Draft
Volume 1

NORTH SAN PABLO BAY RESTORATION AND REUSE PROJECT (NORTH BAY WATER RECYCLING PROGRAM)

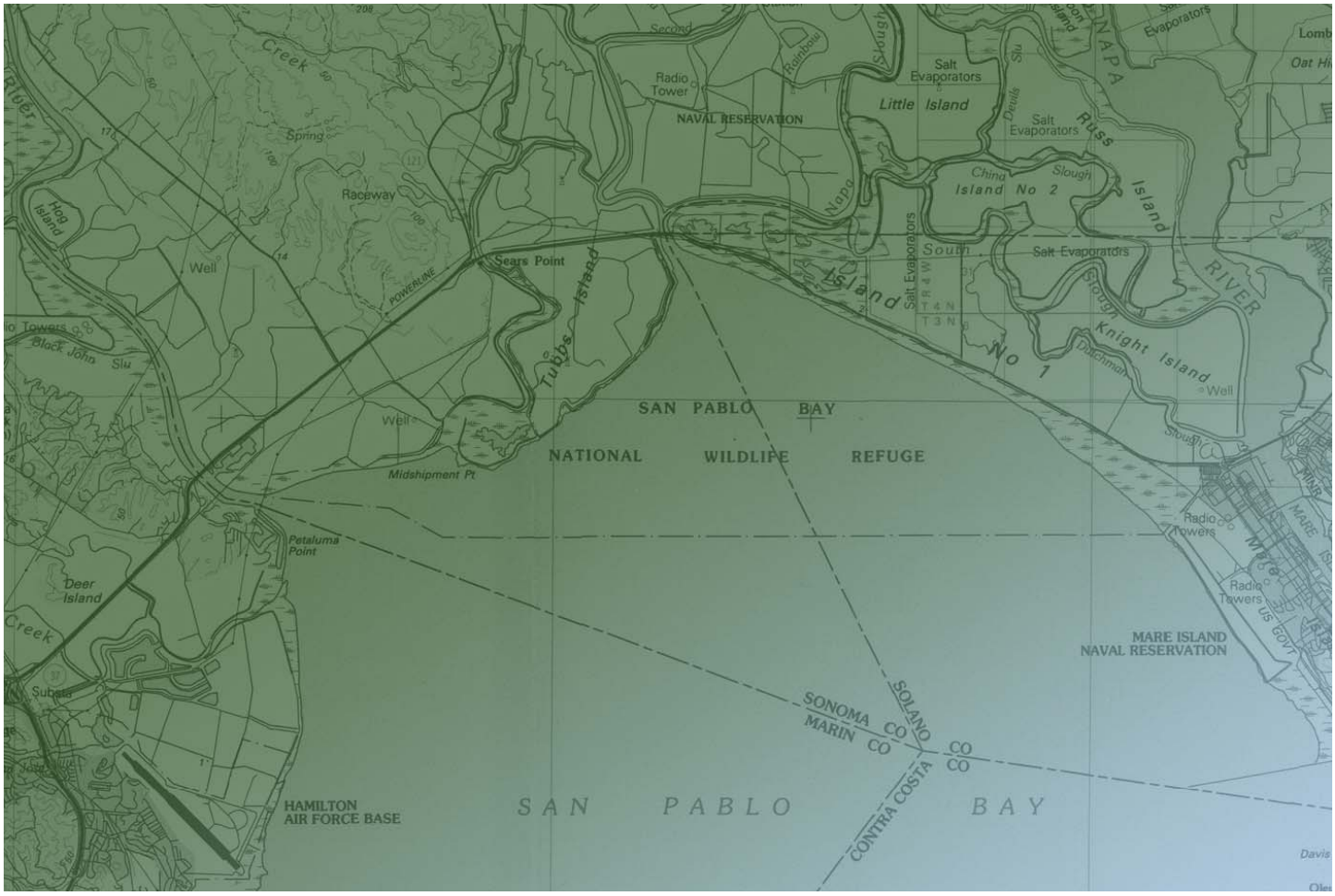
Environmental Impact Report/ Environmental Impact Statement

SCH# 2008072096

Prepared for:
Bureau of Reclamation

North Bay Water Reuse Authority

May 2009



Member Agencies

Contributing Agencies

North Bay Water Reuse Authority

Las Gallinas Valley Sanitary District | Novato Sanitary District | Sonoma County Water Agency | Napa Sanitation District | Sonoma Valley County Sanitation District

Notice of Availability

North Bay Water Recycling Program
(also known as the North San Pablo Restoration and Reuse Project)

The North Bay Water Reuse Authority (NBWRA) has prepared a joint Draft Environmental Impact Report/ Impact Statement (EIR/EIS) pursuant to the California Environmental Quality Act (CEQA) and the National Environment Policy Act (NEPA) to assess potential environmental effects of their proposed North Bay Water Recycling Program or NBWRP (also known as North San Pablo Restoration and Reuse Project). As contract administrator for the NBWRA, the Sonoma County Water Agency (SCWA) will act as Lead Agency under CEQA and the Department of Interior, Bureau of Reclamation will be the federal Lead Agency under NEPA. The 45-day review period begins on **May 5, 2009** and extends to **June 26, 2009**. Written comments on the Draft EIR/EIS may be submitted to:

Sonoma County Water Agency
Attn: Marc Bautista, Senior Environmental Specialist
PO Box 11628
Santa Rosa, CA 95406-1628

You may also submit your comments electronically at the following website: **www.nbwra.org**

The Project: NBWRP is proposed to promote the expanded beneficial use of recycled water in the North Bay region to:

- Offset urban and agricultural demands on potable supplies;
- Enhance local and regional ecosystems;
- Improve local and regional water supply reliability;
- Maintain and protect public health and safety;
- Promote sustainable practices;
- Give top priority to local needs for recycled water; and
- Implement recycled water facilities in an economically viable manner.

The Draft EIR/EIS will consider three alternatives as well as the No Action Alternative. The alternatives represent a range of recycled water reuse and regional facility integration, and include: **Alternative 1, Basic System**, which includes use of recycled water near each of the individual wastewater treatment plants (WWTP); **Alternative 2, Partially Connected System**, which adds pipelines, pump stations and storage to partially connect the existing

WWTPs; and **Alternative 3, Fully Connected System**, which provides a fully integrated and regional recycled water distribution system connecting all four Member Agency WWTPs. Under each alternative treatment and storage capacity would be constructed at existing WWTPs and distribution facilities (pump stations and pipelines) would be constructed within or along public roadways within Marin, Sonoma, and Napa Counties.

Environmental Analysis: Analysis of environmental impacts associated with the NBWRP identified potentially significant impacts, primarily temporary impacts resulting from construction activities, in the following areas: aesthetics; air quality; biological resources; cultural resources; geology, soils, seismicity, and mineral resources; hazards and hazardous materials; hydrology and water quality; land use and planning; recreational and agricultural resources; noise; public services; transportation and traffic; and utilities and service systems. Growth inducement potential, secondary effects of growth and cumulative impacts are also addressed in the Draft EIR. For environmental impacts determined to be significant or potentially significant, mitigation measures have been identified to reduce those impacts. Per CEQA Section 15087(c)(6), the Draft EIR/EIS identifies sites with documented use, storage, or release of hazardous materials or petroleum products under Section 65962.5 of the California Government Code found within 660 feet of the Phase 1 project components.

Document Availability: The Draft EIR/EIS is available for public review at the following locations during normal business hours:

Las Gallinas Valley Sanitary District 300 Smith Ranch Road San Rafael, CA 94903	Novato Sanitary District 500 Davidson Street Novato, California 94945	Napa Sanitation District 935 Hartle Court Napa, CA 94559
Sonoma County Water Agency 404 Aviation Boulevard Santa Rosa, CA 95403	Sonoma Valley Regional Library 755 West Napa St Sonoma, CA 95476	Napa City-County Library 580 Coombs Street Napa, CA 94559
Sonoma County Central Library 211 E Street Santa Rosa, CA 95404	Marin County- Novato Branch Library 1720 Novato Blvd Novato, CA 94947	Marin County- Central Branch Library 3501 Civic Center Drive #427 San Rafael, CA 94903

Persons interested in reviewing documents referenced in the EIR or receiving copies of the Draft EIR/EIS with a fee or are invited to contact: **Marc Bautista, Sonoma County Water Agency, 707-547-1923**.

Public Hearings: Public hearings on the NBWRP will be held on:

June 9, 2009 6:00 p.m. – 7:30 p.m. Margaret Todd Senior Center 1560 Hill Road, Novato	June 10, 2009 2:30 p.m. – 4:00 p.m. Sonoma Community Center 276 East Napa Street, Sonoma	June 11, 2009 6:00 p.m. – 7:30 p.m. Napa Elks Lodge 2840 Soscol Avenue, Napa

Deadline: Comments on the Draft EIR/EIS must be received by the end of the 45-day public review period, which is **June 26, 2009** at 5:00 p.m. Submit comments in writing to: **Marc Bautista, Sonoma County Water Agency, P.O. Box 11628, Santa Rosa, CA 95406-1628**.

DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT for the North Bay Water Recycling Program

This Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been prepared by the North Bay Water Reuse Authority's Member Agencies and the Bureau of Reclamation in accordance with the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) for the North San Pablo Bay Restoration and Reuse Project or the North Bay Water Recycling Program (NBWRP). Napa County and North Marin Water District are additional agencies supporting the NBWRA through contribution of funds and staff time.

NBWRA is exploring "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." This Draft EIR/EIS describes and evaluates the potential environmental, social and economic effects of the North Bay Water Recycling Program (or North San Pablo Bay Restoration and Reuse Project). The NBWRP would provide increased recycled water supply to urban, agricultural and environmental uses in the North San Pablo Bay region.

The Draft EIR/EIS considers three action alternatives and the No Project and No Action Alternatives. Each of the action alternatives are intended to meet the purpose, objectives, and need identified by the NBWRA.

- **No Action Alternative,** provides a "future without the project" scenario as a NEPA baseline to compare the impacts of the proposed Action Alternatives.
- **Alternative 1, Basic System**, which includes use of recycled water near each of the individual wastewater treatment plants (WWTPs);
- **Alternative 2, Partially Connected System**, which adds pipelines, pump stations and storage to partially connect the existing WWTPs; and
- **Alternative 3, Fully Connected System**, which provides a fully integrated and regional recycled water distribution system connecting all four Member Agency WWTPs.

This Draft EIR/EIS analyzes the direct, indirect, and cumulative environmental effects of the project on the following resources: hydrology and drainage, water quality, terrestrial and aquatic resources, earth resources, biological resources, land use, agriculture, transportation and circulation, air quality, noise, utilities and public service systems, hazardous materials and public health, visual/aesthetic resources, recreation, cultural and paleontological resources, socioeconomic effects, environmental justice, Indian Trust Assets, growth-inducing effects, and climate change.

Please submit any comments before **5 p.m.** on **June 25, 2009** to ***Marc Bautista, Sonoma County Water Agency***, P.O. Box 11628, Santa Rosa, CA 95406-1628, Phone: (707) 547-1998, Email: marc.bautista@scwa.ca.gov or ***David White, Bureau of Reclamation***, Mid-Pacific Region, 2800 Cottage Way, MP-730, Room W-2830, Sacramento, CA 95825-1898, Phone: (916) 978-5074, Email: dtwhite@mp.usbr.gov.

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Member Agencies

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206088.01

ESA

NORTH SAN PABLO BAY RESTORATION AND REUSE PROJECT

Environmental Impact Report / Environmental Impact Statement

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ACRONYMS, ABBREVIATIONS AND GLOSSARY

Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
ADFW	average dry weather flow
ADI	Area of Direct Impact
af	acre-feet
AFY	acre-feet per year
afa	acre-feet per annum
amsl	above mean sea level
APE	Areas of Potential Effect
ASA	Area of Sensitivity Assessment
ASCE	American Society of Civil Engineers
ASR	Aquifer Storage and Recovery
ASTs	aboveground storage tanks
Authority	North Bay Water Reuse Authority
BA	Biological Assessment
BAAQMD	San Francisco Bay Area Air Quality Management District
BCDC	Bay Conservation and Development Commission
BEA	Bureau of Economic Analysis
BEPA	Bald Eagle Protection Act
bgs	below ground surface
BMOs	Basin Management Objectives
BMPs	Best Management Practices
BOD	biochemical oxygen demand
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CA FID	Facility Inventory Database
Cal EPA	California Environmental Protection Agency

CalARP	California Accidental Release Prevention Program
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDF	California Department of Forestry
CDFG	California Department of Fish and Game
CDPH	California Department of Public Health
CDMG	California Division of Mines and Geology
CEQ	Council of Environmental Quality
CEQA	California Environmental Quality Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	Methane
CHMIRS	California Hazardous Material Incident Report System
CHP	California Highway Patrol
CHSC	California Health and Safety Code
CIP	Capital Improvements Program
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	CO_2 equivalent
CRLF	California red-legged frog
CSC	California Species of Special Concern
CTS	California tiger salamander
CTR	California Toxics Rule
CUPA	Certified Unified Program Agency
CUWCC	California Urban Water Conservation Council

CWA	Clean Water Act
cy	cubic yards
dB	decibel
dBA	A-weighted decibels
DEIR	Draft Environmental Impact Report
DGESL	Department of Geosciences Environmental Studies Laboratory
DOT	Department of Transportation
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EDD	Economic Development Department
EDR	Environmental Data Resources
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMI	Emissions Inventory Data
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Science Associates
ESU	Evolutionary Significant Unit
FCWCD	Flood Control and Water Conservation District
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FIGR	Federation of Indians of Graton Rancheria
FINDS	Facility Index System
FMMP	Farmland Mapping and Monitoring Program
FMP	Fisheries Management Plan
FPPA	Farmland Protection Policy Act
FPP	Farmland Protection Program
FRHZ	Fault Rupture Hazard Zone
ft	feet
FTA	Federal Transit Administration
FUDS	Formerly Used Defense Sites
g	gravity

GHG	Green House Gases
GULP	Groundwater Under Local Protection
H:V	horizontal-to-vertical
hp	horsepower
HWCL	Hazardous Waste Control Law
Hz	hertz
I & I	Infiltration and Inflow
IBC	International Building Code
ICBO	International Conference of Building Officials
ICC	International Code Council
IPS	Influent pump station
IRWMP	Integrated Regional Water Management Plan
kwH	kilowatt hours
km	kilometers
kV	kilovolt
L_{dn}	day-night average noise level
L_{eq}	energy-equivalent noise level
L_{max}	maximum noise level
LESA	Land Evaluation and Site Assessment
lf	linear feet
LGVSD	Las Gallinas Valley Sanitary District
LOS	Level of Service
LUST	Leaking Underground Storage Tank
M	Richter magnitude
M&I	municipal and industrial
MBTA	Migratory Bird Treaty Act
MCFC&WCD	Marin County Flood Control & Water Conservation District
mg	milligrams
MG	million-gallon
mg/L	milligrams per liter
mgd	million gallons per day
MMI	Modified Mercalli Intensity
MMWD	Marin Municipal Water District
MST	Milliken-Sarco-Tulucay
MOU	Memorandum of Understanding

MP	milepost
mph	miles per hour
MPN	Most Probable Number
MRZ	Mineral Resources Zone
msl	mean sea level
MTC	Metropolitan Transportation Commission
µS/cm	microsiemens per centimeter
Mw	Moment magnitude
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NBA	North Bay Aqueduct
Napa SD	Napa Sanitation District
NBBR	Nesting Breeding Birds and Raptors
NBWA	North Bay Watershed Association
NBWRA	North Bay Water Reuse Authority
NBWRP	North Bay Water Recycling Program
NCTPA	Napa County Transportation Authority
NEPA	National Environmental Protection Act
NMWD	North Marin Water District
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen oxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
Novato SD	Novato Sanitary District
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPPA	Native Plant Protection Act
NRCS	National Resource Conservation Service
NSCARP	North Sonoma County Agricultural Reuse Project
NUSD	Novato Unified School District
NVUSD	Napa Valley Unified School District

NWIC	Northwest Information of the California Historical Resources Information System
NWPRA	Northwestern Pacific Railroad Authority
O_3	Ozone
O & M	Operations and Maintenance
OES	California Office of Emergency Services
OHW	Ordinary high water
OPR	Office of Planning and Research
PBO	Programmatic Biological Opinion
PG&E	Pacific Gas & Electric Company
PGA	Peak ground acceleration
PM 10	Particulate matter $\leq$ 10 microns
PM 2.5	Particulate matter $\leq$ 2.5 microns
PM	Particulate matter
POD	Pelagic Organism Decline
PPCP	Pharmaceutical and Personal Care Products
ppm	parts per million
PPV	peak particle velocity
PVP	Potter Valley Project
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RH Plan	Regional Haze Plan
ROG	Reactive organic gases
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCTA	Sonoma County Transportation Authority
SCWA	Sonoma County Water District
SD	Sanitation District
SDC	Seismic Design Category
SF_6	Sulfur Hexafluoride
SIP	State Implementation Plan
SLIC	Spills, Leaks, Investigation, and Cleanup
SMARA	Surface Mining and Reclamation Act
SMART	Sonoma-Marin Area Rapid Transit
SMMP	Stream Management Master Plan

SO_2	Sulfur Dioxide
SOI	Sphere of Influence
SR-37	State Highway 37
SSC	Species of Special Concern
SSCRCD	Southern Sonoma County Resource Conservation District
SVCSD	Sonoma Valley County Sanitation District
SVFRA	Sonoma Valley Fire and Rescue Authority
SVWRP	Sonoma Valley Recycled Water Project
SVUSD	Sonoma Valley Unified School District
SWEEPS	Statewide Environmental Evaluation and Planning System
SWF/LF	Solid Waste Facilities/Landfill Sites
SWMP	Stormwater Management Plan
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
SWRCY	Recycling Facilities in California Database
T&E	Threatened and Endangered
TAC	toxic air contaminants
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
UC	University of California
UBC	Uniform Building Code
UGB	Urban Growth Boundary
USACOE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank system
USTs	underground storage tanks
UV	ultraviolet light
VOMWD	Valley of the Moon Water District
WDS	Waste Discharge System
WMI	Waste Management Incorporated
WMUDS/SWAT	Waste Management Unit Database System

WQCP	Water Quality Control Plans
WRAP	Western Regional Air Partnership
WRP	Water Reclamation Plant
WSPP	Water Supply Planning Program
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Glossary of Terms

100-year flood	The flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years.
acre-foot (AF)	The volume of water that would cover 1 acre to a depth of 1 foot. Equal to 1,233.5 cubic meters (43,560 cubic feet).
active fault	Defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years).
anadromous fish	Fish that spend a part of their lifecycle in the sea and return to freshwater streams to spawn.
beneficial uses	Those uses of water as defined in the State of California Water Code (Chapter 10, Part 2, Division 2), including but not limited to, agricultural, domestic, municipal, industrial, power generation, fish and wildlife, recreation, and mining.
bentonite	A clay mineral used in drilling operations; mixed with water to form a gel that lubricates the drill bit, helps keep the walls of a borehole intact, and helps bring drill cuttings to the surface.
Biological Opinion	Document issued under the authority of the Federal Endangered Species Act stating the findings of the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service as to whether a federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of adverse modification of critical habitat.
California Environmental Quality Act (CEQA)	Act requiring California public agency decision-makers to document and consider the environmental impacts of their actions. Also requires an agency to identify ways to avoid or reduce environmental damage and to implement those measures where feasible. Provides means to encourage public participation in the decision-making process.
channel	Natural or artificial watercourse, with a defined bed and banks to confine and conduct continuously or periodically flowing water.

CNEL	Community Noise Equivalent Level adds a 5-dBA "penalty" for the evening between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between 10:00 p.m. and 7:00 a.m. See also "decibel (dB)", below.
cooperating agency	Any federal agency other than the lead agency that has jurisdiction by law or special expertise with respect to the environmental impacts expected to result from a proposed project.
criteria air pollutants	Pollutants that are the primary focus of regulatory agencies as indicators of ambient air quality, which include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. These are the most prevalent air pollutants known to be harmful to human health, and extensive documentation on health-effects criteria is available for them.
critical habitat	An area designated as critical habitat listed in 50 CFR Parts 17 or 226 (50 CFR Section 402.02); specific geographic areas, whether occupied by special-status species or not, that are determined to be essential for the conservation and management of the special-status species, and that have been formally described in the Federal Register.
cultural resource	An aspect of a cultural system that is valued by or significantly representative of a culture or that contains significant information about a culture. Properties such as landscapes or districts, sites, buildings, structures, objects, or cultural practices that are usually more than 50 years old and possess architectural, historic, scientific, or other technical value.
cumulative impact	For NEPA purposes, defined in Council of Environmental Quality (CEQ) regulations as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Under CEQA, defined as the change in the environment that results from the incremental impact of the project when added to other, closely related past, present, and reasonably foreseeable probable future projects.
decibel (dB)	A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals. An A-weighted dB (dBA) is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear. A measurement that includes the low frequency component is denoted by dBL.
desalination	A process whereby the salt concentration of sea water or brackish water is reduced, generally through an advanced form of water treatment.
dewater	To remove water.

DNL	The 24-hour day and night A-weighted noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.
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. Official federal designations of endangered species are made by the USFWS or NMFS and published in the Federal Register. Species are listed under the California Endangered Species Act by the California Department of Fish and Game.
Endangered Species Act (ESA)	The federal or state acts administered by the USFWS/NMFS and California Department of Fish and Game, respectively, to list and protect animal and plant species that are listed as threatened or endangered, are formally recognized candidates for listing, or are declining to a point where they may be listed.
Environmental Impact Report (EIR)	A detailed statement (i.e., report) prepared under the California Environmental Quality Act by a state or local agency describing and analyzing the significant environmental effects of a project and discussing ways to mitigate or avoid the effects.
Environmental Impact Statement (EIS)	An environmental impact document required of federal agencies under the National Environmental Policy Act for major projects or legislative proposals significantly affecting the environment. Describes the positive and negative effects of the proposed action, lists alternative actions, and documents the information required to evaluate the environmental impacts of a proposed action.
environmental justice	Defined by the U.S. Environmental Protection Agency (EPA) Office of Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means "no group of people, including racial, ethnic, or socioeconomic group shall bear a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."
erosion	The gradual wearing away of land by water, wind, and general weather conditions; the diminishing of property by the elements. With regard to levees specifically: loss of levee material as a result of the effects of channel flows, tidal action, boat wakes, and wind-generated waves.
expansive soils	Soils that shrink and swell as a result of moisture changes.

fault	A planar rock fracture which shows evidence of relative movement. Large faults within the Earth's curst are the result of differential or shear motion.
fault rupture	Displacement at the earth's surface resulting from fault movement associated with an earthquake.
federal P&Gs	Principles and Guidelines for federal water studies, published as "Federal Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" by the U.S. Water Resources Council, 1983.
floodplain	Any land area susceptible to inundation by floodwaters from any source.
flow	The volume of water passing a given point per unit of time.
groundwater	Any water naturally stored underground in aquifers, or that flows though and saturates soil and rock, supplying springs and wells.
habitat	The specific area or environment in which a particular type of animal or plant lives.
HAZNET	A California Department of Toxic Substances Control database that records annual hazardous waste shipments, as required by RCRA. All businesses that use and dispose of hazardous materials are entered into the database.
HIST UST	Contains a list of registered historical USTs
Important Farmland	Farmland categories mapped by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP). Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance are often described together under the term "Important Farmland."
infiltration	Process by which water on the ground surface enters into, or percolates through the soil
L50	The noise level that is equaled or exceeded 50 percent of the specified time period. The L50 represents the median sound level.
L90	The noise level that is equaled or exceeded 90 percent of the specified time period. The L90 is sometimes used to represent the background sound level.
Leq	The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The Leq is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
levee	An embankment raised to restrict a river to a defined channel.
liquefaction	The process in which soil loses cohesion when subject to seismic activity (i.e., shaking).

Lmax	The instantaneous maximum noise level for a specified period of time.
Microconstituents	Microconstituents is a term currently used to describe a variety of natural and manmade substances, including pharmaceuticals, household cleaning products, personal care products, plastics, packaging, and other products of a developed society.
modeling	Computer simulations of natural and man-made water systems used to provide a forecast of outcomes for a variety of parameters, such as water quality, flow rates, and reservoir levels, under an assumed set of conditions.
National Environmental Policy Act (NEPA)	Act that directs federal agencies to prepare an environmental impact statement for all major federal actions that may have a significant effect on the environment. States that it is the goal of the federal government to use all practicable means, consistent with other considerations of national policy, to protect and enhance the quality of the environment. Requires all federal agencies to consider the environmental impacts of their proposed actions during the planning and decision-making processes.
non-attainment	The Clean Air act (1990) defines this as a locality where are pollution levels persistently exceed national ambient air quality standards, or the contributes to ambient air quality in a nearby area that fails to meet standards.
Notice of Availability (NOA)	The notice issued by a local, state, or federal agency to publicly announce that a draft environmental impact report or environmental impact statement is available for review, pursuant to the California Environmental Quality Act and the National Environmental Policy Act, respectively.
Notice of Intent (NOI)	The notice issued by a federal agency to publicly announce its intention to prepare an environmental impact statement, pursuant to the National Environmental Policy Act.
Notice of Preparation (NOP)	The notice issued by a state or local agency to publicly announce its intention to prepare an environmental impact report, pursuant to the California Environmental Quality Act.
Proposed Project/ Proposed Action	North Bay Water Recycling Program or North San Pablo Bay Restoration and Reuse Project
Record of Decision (ROD)	Concise, public, legal document that identifies and officially discloses the federal lead agency's decision following the completion of an environmental impact statement.
recycled water	Wastewater that becomes suitable for a specific beneficial use as a result of treatment.
reservoir	An artificially impounded body of water.
responsible agency	As per the CEQA Guidelines, a public agency other than the lead agency that has discretionary approval over a project.

riparian area	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 or fall into the water.
salinity	The amount of dissolved salts in a given volume of water.
seawater intrusion	The intrusion and mixing of saline or brackish water into a body of freshwater (in this case, into the Delta).
sedimentation	The phenomenon of sediment or other fine particulates entering a water body, or being disturbed from the bottom of a water body such that they move downstream and settle on the substrate in other aquatic areas.
seiche	A wave on the surface of a lake or landlocked bay caused by atmospheric or seismic disturbances.
seismicity	The frequency, intensity, and distribution of earthquake activity in a given area.
siltation	Sediment influx either from erosion or sediment carried into a water body by inflowing rivers and tributaries.
special-status species	Federal and state classifications for plant and animal species that are listed as threatened or endangered, are formally recognized candidates for listing, or are declining to a point where they may be listed.
stage	Water surface elevation; the elevation above mean sea level (msl) datum (typically measured in feet msl).
stormwater	Untreated surface runoff into a body of water during periods of precipitation.
Stormwater Pollution Prevention Plan (SWPPP)	Required to be developed and implemented when an entity is obtaining a General Permit under the National Pollutant Discharge Elimination System (NPDES). The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of stormwater discharges, and (2) to describe and ensure the implementation of best management practices to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges.
subsidence	A decrease in ground surface elevation in the Delta, which results primarily from peat soil being converted into gas.
take	Defined in the Federal Endangered Species Act as "…harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" on special-status species covered under the Act.
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 animals 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 NMFS for federal species and by the California Department of Fish and Game for state species.
tidal flow	Water movements caused by tidal forces (i.e. gravitational); used to describe the movement of water in Delta channels caused by tidal level variations propagating from San Francisco Bay.
total organic carbon (TOC)	A measure of organic matter content in water, which plays a significant role in aquatic ecosystems and has direct implications to drinking water treatment, including the potential for formation of disinfection byproducts.
turbidity	A measure of the cloudiness of water caused by the presence of suspended matter. Turbidity in natural waters may be composed of organic and/or inorganic constituents, and has direct implications to drinking water treatment.
viewshed	An area of land, water, and other environmental elements that is visible from a fixed vantage point. Viewshed is typically evaluated both from a roadway and conversely of a roadway as viewed from the adjacent area.
waters of the U.S.	As defined in the Clean Water Act Section 404, waters of the U.S. applies only to surface waters, rivers, lakes, estuaries, coastal waters, and wetlands. Not all surface waters are legally waters of the U.S. Generally, those waters include interstate waters and tributaries, intrastate waters and tributaries used in interstate and/or foreign commerce, territorial seas at the cyclical high-tide mark, and wetlands adjacent to the above.
watershed	A region or area that ultimately drains to a particular watercourse or body of water.
wetland	A zone that is periodically or continuously submerged or has high soil moisture, has aquatic and/or riparian vegetation components, and is maintained by water supplies significantly in excess of those otherwise available through local precipitation.
Williamson Act	The California Land Conservation Act of 1965, commonly known as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use for 10 years. In return, landowners receive property tax assessments that are based on farming and open space uses as opposed to full market value.

EXECUTIVE SUMMARY

ES.1 Introduction

The North Bay Water Reuse Authority's (NBWRA) Member Agencies and the U.S. Department of Interior, Bureau of Reclamation (Reclamation) have prepared this Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the North San Pablo Bay Restoration and Reuse Project. The North San Pablo Bay Restoration and Reuse Project has been developed in conformance with the requirements of the Reclamation's Public Law 102-575, Title XVI, including preparation of a Feasibility Study, and passage of Senate Bill 1475. For the purposes of this EIR/EIS, this project or action will be referred to as the **North Bay Water Recycling Program (NBWRP**).

