 dilution of the sample, the total concentration of a substance in the soil would need to exceed 20 times the regulatory level for the soluble concentration to possibly be greater than the regulatory level in the extract.
STLC = Soluble Threshold Limit Concentration. The California Waste Extraction Test, used to determine the soluble concentration of a substance under state regulations, involves a 10-to-1 dilution of the sample. Therefore, the total concentration of a substance would need to exceed 10 times the STLC for the soluble concentration to possibly exceed the STLC in the extract.

TTLC = Total Threshold Limit Concentration
mg/kg = milligram per kilogram
mg/L = milligram per liter
– = Criterion has not been established for this parameter.
<0.43 = Constituent was not detected in sample at the detection limit provided.
* = Concentration in excess of residential environmental screening level.

SOURCE: Baseline, 2010. \