This EIR/EIS has been developed to provide the public and responsible and trustee agencies reviewing the NBWRP an analysis of the potential effects, both beneficial and adverse, on the local and regional environment associated with construction and operation of the NBWRP. The basic purpose of the NBWRP is to provide recycled water for agricultural, urban, and environmental uses and to promote the expanded beneficial use of recycled water in the North Bay region. Implementation of NBWRP would include upgrades of treatment processes and construction of pipelines, pump stations, and storage to distribute recycled water for use in compliance with Article 4 in Title 22 of the California Code of Regulations, which sets water quality standards and treatment reliability criteria for recycled water.

This EIR/EIS considers a No Project, No Action and three Action Alternatives. The Action Alternatives consist of treatment, transmission, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area through 2020. Each Action Alternative considers varying levels of recycled water use, and corresponding levels of regional facility integration. The Alternatives considered are as follows:

- **No Project Alternative,** assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is identical to the No Action Alternative, identified below.
- **No Action Alternative,** provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives.
- **Alternative 1, Basic System**, includes use of recycled water near each of the individual wastewater treatment plants (WWTP);

- **Alternative 2, Partially Connected System**, adds additional pipelines, pump stations and storage to partially connect the existing WWTPs; and
- **Alternative 3, Fully Connected System**, provides a fully integrated recycled water distribution system connecting all four Member Agency WWTPs.

The Member Agencies have collectively prioritized the projects within their individual service areas to establish an Implementation Plan identifying the order in which projects would be constructed. Phase 1 of the Implementation Plan includes projects that are defined to a level of detail that allows for project-level environmental review. The Phase 1 Implementation Plan represents the set of projects, common to all of the NBWRP alternatives, and would likely be the first phase implemented under any alternative.

ES.1.1 Purpose and Need of the Proposed Action

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. The Bureau of Reclamation's water reclamation and reuse program is authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575). Also known as Title XVI, the act directs the Secretary of the Interior to undertake a program to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters, and for design and construction of demonstration and permanent facilities to reclaim and reuse wastewater.

The NBWRA is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water. The purpose of the NBWRP is to provide recycled water for agricultural, urban, and environmental uses thereby reducing reliance on local and imported surface and groundwater and reducing the amount of treated effluent releases to San Pablo Bay.

ES.1.2 Project Objectives

In addition to the purpose and need for the proposed Federal Action, the following project objectives have been developed by the NBWRA for the NBWRP. The project is proposed to promote the expanded beneficial use of recycled water in the North Bay region to achieve the following objectives:

- Offset urban and agricultural demands on potable water supplies;
- Enhance local and regional ecosystems;
- Improve local and regional water supply reliability;
- Maintain and protect public health and safety;
- Promote sustainable practices;
- Give top priority to local needs for recycled water, and;

- Implement recycled water facilities in an economically viable manner.

All of the Member Agencies already have existing recycled water programs. The NBWRA anticipates that provision of recycled water from the Proposed Action will be made available for use to new and existing water customers on reasonable terms and conditions. As appropriate, fee structures for recycled water have been or will be developed by Member Agencies within the context of each agency's rules, regulations and financial planning.

ES.1.3 Proposed Federal Action

As implementation of the Project would likely require external funding assistance, the investigation and development of the Project is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for Federal participation and cost-sharing in approved water reuse projects. The proposed Federal Action is the provision of federal funds by the Bureau of Reclamation under the Title XVI Program to NBWRA Member and Cooperating Agencies for the implementation of water recycling projects examined in this EIR/EIS. The Bureau of Reclamation is the NEPA Lead Agency for this proposed action.

Reclamation intends to use this EIR/EIS to consider provision of federal funding under Title XVI for implementation of NBWRP. As lead Federal agency, Reclamation would use this EIR/EIS to support a Record of Decision, which would document Reclamation's decision to choose one of the alternatives including the proposed action and no action.

The NBWRA Member Agencies and cooperating agencies may use this EIR/EIS to approve the NBWRP, or components of the NBWRP, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. SCWA will act as CEQA Lead Agency. Individual NBWRA Member Agencies and cooperating agencies are Responsible Agencies as provided for under CEQA §15096 and may use this EIR/EIS for the approving the proposed components (i.e., Phase 1) in their respective service areas.

ES.2 Project Background

Five participating agencies organized themselves under a Memorandum of Understanding (MOU) in August 2005 as the NBWRA. Additional agencies supporting the NBWRA through contribution of funds and staff time include North Marin Water District (NMWD) and Napa County. The following Member Agencies form the NBWRA and would participate in the implementation of NBWRP:

- **LGVSD** – LGVSD provides wastewater treatment and disposal service to approximately 30,000 people within the area of Marinwood, Lucas Valley, Terra Linda, Santa Venetia, Los Ranchitos, and Smith Ranch Road (LGVSD, 2005).

- **Novato SD**– Novato SD provides wastewater treatment and disposal services to approximately 60,000 residents within the city of Novato, an area of 28 square miles, and surrounding areas (Novato SD, 2006).

- **SVCSD** – The SVCSD WWTP began operations in 1954 and provides service to about 34,000 people in the city of Sonoma, within a 7-square-mile area (SVCSD, 2006).

- **Napa SD** – The Napa SD's Soscol Water Recycling Facility (SCRF) treats wastewater from the city of Napa and surrounding unincorporated communities, an area of about 23 square miles, and serves a population of approximately 80,000 (Napa SD, 2007).

- **SCWA** – SCWA, which began the Title XVI process for investigating a recycled water distribution system under a Cooperative Agreement with the Bureau of Reclamation, is a drinking water provider to over 600,000 residents and continues to be an actively participating partner.

ES.2.1 Supporting Agencies

- **NMWD –** NMWD has partnered with Novato SD to implement recycled water projects in their collective service areas, including a 0.5 million gallons per day-tertiary treatment facility located at the Novato SD reclamation facility. NMWD is contributing funds and staff time to NBWRA.

- **Napa County –** Napa County is cooperating with Napa SD in the development of recycled water options for the Milliken-Sarco-Tulucay (MST) Creeks areas, and is contributing funds and staff time to NBWRA.

ES.2.2 Feasibility Study Preparation

The NBWRA members undertook cooperative planning efforts over a 5-year period, including 19 bi-monthly technical workshops as well as monthly institutional workshops with extensive outreach to potential NBWRP stakeholders to define shared objectives and develop feasible alternatives toward definition of region-wide water reclamation and reuse project that would enable them to meet those objectives. Under the MOU, Camp Dresser McKee, Inc. (CDM) prepared a Phase 1 Engineering Feasibility Report (2005) and a Phase 2 Engineering Feasibility Study Report (2006) in coordination with NBWRA. The Phase 3 Engineering and Economic/Financial Analysis Report (or Phase 3 Report) completed in June 2008 updated the Phase 2 Feasibility Report to be consistent with project planning conducted by the individual Member Agencies, included an economic and financial analysis, and discussed potential environmental effects.

ES.2.3 Water Supply Setting and Future Conditions

The action area encompasses approximately 318 square miles of land within Marin, Sonoma, and Napa Counties. This region extends roughly 10 to 15 miles inland of the tidal San Pablo Bay, with a total population of over 270,000 in the major urban centers of San Rafael, Novato, Sonoma, and Napa. The region supports agriculture, including some of the premier wine-grape growing land in North America, as well as light industry, commercial and institutional uses, parklands, and residential areas.

Local and regional planning projections indicate that approximately 10 to -12 percent of growth would occur in most of the existing urban centers in the action area by the year 2020 (as compared to 2005 populations). Existing policies in principal cities will tend to favor concentrated rather than dispersed growth.

Agricultural land use is expected to remain relatively constant over a 20-year planning period. The local governing policies in the Marin, Sonoma, and Napa Counties in the action area protect agricultural lands. Given the high value of wine-grape culture, it is unlikely that there would be much change in the 75 percent of agricultural acreage committed to vineyards.

Total urban water use – including both residential and non-residential uses – in the project area is projected to increase from the 2005 level of 63,700 acre-feet per year (AFY) to about 72,800 AFY in 2020. Total water use for irrigation of agricultural lands is estimated at approximately 23,300 AFY at present. The sources that serve these water demands include surface water supplies (both within and outside of the action area), groundwater, and recycled water. SCWA supplies much of the Sonoma and Marin County area with ***surface water*** conveyed from the Russian River and its tributaries in central Sonoma County, adjacent to the project area watershed. SCWA's reliable supplies to customers in the action area consist of 87,970 AF of water during a dry year.

Groundwater serves agricultural users (and some residential users) as a primary source of supply, particularly in the MST area of Napa County. Groundwater also serves as a secondary source of supply for some urban users as well, including the City of Sonoma, Valley of the Moon Water District, and SCWA contractors. Although the total quantity of groundwater in the action area is unknown, groundwater pumping has been measured. The vast increase (i.e., 80 percent) in pumping of groundwater in the past 30 years to support agricultural irrigation has resulted locally in groundwater outflow exceeding inflow, some impacts on groundwater quality, and a lowering of groundwater levels in some parts of the action area that are dependent on groundwater supplies.

Existing treatment and distribution infrastructure in the action area currently allows for about 7,300 AFY of ***recycled water*** for irrigation and wetlands restoration purposes, which could increase to 11,250 AFY by 2020.

The average year and wet season conditions appear to yield sufficient surface water and groundwater to meet total annual demand in the action area. However, the seasonal availability of some water sources (against the strong seasonality of agricultural demand), the potential for overdraft of groundwater with impacts on quality and quantity, and the growth pressures on the area's urban centers suggest a need for an effective, coordinated, and regional approach to the increased use of recycled water.

ES.3 Description of Project Alternatives

ES.3.1 Project Location

The action area, illustrated in **Figure ES-1**, extends approximately 10 to 15 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa Counties. The action area extends as far south as Point San Pedro in Marin County, and as far north as Milliken Canyon located 28 miles to the northeast in eastern Napa County, and encompasses about 318 square miles of land. Urban centers in the action area are San Rafael (county seat) and Novato in Marin County, Sonoma in Sonoma County, and Napa (county seat) in Napa County.

In order to form candidate recycled water projects, land use information and Member Agency recycled water planning documents were reviewed. Water and wastewater agencies in the action area have developed several existing recycled water projects and identified recycled water projects for future implementation. Additional potential recycled water project areas were identified by grouping land uses either in major agricultural or landscaping areas or in areas between existing and proposed projects. These potential recycled water use areas are summarized in **Table ES-1** and are described below.

TABLE ES-1
RECYCLED WATER SERVICE AREAS

LGVSD
• Peacock Gap Golf Course
Novato SD
• North Marin Water District Urban Reuse Project
• Sears Point
SVCSD
• Sonoma Valley Recycled Water Project
• Napa Salt Marsh Restoration
• Southern Sonoma Valley
• Central Sonoma Valley
Napa SD
• Milliken-Sarco-Tulocay Creeks Area
• Carneros East

ES.3.2 Overview of Alternatives

This EIR/EIS considers a No Project Alternative, No Action Alternative, and three Action Alternatives. The Action Alternatives consist of treatment, transmission, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area through 2020. Each Action Alternative considers varying levels of recycled water use, and

SOURCE: CDM, 2008

NBWRA North Bay Water Recycling Program 206088.01

Figure ES-1
Action Area

corresponding levels of regional facility integration. **Table ES-2** summarizes the key distinctions among the action alternatives. The project alternatives could be constructed and in operation by 2020 if required approvals, authorizations, appropriations, and permits are obtained.

TABLE ES-2
ALTERNATIVES SUMMARY –
RECYCLED WATER SUPPLY, DEMAND, AND RESULTING DISCHARGE (AFY)

Alternatives	WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand (Beneficial Reuse)	Total Recycled Water Demand	Discharge to San Pablo Bay*
Alternative 1: Basic System	LGVSD and Novato WWTPs	12,347	1,172	744	1,916	8,643
	SVCSD and Napa WWTPs	15,308	3,772	5,911	9,683	5,043
	Total	**27,655**	**4,944**	**6,655**	**11,599**	**13,686**
Alternative 2; Partially Connected System	LGVSD and Novato WWTPs	12,347	1,172	2,477	3,619	8,032
	SVCSD and Napa WWTPs	15,308	3,772	8,802	12,574	2,657
	Total	**27,655**	**4,944**	**11,279**	**16,193**	**10,689**
Alternative 3: Fully Connected System	LGVSD, Novato, SVCSD, and Napa WWTPs	27,655	4,944	12,761	17,705	9,543
Total		**27,655**	**4,944**	**12,761**	**17,705**	**9,543**

* The number does not equal supply and demand due to evaporative and other losses (e.g. spreading).

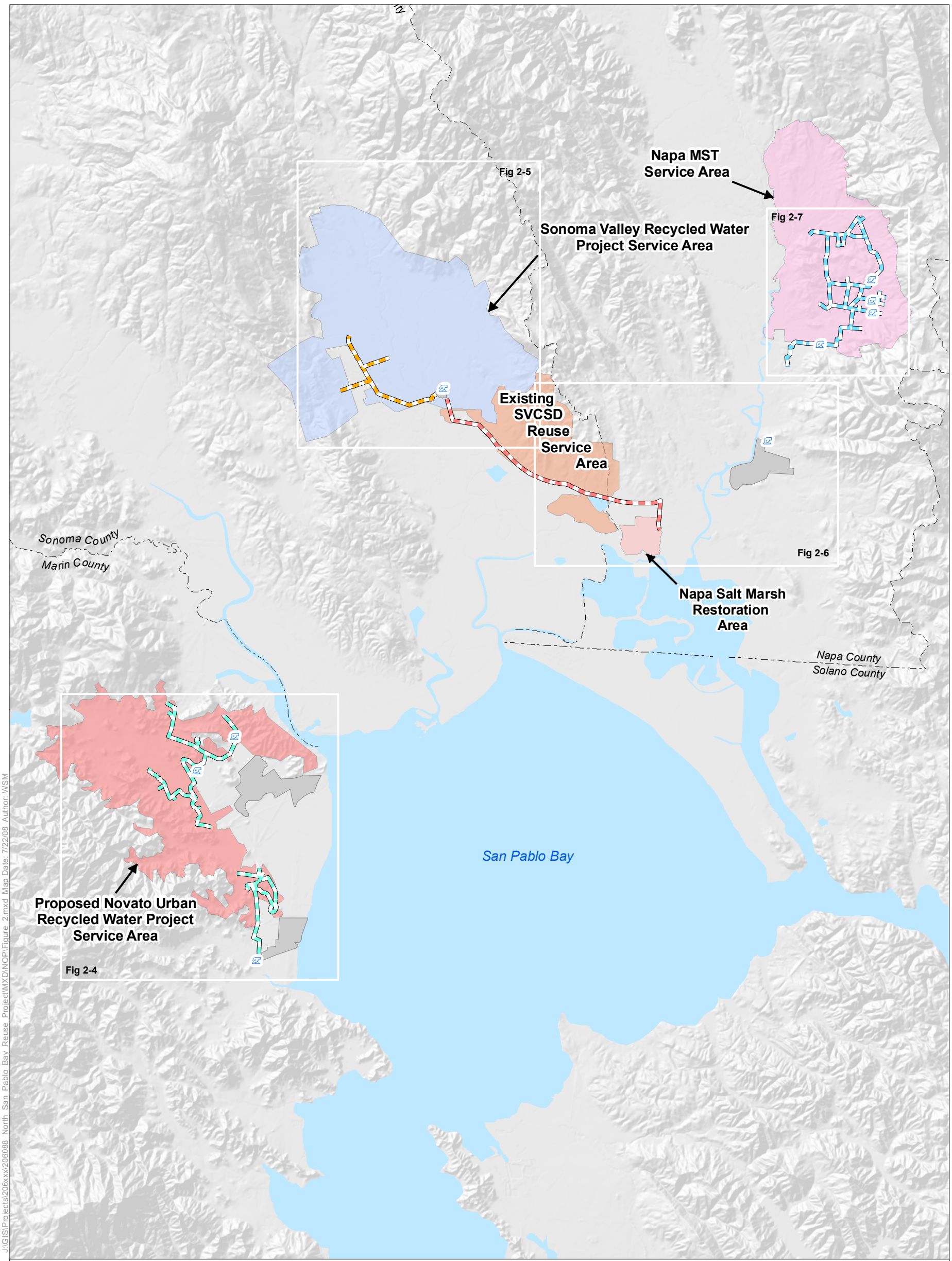
SOURCES: CDM, 2009; ESA, 2009.

The Member Agencies have collectively prioritized the projects within their individual service areas to establish an Implementation Plan identifying the order in which projects would be constructed. Phase 1 of the Implementation Plan includes projects that are defined to a level of detail that allows for project-level environmental review. These projects are collectively referred to as Phase 1 Projects. The Phase 1 Projects are common to Alternatives 1, 2, and 3. This EIR/EIS may be relied upon by individual member agencies for approval of these individual Phase 1 Projects (see **Figure ES-2**). The Member Agencies would implement the Phase 1 projects described below.

Phase 1 Implementation Plan

Las Gallinas Valley Sanitary District/North Marin Water District

LGVSD would provide recycled water service to the Novato South area. This system would not be connected to the remainder of the NMWD recycled water system.



Phase 1

- Proposed Pump

Phase1

- Napa SD-MST Pipelines (Phase1)
- Napa Salt Marsh Restoration Pipelines (Phase 1)
- Novato Urban Recycled Water Pipelines (Phase 1)
- SVRW Pipelines (Phase 1)
- Existing SVCSD Reuse Service Area
- Sonoma Valley Recycled Water Project Service Area
- Napa MST Service Area
- Napa Salt Marsh Restoration Area
- Proposed Novato Urban Recycled Water Project Area
- Waste Water Treatment Plant

0 4
Miles

J:\GIS\Projects\206xxx\206088_North_San_Pablo_Bay_Reuse_Project\MXD\NOP\Figure_2.mxd Map Date: 7/22/08 Author: WSM

SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure ES-2

Phase 1 Implementation Plan

Service Areas and Facilities

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Novato South Service Area – Hamilton Field

Service to the Hamilton Field area would be established through implementation of a of 0.7 million gallons per day (mgd) tertiary treatment upgrade at the existing LGVSD WWTP, construction of a new booster pump station onsite, and construction by NMWD of a pipeline distribution system from LGVSD north to serve the Hamilton Field area. NMWD would construct a pipeline from the LGVSD WWTP to the Hamilton Field area along three route options:

- **Option A:** This option would consist of approximately 2.75 miles of pipeline that would originate at the Recycled Water Treatment Facility at LGVSD WWTP, extend west adjacent to the WWTP ponds and northwest through grazing land.
- **Option B:** This option would consist of approximately 2.1 miles of pipeline that would originate at LGVSD WWTP, extend west adjacent to the WWTP ponds and north along agricultural access roads through grazing land.
- **Option C:** This option would consist of approximately 2.15 miles of pipeline that would extend north from LGVSD WWTP through grazing land. The alignment would turn west along St. Vincent's Drive then north, adjacent to the Northwest Pacific Railroad (NWPRR) right-of-way.

Novato Sanitary District/ North Marin Water District

Novato North Service Area

Novato SD and NMWD would implement service in the Novato North Service Area by incrementally expanding tertiary capacity at the existing Novato Recycled Water Treatment Facility from 0.5 mgd to 1.2 mgd. The recycled water pipeline would be routed from Atherton Avenue to Olive Avenue under Highway 101, and north on Redwood Boulevard to San Marin Drive. A separate pipeline would be routed on H Lane to serve the Valley Memorial Park Cemetery. A booster pump would be installed at Atherton Avenue and the distribution system would be connected to the existing 0.5-MG Plum Street Tank, which would be rehabilitated to provide recycled water storage.

Novato Central Service Area

Novato SD and NMWD would implement service in the Novato Central Service Area through construction of a recycled water distribution system from the Novato SD WWTP south to Rowland Boulevard and the Vintage Oaks shopping center, and across Highway 101 to serve urban users west of Highway 101. The treatment facilities at the Recycled Water Treatment Facility would be decommissioned and relocated to the Novato SD WWTP. From the WWTP, an 18-inch pipeline would be installed along Novato SD's existing easement, with a jack and bore crossing of US 101 from Rowland Boulevard to Redwood Boulevard. An 18-inch recycled trunk line would then extend north through Novato to deliver recycled water to Novato High School and other irrigated playing fields, with a 10-inch line extending south along Redwood Boulevard.

A new pipeline would connect the WWTP with the North Service Area pipeline in Olive Drive via Lea Drive or McClelland Drive. This would allow continuation of recycled water service to the Stone Tree Golf Course and the other customers in the North Service Area during the course of the relocation of the recycled water facility to the WWTP. This intertie would also incorporate the Plum Street Tank into the distribution system serving both the Novato North and Central Service Areas (Nute Engineering, 2006).

SVCSD

Sonoma Valley Recycled Water Project (SVRWP)

The Phase 1 Implementation Plan includes specific elements of the SVRWP, including construction of 5.2 miles of pipeline, additional storage at the SVCSD WWTP and construction of additional pumping capacity for distribution. The Phase 1 Implementation Plan includes SVRWP Alignment 1A, which would consist of approximately 5.2 miles of pipeline in western Sonoma Valley. The main pipeline would originate from the SVCSD WWTP, extend southwest and then northwest through a vineyard to Arnold Drive. The pipeline would continue north along Arnold Drive to Orange Avenue, and extend north on Orange Avenue to Elm Avenue. The pipeline would then continue east on Elm Avenue, cross a field to Arnold Drive, extend north on Arnold Drive, and end just north of Leveroni Road. Secondary pipelines or segments would extend from the main pipeline on the following roadways: Highway 116, Watmaugh Road, and Leveroni Road.

SVCSD Napa Salt Pond Pipeline

Under Phase 1 of the NBWRP, SVCSD would construct a pipeline to provide recycled water to Pond 7 and 7A for habitat enhancement. Proposed facilities in the Napa Salt Marsh area include construction of a new pipeline from the existing SVCSD WWTP to the existing SVCSD storage reservoirs located near the intersection of the Northwestern Pacific Railroad Authority (NWPRA) and Ramal Road. SCWA has identified three potential route options, which are described below.

- **Option A:** This option consists of installation of approximately 4.0 miles of 24-inch pipeline that would be installed from the reservoirs to Pond 7 and 7A. Approximately 1.0 mile of pipeline would extend from the reservoirs along the south side of NWPRA railroad tracks to Skaggs Island Road, at which point the pipeline would cross to the south side of the railroad tracks and continue east along the south side of the railroad tracks for approximately 0.4 miles. At this point, the pipeline would cross to the north side of the railroad tracks and continue east along the north side of the railroad for approximately 0.9 miles, then cross to the south side of the railroad tracks. The pipeline would extend 1.7 miles until it reaches the access road for Ponds 7 and 7A, which includes pipeline installation south along the access road for approximately 4,200 feet, terminating at the mixing chamber. This option is consistent with the pipeline route reviewed in the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2004).

- **Option B:** This option consists of installation of 4.5 miles of a 24-inch pipeline from the reservoirs to the salt ponds. Approximately 0.25 miles of pipeline would be installed north along an access road to Ramal Road. The alignment would then extend 1.75 miles east along Ramal Road. At this point, the pipeline would transverse east along an agricultural access road for approximately 1.25 miles until it reaches Buchli Station Road. The pipeline

would then run south on Buchli Station Road for approximately 1.25 miles, until it reaches the Huichica Creek entrance of the Napa-Sonoma Marshes Wildlife Area (NSMWA) and the access road for Ponds 7 and 7A.

- **Option C:** This option would consist of 4.7 miles, and would follow the above Option B route for approximately 3.0 miles (from the reservoir, east along the access road to Ramal Road, and along Ramal Road). However, the pipeline would then extend south approximately 0.3 miles to access an existing reservoir. At this point it would transverse 0.4 miles east to Buchli Station Road (Figure 2-6). The pipeline would run south on Buchli Station Road for approximately 1.0 mile, until it reaches the Huichica Creek entrance of the Napa-Sonoma Marshes Wildlife Area (NSMWA) and the access road for Ponds 7 and 7A.

Napa SD

The Phase 1 project in the Napa SD service area would provide a recycled water distribution system to address groundwater overdraft in the Miliken-Sarco-Tulucay (MST) area of Napa County.

MST Area Project

The MST Area Project would consist of 17.5 miles of new pipeline, four booster pump stations along the pipeline routes, and a new booster pump at the WWTP. The new pipeline would be installed from the end of the Streblow Drive pipeline through the Napa State Hospital grounds and north to the MST area. A looped system using existing roadways would be constructed, with one segment extending west along First Avenue and the second segment extending east along Third Avenue; both segments would then merge along Hagen Road north of the Napa Valley Country Club. Four booster pump stations would be installed to maintain pressure throughout the distribution system, and an additional pump would be installed at the WWTP. Pump stations would be located on Imola, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Potential recycled water users include the Napa State Hospital, the Napa Valley Country Club, and agricultural and residential parcels along the proposed pipeline route.

Under the MST Local Project (Options 1 and 2), a more direct pipeline system extending north from Imola Avenue along 4th Avenue, Coombsville Road, 2nd Avenue and terminating at the Napa Valley Country Club would be implemented.

Table ES-3 identifies projects that would be implemented as Phase 1 Projects under any of the Action Alternatives considered.

Alternative 1: Basic System

Alternative 1 – Basic System would expand recycled water programs currently in operation within each of the Member Agency service areas. It puts greatest emphasis on the service of local demands by the individual WWTPs. Alternative 1 would provide 6,655 AFY of new recycled water for irrigation use and 5,825 AFY for habitat restoration, and would include installation of 83 miles of new pipeline, construction of facilities onsite at the existing WWTPs to provide an additional 7.8 mgd of tertiary treatment capacity, and development of approximately 1,020 acre-feet of new storage, primarily at existing or planned storage ponds at the WWTPs.

TABLE ES-3
IMPLEMENTATION PLAN – PHASE 1

		New Pipeline (miles)	New Demand (AFY)	Capacity Increase (mgd)	New Pumps (HP)	New Storage (AF)
LGVSD	Peacock Gap	--	--	--	--	--
	NMWD URWP (South)	5.9	204	0.7	72	(3)
	Sears Point	--	--	--	--	--
Novato SD	NMWD URWP (North/Central)	9.8	542	1.2	259	(3)
	Sears Point	--	--	--	--	--
SVCSD	Southern Sonoma Valley	--	--	--	--	--
	Central Sonoma Valley	--	--	--	--	--
	Sonoma Valley (1A)[1]	5.2	874	0	662	65
	Napa Salt Marsh	7.9	(2)	0	0	0
Napa SD	Carneros East	--	--	--	--	--
	MST Area	17.5	2,137	4.5	880	0
	Napa (local)	--	--	--	--	--
	Napa Salt Marsh	--	--	--	--	--
Total		**46.3**	**3,757**	**6.4**	**1,873**	**65**

1 Sonoma Valley (1A) is a pipeline alignment originally analyzed as a part of the Sonoma Valley Recycled Water Project EIR and proposed under Phase 1 for the NBWRP. The alignment is described on page 2-18 of this document.
2 Additional 3,460 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type. Because this is a beneficial use that is not related to recycled water supply, this number is tracked separately in each of the alternatives.
3 Existing 0.5 mg reservoir would be rehabilitated to provide recycled water system storage.

SOURCE: CDM, 2009, Napa SD, 2009.

Alternative 2: Partially Connected System

Alternative 2 – Partially Connected System involves development of a subregional recycled water system, taking advantage of increased storage capacity and additional pipelines under Alternative 1 to distribute recycled water more extensively throughout the project area. Alternative 2 would provide 11,250 acre feet of new recycled water for irrigation uses and potentially 2,933 AFY for habitat restoration, and would include: installation of 140 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 15.9 mgd of tertiary treatment capacity, and development of approximately 2,220 acre-feet of storage, primarily at existing or planned storage ponds at the WWTPs.

Alternative 3: Fully Connected System

Alternative 3 – Fully Connected System creates a regional system that connects all four WWTPs in the project area. This alternative maximizes water reuse by allowing recycled water from any WWTP to be delivered to any area that needs recycled water. Since the majority of the demand for recycled water lies in the area near Sonoma and Napa, the regional interconnection achieved

under Alternative 3 would allow the other WWTPs to help satisfy the demand in this area. Alternative 3 would provide 12,761 acre feet of new recycled water for irrigation use and 3,085 AFY for habitat restoration, and would include: installation of 153 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 20.8 mgd of tertiary treatment capacity, and development of approximately 2,220 acre-feet of storage, primarily at existing or planned storage ponds at the WWTPs.

No Project Alternative

No project elements would be implemented under this alternative. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

The "No Action Alternative" assumes that there would be no joint project among the member agencies. It represents the "current status" in which additional wastewater treatment capacity and water recycling occurs strictly from the implementation of local plans for expansion, and the potential need to develop additional potable water supplies continues to be a regional challenge. In general, each Member Agency would continue to implement individual recycling projects, subject to the availability of funding and completion of the CEQA process. The No Action Alternative would likely result in a smaller increment of water recycling projects within the region. Specific projects that would have the greatest potential to be implemented under the No Action Alternative are below:

- **LGVSD.** LGVSD would prioritize expenditures on projects that meet its NPDES permit requirements. For the purpose of this EIR/EIS, it is assumed that this strategy would result in no additional recycled water projects being implemented in the LGVSD service area.

- **Novato SD.** Novato SD and NMWD would pursue implementation of recycled water distribution facilities solely within the Novato North Service Area. This includes 4.4 miles of pipeline, a 0.5 mgd upgrade at the Recycled Water Treatment Facility, and one pump station at the intersection of Atherton and Olive.

- **SVCSD. Sonoma Valley Recycled Water Project – Alignment 1A:** This would include construction of approximately 5.2 miles of pipeline in the Sonoma Valley, with completion of a pump station at the SVCSD WWTP.

- **SVCSD. Napa Salt Pond Pipeline:** This would include construction of approximately 4.0 miles of pipeline from the SVCSD WWTP to the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds an additional 4.5 miles of new pipeline would be constructed to convey water to the salt pond mixing chamber. The pipeline and the pump station were discussed and analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2004) under the Water Delivery Project Component (Sonoma Pipeline) (see **Figure 2-6**). Potential route options would extend east along Ramal Road and south along Duhlig Road toward the ponds.

- **Napa SD.** Napa SD would prioritize expenditures on projects that meet its NPDES permit requirements. For the purpose of this EIR/EIS, it is assumed that this strategy would result in no additional recycled water projects being implemented in the Napa SD service area.

Table ES-4 summarizes the components proposed under the action alternatives.

TABLE ES-4
SUMMARY OF PROJECT COMPONENTS UNDER THE ACTION ALTERNATIVES

Project Components	No Action Alternative	Basic System	Partially Connected System	Fully Connected System
Pipeline (in miles)				
LGVSD	0.0	5.88	17.94	17.94
Novato SD	4.4	12.44	35.90	47.00
SVCSD	13.1	33.72	42.00	44.20
Napa SD	0.0	31.14	44.08	44.08
Total Pipeline	**17.5**	**83.00**	**140.00**	**153.00**
Pump Station (in horsepower)				
LGVSD	0	71	91	203
Novato SD	250	258	586	965
SVCSD	662	1,109	1,819	2,693
Napa SD	0	720	958	958
Total Pump Stations	**912**	**2,158**	**3,454**	**4,819**
Storage Capacity				
LGVSD	0.0	0.0	0.0	0
Novato SD	0.0	0.0	0	0
SVCSD	65.0	1,020	2,220	2,220
Napa SD	0.0	0.0		
Total New Storage[(1)]	**65.0**	**1,020**	**2,220**	**2,220**
Tertiary Treatment Capacity Increase (million gallons per day)				
LGVSD	0.0	0.7	1.2	1.2
Novato SD	0.5	1.2	5.1	10.0
SVCSD	0.0	0.0	0.0	0.0
Napa SD	0.0	5.9	9.6	9.6
Total Tertiary Treatment Capacity Increase	**0.5**	**7.8**	**15.9**	**20.8**
Potable Offset (acre-feet per year)				
LGVSD	0	202	409	409
Novato SD	193	542	2,038	3,701
SVCSD	874	2,719	4,381	4,230
Napa SD	0	3,192	4,221	4,421
Total Potable Offset	**1,067**	**6,655**	**11,250**	**12,761**

1 This total only represents new storage. The Proposed Action will rely on existing storage and retrofit existing facilities to accommodate storage needs. Please refer to Chapter 2, Project Description for a break down of new versus existing storage by alternative.

NOTE: The No Project Alternative would be equivalent to existing conditions and no project elements would be implemented, therefore not included in the table.

SOURCE: CDM, 2009.

ES.4 Summary of Potential Environmental Impacts and Mitigation Measures

The impacts are analyzed for construction and operation of the NBRWP for the individual Member Agencies in compliance with both CEQA and NEPA. Phase 1 impacts are discussed at project level and impacts from the Action Alternatives are discussed at program level.

While the project alternatives are designed to provide recycled water to offset potable water supplies and achieve the project objectives discussed above, these alternatives also would result in some short-term and long-term impacts to the environment. **Table ES-6**, included at the end of this section, summarizes the environmental impacts associated with each of the project alternatives. For impacts determined to be significant, mitigation measures are presented and the impact significance after mitigation is shown. The environmental impacts associated with the project alternatives can be generally categorized as follows: project construction; project operation; climate change; and growth-inducement.

ES.4.1 Construction

Most environmental impacts identified for the project alternatives would be associated with project construction; these impacts would occur as individual projects are implemented by Member Agencies, and would cease once project construction is completed. Construction impacts include effects associated with transport of construction materials and equipment and carrying out construction activities such as excavation, grading, foundation development, paving, and building of structures. Construction activities generate impacts such as noise, dust, impacts to sensitive species or wetland habitats, temporary effects on agricultural activities, construction traffic and access disruption, increased erosion, or increased potential for spill of hazardous materials used in construction (such as fuel, or paint) and related water quality issues. In some cases, construction effects were found to be less than significant and in other cases they were determined to be significant. In all cases, feasible mitigation measures have been identified to reduce construction impacts to less than significant levels. There would be no significant and unavoidable construction impacts.

ES.4.2 Project Operations

Project operational effects relate primarily to the distribution and use of recycled water. These impacts are generally less than significant, or mitigable to a less than significant level, and include: exposure of facilities to geologic hazards; reduction of the amount of treated effluent discharged to tributaries of North San Pablo Bay; increased impervious surface areas; exposure of facilities to 100-year flood events; beneficial effects to groundwater, water supply, and habitat enhancement; conversion of farmland to non-agricultural uses; potential impacts to groundwater quality; increased use of electricity to pump recycled water to end users; increased greenhouse gas emissions; localized noise increases; localized use of treatment chemicals; beneficial potable water offset; alteration of designated scenic vistas or views; disproportionate effects to minority communities; and cumulative effects. All of these potential impacts were reduced to a less than significant level of incorporation of the mitigation measures identified in Table ES-6.

ES.4.3 Climate Change

This Draft EIR/EIS examines the potential for the project alternatives to increase greenhouse gas emissions, which in turn would contribute to global climate change effects. As a global concern, increases in greenhouse gases contribute to cumulative impacts, rather than constituting a direct impact associated with a single project. This Draft EIR/EIS also reviews sea level rise and the potential for increased flooding caused by climate change to assess how the project might affect or be affected by these environmental changes.

Project construction and operation would result in increased greenhouse gas emissions. Construction emissions would be short-term. Greenhouse gas emissions associated with project operation would result primarily from recycled water distribution. The project alternatives would not conflict with any measures adopted by the state or other agencies to implement the California Global Warming Solutions Act of 2006 (AB 32), the state law that requires the Air Resources Board to design and implement measures to reduce greenhouse gas emissions to 1990 levels by 2020.

With respect to the potential effects of climate change, the project increases the flexibility of local and regional water supply systems to adapt to changes in water supply availability. As described in Chapter 1, Introduction, the NBWRA Member Agencies have initiated programs to promote sustainability and implement energy efficiency and water conservation programs including local recycled water projects as means of adaptive strategies to the effects of climate change. As part of the proposed project, the NBWRA would expand the recycled water use in the North San Pablo Bay region. As discussed in Section 3.11, Public Services and Utilities, the proposed project would treat and reuse the wastewater that is otherwise discharged to the San Pablo Bay. The project would therefore offset the potable water supply, making an equivalent amount of potable water available for other uses. Given the increased variability in the precipitation and thus, the water supplies, the proposed project would have a beneficial effect on the water supplies in the region. The proposed project would provide several opportunities for management flexibility and implementation of adaptive management strategies to improve water supply reliability.

ES.4.4 Growth-Inducement

None of the project alternatives would be directly growth inducing. However, the provision of recycled water, like potable water supplies, would assist in meeting the water supply needs identified for buildout of approved General Plans within the region. As such, provision of recycled water supply would have the potential to contribute to secondary effects associated with development under the approved General Plans. The potential environmental effects of this future planned growth have been evaluated and fully disclosed previously in the CEQA environmental documents prepared the General Plans for Sonoma County, Marin County, and Napa County. Both the General Plans and the water supply planning documents for these areas include policies encouraging the use of recycled water.

ES.4.5 Significant and Unavoidable Impacts

There are no significant and unavoidable impacts identified for the NBWRP, with the exception o of the NBWRP's contribution to potential secondary effects of growth associated with development under the approved General Plans with the region.

ES.5 Issues of Known of Controversy and Issues to be Resolved

ES.5.1 Issues of Known Controversy

Based on public and agency comments received throughout the project planning process, Reclamation and NBWRA have identified the following areas of controversy related to the proposed NBWRP. **Appendix 1**, Scoping Report, summarizes all of the issues raised by agencies and the public during the public scoping process in July 2008 through August 2008. Areas of potential public controversy include: the proposed end uses of recycled water, beneficial offset; integration of conservation measures; regional distribution of recycled water; cost and benefit; water quality; effects on agricultural uses; and growth inducement.

ES.5.2 Issues to be Resolved

Reclamation and NBWRA will need to identify a preferred alternative. The decision will be based on project benefits, potential environmental effects, and numerous factors including the type of financing available, permitting requirements, and implementation schedule. Other issues to be resolved include:

- Project design and operations will also be refined by Member Agencies through the environmental permitting process, in particular compliance with the federal and state Endangered Species Acts, which will also affect the overall project benefits. The selection of an alternative also determines the level and type of environmental impacts, as described in this Draft EIR/EIS.

- Regardless of which alternative is selected for implementation, detailed design of project features and planning of construction will need to be coordinated with mitigation requirements so that sensitive resources in the project areas are avoided where practicable. The methods for achieving required mitigation would be determined during detailed project design through consultation and coordination with the permitting agencies.

- Completion and conclusions of the Federal Feasibility Report, described below in Section ES.7, including related engineering design, economic (costs and benefits), and financial analyses as a basis for determining the type and extent of federal interest in project implementation.

- Completion and conclusions of public review of this Draft EIR/EIS and the subsequent Final EIR/EIS as a basis for determining mitigation commitments, the Environmentally Superior Alternative per CEQA.

ES.6 Relationship to Environmental Protection Statutes, Plans, and Other Requirements

This Draft EIR/EIS has been prepared in consideration of NEPA, CEQA, and other pertinent federal, state, and local environmental regulations. NEPA requires that environmental consequences of a Proposed Action and project alternatives be considered before the decision making for implementation of a federal project. CEQA requires that environmental consequences of a Proposed Project and project alternatives be considered before approval, financing, or participation by the lead agency pursuant to CEQA. Chapter 7 of this Draft EIR/EIS presents the applicable environmental laws, regulations, and alternative plans being considered and the intended uses and users of the document. This Draft EIR/EIS is not a decision document and is not serving as public notice for any permit actions.

Table ES-5 summarizes the status of consultation for the requirements that must be met by Reclamation and NBWRA before the NBWRP can be implemented.

ES.7 Public Involvement and Next Steps

In accordance with 40 CFR 1508.22, a Notice of Intent (NOI) was published in the Federal Register by Reclamation on July 28, 2008. In accordance with Sections 15063 and 15082 of *CEQA Guidelines*, the NBWRA circulated a Notice of Preparation (NOP) to local, state, and federal agencies, and to other interested parties on July 25, 2008. During the 30-day public review period, NBWRA held three local public scoping meetings on August 4, 5, and 6 of 2008 at the locations identified below.

August 4, 2008	August 5, 2008	August 6, 2008
6:30 p.m. – 7:30 p.m.	6:30 p.m. – 7:30 p.m.	6:30 p.m. – 7:30 p.m.
Napa Elks Lodge	Margaret Todd Senior Center	Sonoma Community Center
2804 Soscol Avenue, Napa	1560 Hill Road, Novato	276 East Napa Street, Sonoma

Public notices were placed in local newspapers informing the general public of the availability of the NOP and NOI and the time and place of scheduled scoping meetings. The purpose of the scoping meetings were to present the Proposed Action to the public through use of display maps, route alignments and handouts describing project components and potential environmental impacts. Attendees were provided an opportunity to voice comments or concerns regarding potential effects of the Proposed Action.

Additional scoping meetings with individual stakeholders were held on August 6th, 2008 with the Russian River and Eel River Interest Groups, and on July 27th, 2008 with California Department of Parks and Recreation (staff meeting).

In accordance with CEQA and NEPA review requirements, this Draft EIR/EIS will be circulated for public and agency review and comment for a 45-day period following the date when the U.S. Environmental Protection Agency publishes the Notice of Availability of Weekly Receipt of Environmental Impact Statements in the Federal Register, and the filing of the Notice of

TABLE ES-5
SUMMARY OF ENVIRONMENTAL COMPLIANCE FOR THE PROPOSED PROJECT

Requirements	Status of Compliance/Expected Completion
National Environmental Policy Act	Ongoing until this EIR/EIS Record of Decision is published
California Environmental Quality Act	Ongoing until this EIR/EIS document is certified and mitigation met
Federal Endangered Species Act and California Endangered Species Act	Ongoing until project Biological Opinion issued (see Section 3.5, Biological Resources)
Magnuson-Stevens Fishery Conservation and Management Act	Ongoing until project Biological Opinion or ASIP issued (see Section, 3.5 Biological Resources)
Clean Water Act Section 401	Member Agencies will apply for Water Quality Certification after EIR/EIS is approved and project design underway (see Sections 3.5, Biological Resources, and Section 3.4, Water Quality)
Clean Water Act Section 404	Member Agencies will apply for Wetland Permit after the EIR/EIS is approved and project design underway (see Section 3.5, Biological Resources)
Clean Air Act	In compliance. Conformity analysis is not required. (see Section 3.8, Air Quality)
National Historic Preservation Act and Native American Consultation	Ongoing. Once Section 106 review process is completed, the project will proceed in accordance with conditions stipulated in the agreement with the State Historic Preservation Officer and appropriate agencies (see Section 3.12, Cultural Resources)
Executive Order 11988 - Floodplain Management	Ongoing. The project complies by using this EIR/EIS to identify and assess project effects (see Section 3.2, Surface Hydrology)
Executive Order 11990 - Protection of Wetlands	Member Agencies will apply for Wetland Permit after the EIR/EIS is approved and project design underway (see Section 3.5, Biological Resources)
Executive Order 12898 - Environmental Justice	In compliance based on EIR/EIS Section 3.16, Environmental Justice.
Migratory Bird Treaty Act	Member Agencies will comply with provisions of the Migratory Bird Treaty Act (see Section 3.5, Biological Resources)
California Fish and Game Code (Section 1600 Lake or Streambed Alteration Agreement Program)	Ongoing. The project complies with Section 1600 by using this EIR/EIS to identify and address expected project effects (Section 3.5, Biological Resources)
Caltrans Encroachment Permit	Member Agencies will apply for a Caltrans Encroachment Permit to construct within Caltrans right-of-way prior to construction (see Section 3.7, Transportation and Circulation)
Disabilities Regulations - Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act	Project adheres to the construction guidelines of the Uniform Federal Accessibility Standards and complies with regulations proposed for incorporation into the Americans With Disabilities Act Accessibility Guidelines as a part of design for individual facilities.
Farmland Protection Policy Act	Ongoing. (see Section 3.6, Land Use and Agricultural Resources)
Section 10 of the Rivers and Harbors Act of 1899	Ongoing. This regulation is addressed in coordination with other wetlands regulations (see Clean Water Act, Section 404, above)
NPDES Construction Stormwater Permit	Member Agencies will comply by preparing and using a Storm Water Pollution Prevention Plan at the time of construction (see Section 3.2, Surface Hydrology)
General Order for Dewatering and Other Low Threat Discharge to Surface Waters	Member Agencies will comply by preparing and using a permit at the time of construction (see Section 3.2, Surface Hydrology)

Completion with the California State Clearinghouse. Three public hearings have been scheduled in Novato, Sonoma, and Napa to receive public input on the Draft EIR/EIS. These hearings will be held during the public review and comment period so that any comments received at the hearings can be addressed in the Final EIR/EIS. In addition, written comments from the public, reviewing agencies, and stakeholders will be accepted during the public comment period.

A Final EIR/EIS that will include responses to all comments will be prepared and circulated in accordance with NEPA and CEQA requirements. The Final EIR/EIS will be circulated for 30 days prior to taking action on the project and issuance of a Record of Decision (ROD).

NBWRA Decision Making Process

The NBWRA Member Agencies and cooperating agencies may use this EIR/EIS to approve the NBWRP, or components of the NBWRP, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. SCWA will act as CEQA Lead Agency. Individual NBWRA Member Agencies and cooperating agencies are Responsible Agencies as provided for under CEQA §15096 and may use this EIR/EIS for the approving the proposed components (i.e., Phase 1) in their respective service areas.

Federal Decision Making Process

Reclamation intends to use this EIR/EIS to consider provision of federal funding under Title XVI for implementation of NBWRP. As lead Federal agency, Reclamation would use this EIR/EIS to support a Record of Decision, which would document Reclamation's decision to choose one of the alternatives including the proposed action and no action.

Integral to the federal decision process are other legally required processes and information, such as biological opinions from the Federal Endangered Species Act consultation process and permits required by federal, state and local laws. The federal decision process also includes consideration of input from other federal, state, and local agencies, concerned stakeholders, tribes, and the general public.

The final federal decision is documented in a ROD. The ROD will address the decision and the alternatives considered; the alternative(s) considered to be environmentally preferable; the factors that were considered; whether or not all practicable means to avoid or minimize environmental harm for the alternative selected have been adopted, and if not, why; any monitoring and enforcement program established to ensure identified mitigation measures are accomplished; and any significant comments received on the Final EIR/EIS.

Reclamation. Reclamation is the lead Federal agency, as delegated by the Secretary of the Interior, and therefore is responsible for the preparation and processing of the Federal Feasibility Report and EIS. For efficiency, the EIS has been combined with an EIR, prepared by NBWRA for compliance with the CEQA.

While the NEPA compliance process is a subset of the federal feasibility study process, there are important distinctions to make. The purpose of the NEPA process is to analyze and disclose the impacts of a range of alternatives, and to provide an opportunity for public review and comment prior to the final federal decision. The purpose of a Federal Feasibility Report is to address engineering, economic, environmental and financial aspects of alternatives, determine the potential benefits and costs, and determine if there is a federal interest in the implementation of a project.

Upon completion of the Final Federal Feasibility Report and the Final EIR/EIS, Reclamation's Mid-Pacific Regional Director will make a recommendation that will be submitted to the Commissioner of Reclamation for consideration. Then, the Commissioner will concur or modify the recommendation and forward the Final Federal Feasibility Report, Final EIR/EIS, and Draft ROD to the Secretary of the Interior.

Secretary of the Interior. The Secretary will review the Federal Feasibility Report and sign the ROD if he concurs with the recommendation and then send the Final Federal Feasibility Report, Final EIR/EIS, and signed ROD to Office of Management and Budget (OMB) for review.

OMB. In accordance with Executive Order 12322, OMB will review the Federal Feasibility Report for consistency with the policy and programs of the President, the federal P&Gs, and other applicable laws, regulations and requirements relevant to the federal planning process.

Congress. Congress will review the information provided by the Secretary and OMB, and then decide whether to authorize the recommended project. Congress is responsible for authorizing projects for construction and providing appropriations to construct projects.

Other Uses and Users of the EIR/EIS

The NBWRA Member Agencies and cooperating agencies may use this EIR/EIS to approve the NBWRP, or components of the NBWRP, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. As the CEQA Lead Agency, SCWA's Board of Directors will consider certification of the EIR/EIS as complete under CEQA (*CEQA* Guidelines §15090). Once the EIR/EIS has been certified as complete, the Board, or NBWRA Member Agencies, as Responsible Agencies, will consider the certified EIR/EIS (15096(a)). Any project approvals (see **Table 1-1**; also see Section 1.6.6 below) would require the Board or NBWRA Member Agencies to make written findings with respect to each significant environmental effect relevant to their aspect of the project identified in the EIR/EIS in accordance with Section 15091 of *CEQA Guidelines*.

The analyses contained within this EIR/EIS would be used to support the acquisition of the following regulatory permits or approvals if needed:

- Clean Water Act Section 404– Individual Permit (USACE);
- Endangered Species Act – Section 7 Consultation (USFWS);

- 1603 Streambed Alteration Agreement – (California Department of Fish and Game);
- Section 401 Water Quality Certification (San Francisco Bay Regional Water Quality Control Board);
- Roadway Encroachment Permit (California Department of Transportation);
- Roadway Encroachment Permits as applicable (Counties of Marin, Sonoma, and Napa, Cities of San Rafael, Novato, Sonoma, and Napa).

The majority of the proposed activities would lie within public rights-of-way. Acquisition of right-of-ways and temporary construction easements may be necessary for construction of some of the proposed facilities. Temporary construction easements would also be required for contractor staging areas and equipment and materials storage.

References – Executive Summary

Camp, Dresser & McKee, Inc. (CDM), Updated Data on Wastewater Discharge, Recycled Water Use, and Power Use, 2009.

TABLE ES-6
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.1: Geology and Soils							
3.1.1: Seismicity. In the event of a major earthquake in the Bay Area Region, the proposed facilities could be subject to fault rupture, severe ground shaking, liquefaction, or earthquake induced landslides capable of causing injury, structural damage, pipeline rupture and service interruption.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.1.1:** The Member Agencies will implement the following measures: • All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria, including the California Building Code (CBC) and American Waterworks Association (AWWA) criteria. • The project construction materials and backfill materials will be designed according to a geotechnical investigation by a California-licensed geotechnical engineer or engineering geologist to address landslide, subsidence, liquefaction, and expansive soils and seismic hazards such as ground shaking and liquefaction. • Implementation of industry standard geotechnical measures such as replacing excavated soils with engineered fill materials are effective means to overcome the potential for subsidence. If excavated soils are to be reused for backfill, they would still be appropriately compacted to mitigate the potential for subsidence or settlement and evaluated for expansion and amended, if necessary, to reduce the potential for expansion in accordance with accepted geotechnical practices. • Proposed facilities will be designed to include flexible connections, where deemed necessary, along with backfill requirements that minimize the potential for significant damage. All other associated improvements will employ standard design and construction using the most recent geotechnical practices and California Building Code (CBC) seismic criteria, which would provide conservative design criteria.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.1.2: Erosion. Project construction activities could result in short-term erosion and loss of topsoils.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.1.2:** The Member Agencies will implement the following measures: • Consistent with SWPPP requirements, the construction contractor shall be required to implement BMPs for erosion control onsite. The use of construction BMPs will minimize the potential for erosion and loss of topsoil, and shall include, without limitation, the following: - Avoid scheduling construction activities during a rain event, but be prepared for sudden changes in conditions;	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		

NOTES:

[a] NI = no impact, LTS = less than significant, LSM = less than significant with mitigation, BI = beneficial
[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.1: Geology and Soils (cont.)							
3.1.2 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	- Construct berms, silt fences, straw bales, fiber rolls, and/or sand bags around stockpiled soils; - Cover stockpiled soils during a rain event and monitor perimeter barriers, repair as necessary; - Stabilize entrances to work area to prevent tracking of dirt or mud onto roadways; and - Implement dust control practices as appropriate on all stockpiled material.	
	Fully Connected	LSM	LSM	LSM	LSM		
3.1.3: Unstable Soils. Project improvements could be located on a geologic unit or soil that is unstable that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse causing damage to structures and service disruptions.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.1.1**	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.1.4: Expansive Soils. Project improvements could be located on expansive soils that over time could cause damage to foundations and pipelines resulting in service disruptions.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.1.1**	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

NOTES:

[a] NI = no impact, LTS = less than significant, LSM = less than significant with mitigation, BI = beneficial
[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.2: Surface Hydrology							
3.2.1: Changes in drainage patterns. Project construction could modify existing drainage patterns.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.2.1:** The Member Agencies would implement the following measure during pipeline installation at stream crossings: • Schedule construction so as to avoid storm events to the extent feasible; • Use trenchless techniques such as jack and bore tunneling to avoid direct impacts to the streams; • Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means; and • Following construction, restore the construction area to pre-existing conditions • Implement **Mitigation Measure 3.5.1** (see Section 3.5).	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.2.2: Flooding and Effects to Surface Waters. The proposed action could expose public or structures to the risk of flooding due to placement of facilities within the 100-year flood plain. The proposed action would also change the amount of discharge to local surface waters.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LSM	NI		
	Phase 1	LTS	LTS	LTS	NI		
	Basic	LTS	LTS	LTS	NI		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.2.3: Increased storm runoff. New impervious surfaces for NBWRP would result in an increase in storm runoff.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.2.3:** The Member Agencies will implement the following measures: • Comply with the local storm drainage requirements; • Incorporate site design features to control any site runoff onsite; and • Install storm runoff, collection, and treatment system, as applicable, to control the runoff flow offsite.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

NOTES:

[a] NI = no impact, LTS = less than significant, LSM = less than significant with mitigation, BI = beneficial
[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.2: Surface Hydrology (cont.)							
3.2.4: Flooding - Sea level rise. Sea-level rise could affect operation of project facilities.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.2.4:** Design of proposed facilities shall consider sea level rise potential, and shall include appropriate measures in facility siting and design to address potential impacts related to sea level rise, similar to those applied to facility installation within 100-year flood plains. Design measures may include, but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LSM	LSM	LSM	LTS		
	Basic	LSM	LSM	LSM	LTS		
	Partially Connected	LSM	LSM	LSM	LTS		
	Fully Connected	LSM	LSM	LSM	LTS		
Section 3.3: Groundwater Resources							
3.3.1: Long-term groundwater levels. NBWRP would provide an alternative irrigation supply to existing groundwater pumping; offset of groundwater pumping could maintain or raise groundwater levels in portions of the project area.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	B	NI		
	Phase 1	B	NI	B	B		
	Basic	NI	NI	B	B		
	Partially Connected	NI	B	B	B		
	Fully Connected	NI	B	B	B		
3.3.2: Hydrostatic Pressure. Proposed facilities may be affected by shallow groundwater levels and natural groundwater fluctuations.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.3.1:** The Member Agencies will implement the following measures: • All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria. • Implement industry standard geotechnical measures to address high groundwater conditions as appropriate to reduce the potential for impacts related to groundwater fluctuation, in accordance with accepted geotechnical practices. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

NOTES:

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[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.3: Groundwater Resources							
3.3.3: High Groundwater Conditions. NBWRP could result in localized increases in groundwater levels over the long term that could effect structures or contribute to flooding.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.3.4: Groundwater Quality. The use and storage of recycled water could affect groundwater quality for potable and agricultural uses.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.3.5: Groundwater recharge. Impervious surfaces constructed under NBWRP could affect groundwater recharge in the project area.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	NI	NI		
	Phase 1	NI	LTS	NI	LTS		
	Basic	NI	LTS	NI	LTS		
	Partially Connected	NI	LTS	LTS	LTS		
	Fully Connected	NI	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.4: Water Quality			
3.4.1: Short Term Construction-Related Effects. Disturbance of soils during construction of new project-related infrastructure could generate short term erosion-related water quality impacts. Construction activities could result in the accidental release of fuels or hazardous materials. Project construction activities could require dewatering that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks.		**Mitigation Measure 3.4.1a:** NPDES Construction Activity Stormwater Permit. Member Agencies or their contractor shall comply with the provisions of the NPDES Construction Activity Stormwater permit, including preparation of Notice of Intent to comply with the provisions of this General Permit and preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify implementation measures necessary to mitigate potential water quality degradation as a result of construction-related runoff. These measures will include BMPs and other standard pollution prevention actions, such as erosion and sediment control measures, proper control of non-stormwater discharges, and hazardous spill prevention and response. The SWPPP will also include requirements for BMP inspections, monitoring, and maintenance. The following items are examples of BMPs that would be implemented during construction to avoid causing water quality degradation: • Erosion control BMPs, such as use of mulches or hydroseeding to prevent detachment of soil, following guidance presented in the California BMP Handbooks – Construction (CASQA 2003). A detailed site map will be included in the SWPPP outlining specific areas where soil disturbance may occur, and drainage patterns associated with excavation and grading activities. In addition, the SWPPP will provide plans and details for the BMPs to be implemented prior, during, and after construction to prevent erosion of exposed soils and to treat sediments before they are transported offsite. • Sediment control BMPs such as silt fencing or detention basins that trap soil particles. • Construction staging areas designed so that stormwater runoff during construction will be collected and treated in a detention basin or other appropriate structure. • Management of hazardous materials and wastes to prevent spills. • Groundwater treatment BMPs such that localized trench dewatering does not impact surface water quality. • Vehicle and equipment fueling BMPs such that these activities occur only in designated staging areas with appropriate spill controls. • Maintenance checks of equipment and vehicles to prevent spills or leaks of liquids of any kind.	Less than Significant

Alternative	LGVSD/ NMWD	Novato SD/NMWD	SVCSD	Napa SD/ Napa County
No Project	NI	NI	NI	NI
No Action	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Basic	LSM	LSM	LSM	LSM
Partially Connected	LSM	LSM	LSM	LSM
Fully Connected	LSM	LSM	LSM	LSM

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.4: Water Quality (cont.)							
3.4.2: Incidental Runoff. Project operation would increase the use of recycled water for irrigation within the action area, with the potential to impact surface water quality.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No additional mitigation measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.4.3: Public Health. The proposed project would increase the use of recycled water on lands within the action area, with the potential to affect public health.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.4.4: Agricultural Uses. The proposed action would offset the use of potable water supplies for agricultural irrigation. Recycled water quality could have the potential to affect crop production.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.4: Water Quality (cont.)							
3.4.5: Secondary Effects to Groundwater Quality. Irrigation with recycled water could contribute to loading of specific constituents to groundwater.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.4.6: Surface Water Storage. The proposed project would include storage of recycled water at existing WWTP facilities, as well as at individual user properties. Storage of recycled water quality would have the potential to affect localized surface water quality or groundwater quality.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.4.6a:** Under the Master Recycling Permit for each Member Agency and Cooperating Agency, user agreements shall include provisions for compliance with Title 22 and the State Draft Recycled Water Policy regarding storage and use of recycled water onsite at individual properties. **Mitigation Measure 3.4.6b:** Prior to storage of recycled water in any "on-stream" storage facility that directly receives and releases stream flow, each Member Agency or Cooperating Agency shall enter into discussions with RWQCB regarding operational requirements to ensure operation of proposed facilities in compliance with Title 22 and the State Recycled Water Policy. It is anticipated that specific operational standards, such as pumping on-stream ponds dry prior to the onset of winter rains or other measures, would be required in order to ensure storage in compliance with Title 22.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LSM		
	Basic	LTS	LTS	LTS	LSM		
	Partially Connected	LTS	LTS	LTS	LSM		
	Fully Connected	LTS	LTS	LTS	LSM		
3.4.7: Pipeline Rupture. Pipeline ruptures could generate accidental releases of recycled water.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.4: Water Quality (cont.)							
3.4.8: Reduced Discharge to Surface Water. The proposed project would result in reduced discharge from the WWTPs.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Beneficial Impact
	No Project	NI	NI	NI	NI		
	No Action	NI	BI	BI	NI		
	Phase 1	BI	BI	BI	BI		
	Basic	BI	BI	BI	BI		
	Partially Connected	BI	BI	BI	BI		
	Fully Connected	BI	BI	BI	BI		
3.4.9: Reuse for Habitat Restoration. Disinfected tertiary-treated wastewater from the SVCSD WWTP would be delivered to the Napa Salt Marsh ponds as a dilution source for bittern ponds, thereby improving water quality.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.4. 9a:** SVCSD and Napa SD (as appropriate) shall implement the following measures: • Prepare a Management Plan required by the San Francisco Bay RWQCB to obtain a discharge prohibition. The management plan will comply with the RWQCB Resolution 94-086. The management plan will include the following features for Ponds 7 and 7A: a) Facility Plan, includes project purpose and objectives, site selection factors, site sampling and analyses, planning and design elements. b) Operations and Maintenance plan, includes vegetation planning and harvesting, channel and bank maintenance, pump and gate maintenance, vector controls, and contingency/emergency plans. c) Monitoring Program, includes monitoring of pollutants, habitat diversity, wildlife use, and vector populations.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	Ni	LSM	NI		
	Phase 1	NI	NI	LSM	NI		
	Basic	NI	NI	LSM	LSM		
	Partially Connected	NI	NI	LSM	LSM		
	Fully Connected	NI	NI	LSM	LSM		
Section 3.5: Biological Resources							
3.5.1: Impacts on Wetlands, Streams and Riparian Habitats. Construction of the Proposed Project could result in impacts to jurisdictional wetlands and other waters of the United States, as well as impacts to riparian habitat.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.1:** Implement the following measures to avoid, minimize and compensate for impacts to jurisdictional wetlands and other waters of the U.S. and impacts to riparian habitat. Construction activities resulting in the introduction of fill or other disturbance to jurisdictional wetlands and other waters of the U.S. will require permit approval from the U.S. Army Corps of Engineers and water quality certification from the Regional Water Quality Control Board, pursuant to	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	LSM		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)							
3.5.1 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	Section 401 of the Clean Water Act. The Proposed Project will most likely be authorized under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the Clean Water Act. The CDFG has jurisdiction in the project area over riparian habitat, including stream bed and banks, pursuant to Sections 1600-1616 of the Fish and Game Code. Pipeline construction resulting in alteration to channel bed or banks, extending to the outer dripline of trees forming the riparian corridor, is subject to CDFG jurisdiction. The project proponent will be required to obtain a Streambed Alteration Agreement (SAA) from the CDFG. Terms of these permits and SAA will likely include, but will not necessarily be limited to, the mitigation measures listed below. 1) Specific locations of pipeline segments, storage reservoirs, and pump stations shall be configured, wherever feasible, to avoid and minimize direct and indirect impacts to wetlands and stream drainage channels. Consideration taken in finalizing configuration placement shall include: • Reducing number and area of stream channel and wetland crossings where feasible. Crossings shall be oriented as close to perpendicular (90 degree angle) to the drainage or wetland as feasible. • Placement of project components as distant as feasible from channels and wetlands. • For pipeline construction activities in the vicinity of wetland and stream drainage areas, the construction work area boundaries shall have a minimum 20-foot setback from jurisdictional features[1]. Pipeline construction activities in proximity to jurisdictional features include: 1) entrance and exit pits for directional drilling and bore and jack operations; and 2) portions of pipeline segments listed as "parallel" to wetland/water features. 2) Sites identified as potential staging areas will be examined by a qualified biologist prior to construction. If potentially jurisdictional features are found that could be impacted by staging activities, the site will not be used.	
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

[1] Setbacks of channels with associated riparian vegetation will be from the outer dripline edge of the riparian corridor canopies and/or the upper bank edge, or per City or County code, whichever is greater.

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)			
3.5.1 (cont.)		3) Construction methods for channel crossing shall be designed to avoid and minimize direct and indirect impacts to channels to the greatest extent feasible. Use of trenchless methods including suspension of pipeline from existing bridges, directional drilling, and bore and jack tunneling will be used when feasible. Trenchless methods are required for all perennial drainage crossings (i.e., Sonoma Creek). Construction occurring in the vicinity of riparian areas shall be delimited with a minimum 20-foot setback to avoid intrusion of construction activities into sensitive habitat. The following additional measures shall apply to channel crossings in which the trenching construction method is used: • Limiting of construction activities in drainage channel crossings to low-flow periods: approximately April 15 to October 15. • At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation. • At off-road drainage crossings, the construction corridor width will be minimized to the greatest extent feasible at the crossing and at least 20 additional feet to either side of the drainage at the crossing. • If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone. 4) Implement BMPs required in **Mitigation Measure 3.4.1** to reduce risk of sediment transport into all construction areas in proximity of drainages. 5) For channels or wetlands for which soil removal is necessary (off-road crossings or wetlands to be trenched or otherwise directly disturbed), the top layer of the drainage or wetland bottom shall be stockpiled and preserved during construction. After the pipeline has been installed, the stockpiled material shall be placed back into the drainage or wetland feature to return the beds to approximately their original composition.	

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)			
3.5.1 (cont.)		6) To offset temporary and permanent impacts to wetlands and other waters of the U.S., and impacts to riparian habitat, compensatory mitigation will be provided as required by regulatory permits and SAAs.	
3.5.2: Construction Impacts on Special-status Fish and California Freshwater Shrimp. Construction of Proposed Project facilities could affect special-status invertebrate or fish species including central California coast steelhead, Chinook salmon, California freshwater shrimp, Pacific lamprey, and Sacramento splittail, or designated critical habitat for steelhead.		**Mitigation Measure 3.5.2:** Specific measures shall be implemented to protect aquatic habitats potentially inhabited by special-status fish and California freshwater shrimp. Sensitive fisheries and other aquatic resources shall be protected by minimizing in-stream and near-stream habitat impacts during project design, informally consulting with resource agencies (NMFS, USFWS, CDFG, and USACOE), and implementing protective measures. For Sonoma Creek, Petaluma River, Napa River, and other perennial drainages, special-status fish are presumed present. California freshwater shrimp are presumed present in Sonoma Creek. Because of the sensitivity of seasonal and ephemeral drainages, the following measures will be required to avoid and minimize impacts to aquatic habitat: • Project designs shall be reconfigured, whenever feasible, to avoid direct impacts to sensitive wetland areas and minimize disturbances to wetland and riparian corridors. Ground disturbance and construction footprints in these areas shall be minimized to the greatest degree feasible. • If trenching or directional boring stream crossing methods are used, the construction schedule of such activities shall be implemented according to conditions of the SAAs. • In-stream construction shall be avoided at all locations that are known, or presumed, to support threatened or endangered species, if at the time of construction such locations contain flowing or standing water. • In the event that equipment shall operate in any watercourse with flowing or standing water, the project proponent will ensure that they have the appropriate permit authorizations. • Prior to construction, a qualified biologist shall install fencing to establish a minimum 20-foot setback from sensitive habitat. • For work sites located adjacent to sensitive aquatic sites, a biological resource education program shall be provided by a qualified biologist, as per conditions of the SAAs.	Less than Significant

Alternative	LGVSD/ NMWD	Novato SD/NMWD	SVCSD	Napa SD/ Napa County
No Project	NI	NI	NI	NI
No Action	NI	NI	NI	NI
Phase 1	LSM	LSM	LSM	LSM
Basic	LSM	LSM	LSM	LSM
Partially Connected	LSM	LSM	LSM	LSM
Fully Connected	LSM	LSM	LSM	LSM

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)							
3.5.3: Long term impacts on Special-status Fish. Operation of the proposed project has the potential to affect special-status fish species due to reduced discharges from the WWTPs.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.5.4: Impacts on Special-status Invertebrates. Construction of Proposed Project facilities could impact special-status invertebrates including Myrtle's silverspot butterfly, Opler's longhorn moth, Monarch butterfly wintering sites, Ricksecker's water scavenger beetle and California brackishwater snail.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.3** would reduce potential impacts on special-status invertebrates to a less-than-significant level. Implementation of **Mitigation Measure 3.5.5** for the protection of California red-legged frogs and **Mitigation 3.5.1** for protection and restoration of wetlands would protect special-status invertebrates that could potentially be impacted by the project. No specific mitigation is required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	NI	LSM	LSM	LSM		
	Basic	NI	LSM	LSM	LSM		
	Partially Connected	NI	LSM	LSM	LSM		
	Fully Connected	NI	LSM	LSM	LSM		
3.5.5: Impacts on Western Pond Turtle. Construction of the proposed project has the potential to impact western pond turtles in upland and aquatic habitat.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.5:** Implement protection measures to avoid and minimize impacts to western pond turtles. • When working within 200 feet of stream crossings, all construction personnel shall receive awareness training relating to the protection of western pond turtles, in accordance with the SAAs. Also, to minimize the likelihood of encountering turtles in upland areas near stream crossings, construction footprints shall be minimized to the greatest extent feasible. Based on reconnaissance-level surveys, if staging and construction activities occur principally within or immediately adjacent to project alignment roads the project will be outside of principal pond turtle habitat.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)			
3.5.5 (cont.)		• Within 48 hours prior to the start of construction activities, a qualified biologist shall perform pond turtle surveys within suitable habitat within projected work areas. If a pond turtle nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall. The measures proposed for protection of aquatic species and red-legged frogs (**Mitigation Measure 3.5.2 and Mitigation Measure 3.5.6**) will additionally protect western pond turtles during construction.	
3.5.6: Impacts on California Red-legged Frog. Construction of the Proposed Project has the potential to affect California red-legged frogs, if present.		**Mitigation Measure 3.5.6:** Protection measures to avoid and minimize impacts on California red-legged frogs. 1) The implementation of measures identified for the protection of special-status fish and California freshwater shrimp would also protect California red-legged frogs within aquatic habitat. All protection measures identified in **Mitigation Measure 3.5.2** shall be applied to the protection of red-legged frogs at sites that provide potential aquatic habitat for this species. These include informal USFWS consultation, avoiding aquatic habitat, establishing a suitable buffer from the aquatic habitat (e.g., 50 feet), and implementing a worker education program. 2) All work activities within or adjacent to aquatic habitat that is potentially occupied by red-legged frogs will be completed between May 1 and November 1. 3) A qualified biological resource monitor will conduct a training session for construction personnel working in upland habitat near potentially occupied drainages, as per conditions of the SAAs. 4) All trash that could attract predators will be regularly contained and removed from the work site. In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements.	Less than Significant

Alternative	LGVSD/ NMWD	Novato SD/NMWD	SVCSD	Napa SD/ Napa County
No Project	NI	NI	NI	NI
No Action	NI	NI	LSM	NI
Phase 1	NI	NI	LSM	NI
Basic	NI	NI	LSM	NI
Partially Connected	NI	LSM	LSM	NI
Fully Connected	NI	LSM	LSM	NI

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)							
3.5.7: Impacts on Threatened and Endangered Marsh Birds. Construction of the proposed project has the potential to affect western snowy plover, California black rail and California clapper rail and their habitat in and near the project alignments.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.7:** Impacts to Threatened and Endangered Marsh Birds. To minimize the likelihood of project effects on threatened and endangered marsh birds, the following mitigation measures will be implemented: • Protocol-level surveys will be conducted in locations with suitable habitat to determine species presence or absence. • Agency consultation will be initiated. • Construction activities will occur during the non-breeding season, September 15 through January 31. The combined breeding season for all three species extends from February 1 through September 14. • Construction personnel will receive environmental awareness training specific to the identification of clapper rails, black rails, western snowy plover and their habitat. • Any clapper rail and western snowy plover activity will be immediately reported to the USFWS; black rail activity will be reported to the CDFG. • Construction activities will be constrained to the smallest area possible to minimize marsh disturbance.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LSM	NI		
	Phase 1	NI	LSM	LSM	NI		
	Basic	NI	LSM	LSM	NI		
	Partially Connected	LSM	LSM	LSM	NI		
	Fully Connected	LSM	LSM	LSM	NI		
3.5.8: Impacts on Burrowing Owl. Construction of the proposed project could result in direct and indirect impacts to burrowing owls, if present in portions of the project alignment.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.8:** The following measures to avoid, minimize, or mitigate impacts on burrowing owls would be incorporated into the project. • In areas identified to provide potential burrowing owl habitat, preconstruction surveys for burrowing owls would be conducted by a qualified biologist 14-30 days prior to the start of construction. Surveys would cover grassland areas within 500-foot buffer and check for adult and juvenile burrowing owls and their habitat. • Construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the non-breeding season (September 1 through January 31), the exclusion zone would extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250 feet around occupied burrows. Passive relocation of owls is not proposed. • A qualified biologist (the on-site monitor or otherwise) will monitor owl activity on the site to ensure the species is not adversely affected by the project.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LTS	NI		
	Phase 1	LTS	NI	LTS	NI		
	Basic	LTS	LSM	LTS	LTS		
	Partially Connected	LTS	LSM	LSM	LTS		
	Fully Connected	LTS	LSM	LSM	LTS		

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[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)							
3.5.9: Impacts on Nesting Birds. Construction of the proposed project has the potential to affect nesting birds including Swainson's hawk, willow flycatcher, sharp-shinned hawk, Cooper's hawk, tri-colored blackbird, Bell's sage sparrow, golden eagle, northern harrier, California yellow-warbler, white-tailed kite, California horned lark, salt marsh common yellowthroat, loggerhead shrike, San Pablo song sparrow, California thrasher, rookeries, and additional bird species protected by California Fish and Game Code Section 3503 and the federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989).	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.9:** The appropriate Member Agency shall implement the following protection elements to avoid disturbing common and special-status nesting birds: • Whenever feasible, vegetation shall be removed during the non-breeding season (generally defined as September 1 to January 31). • For ground disturbing activities occurring during the breeding season (generally defined as February 1 to August 31), a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. • If active bird nests are found during preconstruction surveys, a 500-foot no-disturbance buffer will be created around active raptor nests during the breeding season or until it is determined that all young have fledged. A 250-foot buffer zone will be created around the nests of other special-status birds. These buffer zones are consistent with CDFG avoidance guidelines; however, they may be modified in coordination with CDFG based on existing conditions at work locations. • If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs that have been determined to be unoccupied by special-status birds or that are located at least 500 feet from active nests may be removed.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.5.10: Impacts on Salt Marsh Harvest Mouse and Suisun Ornate Shrew. Construction of the proposed project has the potential to affect salt marsh harvest mouse and suisun ornate shrew and their habitat in and near the project alignments.	***Alternative***	***LGVSD/ NMWD***	***Novato SD/NMWD***	***SVCSD***	***Napa SD/ Napa County***	**Mitigation Measure 3.5.10:** The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on salt marsh mammals during construction. Where avoidance of sensitive habitat is not feasible (e.g., by bridging or bore and jack), consultation with CDFG and/or USFWS would be initiated. If species are present or presumed to be present after informal consultation with USFWS and/or CDFG, then a formal consultation and Biological Assessment in support of a Biological Opinion would be required. Such a consultation would proceed as part of the Corps 404 permitting program. To avoid potential impacts on salt marsh harvest mouse and Suisun ornate shrew, a qualified biologist shall conduct specific preconstruction surveys prior to project initiation, following USFWS survey guidelines. The project proponent shall install exclusionary fences to prevent species movement	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LSM	NI		
	Phase 1	NI	NI	LSM	NI		
	Basic	NI	NI	LSM	NI		
	Partially Connected	NI	LSM	LSM	NI		
	Fully Connected	NI	LSM	LSM	NI		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)							
3.5.10 (cont.)						into the project area, and a biologist with the appropriate permits to relocate these species shall live-trap mice and shrews within the enclosure and move these animals outside the fence. The biological monitor shall inspect these fences to ensure their integrity, and shall conduct an education workshop for contractors employees outlining species' biology, legislative protection, and construction restrictions to reduce potential impacts.	
3.5.11: Impacts on Special-Status Bats. Construction of the proposed project has the potential to affect roosting or breeding special-status bats in and near the project alignments.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.11:** The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on special-status bats in and near project facilities during construction. Concurrent with breeding bird surveys (**Mitigation Measure 3.5.8**), a qualified biologist will conduct preconstruction surveys for special-status bats at each bridge crossing location and in rural (i.e., non-road) areas where any large trees (e.g., > 24 inch diameter at breast height) will be removed. If an active roost is observed, a suitably-sized buffer (e.g., 100 to 150 feet) will be placed around the roost if it appears that trenching or other project activities may cause abandonment. Demolition activities must cease until juvenile bats are self-sufficient and will not be directly or indirectly impacted by activities.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LSM	NI		
	Phase 1	LTS	NI	LSM	NI		
	Basic	LTS	NI	LSM	NI		
	Partially Connected	LTS	NI	LSM	NI		
	Fully Connected	LTS	NI	LSM	NI		
3.5.12: Impacts on American Badger. Construction of the proposed project has the potential to affect American badger and its habitat in and near the project alignments.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.12:** would be implemented prior to ground-clearing activities to reduce potential impacts on badgers to a less-than-significant level. **Mitigation Measure 3.5.12:** Avoid and minimize impacts on badgers through preconstruction surveys prior to ground clearing and grading in annual grasslands habitat or areas that are known or suspected to support badger. • Within 30-days prior to ground-clearing, a qualified biologist shall survey areas that provide potential badger habitat that occur within 100-feet of project activities. If no evidence of badgers presence is detected, no further mitigation is required. If active badger dens are identified within the project area, badgers will be passively relocated. If identified, vacated dens shall be temporarily covered using plywood sheets or similar materials to prevent badgers from returning to the project area during construction.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LSM	NI		
	Phase 1	NI	NI	LSM	NI		
	Basic	NI	LTS	LSM	LTS		
	Partially Connected	NI	LTS	LSM	LSM		
	Fully Connected	NI	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)			
3.5.13: Impacts on Rare Plants. Project construction could result in impacts to listed and other special-status plants.		**Mitigation Measure for Impact 3.5.13.** Impacts on Rare Plants. Before the initiation of any vegetation removal or ground-disturbing activities in areas that provide suitable habitat for special-status plants, the following measures shall be implemented: • A qualified botanist will conduct appropriately-timed surveys for special-status plant species, including those identified in Table 3.5.1, in all suitable habitat that would be potentially disturbed by the project. • Surveys shall be conducted following CDFG- or other approved protocol. • If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter to the appropriate agencies and no further mitigation will be required. If special-status plants are found during focused surveys, the following measures shall be implemented: • Information regarding the special-status plant population shall be reported to the CNDDB. • If the populations can be avoided during project implementation, they shall be clearly marked in the field by a qualified botanist and avoided during construction activities. Before ground clearing or ground disturbance, all on-site construction personnel shall be instructed as to the species' presence and the importance of avoiding impacts to this species and its habitat. • If special-status plant populations cannot be avoided, consultations with CDFG and/or USFWS would be required. A plan to compensate for the loss of special-status plant species could be required, detailing appropriate replacement ratios, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures that would be implemented if the initial mitigation fails; the plan would be developed in consultation with the appropriate agencies prior to the start of local construction activities. • If mitigation is required, the project proponent shall maintain and monitor the mitigation area for 5 years following the completion of construction and restoration activities. Monitoring reports shall be submitted to the resource agencies at the completion of restoration and for 5 years following restoration implementation. Monitoring reports shall include photo-documentation, planting specifications, a site layout map, descriptions of materials used, and justification for any deviations from the mitigation plan.	Less than Significant

Alternative	LGVSD/ NMWD	Novato SD/NMWD	SVCSD	Napa SD/ Napa County
No Project	NI	NI	NI	NI
No Action	NI	NI	LSM	NI
Phase 1	LTS	LSM	LSM	LTS
Basic	LTS	LSM	LSM	LSM
Partially Connected	LTS	LSM	LSM	LSM
Fully Connected	LSM	LSM	LSM	LSM

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Biological Resources (cont.)							
3.5.14: Impacts on Heritage and Other Significant Trees. The proposed project could affect heritage and other significant tress.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.5.14:** The following measures will be implemented to avoid or reduce impacts to heritage or other significant trees: • Prior to the commencement of construction activities, trees necessary to remove or at risk of being damaged will be identified. • A certified arborist will inventory these trees, with the results of the inventory providing species, size (diameter at breast height, or *dbh*), and number of protected trees. Also, in consultation with the appropriate County, the arborist will determine if any are heritage or landmark trees. • If any protected trees are identified that will be potentially removed or damaged by construction of the proposed project, design changes will be implemented where feasible to avoid the impact. • Any protected trees that are removed will be replaced per applicable City and County tree protection ordinances. Foliage protectors (cages and tree shelters) will be installed to protect the planted trees from wildlife browse. The planted trees will be monitored as required by the ordinance, or regularly during a minimum two-year establishment period and maintenance during the plant establishment period will include irrigation. After the establishment period, the native tree plantings are typically capable of survival and growth without supplemental irrigation.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
Section 3.6 Land Use and Agricultural Resources							
3.6.1: Physically Divide a Community. NBWRP would not physically divide an existing community.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	NI		
	Basic	NI	NI	NI	NI		
	Partially Connected	NI	NI	NI	NI		
	Fully Connected	NI	NI	NI	NI		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.6 Land Use and Agricultural Resources (cont.)							
3.6.2: Conflict with Existing Plans. NBWRP would not conflict with applicable land use plans adopted for the purpose of avoiding or mitigating a significant environmental effect.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.6.3: Impact to Farmland. Construction activities associated with the project could temporarily affect the agricultural use of important farmland.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Measure 3.6.1:** To support the continued productive use of Important Farmlands in the project area, the NBWRA shall ensure that the following measures are taken, during construction of the project: • Replace soils over pipelines in a manner that will minimize any negative impacts on crop productivity. The surface and subsurface soil layers will be stockpiled separately and returned to their appropriate locations in the soil profile. • To avoid over-compaction of the top layers of soil, monitor pre-construction soil densities and return the surface soil (approximately the top 3 feet) to within 5 percent of original density. • Where necessary, the top soil layers will be ripped to achieve the appropriate soil density. Ripping may also be used in areas where vehicle and equipment traffic have compacted the top soil layers, such as the construction staging areas. • The NBWRA will avoid working or traveling on wet soil to minimize compaction and loss of soil structure. Before construction begins, geotechnical testing will be done to determine the moisture content limit above which work should not occur. Where working or driving on wet soil cannot be avoided, roadways will be capped with spoils that will be removed at the end of construction and/or ripped and amended with organic material as needed.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.6 Land Use and Agricultural Resources (cont.)							
3.6.3 (cont.)						• The NBWRA will remove all construction-related debris from the soil surface. This will prevent rock, gravel, and construction debris from interfering with agricultural activities. • Perform soil density monitoring during backfill and ripping to minimize excessive compaction and minimize effects on future agricultural land use. • Remove topsoil before excavating in fields. Return it to top of fields to avoid detrimental inversion of soil profiles. • Control compaction to minimize changes to lateral groundwater flow which could affect both irrigation and internal drainage.	
3.6.4: Conversion of Farmland. The project would permanently convert Important Farmland to nonagricultural use.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	Implementation **Mitigation Measure 3.6.1** would avoid permanent impacts to Important Farmland.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
Section 3.7 Transportation and Traffic							
3.7.1: Temporary Congestion and Delays. Project construction activities could adversely affect traffic and transportation conditions in the project area. Significant, Unavoidable and Short-term.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.7.1a:** The appropriate Member Agency for each project component shall obtain and comply with local road encroachment permits for roads that are affected by construction activities. The *Work Area Protection and Traffic Control Manual* includes requirements to ensure safe maintenance of traffic flow through or around the construction work zone, and safe access of police, fire, and other rescue vehicles (CJUTCC, 1996). In addition, the Traffic Management Plan (subject to local jurisdiction review and approval) required by **Mitigation Measure 3.7.1b**, below, would direct how traffic flow is safely maintained during project construction. **Mitigation Measure 3.7.1b:** The construction	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.7 Transportation and Traffic (cont.)							
3.7.1 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	contractor for each project component shall prepare and implement a Traffic Control/Traffic Management Plan subject to approval by the appropriate local jurisdiction prior to construction. The plan shall: • Identify hours of construction (between 8:00 AM and 7:00 PM; no construction shall be permitted between 10:00 PM and 7:00 AM); • Identify hours for deliveries (Monday – Friday, 9:00 AM to 3:30 PM, or other hours if approved by the appropriate local jurisdiction); • Include a discussion of haul routes, limits on the length of open trench, work area delineation, traffic control and flagging; • Identify all access and parking restriction, pavement markings and signage requirements (e.g., speed limit, temporary loading zones); • Layout a plan for notifications and a process for communication with affected residents and businesses prior to the start of construction. Advance public notification shall include posting of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access point/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints; • Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times; • Include a plan to coordinate all construction activities with the appropriate local school district at least two months in advance. The school district shall be notified of the timing, location, and duration of construction activities. Coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. The construction contractor for each project component shall be required to maintain vehicle, pedestrian, and school bus service during construction through	
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.7 Transportation and Traffic (cont.)			
3.7.1 (cont.)		inclusion of such provisions in the construction contract. The assignment of temporary crossing guards at designated intersections may be needed to enhance pedestrian safety during project construction; • Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and • Specify the street restoration requirements pursuant to agreements with the local jurisdictions. **Mitigation Measure 3.7.1c:** The appropriate Member Agency for each project component shall identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling or night construction) will be used to minimize impacts to traffic flow. **Mitigation Measure 3.7.1d:** The appropriate Member Agency for each project component shall develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. **Mitigation Measure 3.7.1e:** The appropriate Member Agency for each project component shall encourage construction crews to park at staging areas to limit lane closures in the public right-of-way. **Mitigation Measure 3.7.1f:** The appropriate Member Agency for each project component shall consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.	
3.7.2: Temporary Disruption to Access. Project construction activity would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers).	**Alternative** / **LGVSD/ NMWD** / **Novato SD/NMWD** / **SVCSD** / **Napa SD/ Napa County** ***No Project*** / NI / NI / NI / NI ***No Action*** / NI / LSM / LSM / NI ***Phase 1*** / LSM / LSM / LSM / LSM ***Basic*** / LSM / LSM / LSM / LSM	**Mitigation Measure 3.7.2a:** Pipeline construction near schools shall occur when school is not in session (i.e., summer or holiday breaks). If this is not feasible, a minimum of two months prior to project construction, the appropriate Member Agency for each project component shall coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods.	Less than Significant

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.7 Transportation and Traffic (cont.)							
3.7.2 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.7.2b:** A minimum of two months prior to project construction, the appropriate Member Agency for each project component shall coordinate with the appropriate local school district to identify alternatives to their Safe Routes to School program, alternatives for the school busing routes and stop locations, and other circulation provisions, as part of the Traffic Control/Traffic Management Plan (see Mitigation Measure 3.7.1a). **Mitigation Measure 3.7.2c:** Implement Mitigation Measure 3.7.1b.	
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.7.3: Temporary Disruption to Access. Project construction activity would have temporary effects on alternative transportation or alternative transportation facilities.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.7.3:** Implement Mitigation Measure 3.7.1f.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.7.4: Temporary Displacement of Parking. Project construction activity would temporarily create parking demand for construction workers and construction vehicles, and displace parking spaces.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.7.4:** Implement Mitigation Measure 3.7.1e.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.7 Transportation and Traffic (cont.)							
3.7.5: Temporary Potential Traffic Hazards. Project construction activity would temporarily increase the potential for accidents on project roadways.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.7.5:** Implement Mitigation Measure 3.7.1b through 3.7.1f.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.7.6: Road Wear. Project construction activity would increase wear and tear on the designated haul routes used by construction vehicles to access the project work sites.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.7.6:** Roads damaged by construction shall be repaired to a structural condition equal to that which existed prior to construction activity as per conditions of the encroachment permit (see **Mitigation Measure 3.7.1a**).	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
Section 3.8 Air Quality							
3.8.1: Temporary Construction Emissions of Criteria Pollutants. Project construction activities could result in substantial short-term criteria pollutant emissions.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.8.1a: Construction Fugitive Dust Control Plan.** The appropriate Member Agency shall require its contractor(s) to implement a dust control plan that shall include the following dust control procedures during construction as required by the BAAQMD: • Water all active construction areas at least twice daily, taking into consideration temperature and wind conditions. • Cover all trucks hauling soil, sand, and other loose materials *or* require trucks to maintain at least two feet of freeboard.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		

NOTES:

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[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Air Quality (cont.)							
3.8.1 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	• Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). • Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.) • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways, consistent with **Mitigation Measure 3.1.2**, Erosion Control. • Replant vegetation in disturbed areas as quickly as possible. **Mitigation Measure 3.8.1b: Construction Exhaust Emissions Control Plan.** The appropriate Member Agency shall require its contractor(s) to implement an exhaust emissions control plan that shall include the following controls and practices: • On road vehicles with a gross vehicular weight rating of 10,000 pounds or greater shall not idle for longer than five minutes at any location as required by Section 2485 of Title 13, Division 3, Chapter 10, Article 1 of the California Code of Regulations. This restriction does not apply when vehicles remain motionless during traffic or when vehicles are queuing. • Off road equipment engines shall not idle for longer than five minutes per Section 2449(d)(3) of Title 13, Division 3, Chapter 9, Article 4.8 of the California Code of Regulations. All vehicle operators shall receive a written idling policy to inform them of idling restrictions. The policy shall list exceptions to this rule that include the following: idling when queuing; idling to verify that the vehicle is in safe operating condition; idling for	
	Fully Connected	LSM	LSM	LSM	LSM		

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[b] Mitigation measure would apply to impacts identified as LSM.

TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Air Quality (cont.)							
3.8.1 (cont.)						testing, servicing, repairing or diagnostic purposes; idling necessary to accomplish work for which the vehicle was designed (such as operating a crane); idling required to bring the machine to operating temperature as specified by the manufacturer; and idling necessary to ensure safe operation of the vehicle. • Off road engines greater than 50 horsepower shall, at a minimum, meet Tier 2 emissions standards. When available, higher Tier engines shall be utilized.	
3.8.2: Long-term emissions of criteria pollutants. Project operations could result in criteria pollutant emissions from powering pumps and from maintenance/repair trips.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.8.3: Long term increase in toxic air contaminant (TAC) levels. Project operation could result in emissions of TACs that would have the potential to harm sensitive receptors located in the project vicinity.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Air Quality (cont.)							
3.8.4: Long term Increase in GHG Emissions. Project construction and operation would increase GHG emissions potentially interfering with the State's GHG reduction goals.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Implement Mitigation Measure 3.8.1b:** Construction Exhaust Emissions Control Plan, discussed under Impact 3.8.1.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
Section 3.9 Noise							
3.9.1: Temporary construction noise. Construction activity would violate standards established in the local General Plans or noise ordinances, and/or would adversely affect nearby sensitive receptors.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.9.1:** The appropriate Member Agency shall develop and implement a Construction Noise Reduction Plan that requires, at a minimum, the following: • The contractor shall locate all stationary noise-generating equipment, including hammer bore and drill rigs, as far as possible from nearby noise-sensitive receptors. Stationary noise sources located within 500 feet of noise-sensitive receptors shall be equipped with noise reducing engine housings, and the line of sight between such sources and nearby sensitive receptors shall be blocked by portable acoustic barriers. • The contractor shall assure that construction equipment with internal combustion engines have sound control devices at least as effective as those provided by the original equipment manufacturer. No equipment shall be permitted to have an un-muffled exhaust. • All construction activities within unincorporated Sonoma County shall be limited to between the hours of 7 a.m. and 6 p.m. on weekdays and between 9 a.m. and 5 p.m. on Saturdays. • Residences and other sensitive receptors within 200 feet of a construction area shall be notified of the construction schedule in writing, at least two weeks prior to the commencement of construction activities. This notice shall indicate the allowable hours of construction activities as specified by the applicable local jurisdiction or as defined by this	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.9 Noise (cont.)							
3.9.1 (cont.)						mitigation measure. The construction contractor shall designate a noise disturbance coordinator who would be responsible for responding to complaints regarding construction noise. The coordinator shall determine the cause of the complaint and ensure that reasonable measures are implemented to correct the problem. A contact number for the noise disturbance coordinator shall be conspicuously placed on construction site fences and entrances and included in the construction schedule notification sent to nearby residences and sensitive receptors.	
3.9.2: Temporary vibration impacts. Construction activities could expose sensitive receptors to excessive ground-borne vibration levels.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.9.2:** The appropriate Member Agency will implement the following measure: The construction contractor shall use a trenchless technology (e.g., horizontal directional drill, lateral drilling, etc.) other than jack and bore when there are structures within 100 feet of the proposed activities. If the construction contractor provides the Member Agency with acceptable documentation indicating that alternative trenchless technology is not feasible for the crossing, the contractor shall develop and implement a Construction Vibration Mitigation Plan to minimize construction vibration damage using all reasonable and feasible means available, including siting the jack and bore as far a possible from all nearby structures. The plan shall provide a procedure for establishing thresholds and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan should also include the development of a vibration monitoring plan to be implemented during construction of particular crossing.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.9.3: Permanent increases to ambient noise levels. Operational activities could permanently generate noise levels above existing ambient levels in the vicinity of sensitive receptor locations.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.9.3:** The appropriate Member Agency shall implement the following measure: • All new pump stations shall be located within enclosed structures with adequate setback and screening to achieve acceptable regulatory noise standards for industrial uses as well as to achieve acceptable levels at the property lines of nearby residences, as determine by the applicable local jurisdiction. Noise enclosures shall be designed to reduce equipment noise levels by at least 20 dBA.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LTS	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.10 Hazards and Hazardous Materials							
3.10.1: Exposure to Hazardous Materials. Project construction could expose workers and the public to hazardous materials that could be present in the soil or shallow groundwater encountered during excavation.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.10.1a:** Project contract specifications shall require that, in the event that evidence of potential soil contamination such as soil discoloration, noxious odors, debris, or buried storage containers, is encountered during construction, the contractor will have a contingency plan for sampling and analysis of potentially hazardous substances, including use of a photoionization detector. The required handling, storage, and disposal methods shall depend on the types and concentrations of chemicals identified in the soil. Any site investigations or remediation shall comply with applicable laws and will coordinate with the appropriate regulatory agencies, **Mitigation Measure 3.10.1b:** If unknown USTs are discovered during construction, the UST, associated piping, and impacted soil shall be removed by a licensed and experienced UST removal contractor. The UST and contaminated soil shall be removed in compliance with applicable county and state requirements governing UST removal. **Mitigation Measure 3.10.1c:** Prepare a project-specific Health and Safety Plan that would apply to excavation activities. The plan shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials. The plan shall be prepared according to federal and California OSHA regulations and submitted to the appropriate agency with jurisdiction prior to beginning site activities. **Mitigation Measure 3.10.1d:** Project contract specifications shall include a Dust Abatement Program to minimize potential public health impacts associated with exposure to contaminants in soil dust.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.10.2: Release of Hazardous Materials During Construction. Project construction could increase the potential for accidental release of hazardous materials.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.10.2a:** Consistent with the SWPPP requirements, the construction contractor shall be required to implement BMPs for handling hazardous materials onsite. The use of construction BMPs will minimize any adverse effects on groundwater and soils, and will include, but not limited to, the following: • Follow manufacturers' recommendations and regulatory requirements for use, storage, and disposal of chemical products and hazardous materials used in construction; • Spill control and countermeasures, including employee spill prevention/response training;	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.10 Hazards and Hazardous Materials (cont.)							
3.10.2 (cont.)						• Avoid overtopping construction equipment fuel gas tanks; • During routine maintenance of construction equipment, properly contain and remove grease and oils; and • Properly dispose of discarded containers of fuels and other chemicals. **Mitigation Measure 3.10.2b:** The contractor shall follow the provisions of California Code of Regulations, Title 8, Sections 5163 through 5167 for General Industry Safety Orders to protect the project area from being contaminated by the accidental release of any hazardous materials and/or wastes. The local CUPA agency will be contacted for any site-specific requirements regarding hazardous materials or hazardous waste containment or handling. **Mitigation Measure 3.10.2c:** Oil and other solvents used during maintenance of construction equipment shall be recycled or disposed of in accordance with applicable regulatory requirements. All hazardous materials shall be transported handled, and disposed of in accordance with applicable regulatory requirements. **Mitigation Measure 3.10.2d:** In the event of an accidental release of hazardous materials during construction, containment and clean up shall occur in accordance with applicable regulatory requirements.	
3.10.3: Release of Hazardous Materials During Long-term Operation. Project operation could increase the potential for accidental release of hazardous materials.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.10 Hazards and Hazardous Materials (cont.)							
3.10.4: Wildland Fire Hazard. Construction activities in grassland areas could have the potential to expose people or equipment to risk of loss, injury, or death involving wildland fires.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.10.4a:** For applicable Member Agencies, in consultation with local fire agencies, a Fire Safety Plan will be developed for each of the service areas associated with the project. The Fire Safety Plan(s) will describe various potential scenarios and action plans in the event of a fire. **Mitigation Measure 3.10.4b:** For applicable Member Agencies, during project construction, all staging areas, welding areas, or areas slated for development using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Any construction equipment that includes a spark arrestor shall be equipped with a spark arrestor in good working order. All vehicles and crews working at the project site(s) will have access to functional fire extinguishers at all times. In addition, construction crews will be required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	NI		
	Basic	LSM	LSM	LSM	NI		
	Partially Connected	LSM	LSM	LSM	NI		
	Fully Connected	LSM	LSM	LSM	NI		
Section 3.11 Public Services and Utilities							
3.11.1: Temporary effect on response times for emergency service providers. Project construction activities could temporarily affect response times for emergency service providers.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.11.1:** The Member Agencies will coordinate with local emergency service providers in its service area to inform them of the proposed construction activities and schedule, and provide temporary alternate access routes around construction areas as necessary.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.11.2: Short-term police and fire assistance. Project construction activities could require short-term police and fire protection services to assist in traffic management or in the event of an accident.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.11-2:** Public service providers shall provide, upon request, a copy of the Traffic Control Plan to the related police and fire agencies for their review prior to construction. The appropriate Member Agency shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.7, Traffic and Circulation.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.11 Public Services and Utilities (cont.)							
3.11.2 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.11.3: Temporary Accidental Disruption to Utility Services. Project construction could result in temporary planned or accidental disruption to utility services.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Measure 3.11.3:** The Member Agencies will identify utilities along the proposed pipeline routes and project sites prior to construction and implement the following measures: a. Utility excavation or encroachment permits shall be obtained as required from the appropriate agencies. These permits include measures to minimize utility disruption. The service provider and its contractors shall comply with permit conditions regarding utility disruption. b. Utility locations shall be verified through the use of the Underground Service Alert services and/or field survey (potholing). c. As necessary, detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services. d. In areas where the pipeline would traverse parallel to underground utility lines within five feet, the project applicant shall employ special construction techniques, such as trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the excavated areas. e. Residents and businesses in the project corridor shall be notified of any planned utility service disruption two to four days in advance, in conformance with county and state standards.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.11 Public Services and Utilities (cont.)							
3.11.4: Increase in Power Usage. NBWRP could increase power usage.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.11.5: Offset Potable Water Demand. Project operation could increase recycled water use in the project area and offset potable water supply, making it available for municipal uses.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	BI	BI	NI		
	Phase 1	BI	BI	BI	BI		
	Basic	BI	BI	BI	BI		
	Partially Connected	BI	BI	BI	BI		
	Fully Connected	BI	BI	BI	BI		
Section 3.12 Cultural Resources							
3.12.1: Impact to Cultural Resources/Archaeological Sites. Project construction could affect existing cultural resources or uncover unknown and/or buried archaeological materials in areas of high prehistoric archaeological sensitivity.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.12.1:** The appropriate Member Agency will incorporate the following measures: **Mitigation Measure 3.12.1a: Prepare a Cultural Resources Monitoring Plan.** Prior to authorization to proceed, or issuance of permits, the applicant shall prepare and submit a cultural resources monitoring plan to the appropriate jurisdiction for review and approval. Monitoring shall be required for all surface alteration and subsurface excavation work including trenching, boring, grading, use of staging areas and access roads, and driving vehicles and equipment within all areas delineated as sensitive for cultural resources. A qualified professional archaeologist (cultural resources monitor) that is approved by each sanitation district in consultation with all	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Cultural Resources (cont.)			
3.12.1 (cont.)		affected jurisdictions shall prepare the plan. The plan shall address (but not be limited to) the following issues: • Training program for all construction and field workers involved in site disturbance; • Person(s) responsible for conducting monitoring activities, including Native American monitors; • How the monitoring shall be conducted and the required format and content of monitoring reports, including any necessary archaeological re-survey of the final pipeline alignment (including the need to conduct shovel-test units or auger samples to identify deposits in advance of construction), assessment, designation and mapping of the sensitive cultural resource areas on final project maps, assessment and survey of any previously unsurveyed areas; • Person(s) responsible for overseeing and directing the monitors; • Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports; • Procedures and construction methods to avoid sensitive cultural resource areas (i.e. boring conduit underneath recorded or discovered cultural resource site); • Clear delineation and fencing of sensitive cultural resource areas requiring monitoring; • Physical monitoring boundaries (e.g., 200-foot radius of a known site); • Protocol for notifications in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation); • Methods to ensure security of cultural resources sites; • Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction.	

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Cultural Resources (cont.)			
3.12.1 (cont.)		**Mitigation Measure 3.12.1b: Archaeological and Native American Monitoring.** If an intact archaeological deposit is encountered, all soil disturbing activities in the vicinity of the deposit shall cease until the deposit is evaluated. The appropriate Member Agency, as necessary, shall retain the services of a Native American monitor and a qualified archaeological consultant that has expertise in California prehistory to monitor ground-disturbing within areas designated as being sensitive for buried cultural resources. The archaeological monitor shall immediately notify the appropriate Member Agency of the encountered archaeological deposit. The monitors shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to NBWRA and the appropriate Member Agency. During the course of the monitoring, the archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to impact resources. If a Member Agency, in consultation with the monitors, determines that a significant archaeological resource is present within their jurisdiction and that the resource could be adversely affected by NBWRP, the Member Agency shall: • Re-design NBWRP to avoid any adverse effect on the significant archaeological resource; *or*, • Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible). If the circumstances warrant an archaeological data recovery program, an ADRP shall be conducted. The project archaeologist and NBWRA shall meet and consult to determine the scope of the ADRP. The archaeologist shall prepare a draft ADRP that shall be submitted to the appropriate Member Agency for review and approval. The ADRP shall identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The ADRP shall identify the scientific/historic research questions applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research	

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Cultural Resources (cont.)			
3.12.1 (cont.)		questions. Data recovery, in general, shall be limited to the portions of the historic property that could be adversely affected by NBWRP. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical. **Mitigation Measure 3.12.2: Cultural Resources Assessment for Staging Areas.** When locations for staging are defined the areas of potential effect should be subject to a cultural resources investigation that includes, at a minimum: • An updated records search at the Northwest Information Center; • An intensive survey of all areas within the lots; • A report disseminating the results of this research; and, • Recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources. **Mitigation Measure 3.12.3: Inadvertent Discoveries.** If discovery is made of items of historical or archaeological interest, the contractor shall immediately cease all work activities in the area (within approximately 100 feet) of discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation the contractor shall immediately contact the NBWRA and appropriate Member Agency. The contractor shall not resume work until authorization is received from the appropriate Member Agency. • In the event of unanticipated discovery of archaeological indicators during construction, NBWRA shall retain the services of a qualified professional archaeologist to evaluate the significance of the items prior to resuming any activities that could impact the site.	

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Cultural Resources (cont.)			
3.12.1 (cont.)		• In either the case of an unanticipated archaeological discovery, if it is determined that the find is unique under NHPA and/or potentially eligible for listing in the National Register, and the site cannot be avoided, appropriate Member Agency shall provide a research design and excavation plan, prepared by an archaeologist, outlining recovery of the resource, analysis, and reporting of the find. The research design and excavation plan shall be submitted to NBWRA and appropriate Member Agency and approved by the appropriate Member Agency prior to construction being resumed. **Mitigation Measure 3.12.4: Project-level Cultural Resources Assessment:** When project-level plans are completed for the Basic System; the Partially Connected System; and the Fully Connected System, NBWRA the appropriate Member Agency will conduct a cultural resources investigation for the APE that includes, at a minimum: • An updated records search at the NWIC; • An intensive cultural resources survey of the APE; • A report disseminating the results of this research; and, • Recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources.	
3.12.2: Discovery of Human Remains. Project construction could result in damage to previously unidentified human remains.		**Mitigation Measure 3.12.5: Discovery of Human Remains.** If potential human remains are encountered, the appropriate Member Agency shall halt work in the vicinity of the find and contact the county coroner in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner shall contact the NAHC. As provided in Public Resources Code Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.	Less than Significant

Alternative	LGVSD/ NMWD	Novato SD/NMWD	SVCSD	Napa SD/ Napa County
No Project	NI	NI	NI	NI
No Action	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Basic	LSM	LSM	LSM	LSM
Partially Connected	LSM	LSM	LSM	LSM
Fully Connected	LSM	LSM	LSM	LSM

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Cultural Resources (cont.)							
3.12.3: Impact to historic architectural resources. NBWRP has the potential to impact the setting of historic architectural resources.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	NI		
	Basic	NI	NI	NI	NI		
	Partially Connected	NI	NI	NI	NI		
	Fully Connected	NI	NI	NI	NI		
3.12.4: Ground-borne vibration. Ground-borne vibration from construction activities could damage historic architectural resources.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	LSM	NI		
	Phase 1	NI	NI	LSM	NI		
	Basic	NI	NI	LSM	NI		
	Partially Connected	NI	NI	LSM	NI		
	Fully Connected	NI	NI	LSM	NI		
Section 3.13 Recreation							
3.13.1: Temporary disturbance. Project construction could result in short-term disturbance adjacent to recreational facilities.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.13.1a:** The appropriate Member Agency shall coordinate with the appropriate local and regional agencies to identify detour routes for the bikeways and trails during construction where feasible, as part of the Traffic Control/Traffic Management Plan (see **Measure 3.11.1a**). **Mitigation Measure 3.13.1b:** Implement Mitigation Measures 3.8-1a through 3.8.1b, Mitigation Measures 3.9.1 through 3.9-3. **Mitigation Measure 3.13.2:** Before beginning construction, the contractor will develop, in consultation with the appropriate representative(s) of the	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.13 Recreation							
3.13.1 (cont.)	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	affected park's managing agency, a plan indicating how public access to the park will be maintained during construction. If needed, flaggers will be stationed near the construction activity area to direct and assist members of the public around the activity areas while maintaining access to the parks.	
	Fully Connected	LSM	LSM	LSM	LSM		
Section 3.14 Aesthetics							
3.14.1: Temporary Impact to Scenic Vistas. NBWRP construction activities could temporarily affect scenic vistas or corridors in the NBWRP area.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.14.1a:** Following construction activities, disturbed areas shall be restored to baseline conditions, including repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area. **Mitigation Measure 3.14.1b:** Berms around constructed reservoirs shall be vegetated with native seed mixes to soften the visual effect of the reservoirs from adjacent roadways. **Mitigation Measure 3.14.1c:** Design elements shall be incorporated to enhance visual integration of the booster pump station and distribution pump station with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Highly reflective building materials and/or finishes shall not be used in the designs for proposed facilities.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	LSM		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.14.2: Impact to views along scenic roadways. Implementation of NBWRP could affect views along eligible or designated Caltrans Scenic Highways, or locally-defined scenic routes.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.14.1a:** **Mitigation Measure 3.14.1b:**	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI		
	Phase 1	NI	LSM	LSM	NI		
	Basic	NI	LSM	LSM	NI		
	Partially Connected	LTS	LSM	LSM	LTS		
	Fully Connected	LTS	LSM	LSM	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.14 Aesthetics							
3.14.3: Source of Light or Glare. NBWRP components could introduce new sources of light and glare on the project sites.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.14.3a:** The exterior lighting installed around the operational and capacity storage reservoirs, distribution pump station, storage tanks, and booster pump station shall be of a minimum standard required to ensure safe visibility. Lighting also shall be shielded and directed downward to minimize impacts of light and glare. **Measure 3.14.3b:** All exterior lighting is directed downward and oriented to insure that limited light source is directly visible from neighboring residential areas. If necessary, landscaping would be provided around proposed facilities. The vegetation would be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	LSM		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		
	Fully Connected	LSM	LSM	LSM	LSM		
3.14.4: Long-term impact to aesthetic character. Development of the proposed facilities, particularly pump stations and storage reservoirs, would permanently alter the aesthetic character of the project area.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 3.14.4a:** After construction of any facility that is above grade and visible to sensitive receptors, visual screening and vegetation measures will be implemented to reduce impacts to scenic views. Trees or other suitable vegetation along the fenceline of the facility should be incorporated to reduce the industrial appearance of the structures. Similarly, berms for new storage ponds or pond reconfiguration will be re-vegetated to reduce the barren appearance of the berms. **Mitigation Measure 3.14.4b:** Dark colored, non-reflective building materials should be used for project components that cause potentially significant impact from glare to visual resources.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	LTS	LTS	LSM		
	Phase 1	NI	LSM	LSM	LSM		
	Basic	NI	LSM	LSM	LSM		
	Partially Connected	NI	LSM	LSM	LSM		
	Fully Connected	LTS	LSM	LSM	LSM		
Section 3.15 Environmental Justice							
3.15.1: Project construction could result in air quality, noise, and/or other environmental impacts that could disproportionately affect nearby minority communities.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	NI		
	Basic	NI	NI	NI	NI		
	Partially Connected	NI	NI	NI	NI		
	Fully Connected	NI	NI	NI	NI		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.15 Environmental Justice (cont.)							
3.15.2: Project construction could result in environmental impacts that could disproportionately affect nearby low-income communities.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	NI		
	Basic	NI	NI	NI	NI		
	Partially Connected	NI	NI	NI	NI		
	Fully Connected	NI	NI	NI	NI		
3.15.3: Increased water and sewer fees. NBWRP would provide recycled water and could result in an increase water and sewer fees that would disproportionately affect minority and low-income populations.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	NI		
	Basic	NI	NI	NI	NI		
	Partially Connected	NI	NI	NI	NI		
	Fully Connected	NI	NI	NI	NI		
3.15.4: Impact on Farm Workers. NBWRP would provide recycled water and could disproportionately affect minority populations.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	NI		
	Basic	NI	NI	NI	NI		
	Partially Connected	NI	NI	NI	NI		
	Fully Connected	NI	NI	NI	NI		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.16 Socioeconomics							
3.16.1: Output in Regional Economy. Project construction and operation would increase jobs, wages and salaries, and output in the regional economy.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	LTS	LTS	LTS	LTS		
	No Action	BI	BI	BI	BI		
	Phase 1	BI	BI	BI	BI		
	Basic	BI	BI	BI	BI		
	Partially Connected	BI	BI	BI	BI		
	Fully Connected	LTS	LTS	LTS	LTS		
3.16.2: Effect on Agricultural Economy. Project implementation could affect the agricultural economy.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	BI		
	Basic	NI	NI	NI	BI		
	Partially Connected	NI	NI	NI	BI		
	Fully Connected	NI	NI	NI	BI		
3.16.3: Impact to Winery-related Industry. Recycled water deliveries to vineyards would support the winery-related tourism industry.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	NI	NI	NI	BI		
	Basic	NI	NI	NI	BI		
	Partially Connected	NI	NI	NI	BI		
	Fully Connected	NI	NI	NI	BI		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Section 3.16 Socioeconomics (cont.)							
3.16.4: Increase in water/sewer charges. Project implementation could increase municipal and industrial customer water or sewer charges.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
3.16.5: Impact on Recreational Spending. Recycled water deliveries to the Napa Salt Mash Restoration Area could increase recreational spending in the region.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI		
	Phase 1	BI	BI	BI	BI		
	Basic	BI	BI	BI	BI		
	Partially Connected	BI	BI	BI	BI		
	Fully Connected	BI	BI	BI	BI		
Chapter 4 Cumulative Impacts							
4-1: Construction-related Cumulative Impacts. Concurrent construction of several projects within the Sonoma, Napa, and Marin County areas could result in cumulative short-term impacts associated with construction activities. If implemented at the same time as other construction projects, construction of facilities under all three of the alternatives could contribute to potential short-term cumulative effects associated	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 4.1:** Member Agencies shall coordinate construction activities along selected alignments to identify overlapping pipeline routes, project areas, and construction schedules. To the extent feasible, construction activities shall be coordinated to consolidate the occurrence of short-term construction-related impacts.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM		
	Phase 1	LSM	LSM	LSM	LSM		
	Basic	LSM	LSM	LSM	LSM		
	Partially Connected	LSM	LSM	LSM	LSM		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Chapter 4 Cumulative Impacts (cont.)							
4-1 (cont.) with erosion, cultural resource disturbance, disturbance of adjacent land uses, traffic disruption, dust generation, construction noise, aesthetics, air quality, biological resources, hazardous materials, water quality, public services and utilities. However, construction-related impacts would not result in long term alteration of the environment, and could be mitigated to less than significant levels through the use of mitigation measures identified throughout Chapter 3.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**		
	Fully Connected	LSM	LSM	LSM	LSM		
4.2: Cumulative Long-term Impacts resulting from Seismic Events. Concurrent construction of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term risk of upset impacts related to groundshaking and surface fault rupture during major earthquakes.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
4.3: Cumulative Long-term Impacts on Water Resources. Concurrent construction of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to water resources, water quality, and flooding.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Chapter 4 Cumulative Impacts (cont.)							
4.4: Cumulative Long-term Impacts on Groundwater. Concurrent construction of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to groundwater resources and groundwater quality.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
4.5: Cumulative Long-term Impacts on Biological Resources. Concurrent construction of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area, and other water and wastewater infrastructure projects, could result in cumulative long-term impacts to biological resources.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	Mitigation Measures in Section 3.5	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
4.6: Cumulative Long-term Impacts on Land Use. Concurrent construction of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to land use and agricultural resources.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Chapter 4 Cumulative Impacts (cont.)							
4.7: Cumulative Impacts from Greenhouse Gas Emissions. Concurrent operation of NBWRP with other projects could result in a cumulatively considerable net increase in GHG emissions or criteria pollutants for which the region is in non-attainment under applicable standards.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
4.8: Cumulative Long-term Impacts on Cultural and Historic Resources. Concurrent operation of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to cultural resources.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	LTS	LTS	LTS	LTS		
	Basic	LTS	LTS	LTS	LTS		
	Partially Connected	LTS	LTS	LTS	LTS		
	Fully Connected	LTS	LTS	LTS	LTS		
Chapter 5 Growth Inducement and Secondary Effects of Growth							
5.1: NBWRP would provide recycled water for urban, agricultural, and environmental uses, and as such, would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans of Marin, Sonoma and Napa Counties. No appreciable growth in population or employment would occur	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**	**Mitigation Measure 5.1a:** In order to maintain consistency with the Napa County General Plan, Napa County and Napa SD will approve the MST Local Options 1 and/or 2. This will provide approximately 530 AFY of recycled water that would be available for the existing users in the MST area. Trunk facilities may be sized to accommodate service of up to 1,400 AFY of service to existing agricultural irrigators only. Any expansion of service beyond the 1,400 AFY or provision of service to new land uses would be subject to approval by the County Planning Department and the Napa County Board of Supervisors.	Implementation of Measure 5-1a would avoid the potential for direct impacts relating to growth inducement in the MST area. However,
	No Project	NI	NI	NI	NI		
	No Action	LTS	LTS	LTS	LTS		
	Phase 1	SU	SU	SU	SU		
	Basic	SU	SU	SU	SU		
	Partially Connected	SU	SU	SU	SU		

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TABLE ES-6 (Continued)
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impacts by Alternative and Member Agency[a]					Mitigation Measure[b]	Significance After Mitigation
Chapter 5 Growth Inducement and Secondary Effects of Growth (cont.)							
effects, which include effects that would be significant and unavoidable. However, development under the General Plans accommodated by the proposed project would result in secondary environmental effects, which include effects that would be significant and unavoidable.	**Alternative**	**LGVSD/ NMWD**	**Novato SD/NMWD**	**SVCSD**	**Napa SD/ Napa County**		provision of recycled water within each of the NBWRP services would contribute to secondary effects of growth associated with buildout under approved General Plans within each service area. Mitigation programs have been established for these impacts, however, some of these impacts may remain significant and unavoidable.
	Fully Connected	SU	SU	SU	SU		

NOTES:

[a] NI = no impact, LTS = less than significant, LSM = less than significant with mitigation, BI = beneficial
[b] Mitigation measure would apply to impacts identified as LSM.

CHAPTER 1
Introduction and Project Background

1.1 Purpose and Need for the Proposed Action

The U.S. Department of Interior, Bureau of Reclamation (Reclamation) and North Bay Water Reuse Authority's Member Agencies have prepared this Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the North San Pablo Bay Restoration and Reuse Project. The North San Pablo Bay Restoration and Reuse Project has been developed in conformance with the requirements of the Reclamation's Public Law 102-575, Title XVI, including preparation of a Feasibility Study, and passage of Senate Bill 1475. For the purposes of this EIR/EIS, this project or action will be referred to as the **North Bay Water Recycling Program (NBWRP)**. As noted in Reclamation's NEPA Handbook (Reclamation, 2000), this section has been prepared in accordance with Title 40 Code of Federal Regulations (CFR) Section 1508.9 to present why the proposed action is being considered.

This EIR/EIS has been developed to provide the public and responsible and trustee agencies reviewing the NBWRP an analysis of the potential effects, both beneficial and adverse, on the local and regional environment associated with construction and operation of the NBWRP. The basic purpose of the NBWRP is to provide recycled water for agricultural, urban, and environmental uses and to promote the expanded beneficial use of recycled water system in the North Bay region. Implementation of the NBWRP would include upgrades to treatment processes and construction of pipelines, pump station, and storage facilities to distribute recycled water for use in compliance with Article 4 in Title 22 of the California Code of Regulations, which sets water quality standards and treatment reliability criteria for recycled water.

The North Bay Water Reuse Authority (NBWRA), established under a Memorandum of Understanding (MOU) in August 2005, is comprised of four wastewater utilities and one water agency: Las Gallinas Valley Sanitary District (LGVSD), Novato Sanitary District (Novato SD), Sonoma Valley County Sanitation District (SVCSD), Napa Sanitation District (Napa SD), and Sonoma County Water Agency (SCWA). Additional agencies supporting the NBWRA through contribution of funds and staff time include North Marin Water District (NMWD) and Napa County.

Under the MOU, the NBWRA is exploring "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." The NBWRP would alter the disposition of recycled water in the North Bay Region by providing increased recycled water supply to urban, agricultural and environmental uses.

1.1.1 Project Area Needs

The action area is unique because of the mix of sensitive environmental, urban, and high-value agricultural areas. Each of these is affected by existing water management challenges and needs, and will be exposed to increasing problems in the future. The problems and needs can be summarized as follows:

- The vitally important estuarine ecosystem of the North San Pablo Bay Area, which includes endangered species and vital wetlands, has been under intense pressure. Although protective and restorative measures are in place, the habitat requires a reliable flow of clean water;
- The agricultural economy, which is dominated by high-value vineyard culture, requires a highly reliable water supply to maintain and to expand its crop base;
- Growing urbanization of the greater San Francisco Bay Area imposes increasing demand on water supply and requires highly reliable sources of water;
- Surface water supplies are already diverted by multiple users, have low flows in the summer (which coincides with the irrigation season), and can have low flows in dry years; and
- Groundwater supplies in some localities are heavily pumped for agricultural and municipal uses and in some localities have marginal quality. In general, groundwater pumping is exceeding natural replenishment.

1.1.2 Purpose of Proposed Action

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. The Bureau of Reclamation's water reclamation and reuse program is authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575). Also known as Title XVI, the act directs the Secretary of the Interior to undertake a program to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters, and for design and construction of demonstration and permanent facilities to reclaim and reuse wastewater.

The NBWRA is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water. The purpose of the NBWRP is to provide recycled water for agricultural, urban, and environmental uses thereby reducing reliance on local and imported surface and groundwater and reducing the amount of treated effluent releases to San Pablo Bay.

1.2 Compliance with CEQA and NEPA

This document is a joint EIR/EIS and satisfies the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). CEQA documentation for some of the project components of the NBRWP has been completed, and this EIR/EIS

satisfies NEPA requirements for those projects (refer to Section 1.8 for the documentation prepared and incorporated by reference). The primary purpose of an EIR/EIS is to identify and publicly disclose environmental impacts that may result from implementation of a project and to identify feasible alternatives, mitigation measures, or revisions to the project that would reduce those impacts, to the degree feasible. While CEQA requires a determination of impact significance for each impact discussed in an EIR based on the significance criteria, NEPA does not require this for an EIS. Under NEPA preparation of an EIS is triggered if a federal action has the potential to "significantly affect the quality of the human environment," which is based on the context and intensity for each potential impact. The significance thresholds used in this EIS/EIR also encompass the factors taken into account under NEPA to evaluate the context and the intensity of the effects of an action.

This EIR/EIS would be used by local, state, and federal agencies to identify, evaluate, and disclose significant environmental impacts of the proposed action and alternatives, as well as provide potential mitigation measures for impacts.

1.2.1 NEPA Lead Agency

As implementation of the NBWRP would likely require external funding assistance, the investigation and development of this program is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in water reuse projects. There is the potential that Congress would authorize and appropriate partial funding for the design and construction of the program under PL102-575, Title XVI. Based on this authorization and appropriation, Reclamation could provide up to 25 percent of project construction cost to a maximum federal cost share contribution of $100 million.

In order for the NBWRA to secure implementation funding, HR[1] 236 was introduced in January of 2007 and S[2] 1472 was introduced in May of 2007; these bills authorized Reclamation's participation in constructing the NBWRP under Title XVI. Both of these bills were combined in the Omnibus Public Lands Act of 2009, S 22. S22 did not pass the Senate, and was reintroduced as HR 146, which passed the Senate in January 2009, passed the House in February 2009, and was signed into law by the President as public law 111-11 section 9110 on March 30, 2009.

The provision of federal funding for implementation of the NBWRP to meet regional recycled water needs is a Federal Action. To support the Federal Action, this EIR/EIS has been prepared in compliance with NEPA and the Council on Environmental Quality (CEQ)'s NEPA implementing regulations (Title 40, Code of Federal Regulations [CFR], Section 1500 et seq.). The EIR/EIS has also been prepared consistent with Reclamation's NEPA Handbook (Public Review Draft, 2000). Because of the complex nature of the NBWRP, Reclamation has determined that preparation of an EIS is the most appropriate form of NEPA compliance. Reclamation intends to use this EIR/EIS to consider provision of federal funding under Title XVI for implementation of the

1 House of Representatives
2 Senate Bill

NBWRP. As lead Federal agency, Reclamation would use this EIR/EIS to support a Record of Decision, which would document Reclamation's decision to choose one of the alternatives including the proposed action and no action. Other federal agencies, such as the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS) may rely on the EIS to satisfy NEPA for their individual approvals of project components.

1.2.2 CEQA Lead Agency

This Draft EIR/EIS has been prepared in compliance with CEQA of 1970 (as amended), codified at California Public Resources Code Sections 21000 et. seq., and the State *CEQA Guidelines* in the Code of Regulations, Title 14, Division 6, Chapter 3.

This document has been prepared as a project-level and program-level EIR/EIS, as provided for by *CEQA Guidelines* §15161 and 15168, respectively. The proposed facilities that are evaluated at the program level will require additional environmental documentation once site-specific project designs are determined. A Program EIR/EIS may be prepared on a series of actions "that can be characterized as one large project and are related either:

1. Geographically;
2. As a logical part in the chain of contemplated actions;
3. In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or;
4. As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways." (*CEQA Guidelines* §15168)"

SCWA is the Lead Agency under CEQA. Each of the NBWRA Member Agencies and Cooperating Agencies are Responsible Agencies under CEQA, and would rely on this EIR/EIS for project approvals within their service areas.

1.3 Alternatives Under Consideration

NEPA and the CEQ's NEPA implementing regulations (40 CFR, Section 1500 et seq.) require federal agencies, when proposing to carry out, approve, or fund a project, to evaluate the environmental effects of the action, including feasible alternatives and mitigation measures to minimize adverse effects.

Pursuant to Section 15126(d) of the CEQA Guidelines, an EIR/EIS must describe and evaluate a reasonable range of alternatives that would feasibly attain most of the basic project objectives, and would avoid or substantially lessen any of the significant impacts of the project as proposed. The *CEQA Guidelines* state that the range of alternatives required to be evaluated in an EIR/EIS is governed by the "rule of reason": the EIR needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision-making and public participation.

Three alternatives are analyzed in this EIR/EIS at a project or program level of detail and compared against the "No Project Alternative" and the "No Action Alternative". Each of the action alternatives (discussed below) are intended to meet the purpose, objectives, and need identified by the NBWRA.

- **No Project Alternative,** assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is identical to the No Action Alternative, identified below.

- **No Action Alternative,** provides a "future without the project" scenario as a NEPA baseline to compare the impacts of the proposed Action Alternatives.

- **Alternative 1, Basic System**, which includes use of recycled water near each of the individual wastewater treatment plants (WWTPs);

- **Alternative 2, Partially Connected System**, which adds pipelines, pump stations and storage to partially connect the existing WWTPs; and

- **Alternative 3, Fully Connected System**, which provides a fully integrated and regional recycled water distribution system connecting all four Member Agency WWTPs.

1.4 Intended Use of the EIR/EIS

Reclamation intends to use this EIR/EIS to consider provision of federal funding under Title XVI for implementation of the NBWRP. As lead Federal agency, Reclamation would use this EIR/EIS to support a Record of Decision, which would document Reclamation's decision to choose one of the alternatives, including the proposed action and no action.

The NBWRA Member Agencies and cooperating agencies may use this EIR/EIS to approve the NBWRP, or components of the NBWRP, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. As the CEQA Lead Agency, SCWA's Board of Directors will consider certification of the EIR/EIS as complete under CEQA (*CEQA* Guidelines §15090). Once the EIR/EIS has been certified as complete, the Board, or NBWRA Member Agencies, as Responsible Agencies, will consider the certified EIR/EIS (15096(a)). Any project approvals (see **Table 1-1**; also see Section 1.6.6 below) would require the Board or NBWRA Member Agencies to make written findings with respect to each significant environmental effect relevant to their aspect of the project identified in the EIR/EIS in accordance with Section 15091 of *CEQA Guidelines*.

The analyses contained within this EIR/EIS would be used to support the acquisition of the following regulatory permits or approvals if needed:

- Clean Water Act Section 404– Individual or Nationwide Permits (USACE);

- Endangered Species Act – Section 7 Consultation (USFWS);

TABLE 1-1
PROPOSED COMPONENTS ANTICIPATED FOR PROJECT APPROVALS

		New Pipeline (miles)	New Demand (AFY)	Capacity Increase (mgd)	New Pumps (HP)	New Storage (AF)
LGVSD	Peacock Gap	--	--	--	--	--
	NMWD URWP (South)	5.9	204	0.7	72	(3)
	Sears Point	--	--	--	--	--
Novato SD	NMWD URWP (North/Central)	9.8	542	1.2	259	(3)
	Sears Point	--	--	--	--	--
SVCSD	Southern Sonoma Valley	--	--	--	--	--
	Central Sonoma Valley	--	--	--	--	--
	Sonoma Valley (1A)[1]	5.2	874	0	662	65
	Napa Salt Marsh	7.9	(2)	0	0	0
Napa SD	Carneros East	--	--	--	--	--
	MST Area	17.5	2,137	4.5	880	0
	Napa (local)	--	--	--	--	--
	Napa Salt Marsh	--	--	--	--	--
Total		**46.3**	**3,757**	**6.4**	**1,873**	**65**

1 Sonoma Valley (1A) is a pipeline alignment originally analyzed as a part of the Sonoma Valley Recycled Water Project EIR and proposed under Phase 1 for the NBWRP. The alignment is described on page 2-18 of this document.
2 Additional 3,460 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type. Because this is a beneficial use that is not related to recycled water supply, this number is tracked separately in each of the alternatives.
3 Existing 0.5-MG reservoir would be rehabilitated to provide recycled water system storage.

SOURCE: CDM, 2009, Napa SD, 2009.

- 1600 Streambed Alteration Agreement – (California Department of Fish and Game);
- Section 401 Water Quality Certification (San Francisco Bay Regional Water Quality Control Board);
- Roadway Encroachment Permit (California Department of Transportation);
- Roadway Encroachment Permits as applicable (Counties of Marin, Sonoma, and Napa, Cities of San Rafael, Novato, Sonoma, and Napa).

The majority of the proposed activities would lie within public rights-of-way. Acquisition of right-of-ways and temporary construction easements may be necessary for construction of some of the proposed facilities. Temporary construction easements would also be required for contractor staging areas and equipment and materials storage.

1.5 Organization of the Draft EIR/EIS

This Draft EIR/EIS has been organized into the following chapters:

ES. Executive Summary. This chapter summarizes the contents of the Draft EIR/EIS.

1. Introduction and Project Background. This chapter discusses the CEQA/NEPA process, the purpose of the EIR/EIS, and background information for the NBWRP.

2. **Project Description.** This chapter provides an overview of the NBWRP, describes the need for and objectives of the NBWRP, and provides detail on the characteristics of the NBWRP.

3. **Affected Environment, Environmental Consequences, and Mitigation Measures.** This chapter describes the environmental setting and identifies potential environmental impacts resulting from the Proposed Action. Measures to mitigate the impacts of the Proposed Action are presented for each resource area.

4. **Cumulative Impacts.** This chapter describes the potential impacts of the Proposed Action when considered together with other related projects in the action area.

5. **Growth Inducement and Secondary Effects of Growth.** This chapter describes the potential for the Proposed Action to induce growth and discusses any indirect impacts.

6. **Alternatives Analysis.** This chapter presents an overview of the alternatives development process and describes the alternatives to the Proposed Action that were considered.

7. **Climate Change.** This chapter presents a discussion of climate change and its potential consequences and how it would affect or be affected by the proposed project.

8. **Consultation Section.** This chapter summarizes public and agency involvement activities which satisfy CEQA and NEPA requirements for public scoping and agency consultation and coordination.

9. **Irreversible Commitment of Resources.** This chapter contains a discussion of the irreversible and irretrievable commitments of resources which may occur should the project be implemented.

10. **Relationship of Uses and Productivity.** This chapter describes how the Proposed Action would affect the short-term use and the long-term productivity of the environment.

11. **Mitigation Monitoring and Reporting Program.** This chapter identifies the significant and potentially significant impacts of the Proposed Action, recommended measures adopted by NBWRA to reduce these impacts to a less-than-significant level, and reporting tasks for implementation of measures.

12. **Report Preparers.** This chapter identifies authors and consultants involved in preparing this Draft EIR/EIS, including persons and organizations consulted.

1.6 CEQA/NEPA Process and Review

1.6.1 Notice of Intent

In accordance with 40 CFR 1508.22, a Notice of Intent (NOI) was published in the Federal Register by Reclamation on July 28, 2008. During the 30-day public review period, NBWRA held three local scoping meetings, which are described in Section 1.6.3 below. No written comments were received by Reclamation during the NOI public review period, which closed on August 28, 2008.

1.6.2 Notice of Preparation

In accordance with Sections 15082 of *CEQA Guidelines*, the NBWRA circulated a Notice of Preparation (NOP; State Clearinghouse #2008072096) to local, state, and federal agencies, and to other interested parties on July 25, 2008. The NOP was mailed to the State Clearinghouse and was available online on the NBWRA website. The NOP was directly mailed to 63 parties, and a postcard notification of the NOP's availability was sent to 580 parties. The NOP was circulated for a 30-day public review period, which ended on August 25, 2008.

1.6.3 Public Scoping

NBWRA held three public scoping meetings on August 4, 5, and 6 of 2008 at the locations identified below.

August 4, 2008	August 5, 2008	August 6, 2008
6:30 p.m. – 7:30 p.m.	6:30 p.m. – 7:30 p.m.	6:30 p.m. – 7:30 p.m.
Napa Elks Lodge	Margaret Todd Senior Center	Sonoma Community Center
2804 Soscol Avenue, Napa	1560 Hill Road, Novato	276 East Napa Street, Sonoma

Public notices were placed in local newspapers informing the general public of the availability of the NOP and NOI and the time and place of scheduled scoping meetings. The purpose of the scoping meetings were to present the Proposed Action to the public through use of display maps, route alignments and handouts describing project components and potential environmental impacts. Attendees were provided an opportunity to voice comments or concerns regarding potential effects of the Proposed Action.

Additional scoping meetings with individual stakeholders were held on August 6th, 2008 with the Russian River and Eel River Interest Groups, and on July 27th, 2008 with California Department of Parks and Recreation (staff meeting).

Written comments received during the Scoping Meeting and circulation of the NOP and NOI are included in **Appendix 1**. Written comments were received from state agencies, including California Department of Fish and Game (CDFG), California Department of Parks and Recreation, California Department of Transportation, California Native American Heritage Commission, State Water Resources Control Board (SWRCB); public organizations, including Groundwater Under Local Protection (GULP), Friends of the Eel River, Marin Audubon Society, Salmon Protection and Watershed Network, Sonoma County Water Coalition; and members of the public. The comments included questions regarding potential effects on surface and groundwater quality, biological resources, cultural resources, recreational resources, and traffic.

1.6.4 Draft EIR/EIS

This document constitutes the Draft EIR/EIS. The report contains a description of the NBWRP (or proposed action), description of the environmental setting, identification of impacts, and mitigation measures for impacts found to be significant, as well as an analysis of alternatives. The impacts are categorized as follows:

1. Significant and unavoidable;
2. Potentially significant, but can be mitigated to a less-than-significant level;
3. Less than significant (mitigation is not required under CEQA, but may be recommended);
4. No impact; or
5. Beneficial.

NEPA requires that the impacts of each alternative be quantified and analyzed separately, with the analysis of the no action alternative presented first, followed by the alternatives. This impact analysis should include at least the following items:

- The direct effects and their significance;
- The indirect effects and their significance;
- Quantification of the impact (when possible);
- Mitigation for the impact; and
- The resultant net, or residual, impact.

The impact analysis should focus on potentially significant effects and should not include discussion of impacts that are minor and short term. Effects include those involving ecological (natural resources, and the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health resources, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if the federal lead agency believes that the effect will be beneficial.

CEQA requires that a lead agency shall neither approve nor carry out a project as proposed unless the significant environmental effects have been reduced to an acceptable level, where possible (*CEQA Guidelines* §15091 and §15092). An acceptable level is defined as eliminating, avoiding, or substantially lessening the significant effects. If such a reduction is not possible, a lead agency must adopt mitigation findings for potentially significant impacts that can be reduced to a less than significant level. For those impacts that remain significant and unavoidable, a lead agency must adopt findings regarding alternatives and a Statement of Overriding Considerations. As defined in *CEQA Guidelines* §15093, a Statement of Overriding Considerations balances the benefits of a project against its unavoidable environmental consequences.

1.6.5 Public Review

This document is being circulated to local, state and federal agencies, and to interested organizations and individuals who may wish to review and comment on the Draft EIR/EIS. Publication of this Draft EIR/EIS marks the beginning of a 45-day public review period, during which written comments may be directed to the address below. During the 45-day review period, the NBWRA will hold public meetings on the Draft EIR/EIS.

Sonoma County Water Agency
Attn: Marc Bautista
Environmental Specialist
P.O. Box 11628
Santa Rosa, CA 95406-1628

1.6.6 Final EIR/EIS

Written and oral comments received in response to the Draft EIR/EIS will be addressed in a Response to Comments document which, together with the Draft EIR/EIS, will constitute the Final EIR/EIS. Reclamation will then consider provision of federal funding under Title XVI for implementation of the NBWRP and use the document to support a Record of Decision to document Reclamation's decision on the project. As the CEQA Lead Agency, SCWA's Board of Directors will consider certification of the EIR/EIS as complete under CEQA (*CEQA* Guidelines §15090). Once the EIR/EIS has been certified as complete, the Board, or NBWRA Member Agencies, as Responsible Agencies, will consider the certified EIR/EIS (15096(a)). Any project approvals would require the Board or NBWRA Member Agencies to make written findings with respect to each significant environmental effect relevant to their aspect of the project identified in the EIR/EIS in accordance with Section 15091 of *CEQA Guidelines*.

1.6.7 Mitigation and Monitoring and Reporting Program

In January 1989, California enacted AB[3] 3180 (Cortese Bill), which requires lead agencies to "adopt a reporting and mitigation monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment" (CEQA §21081.6, *CEQA Guidelines* §15097). The specific "reporting or monitoring" program required by AB 3180 is not required by *CEQA Guidelines* to be included in the EIR/EIS. However, a Mitigation Monitoring and Reporting Program (MMRP) will be included with the EIR/EIS for public review.

1.6.8 Responsible and Trustee Agencies

Other potential responsible and trustee agencies beyond the NBWRA Member Agencies and cooperating agencies with authority over the Proposed Action include, but are not limited to, the following: USACE, USFWS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, CDFG, SWRCB, San Francisco Bay Regional Water Quality Control Board (RWQCB), State Lands Commission, California State Office of Historic Preservation, California Department of Health Services, Bay Area Air Quality Management District, and Sonoma County Public Works.

1.7 Project Background

As discussed above, NBWRA was established under a Memorandum of Understanding (MOU) in August 2005 and is comprised of four wastewater utilities discussed below with SCWA acting as the CEQA Lead Agency and Reclamation acting as the NEPA Lead Agency. Additional agencies supporting the NBWRA through contribution of funds and staff time include NMWD and Napa County.

[3] Assembly Bill

1.7.1 MOU Signatory Agencies

The following Member Agencies form the NBWRA and would participate in the implementation of the NBWRP:

- **LGVSD** – LGVSD provides wastewater treatment and disposal service to approximately 30,000 people within the area of Marinwood, Lucas Valley, Terra Linda, Santa Venetia, Los Ranchitos, and Smith Ranch Road (LGVSD, 2005).

- **Novato SD** – Novato SD provides wastewater treatment and disposal services to approximately 60,000 residents within the city of Novato, an area of 28 square miles, and surrounding areas (Novato SD, 2006).

- **SVCSD** – The SVCSD WWTP began operations in 1954 and provides service to about 34,000 people in the city of Sonoma, within a 7-square-mile area (SVCSD, 2006).

- **Napa SD** – The Napa SD's Soscol Water Recycling Facility (SCRF) treats wastewater from the city of Napa and surrounding unincorporated communities, an area of about 23 square miles, and serves a population of approximately 80,000 (Napa SD, 2007).

- **SCWA** – SCWA, which began the Title XVI process for investigating a recycled water distribution system under a Cooperative Agreement with the Bureau of Reclamation, is a drinking water provider to over 600,000 residents and continues to be an actively participating partner.

1.7.2 Supporting Agencies

- **NMWD –** NMWD has partnered with Novato SD to implement recycled water projects in their collective service areas, including a 0.5 million gallons per day-tertiary treatment facility located at the Novato SD reclamation facility. NMWD is contributing funds and staff time to NBWRA.

- **Napa County –** Napa County is cooperating with Napa SD in the development of recycled water options for the Milliken-Sarco-Tulucay (MST) Creeks areas, and is contributing funds and staff time to NBWRA.

1.7.3 Feasibility Study Preparation

The NBWRA members undertook cooperative planning efforts over a 5-year period, including 19 bi-monthly technical workshops as well as monthly institutional workshops with extensive outreach to potential NBWRP stakeholders to define shared objectives and develop feasible alternatives toward definition of region-wide water reclamation and reuse project that would enable them to meet those objectives. Under the MOU, Camp Dresser McKee, Inc. (CDM) prepared a Phase 1 Engineering Feasibility Report (2005), a Phase 2 Engineering Feasibility Study Report (2006), and a Phase 3 Engineering and Economic/Financial Analysis Report (2008) in coordination with NBWRA. The Phase 1 Engineering Foundation Report, completed in March 2005, represented the submittal of preliminary information on demands in the action area, possible project configuration, and preliminary cost estimates. This initial report analyzed 15 alternatives.

The Phase 2 Feasibility Report, completed in June 2006, presented an engineering evaluation of a regional approach to recycled water use in the North San Pablo Bay area of California. The report described the action area, the key water management problems and needs within the action area, identified water reuse opportunities, and developed and analyzed alternatives that could address the identified water management needs, and presented an overview of associated legal and institutional requirements.

The Phase 3 Engineering and Economic/Financial Analysis Report (or Phase 3 Report) completed in June 2008 updated the Phase 2 Feasibility Report to be consistent with project planning conducted by the individual Member Agencies, included an economic and financial analysis, and discussed potential environmental effects. The Phase 3 Report provided the engineering and economic studies to guide the NBWRA and Reclamation's selection of a recommended Action Alternative for funding and implementation, and generated the four alternatives under consideration, as discussed in Section 1.3.

1.7.4 Water Supply Setting and Future Conditions

The action area encompasses approximately 318 square miles of land within Marin, Sonoma, and Napa Counties. This region extends roughly 10 to 15 miles inland of the tidal San Pablo Bay, with a total population of over 270,000 in the major urban centers of San Rafael, Novato, Sonoma, and Napa. The region supports agriculture, including some of the premier wine-grape growing land in North America, as well as light industry, commercial and institutional uses, parklands, and residential areas.

The waterways of this region – the Napa River, Sonoma Creek, Novato Creek, and Petaluma River, as well as smaller streams, some of which support only seasonal flows – are tributary to the San Pablo Bay estuary. Although threatened until recently by development, the remaining tidal wetlands of the San Pablo Bay estuary serve in a vital ecological role as nurseries for fisheries and wintering areas for migratory waterbirds.

Local and regional planning projections indicate that approximately 10 to 12 percent of growth would occur in most of the existing urban centers in the action area by the year 2020 (as compared to 2005 populations). Existing policies in principal cities will tend to favor concentrated rather than dispersed growth.

Agricultural land use is expected to remain relatively constant over a 20-year planning period. The local governing policies in the Marin, Sonoma, and Napa Counties in the action area protect agricultural lands. Given the high value of wine-grape culture, it is unlikely that there would be much change in the 75 percent of agricultural acreage committed to vineyards.

Total urban water use – including both residential and non-residential uses – in the action area is projected to increase from the 2005 level of 63,700 acre-feet per year (AFY) to about 72,800 AFY in 2020. Total water use for irrigation of agricultural lands is estimated at approximately 23,300 AFY at present. The sources that serve these water demands include surface water supplies (both within and outside of the action area), groundwater, and recycled water. SCWA supplies

much of the Sonoma and Marin County area with ***surface water*** conveyed from the Russian River and its tributaries in central Sonoma County, adjacent to the project area watershed. SCWA's reliable supplies to customers in the action area consist of 87,970 AF of water during a dry year.

Groundwater serves agricultural users (and some residential users) as a primary source of supply, particularly in the MST area of Napa County. Groundwater also serves as a secondary source of supply for some urban users as well, including the City of Sonoma, Valley of the Moon Water District, and SCWA contractors. Although the total quantity of groundwater in the action area is unknown, groundwater pumping has been measured. The vast increase (i.e., 80 percent) in pumping of groundwater in the past 30 years to support agricultural irrigation has resulted locally in groundwater outflow exceeding inflow, some impacts on groundwater quality, and a lowering of groundwater levels in some parts of the action area that are dependent on groundwater supplies.

Existing treatment and distribution infrastructure in the action area currently allows for about 7,300 AFY of ***recycled water*** for irrigation and wetlands restoration purposes, which could increase to 11,250 AFY by 2020.

At first glance, average year and wet season conditions appear to yield sufficient surface water and groundwater to meet total annual demand in the action area. However, the seasonal availability of some water sources (against the strong seasonality of agricultural demand), the potential for overdraft of groundwater with impacts on quality and quantity, and the growth pressures on the area's urban centers suggest a need for an effective, coordinated, and regional approach to the increased use of recycled water.

1.7.5 Recycled Water Availability

The WWTPs in the action area deliver recycled water during the dry season, when the RWQCB imposes restrictions on discharge of secondary effluent to waterways. SVCSD and Napa SD have the most extensive infrastructure in place for conveyance, storage, and distribution of recycled water to local users. Novato SD and LGVSD are currently producing secondary treated wastewater for discharge All of the WWTPs, except LGVSD, currently have the capability to produce disinfected tertiary recycled water conforming to Title 22 requirements for unrestricted use. The Member Agencies have proposed projects that are in various stages of planning and implementation to increase treatment capacity or plan to increase the local use of recycled water, if funding is available. **Table 1-2** summarizes WWTP discharge and beneficial reuse in 2020 assuming implementation of those individual local projects.

As shown in Table 1-2, the potential for use of recycled water in the action area is not limited by demand but rather by the limited capacity for tertiary treatment and by the lack of regional conveyance and storage networks that would deliver disinfected tertiary treated recycled water where and as needed. Acting individually and locally, the NBWRA Member Agencies have limited ability to maximize their potential for water reclamation and reuse. Adopting a regional outlook and plan would provide an opportunity to expand the potential for beneficial water reuse.

TABLE 1-2
POTENTIAL YEAR 2020 WWTP DISCHARGE AND BENEFICIAL REUSE VOLUMES IN ACTION AREA

Wastewater Treatment Plant	Flow (AFY)	Beneficial Reuse (AFY)
LGVSD	3,670	1,104
Novato SD	8,677	812
SVCSD	5,508	3,893
Napa SD	9,800	5,590
TOTAL	**27,655**	**11,599**

SOURCE: CDM, 2009

1.7.6 Environmental Benefits of Water Recycling

In 2001, the U.S. Environmental Protection Agency (USEPA) Water Division, Region IX issued EPA document number 909-F-98-001, which examined water recycling and reuse in an educational context. The document defined water recycling, described some examples of existing recycled water projects, discussed how recycled water affects the public, and identified three major environmental benefits associated with water recycling (discussed below).

The USEPA defines water recycling as reusing treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processing, toilet flushing, and groundwater recharge. The USEPA recognizes “water recycling”, “water reclamation”, and “water reuse” as synonymous terms. A common source of recycled water is water that is reclaimed from municipal wastewater. The USEPA identifies water recycling as a sustainable approach to water supply problems because, with adequate treatment, it does not compromise human health, it can be cost-effective in the long-term, and provides environmental benefits that support aquatic and terrestrial ecosystems.

According to the USEPA, recycled water can safely satisfy most water demands when it is treated to tertiary or advanced treatment levels. Where there is a likelihood of human exposure to the water, advanced treatment is required. There are two treatment levels in the water recycling process: secondary treatment and tertiary or advanced treatment. Secondary treatment consists of biochemical oxidation and disinfection following primary treatment. Water that undergoes secondary treatment is typically suitable for golf course irrigation, surface irrigation of orchards, nonfood crop irrigation, wetlands, wildlife habitat, stream augmentation, and industrial cooling processes. Tertiary treatment involves the use of physical, chemical or biological means to improve secondary effluent quality and may include chemical coagulation, filtration, membrane treatment and higher level disinfection. Wastewater that is treated to a tertiary level is suitable for landscape irrigation, toilet flushing, and food crop irrigation. Tertiary-treated water can also be used for indirect potable reuse to recharge potable groundwater aquifers or augment surface water reservoirs.

Due to the many opportunities for water reuse, the USEPA encourages the development of recycled water systems. The USEPA defines three major benefits of water recycling.

1. **Water recycling can decrease diversion of freshwater from sensitive ecosystems.** Supplementing industrial, agricultural, and urban water demands by using recycled water allows surface water, which is normally diverted, to remain instream and provide flow that supports plants, wildlife, and fish.

2. **Water recycling decreases discharge to sensitive water bodies.** In some cases, reducing wastewater discharges to water bodies can benefit the water bodies. For example, reducing wastewater discharge to a saltwater habitat could avoid brackish water conditions in the marsh. In addition, application of recycled water for agricultural use and landscape irrigation can provide a source of nutrients and lessen the need to apply synthetic fertilizers.

3. **Recycled water may be used to create or enhance wetlands and stream habitats.** Wetlands and streams provide environmental benefits including flood control, fisheries breeding, and water quality control. Aquatic environments and wildlife habitats can be improved by augmenting the water flow with recycled water.

1.7.7 Recycled Water Quality

Regulations stipulate water quality standards in conjunction with requirements for treatment, sampling, and monitoring. With recycled water, a key concern is the potential risk of human exposure to pathogenic organisms. The California Department of Public Health (CDPH) is responsible for regulating the use of recycled water in California. The California RWQCBs issue requirements for individual projects in conformance with the CDPH regulations. Article 4 in Title 22 of the California Code of Regulations sets water quality standards and treatment reliability criteria for recycled water, including Title 22 regulatory requirements for use of recycled water to protect the beneficial uses of recycled water for land applications, such as irrigation of fields, golf courses, or public access lands. **Table 1-3** lists the regulatory requirements for the recycled water quality permitted for different uses.

Title 22 sets bacteriological water quality standards based on the expected degree of public contact with recycled water. Disinfected tertiary treatment of recycled water is required for use involving direct public contact. Disinfected tertiary recycled water is defined as a filtered and subsequently disinfected wastewater.

Disinfected secondary treatment of recycled water is required for recycled water applications with a lower potential for public contact. There are three levels of secondary treatment based on the level of disinfection: disinfected secondary-2.2; disinfected secondary-23; and undisinfected secondary. Disinfected secondary-2.2 recycled water is defined as recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (mpn) of 2.2 per 100 milliliters of sample. Disinfected secondary-23 recycled water has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an mpn of 23 per 100 milliliters of sample. Undisinfected secondary recycled water is oxidized

TABLE 1-3
REGULATORY REQUIREMENTS FOR RECYCLED WATER USES IN CALIFORNIA[a]

Use of Recycled Water	Disinfected Tertiary Recycled Water	Treatment Level		
		Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water
Irrigation				
Food crops where recycled water contacts the edible portion of the crop, including all root crops	Allowed	Not allowed	Not allowed	Not allowed
Parks and playgrounds	Allowed	Not allowed	Not allowed	Not allowed
School yards	Allowed	Not allowed	Not allowed	Not allowed
Residential landscaping	Allowed	Not allowed	Not allowed	Not allowed
Unrestricted-access golf courses	Allowed	Not allowed	Not allowed	Not allowed
Any other irrigation uses not prohibited by other provisions of the California Code of Regulations	Allowed	Not allowed	Not allowed	Not allowed
Food crops, surface-irrigated, above-ground edible portion, and not contacted by recycled water	Allowed	Allowed	Not allowed	Not allowed
Cemeteries	Allowed	Allowed	Allowed	Not allowed
Freeway landscaping	Allowed	Allowed	Allowed	Not allowed
Restricted-access golf courses	Allowed	Allowed	Allowed	Not allowed
Ornamental nursery stock and sod farms with unrestricted public access	Allowed	Allowed	Allowed	Not allowed
Pasture for milk animals for human consumption	Allowed	Allowed	Allowed	Not allowed
Nonedible vegetation with access control to prevent use as a park, playground or school yard	Allowed	Allowed	Allowed	Not allowed
Orchards with no contact between edible portion and recycled water	Allowed	Allowed	Allowed	Allowed
Vineyards with no contact between edible portion and recycled water	Allowed	Allowed	Allowed	Allowed
Non food-bearing trees, including Christmas trees not irrigated less than 14 days before harvest	Allowed	Allowed	Allowed	Allowed
Fodder and fiber crops and pasture for animals not producing milk for human consumption	Allowed	Allowed	Allowed	Allowed
Seed crops not eaten by humans	Allowed	Allowed	Allowed	Allowed
Food crops undergoing commercial pathogen-destroying processing before consumption by humans	Allowed	Allowed	Allowed	Allowed
Supply for Impoundment				
Nonrestricted recreational impoundments, with supplemental monitoring for pathogenic organisms	Allowed[b]	Not allowed	Not allowed	Not allowed
Restricted recreational impoundments and publicly accessible fish hatcheries	Allowed	Allowed	Not allowed	Not allowed
Landscape impoundments without decorative fountains	Allowed	Allowed	Allowed	Not allowed
Supply for Cooling or Air Conditioning				
Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or spraying that creates a mist	Allowed[c]	Not allowed	Not allowed	Not allowed

TABLE 1-3 (Continued)
REGULATORY REQUIREMENTS FOR RECYCLED WATER USES IN CALIFORNIA[a]

Use of Recycled Water	Disinfected Tertiary Recycled Water	Treatment Level: Disinfected Secondary-2.2 Recycled Water	Treatment Level: Disinfected Secondary-23 Recycled Water	Treatment Level: Undisinfected Secondary Recycled Water
Supply for Cooling or Air Conditioning (cont.)				
Industrial or commercial cooling or air conditioning not involving cooling tower, evaporative condenser, or spraying that creates a mist	Allowed	Allowed	Allowed	Not allowed
Other Uses				
Groundwater Recharge	Allowed under special case-by-case permits by RWQCBs[d]			
Flushing toilets and urinals	Allowed	Not allowed	Not allowed	Not allowed
Priming drain traps	Allowed	Not allowed	Not allowed	Not allowed
Industrial process water that may contact workers	Allowed	Not allowed	Not allowed	Not allowed
Structural fire fighting	Allowed	Not allowed	Not allowed	Not allowed
Decorative fountains	Allowed	Not allowed	Not allowed	Not allowed
Commercial laundries	Allowed	Not allowed	Not allowed	Not allowed
Consolidation of backfill material around potable water pipelines	Allowed	Not allowed	Not allowed	Not allowed
Artificial snow making for commercial outdoor uses	Allowed	Not allowed	Not allowed	Not allowed
Commercial car washes, not heating the water, excluding the general public from washing process	Allowed	Not allowed	Not allowed	Not allowed
Industrial process water that will not come into contact with workers	Allowed	Allowed	Allowed	Not allowed
Industrial boiler feed	Allowed	Allowed	Allowed	Not allowed
Nonstructural fire fighting	Allowed	Allowed	Allowed	Not allowed
Backfill consolidation around nonpotable piping	Allowed	Allowed	Allowed	Not allowed
Soil compaction	Allowed	Allowed	Allowed	Not allowed
Mixing concrete	Allowed	Allowed	Allowed	Not allowed
Dust control on roads and streets	Allowed	Allowed	Allowed	Not allowed
Cleaning roads, sidewalks and outdoor work areas	Allowed	Allowed	Allowed	Not allowed
Flushing sanitary sewers	Allowed	Allowed	Allowed	Allowed

[a] Refer to the full text of the most current (December 2, 2000) version of Title 22: California Code of Regulations, Chapter 3 Water Recycling Criteria. This chart is only an informal summary of the uses allowed in this version. The version of the adopted criteria can be downloaded from: http://www.dhs.ca.gov/ps/ddwem/publications/Regulations/recycleregs_index.htm.
[b] Allowed with "conventional tertiary treatment." Additional monitoring for two years or more is necessary with direct filtration.
[c] Drift eliminators and/or biocides are required if public or employees can be exposed to mist.
[d] Refer to Groundwater Recharge Guidelines, available from the CDPH.

SOURCE: ESA, 2006.

wastewater. Oxidized wastewater is wastewater in which the organic matter has been stabilized, is nonputrescible[4] and contains dissolved oxygen.

1.7.8 Water Conservation Programs Within the Action Area

Within Sonoma County and portions of Marin County, SCWA, its water contractors, including NMWD and the City of Sonoma, and other water customers work together to help the community use water wisely. Similarly, the City of Napa, which provides water supply with in the Napa SD service area, and Napa County have education and water conservation device programs in place to encourage water conservation within Napa County. SCWA provides financial incentives, staffing and technical expertise to assist the water contractors and other water customers with cost-effective water conservation programs. SCWA leads its regional water conservation program with a legislative and research component. SCWA sponsors, supports, and tracks water conservation legislation while serving in a leadership role for many federal, state and local councils and boards. SCWA was made promotional partner of the USEPA's WaterSense program in summer of 2007.

SCWA's leadership role has achieved results in emerging regional conservation measures. In 1998, SCWA became a signatory to the MOU Regarding Urban Water Conservation in California as governed by the California Urban Water Conservation Council (CUWCC). SCWA's retail water contractors are also signatories to the MOU, and are responsible for compliance with developing and implementing cost-effective Best Management Practices (BMPs). SCWA was the first wholesaler in the State of California to have all of its retail water agencies sign the CUWCC MOU. Beyond the BMPs, SCWA tracks and supports other emerging measures like water efficiency standards for new development, requirements to implement best available technology, and financial rebates for retrofit of irrigation meters. A third area of emerging regional measures has resulted in grant funding from Proposition 50, Proposition 13, and the California Public Utilities Council for water conservation programs.

Since 1982, SCWA has offered technical, financial, and program management assistance to its water contractors and other customers with water conservation measures that are cost-effective and would reduce water demands on SCWA's Russian River Project and water transmission system. Water contractors and other customers in turn educate their water customers in the wise use of indoor and outdoor water. Please see **Table 1-4** for a comprehensive list of the current water conservation measures being implemented by SCWA and the water contractors. Estimated savings that have resulted from current water conservation programs is over 6,600 AFY.

SCWA and the water contractors are proposing to implement new water conservation measures along with existing water conservation programs as part of the SCWA Water Project EIR, which is currently undergoing environmental review (SCWA, 2008). The goal of the conservation programs is to achieve total savings of 16,040 AFY by the year 2030, through the continued

[4] Solid wastes which are not capable of being decomposed by micro-organisms with sufficient rapidity as to cause odors, gases, attraction of vectors or other offensive conditions. For example, wastes that are putrescible, and do not qualify as nonputrescible, would include food wastes.

TABLE 1-4
COMPREHENSIVE LIST OF BEST MANAGEMENT PRACTICES BEING IMPLEMENTED BY SCWA AND WATER CONTRACTORS

Measure	Description
Residential Water Surveys- Indoor	This is the indoor component of indoor and outdoor water surveys for existing single-family and multi-family customers. Normally those with high water use are targeted and provided customized report to homeowner.
Residential Water Surveys- Outdoor	This is the outdoor component of indoor and outdoor surveys for existing single-family and multi-family customers. Normally those with high water use are targeted and provided customized report to homeowner.
Residential Retrofit	Provide owners of pre-1992 homes with retrofit kits that contain easy-to-install low flow showerheads, faucet aerators, and toilet tank retrofit devices until saturation reaches 75%.
Water Budgets	90%-100% of all irrigators of landscapes with separate irrigation accounts would receive a monthly or bi-monthly irrigation water use budget.
Large Landscape Conservation Audits	All public and private irrigators of landscapes larger than one acre would be eligible for free landscape water audits upon request.
Public Information Program	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc.
Commercial Water Audits	High water use accounts would be offered a free water audit that would evaluate ways for the business to save water and money.
Single Family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.
Multi Family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.
System Water Audits, Leak Detection and Repair	Water provider will undertake annual system water audits and repair leaks proactively. The budget will be $50,000 per year for 10 years with the net results that un-accounted for water will be reduced to below 10%

SOURCE: SCWA, 2008

implementation of existing and new water conservation programs and measures. Brown and Caldwell screened 75 new water conservation measures and determined that 32 water conservation measures would generally be cost-effective and well-suited to implement in SCWA's service area and could realistically achieve additional approximate total savings of 9,440 AFY. Therefore, these measures were selected for implementation under the Water Conservation Component. Demand projections for the Water Project assume that the water conservation measures described would be implemented through the year 2030.

In June 2006, SCWA and other water contractors signed the Restructured Agreement for Water Supply which establishes water supply for each of the water contractors, encourages water conservation and recycled water use that offsets potable water use, and provides payment to SCWA for water delivered to enable SCWA to pay capital costs of major operation, and maintenance of the Transmission System. The agreement will remain in effect until June 30, 2040. The water contractors would be required, by the Restructured Agreement for Water Supply,

to implement these water conservation measures, or other alternative conservation measures that secure at least the same level of water savings. This requirement does not preclude the water contractors from implementing additional or more aggressive water conservation measures resulting in additional savings. SCWA and the water contractors will continue their commitment to water conservation and encourage alternative and innovative methods of saving water to increase conservation and achieve higher savings in the future.

Additionally, the Restructured Agreement's provisions include monetary sanctions, which consist of a penalty of 10 percent of the "operations and maintenance charge" to be imposed in the event that a water contractor fails to implement required conservation measures. This penalty provides an economic incentive for compliance with the water conservation requirements.

The City of Napa, also a signatory to the MOU Regarding Urban Water Conservation in California, has integrated water conservation into its long-term water management strategy by developing a series of programs to educate residents and provide water-efficient devices to customers (City of Napa, 2009). The City of Napa sponsors the following conservation programs:

- **Water Wise Survey (Residential and Commercial).** A water wise survey is a free service conducted by a city representative to evaluate water use practices in the home, or in commercial or industrial businesses and institutions. The surveyor checks for leaks, inspects equipment, makes recommendations for lawn or large-scale irrigation, provides instruction for reading the water meter, and offers rebates for water efficient devices, such as clothes washers. The city also replaces pre-1992 toilets with more efficient models.

- **Water Wise Landscaping Workshop.** The workshop series promotes the principles of native landscaping and efficient irrigation, sponsors a demonstration garden, and sells CD-ROMs with gardening tips.

- **Free Devices and Literature.** Customers are eligible to receive water efficient devices including low flow showerheads, faucet aerators, toilet leak detection dye, toilet flapper valves, rain/ sprinkler gauges with a lawn watering guide, garden hose nozzle, and a hose timer.

- **Educational Programs.** The City offers WWTP field trips and classroom presentations in an effort to educate children on the importance of water conservation and demonstrate water saving techniques that can be used in the home.

1.7.9 Sustainability

Member Agency Sustainability Programs

The NBWRA Member Agencies and Cooperating Agencies have existing programs and projects that are intended to meet the goal of increasing the sustainability of their operations. The programs and projects are focused on energy conservation, water conservation, and energy efficiency.

LGVSD

Implementing green practices is an ongoing goal of LGVSD. Sustainable aspects of operations at LGVSD include solar generation, community outreach programs, and habitat restoration. LGVSD currently has 2,490 solar panels that provide an alternative source of energy. The solar power plant produces approximately 850,000 kilowatt-hours per year, which is enough energy to power 283 homes. Generating electricity with solar power avoids the need to run standard power plants using fossil fuels, increases energy independence and reduces pollution. Community outreach programs focus on pollution prevention and public involvement. Habitat restoration projects provide environmental benefits and enhance the natural environment. The LGVSD *Strategic Plan*, adopted in 2008, established other sustainable goals for LGVSD. According to the Strategic Plan, LGVSD will identify methods to decrease their district vehicle emissions to reduce their carbon footprint and address climate change issues (LGVSD, 2008).

Novato SD

Novato SD has been implementing the following water conservation and energy efficiency programs:

- **Ongoing Sustainability Programs.** Novato SD has undertaken numerous sustainability initiatives and continues to develop initiatives over time. In addition, Novato SD participates with the Marin County Sustainability Team to develop policies and programs that will help make the county healthy, vibrant, and sustainable for future generations. As a result of these efforts, Novato SD has been certified as a green business since 2004.

- **Onsite Energy Generation from Byproducts.** Novato SD has reduced air pollution and electricity use with the installation of a microturbine at the Novato WWTP. The microturbine generates electricity by burning the methane gas generated by the Novato SD's biological treatment process, which will reduce energy demand by 7.5 percent. Waste heat from the microturbine is used to heat the biological digester, saving natural gas. Once Novato SD's WWTP upgrade (currently under construction) is complete, Novato SD will increase biomass energy generation to produce up to 40 percent of the onsite power requirements. Novato SD also plans to add solar power.

- **Energy Efficiency Measures.** The major renovation of the aging WWTP, conversion of the Ignacio WWTP into a pump station, and movement of wastewater from the Ignacio Pump Station through a new 6-inch pipeline to the Novato WWTP involved energy saving measures. These measures include a low-pressure ultra-violet disinfection system, premium-efficiency motors, high-efficiency aeration blowers, advanced dissolved oxygen control, and variable-speed pump drives.

- **Water Recycling.** Novato SD recycles wastewater to irrigate landscapes and sustain wildlife ponds and pasture land.

- **Other Sustainable Processes.** As noted above, Novato SD uses ultra-violet light as a substitute to chlorine to treat wastewater. In an effort to reduce fuel consumption and greenhouse gas emissions, Novato SD is converting its fleet to hybrid vehicles. Novato SD is involved with the community, and assists property owners to stabilize eroded banks and improve fish habitat along Novato Creek. Novato SD is also a participant in several "sustainable Novato" projects, including household and electrical waste recycling programs.

SVCSD

Alternative energy sources are also being utilized at the SVCSD WWTP. In May 2007, a solar plant that consists of 5,200 solar panels on a 5-acre plot at the SVCSD WWTP provides at least one-third of the energy needed to fuel the current operations at the WWTP. The panels will rotate to track the sun in order to provide maximum solar energy. Feeding the power into the PG&E grid means an immediate one-third reduction in the total energy cost for plant operation and a future additional reduction of up to 30 percent.

Napa SD

The Napa SD has implemented multiple programs to achieve a more sustainable treatment facility, and also participates in incentive programs for Napa area residents to reduce energy and water use. A recent and ongoing energy conservation measure at the Soscol Water Recycling Facility includes the Aeration Blower Replacement Project, which was completed in September 2008. This project included replacement of existing aeration blowers with new turbo blowers and positive displacement blowers. This conversion in blower technology is resulting in an energy savings of just over 100,000,000 kilowatt hours per year, equivalent to the energy utilized by 148 vehicles in a year. The Napa SD also utilizes co-generation technology, which recovers digester gas produced during anaerobic digestion, then uses it to co-generate electrical power using a gas engine generator. Waste heat, a by-product of power generation, is recovered from the engines and exhaust. The electricity and heat, which are produced by the cogeneration system, are utilized in the plant to reduce purchased electricity and natural gas. Electricity produced by the generators is fed into the plant electrical distribution system for use where needed. The average recoverable energy produced by the cogeneration unit is between 4,200 and 4,500 kilowatt-hours/day (Napa SD, 2008).

Napa SD currently recycles 25-30% of its influent for various purposes including landscape irrigation in business parks, golf courses, and municipal parks, as well as vineyard irrigation. In addition, Napa SD significantly reduces the solids volume sent to a landfill through the beneficial reuse of biosolids generated during operations. Napa SD discs the biosolids into fields to enrich the soil.

In addition to efforts in achieving a more sustainable treatment facility, Napa SD contributes funding to water and energy conservation programs administered by the City of Napa. The Toilet Retrofit Program provides incentives for Napa residents to replace old, water intensive toilets with Ultra-Low Flush Toilets, using 1.6 gallons per flush. Napa residents can either receive a direct $100 rebate from Napa SD for each retrofitted toilet, or enroll on a waiting list to have their toilets retrofitted through an alternate program administered by the City of Napa. In the alternate program, for each new house in a Napa development, a developer is required to retrofit four houses on the waiting list, at no cost to the homeowners. Napa SD contributes funds to support the Water Conservation Representative responsible for implementation of the Toilet Retrofit Program. Given that toilet flushes and leaks can represent up to 40% of an *indoor* water budget, these program are an effective approach for water conservation.

Napa SD is also involved in a water conservation program for clothes washers, typically the second largest water user inside the home after toilets. The City of Napa, in combination with Napa SD and **Pacific Gas and Electric Company,** offers residents a combined water-energy rebate on certain high-efficiency clothes washer models. New high-efficiency models use less than half the amount of water used by conventional washers and have higher energy efficiency.

SCWA

In February 2006, SCWA's Board of Directors directed SCWA to take several actions to advance implementation of environmentally sustainable practices by SCWA and to promote adoption of sustainable practices by other entities in the area. Several of the programs such as SCWA's water conservation program, recycled water projects, fishery protection and restoration programs, renewable energy projects, public access on SCWA land, bio-diesel use, and other environmental projects are important components of sustainable resource management. Ultimately, SCWA's goal is to supply water produced without an increase in greenhouse gas and carbon emissions. Since 2006, SCWA has been aggressively pursuing its sustainability initiative with the following programs:

- Construction of 2.0 megawatts of solar energy generation capacity at three facilities;
- Conversion of first plug-in hybrid vehicle by a government agency in Sonoma County;
- Implementation of recognized guidelines from the International Organization for Standardization;
- (ISO) 9001 and 14001 registrations;
- Sponsorship of and participation in several conferences promoting sustainability;
- Filing an application with the Federal Energy Regulatory Commission to perform wave energy;
- Feasibility studies off the coast of Sonoma County;
- Working with the City of Santa Rosa to build a bio-diesel production plant;
- Achieving registration with the California Climate Action Registry;
- Achieving certification from the Sustainable Business Institute;
- Participating in the California Environmental Dialogue;
- Participating in the United Nations Conference on Climate Change in Bali, Indonesia; and
- Achieving a Bay Area Green Business certification for SCWA's administration building.

Nearly 20 percent of the electrical energy in SCWA's service area is spent on the supply and treatment of water. SCWA, along with the County of Sonoma and the incorporated cities in the county, has made a commitment to reduce greenhouse gas emissions by 25 percent below 1990 levels by 2015. The intent of SCWA's sustainability program is to make SCWA and its projects a field laboratory for testing new technologies that reduce greenhouse gas emissions and comply with new and emerging regulatory requirements. In March 2008, SCWA's Board of Directors directed SCWA to work collaboratively with County of Sonoma staff and other stakeholders to implement

the actions listed below to promote energy efficiency and renewable energy in SCWA's operations and projects:

- Create "zero net energy" communities by implementing geothermal heat pump technology and other energy efficiencies;
- Expand use of plug-in hybrid vehicles via incentive programs and volume purchases;
- Collect and analyze electric load data to evaluate opportunities for development of renewable energy projects, and harnessing wave energy;
- Build coalitions with other communities with similar goals; and
- Host conferences related to emerging technologies

As new projects are developed, SCWA will continue its ongoing sustainability programs and participation in climate change protection activities, and will incorporate state-of-the-art water and energy efficiencies into the project wherever possible. SCWA will also evaluate and seek opportunities to use renewable energy for facilities, minimize the use of chemicals and power necessary to provide water supply services, and use technology to improve operational processes. Opportunities for "green building" will be investigated for feasibility. Overall, the goal will be to reduce the environmental impact of construction and reduce the embedded energy of the materials incorporated into the work. This can include everything from using bio-diesel blends in the construction equipment, fly ash concrete[5], local sourcing of materials where possible, and on-site reuse or recycling of construction debris. In addition, SCWA will continue its practice of replacing pool vehicles with smaller hybrid vehicles, lighter fuel efficient trucks, and vehicles using other alternative fuels, as technology becomes available.

1.8 Public Scoping and Response to Climate Change Comments

The initial scoping process, required under NEPA by the CEQ regulations (40 CFR 1501.7), was designed to solicit comments and identify issues that participating agencies and interested members of the public consider to be the principal areas for study and analysis. Significant environmental issues raised during scoping are addressed in the EIR/EIS to the extent applicable. In summary, several major issues identified by stakeholders during the scoping process relate to the carbon footprint of the project, the relationship of the project to AB 32, increased greenhouse gas emissions with respect to climate change, and the overall sustainability of the project. Scoping comments expressed concern for the net carbon impact of treating and delivering the proposed volume of recycled water compared to the impact of current practices and the impact of pumping to irrigate crops. Some stakeholders wanted the project to provide a net reduction in regional carbon emissions and believe the EIR/EIS should evaluate the project in the context of the worst case scenario of climate change.

[5] Fly ash, an industrial by product of coal-fire electric power generation, is a fine, glass-like powder composed of silica, aluminum, and iron that can be recycled as concrete material. It is a cost-competitive substitute for Portland concrete, and is generally considered environmentally superior because it requires less water than Portland concrete, is recycled from material that is normally dumped in landfills, and has a low embodied energy (Tool Base Services and NAHB Research Center, 2008)

In an effort to evaluate the carbon footprint of any new project, both to comply with applicable State and federal law, as well as because the NBWRA intends to minimize unnecessary project contributions to carbon emissions, NBWRA investigated the carbon emissions of the project. In addition, in response to public requests for consideration of the emissions related to the broader regional water development, use, and discharge system, NBWRA convened meetings with an energy and resource technologies expert, Ned Orrett, P.E., to discuss the subject of energy consumption related to the regional municipal water development, use, and discharge system. The following discussion summarizes these meetings, and establishes that these are separate issues from the environmental impacts associated with the NBWRP and are beyond the analysis and mitigation in this EIR/EIS.

The largest component of energy use related to the municipal water system occurs in the home, due primarily to the fact that water is heated in the home for a variety of uses, including food preparation and washing. Home use, by far, results in the largest contribution of carbon to the environment when viewed in the context of the overall regional municipal water system. Strategies and technologies are emerging that are designed to reduce greenhouse gases associated with heating of water in the home; however, those strategies and designs have not been broadly adopted or incorporated on a scale that would result in significant reduction of greenhouse gas emissions in the region.

The NBWRP relates to water after it leaves the home, and enters the WWTPs for water treatment prior to reuse. Regardless of the intended goals of SCWA as a wholesaler, or the NBWRA Member Agencies, none of the agencies have any legal authority to require changes to current water use practices in homes. As discussed above, the Member Agencies have implemented a variety of technologies that promote sustainability and target greenhouse gas reductions on the municipal side.

Some of these technologies could be included on the California Air Pollution Control Officers Association (CAPCOA) “Green List”. The CAPCOA, comprised of representatives from 35 local air quality agencies, is involved in training local air district staff on air pollution control techniques, researching new technologies and planning for future needs, and coordinating with federal and state air quality officials to develop and implement statewide air quality regulations. CAPCOA recently developed the “Green List[6]”, a list of projects and project types that are deemed a positive contribution to California’s efforts to reduce greenhouse gas emissions. The Green List will be updated every six months or as major regulatory or legal developments unfold (CAPCOA, 2008). California Air Resources Board (CARB) and the Attorney General are consulted prior to listing of a project on the Green List to ensure consistency with Assembly Bill 32 (AB 32) efforts and to ensure that that the Green List entries are consistent with how the Attorney General’s office interprets AB 32 and GHG CEQA compliance.

6 The definition and function of the Green List is explained in the CAPCOA white paper entitled “CEQA and Climate Change as part of a conceptual approach to developing GHG significance criteria, CAPCOA, 2008.

The potential Green List entries include project types such as wind farms, high-density infill projects, extension of transit lines, projects with LEED "Platinum" rating, and cogeneration plants with a capacity of 50 megawatts or less at existing facilities (as defined in Class 29 Categorical Exemption). It should be noted that the Green List recognizes expansion of recycling facilities within existing urban areas and recycled water projects that reduce energy consumption related to water supplies that service existing development as projects that would be considered to have less than significant impacts for greenhouse gas emission purposes. This list demonstrates the relationship between recycled water projects and greenhouse gas emissions, and further supports that the NBWRP would not contribute to a long-term increase in greenhouse gas emissions.

Nevertheless, the public has raised an important issue for consideration by the broader array of agencies that are responsible for the various stages of water development, use, and discharge. Given the contribution to greenhouse gas emissions that has been demonstrated to occur in homes, NBWRA believes that a robust consideration of strategies to reduce those emissions is in order.

This is comparable to strategies that both required changes in, and provided public incentives to improve the efficiency of, water consumption practices in homes. A large-scale public initiative in California to replace inefficient sinks, faucets, toilets and appliances with more efficient ones has resulted in major reduction of demand on California's limited water supplies. A similar initiative should be considered to reduce the generation of greenhouse gases in the home by replacing inefficient water heating technologies and appliances with those that are more efficient.

Although the Member Agencies cannot directly control in-home water use and energy consumption, the lead agency, SCWA supports Assembly Bill 811 (AB 811), approved by the Governor July 21, 2008, which authorizes local legislative bodies to determine that it would be in the public interest to designate an area with which authorized city officials and free and willing property owners may enter into contractual assessments to finance the installation of distributed generation renewable energy sources or energy efficient improvements that are permanently fixed to real property. The Legislature found that energy conservation efforts, including the promotion of energy efficiency improvements to residential, commercial, industrial, or other real property are necessary to address the issue of global climate change. SCWA, along with several other North Bay local governments, has implemented energy efficiency standards and other strategies that are designed to curb greenhouse gas production. However greenhouse gas emissions generated by in-home water use practices are a separate issue, and unrelated to the environmental impacts associated with the NBWRP; as such, they are beyond the scope of analysis for this EIR/EIS, and are not analyzed.

1.9 Documents Incorporated By Reference

Several documents are referred to and are incorporated in part by reference in this Draft EIR/EIS. As provided for by CEQA Section 15150, an EIR/EIS may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. The incorporated portions of other documents are considered in full as part of the text of

the EIR/EIS. The EIR/EIS must indicate where the incorporated document is available for public review, and the relationship of the referenced document to the EIR/EIS analysis.

The following documents are incorporated by reference and are available for review to gain an understanding of previously completed Master Planning efforts and environmental documents completed by the NBWRA Member Agencies and applicable to the Proposed Action:

1. *Napa River Salt Marsh Restoration Project DEIR/EIS*, April 2003, (State Clearing House Number 1198072074). Certified by California State Coastal Conservancy, April 2003. *Final Napa River Salt Marsh Restoration Project EIR*, April 14, 2004. *Final Napa River Salt Marsh Restoration Project EIS, Vol. 2: Comment Letters and Responses*, June, 2004. Prepared by Jones and Stokes. The California State Coastal Conservancy (Coastal Conservancy), U.S. Army Corps of Engineers (USACE), and California Department of Fish and Game (CDFG) (project sponsors) are proposing a salinity reduction and habitat restoration project for the 9,456-acre Napa River Unit of the Napa-Sonoma Marshes Wildlife Area (Napa River Unit).

2. *Phase 3 Engineering and Economic/ Financial Analysis Report for the North San Pablo Bay Restoration and Reuse Project*, Bureau of Reclamation and SCWA, 2008. Prepared by CDM. The Phase 3 Report, completed in June of 2008, presents a detailed engineering development and evaluation of three alternatives as well as a "No Future Action" alternative. This feasibility report presents an engineering evaluation of a proposed project for a regional approach to reclamation and reuse of treated wastewater in the North San Pablo Bay area of California. The report describes the Proposed Project area and the key water management problems and needs within the Project area, identifies water reuse opportunities in the project area, develops and analyzes alternative measures that could address the identified water management needs, presents an overview of associated legal and institutional requirements, and provides an economic analysis.

3. *Sonoma Valley Recycled Water Project EIR (*State Clearinghouse Number 2005092083), Certified by Sonoma Valley County Sanitation District, December, 2006. Prepared by ESA. SVCSD completed the Final Environmental Impact Report (EIR) in December 2006. The Proposed Project would reduce the discharge of treated wastewater to the waters of the United States and provide a reliable recycled water distribution system to serve agricultural, municipal, and industrial users for irrigation in the Sonoma Valley. The Proposed Project would provide up to approximately 2,750 AFY of recycled water and consist of the construction, operation, and maintenance of approximately 34 miles of recycled water pipelines; capacity and operational storage facilities; one booster pump station; one distribution pump station; associated connecting pipelines; and other appurtenances. The report is detailed with project-level and program-level analysis of the Proposed Project.

4. *Napa Sanitation District Strategic Plan for Recycled Water Use in the Year 2020, Final Draft*, August 2005. Prepared by Larry Walker Associates. The Napa SD completed a Strategic Plan in August 2005 to determine a recycled water planning approach through the year 2020. The potential for recycled water production was estimated to be 9,800 AFY in 2020 if additional storage were available, and 4,540 AFY using existing storage. Various strategies were proposed for consideration ranging from minimal to full recycling, with an associated range of benefits. Recommendations for strategies include consideration of

potential revenues from grants and recycled water users for each strategy. Strategy No. 3 is recommended for phased implementation, but only as funding becomes available. If outside funding is not available, then Strategy No. 2 is recommended, which delivers only enough recycled water to reliably meet NPDES permit requirements.

5. *Final Recycled Water Expansion Hydraulic and Preliminary Engineering Analysis: Phase I Report- Milliken-Sarco-Tulocay (MST) Area*, May 2007. Prepared by Brown and Caldwell. Napa SD and Napa County are investigating expanding Napa SD's existing recycled water system from the corner of Streblow Drive at Napa Valley Community College into southern MST to provide recycled water that will augment surface and well water usage in the basin. The total area that could potentially be serviced is approximately 5,360 acres and includes over 1,100 parcels. Depending on how many users there are, the proposed project will provide between 1,000 and 2,000 AFY of recycled water to the region for outdoor irrigation use.

6. *Recycled Water Implementation Plan*, May 2006. North Marin Water District and Novato Sanitary District. Prepared by Nute Engineering and Winzler & Kelly Consulting Engineers. The Implementation Plan presents a revised basis of design and construction budget for the optimized recycled water treatment and distribution facilities and aligns the project phasing with guidelines for Proposition 50 funding opportunities. The Plan summarized the following recommendations: NMWD should proceed towards implementation of the North service area projects; NMWD and Novato SD should enter into a formal agreement regarding further implementation of the Center service area projects; NMWD should enter into discussions with LGVSD regarding implementation of the South service area project; NMWD should undertake a public information and outreach program; NMWD should develop policies and ordinances necessary for implementation of the project and a programmatic funding source for the projects.

7. *Napa State Hospital Feed and Loop Pipelines and Reservoir Project- Pipeline Alignment and Modifications Mitigated Negative Declaration (MND) and Addendum*, Certified by Napa Sanitation District, January 2007. Prepared by ESA. Napa SD proposed to modify the alignment of the pipeline between Streblow Drive and the potential new storage reservoir to meet irrigation demands at Napa State Hospital and to utilize existing and future treated wastewater as recycled water to meet irrigation demands in areas north of Napa State Hospital in the future. The MND concluded that the pipeline realignment reduces impacts by avoiding wetlands and reducing construction in raptor nesting areas. The Addendum proposed changes to the alignments under the project based on engineering and design efforts subsequent to MND adoption. The Addendum satisfies the requirements of CEQA Guidelines Sections 15162 and 15164.

References – Introduction and Project Background

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Jones and Stokes Associates (JSA), *Napa River Salt Marsh Restoration Project Draft Environmental Impact Report/Environmental Impact Statement*, Certified by California State Coastal Conservancy, April 2003, (SCH#1998072074).

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CHAPTER 2
Project Description

2.1 Introduction

Recognizing the growing need for an integrated and regional approach to water management, four wastewater utilities and one water agency in the North San Pablo Bay region of California have joined forces to plan a project that would promote the expanded beneficial use of recycled water regionwide.

The proposed North Bay Water Recycling Program (NBWRP) would build on commitments to long-term inter-agency cooperation to address common needs related to reliable water supplies and enhanced environmental restoration. As implementation of the Project would likely require external funding assistance, the investigation and development of the Project is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in water reuse projects.

The North Bay Water Reuse Authority (NBWRA), established under a Memorandum of Understanding (MOU) in August 2005, is comprised of four wastewater utilities: Las Gallinas Valley Sanitary District (LGVSD), Novato Sanitary District (Novato SD), Sonoma Valley County Sanitation District (SVCSD), Napa Sanitation District (Napa SD), and Sonoma County Water Agency (SCWA). Additional agencies supporting the NBWRA through contribution of funds and staff time include North Marin Water District (NMWD) and Napa County.

Under the MOU, the NBWRA is exploring "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." The NBWRP would alter the disposition of recycled water in the North Bay Region by providing increased recycled water supply to urban, agricultural and environmental uses.

2.2 Project Purpose

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. The Bureau of Reclamation's water reclamation and reuse program is authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575). Also known as Title XVI, the act directs the Secretary of the Interior to undertake

a program to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters, and for design and construction of demonstration and permanent facilities to reclaim and reuse wastewater.

The NBWRA is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water. The purpose of the NBWRP is to provide recycled water for agricultural, urban, and environmental uses thereby reducing reliance on local and imported surface and groundwater and reducing the amount of treated effluent releases to San Pablo Bay.

2.3 Participants

The five participating agencies have organized themselves under a Memorandum of Understanding (MOU) as the NBWRA. The following agencies would participate in the implementation of the NBWRP:

2.3.1 MOU Signatory Agencies

- **LGVSD** – The LGVSD wastewater treatment plant (WWTP) provides sanitation service to approximately 30,000 people within the area of Marinwood, Lucas Valley, Terra Linda, Santa Venetia, Los Ranchitos, and Smith Ranch Road (LGVSD, 2005).

- **Novato SD** – The Novato WWTP provides service to approximately 60,000 residents within the city of Novato, an area of 28 square miles, and surrounding areas (Novato Sanitary District, 2006).

- **SVCSD** – The SVCSD WWTP began operations in 1954 and provides service to approximately 34,000 people in the city of Sonoma, within a 7-square-mile area (SVCSD, 2006).

- **Napa SD** – The Napa SD's Soscol water recycling facility treats wastewater from the city of Napa and surrounding unincorporated communities, an area of about 23 square miles, and serves a population of approximately 80,000 (Napa SD, 2007).

- **SCWA** – SCWA, which began the Title XVI process for investigating a recycled water distribution system under a Cooperative Agreement with the Bureau of Reclamation, is a wholesale drinking water provider to over 600,000 residents and continues to be an actively participating partner.

2.3.2 Supporting Agencies

- **NMWD –** NMWD has partnered with Novato SD to implement recycled water projects in their collective service areas, including a 0.5 mgd tertiary treatment facility located at the Novato SD reclamation facility. NMWD is contributing funds and staff time to the Authority.

- **Napa County –** Napa County is cooperating with Napa SD in the development of recycled water options for the Milliken-Sarco-Tulocay (MST) Creeks areas, and is contributing funds and staff time to the Authority.

2.3.3 Other Agencies Declining to Participate

During the development of the NBWRP, several other agencies were considered for inclusion. These include the City of Vallejo, American Canyon and Solano County. However, these agencies declined to participate in the initial development phases of the NBWRA. Two agencies that were included in the Phase 1 and Phase 2 Feasibility Studies prepared by the NBWRA, but have declined to participate at this time, include the City of Petaluma and Marin Municipal Water District.

- **City of Petaluma** – The City of Petaluma is not a signatory to the MOU establishing the NBWRA. Given its location within the San Pablo Bay watershed, the City of Petaluma and surrounding unincorporated area was identified as a potential service area for recycled water at the onset of the project. Recognizing that the City had historically provided recycled water to golf course and agricultural customers within its city limits and surrounding unincorporated area, and was in the process of developing a Recycled Water Master Plan to increase service, the City was included as a potential participant in the Alternatives presented in the Phase 1 and Phase 2 Feasibility Studies. In written communication to the Authority, the City of Petaluma has declined to participate in the North San Pablo Bay Restoration and Reuse Project. Therefore, facilities previously identified in the Phase 1 and Phase 2 Feasibility Studies to serve the Petaluma area are not included in this EIR/EIS analysis.

  The City of Petaluma is moving forward with its Recycled Water Master Plan; a Draft EIR for the project was circulated in July of 2008, and was certified by the City Council in November 2008. This project is further reviewed in Section 4, Cumulative Impacts, as a cumulative project occurring within the North San Pablo Bay Watershed.

- **Marin Municipal Water District** – Marin Municipal Water District (MMWD) is not signatory to the MOU, but had been identified as a potential partner with LGVSD in the implementation of recycled water service to the Peacock Gap Golf Course Area in Marin County. MMWD has declined to participate in the North San Pablo Bay Restoration and Reuse Project. Service to the Peacock Gap area will be considered for implementation by LGVSD independent of MMWD participation.

2.3.4 Proposed Federal Action

The CEQ regulations outlined in the NEPA Handbook, require an EIS to define, in a brief statement, what Federal action is under consideration. As implementation of the NBWRP would likely require external funding assistance, the investigation and development of the NBWRP is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for Federal participation and cost-sharing in approved water reuse projects. The proposed Federal Action is the provision of federal funds by the Bureau of Reclamation under the Title XVI Program to NBWRA Member and Cooperating Agencies for the implementation of water recycling projects examined in this EIR/EIS. The Bureau of Reclamation is the NEPA Lead Agency for this proposed action.

2.4 Project Area

2.4.1 NBWRA Action Area

The action area, illustrated in **Figure 2-1**, extends approximately 10 to 15 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa Counties. The action area extends as far south as Point San Pedro in Marin County, and as far north as Milliken Canyon located 28 miles to the northeast in eastern Napa County, and encompasses about 318 square miles of land. Urban centers in the action area are San Rafael (county seat) and Novato in Marin County, Sonoma in Sonoma County, and Napa (county seat) in Napa County. The topography of the action area consists of gently sloping river valleys, separated by northwest trending mountain ranges with steep slopes and peaks exceeding elevations of 2,500 feet above mean sea level. Flat lying mudflats and marshland border San Pablo Bay. The majority of the action area is within Napa, Sonoma, and Novato Valleys and the foothills bounding these valleys.

The action area receives water supplies from sources both within and outside the region. Water sources within the region include the Petaluma and Napa Rivers, Sonoma Creek, and Stafford Lake on Novato Creek. Surface water sources outside the region include the Russian River Project (including Lake Mendocino, Lake Sonoma, and imports from the Eel River via Pacific Gas & Electric Company's Potter Valley Project), Dry Creek, Warm Springs Creek, Lake Hennessey, Milliken Reservoir, MMWD's six Lagunitas Creek watershed reservoirs, Soulajule Reservoir on Walker Creek, and the Sacramento-San Joaquin Delta via the State Water Project. The region relies on groundwater and recycled water as additional sources.

2.4.2 Recycled Water Service Areas

In order to form candidate recycled water projects, land use information and Member Agency recycled water planning documents were reviewed. Water and wastewater agencies in the action area have developed several existing recycled water projects and identified recycled water projects for future implementation. Additional potential recycled water project areas were identified by grouping land uses either in major agricultural or landscaping areas or in areas between existing and proposed projects. These potential recycled water use areas are summarized in **Table 2-1** and are described below. Potential recycled water use areas are shown in **Figure 2-2**.

- **Peacock Gap Golf Course** – LGVSD proposes to serve recycled water to the Peacock Gap Golf Course at the eastern end of San Rafael. In 2008, the golf course and neighboring facilities was estimated to use about 437 AFY (Nute, 2008).

- **North Marin Water District (NMWD) Urban Reuse Project** Area – Under the originally proposed NMWD Urban Reuse Project, Novato SD was estimated to provide 1,312 AFY of recycled water for urban landscaping in the City of Novato (Nute Engineering, 2004[k1]). Please see **Appendix 2** for anticipated recycled water users in the Novato SD service area.

SOURCE: CDM, 2008

NBWRA North Bay Water Recycling Program 206088.01

Figure 2-1
Action Area

TABLE 2-1
RECYCLED WATER SERVICE AREAS

LGVSD
• Peacock Gap Golf Course
Novato SD
• North Marin Water District Urban Reuse Project Area • Sears Point
SVCSD
• Sonoma Valley Recycled Water Project Area • Napa Salt Marsh Restoration Area • Southern Sonoma Valley • Central Sonoma Valley
Napa SD
• Milliken-Sarco-Tulucay Creeks Area • Carneros East

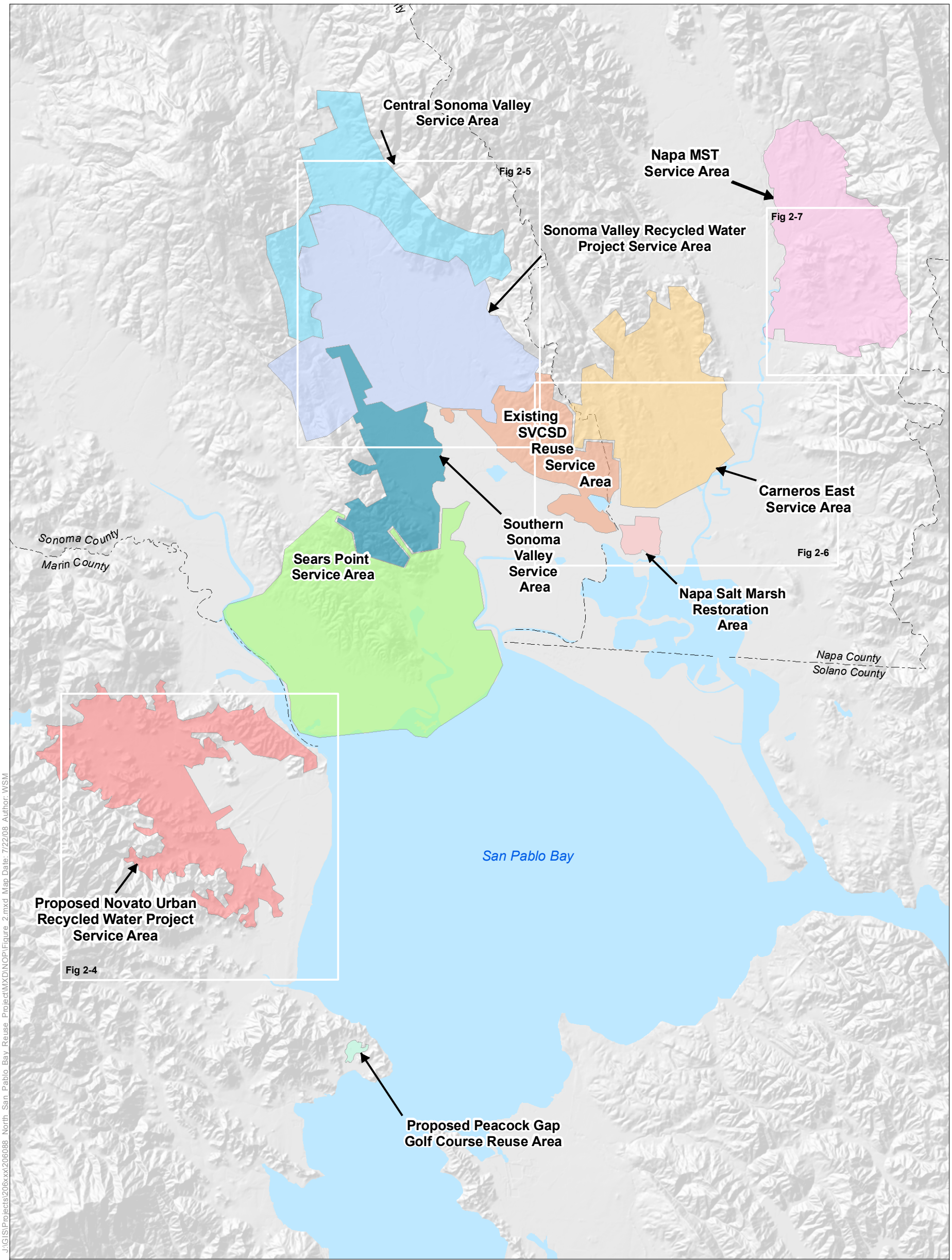
- **Sears Point** – The land in the vicinity of Sears Point lies in between SVCSD WWTP and Novato SD WWTP, but is not currently served with recycled water. This area could act as a convenient link between these treatment plants. The Sears Point reuse area encompasses 326 acres of dairy/pasture land, 76 acres of irrigated farm land, and 1,236 acres of vineyards for a total of about 1,638.

- **Sonoma Valley Recycled Water Project Area** – SVCSD is developing the Sonoma Valley Recycled Water Project, which identified about 1,015 acres of dairy/pasture land, 234 acres of urban landscaping, 2 acres of irrigated farm land, and 6,249 acres of vineyards, for a total of about 7,500 acres.

- **Southern Sonoma Valley** – The area south of the City of Sonoma is dedicated predominantly to vineyard uses and is close to the SVCSD WWTP. The Southern Sonoma Valley reuse area includes 55 acres of dairy/pasture land, 48 acres of urban landscaping, and 4,005 acres of vineyards, for a total area of 4,108 acres.

- **Central Sonoma Valley** – The Central Sonoma Valley reuse area is located north of the proposed Sonoma Valley Recycled Water Project, and includes additional vineyard areas in the valley still relatively close to the SVCSD WWTP. It encompasses 51 acres of urban landscaping, 258 acres of irrigated farm land, and 2,929 acres of vineyards, for a total area of 3,237 acres.

- **Napa Salt Marsh Restoration Project Area**– The Napa River Salt Marsh Restoration Project consists of restoration of tidal wetlands and enhancement of managed ponds in the Napa Sonoma Marsh Wildlife Area. Two water sources have been evaluated for habitat and bittern dilution operations: Napa River and slough diversions via planned levee breaches, and construction of a recycled water pipeline from the SVCSD WWTP and the Napa SD WWTP. The use of recycled water would be confined to Ponds 7 and 7A of the Napa Salt Marsh. Recycled water would be used to dilute bittern within ponds 7 and 7A and would not involve the breaching of levees.



Service Areas

- Central Sonoma Valley Service Area
- Southern Sonoma Valley Service Area
- Sears Point Service Area
- Carneros East Service Area
- Existing SVCSD Reuse Service Area
- Sonoma Valley Recycled Water Project Service Area
- Napa MST Service Area
- Napa Salt Marsh Restoration Area
- Proposed Novato Urban Recycled Water Project Area
- Proposed Peacock Gap Golf Course Reuse Area

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J:\GIS\Projects\206xxx\206088_North_San_Pablo_Bay_Reuse_Project\MXD\NOP\Figure_2.mxd Map Date: 7/22/08 Author: WSM

SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-2

Service Areas

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- **Milliken-Sarco-Tulucay Creeks** (**MST**) **Area** – Napa SD's *Recycled Water Expansion Hydraulic and Preliminary Engineering Analysis: Phase 1 Report – Milliken-Sarco-Tulocay Area* indicates that Napa SD's MST area potentially consists of 4,335 acres (3,856 acres of vineyards, 389 acres of urban landscaping, and 90 acres of golf course/cemeteries) (Brown and Caldwell, 2007).

- **Carneros East** – Napa SD's St*rategic Plan for Recycled Water Use in the Year 2020* included the development of alternatives for a recycled water system to serve two areas of southern Napa County (LWA, 2005). According to the land use data used for the Project, Napa SD's Carneros East reuse area consists of about 6,654 acres of vineyards in the Napa County portion of the Los Carneros American Viticulture Area (AVA).

2.5 Project Objectives

In addition to the purpose and need for the proposed Federal Action identified in Section 2.3.4, the following project objectives have been developed by the NBWRA for the NBWRP. The project is proposed to promote the expanded beneficial use of recycled water in the North Bay region to achieve the following objectives:

- Offset urban and agricultural demands on potable water supplies;
- Enhance local and regional ecosystems;
- Improve local and regional water supply reliability;
- Maintain and protect public health and safety;
- Promote sustainable practices;
- Give top priority to local needs for recycled water, and;
- Implement recycled water facilities in an economically viable manner.

All of the Member Agencies already have existing recycled water programs. The NBWRA anticipates that provision of recycled water from the Proposed Action will be made available for use to new and existing water customers on reasonable terms and conditions. As appropriate, fee structures for recycled water have been or will be developed by Member Agencies within the context of each agency's rules, regulations and financial planning.

2.6 Action Alternatives to be Considered

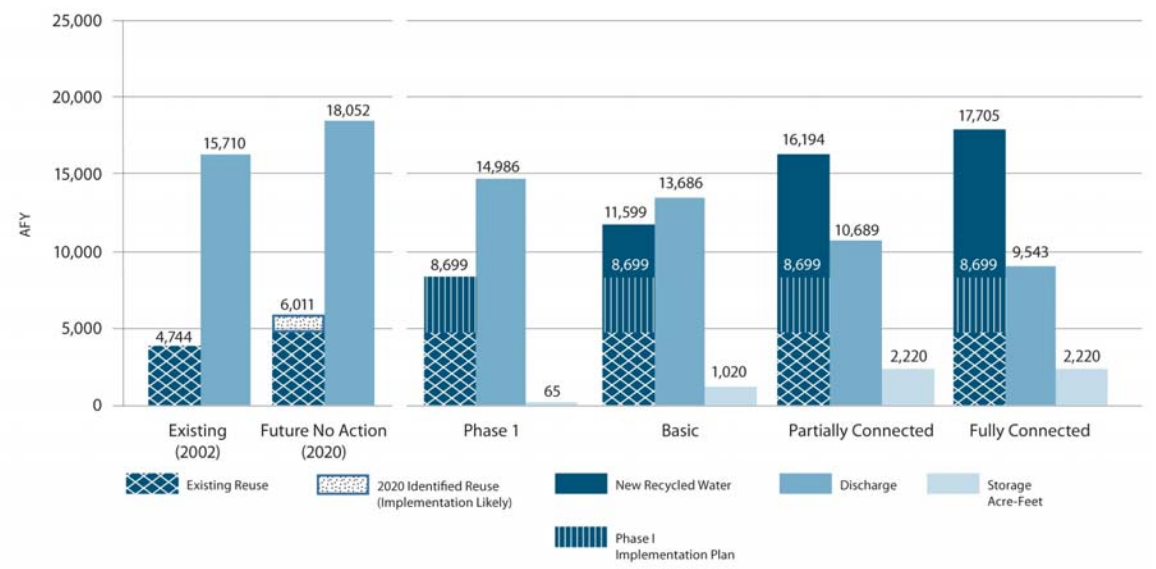
2.6.1 Action Alternatives Summary

This EIR/EIS considers the No Project Alternative, a No Action Alternative and three Action Alternatives. The Action Alternatives consist of treatment, transmission, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area through 2020. Each Action Alternative considers varying levels of recycled water use, and corresponding levels of regional facility integration. The Phase 1 Implementation Plan (discussed in Section 2.6.2 below) represents the set of projects, common to all of the NBWRP alternatives, which are defined to a level of detail that allows for project-level analysis, and would likely be

the first phase implemented under any alternative. The No Project Alternative, No Action Alternative and Action Alternatives are as follows:

- **No Project Alternative,** assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is identical to the No Action Alternative, identified below.
- **No Action Alternative,** provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives.
- **Alternative 1, Basic System**, includes use of recycled water near each of the individual WWTPs;
- **Alternative 2, Partially Connected System**, adds additional pipelines, pump stations and storage to partially connect the existing WWTPs; and
- **Alternative 3, Fully Connected System**, provides a fully integrated recycled water distribution system connecting all four Member Agency WWTPs.

A comparison of each alternative in terms of the amount of recycled water made available, the corresponding amount of discharge to tributaries of North San Pablo Bay, and the amount of storage necessary to provide the level of recycled water use is provided in **Chart 1**, below. **Table 2-2** summarizes the existing and future recycled water supply demand and resulting discharge that would occur under Alternatives 1, 2, and 3.



SOURCE: ESA

North Bay Water Reuse Authority . 206088

Chart 1
Existing and Future Conditions (2020) vs. Proposed Project Recycled Water, Discharge, Storage (Acre-Feet Per Year)

TABLE 2-2
ALTERNATIVES SUMMARY –
RECYCLED WATER SUPPLY, DEMAND, AND RESULTING DISCHARGE (AFY)

Alternatives	WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand (Beneficial Reuse)	Total Recycled Water Demand	Discharge to San Pablo Bay[1]
Alternative 1: Basic System	LGVSD and Novato WWTPs	12,347	1,172	744	1,916	8,643
	SVCSD and Napa WWTPs	15,308	3,772	5,911	9,683	5,043
	Total	**27,655**	**4,944**	**6,655**	**11,599**	**13,686**
Alternative 2: Partially Connected System	LGVSD and Novato WWTPs	12,347	1,172	2,477	3,619	8,032
	SVCSD and Napa WWTPs	15,308	3,772	8,802	12,574	2,657
	Total	**27,655**	**4,944**	**11,279**	**16,193**	**10,689**
Alternative 3: Fully Connected System	LGVSD, Novato, SVCSD, and Napa WWTPs	27,655	4,944	12,761	17,705	9,543
Total		**27,655**	**4,944**	**12,761**	**17,705**	**9,543**

[1] The number does not equal supply and demand due to evaporative and other losses (e.g. spreading).

SOURCES: CDM, 2009; ESA, 2009

A full description of the facilities proposed under each Action Alternative is provided in Section 2.8.

2.6.2 Phase 1 Implementation Plan

The Member Agencies have collectively prioritized the projects within their individual service areas to establish an Implementation Plan identifying the order in which projects would be constructed. Phase 1 of the Implementation Plan includes projects that are defined to a level of detail that allows for project-level environmental review. These projects are collectively referred to as Phase 1 Projects. The Phase 1 Projects are common to Alternatives 1, 2, and 3. This EIR/EIS may be relied upon by individual member agencies for approval of these individual Phase 1 Projects. **Table 2-3** identifies projects that would be implemented as Phase 1 Projects under any of the Action Alternatives considered. These projects will be examined at a project level of detail, and are described in Section 2.7, Project Level Analysis – Phase 1 Implementation Plan. **Figure 2-3** shows proposed facilities that would be implemented under Phase 1.

2.7 Project Level Analysis

2.7.1 Phase 1 Implementation Plan

The Member Agencies have collectively prioritized the projects within their individual service areas to identify a phased Implementation Plan under any of the alternatives being considered. The first phase of the Implementation Plan includes projects that each Member Agency has defined to a level of detail that allows for project-level environmental review. These projects are collectively referred to as Phase 1 Projects. This EIR/EIS may be relied upon by individual member agencies or other cooperating agencies for approval of these individual projects.

TABLE 2-3
IMPLEMENTATION PLAN – PHASE 1

		New Pipeline (miles)	New Demand (AFY)	Capacity Increase (mgd)	New Pumps (HP)	New Storage (AF)
LGVSD	Peacock Gap	--	--	--	--	--
	NMWD URWP (South)	5.9	204	0.7	72	(3)
	Sears Point	--	--	--	--	--
Novato SD	NMWD URWP (North/Central)	9.8	542	1.2	259	(3)
	Sears Point	--	--	--	--	--
SVCSD	Southern Sonoma Valley	--	--	--	--	--
	Central Sonoma Valley	--	--	--	--	--
	Sonoma Valley (1A)[1]	5.2	874	0	662	65
	Napa Salt Marsh	7.9	(2)	0	0	0
Napa SD	Carneros East	--	--	--	--	--
	MST Area	17.5	2,137	4.5	880	0
	Napa (local)	--	--	--	--	--
	Napa Salt Marsh	--	--	--	--	--
Total		**46.3**	**3,757**	**6.4**	**1,873**	**65**

1 Sonoma Valley (1A) is a pipeline alignment originally analyzed as a part of the Sonoma Valley Recycled Water Project EIR and proposed under Phase 1 for the NBWRP. The alignment is described on page 2-18 of this document.
2 Additional 3,460 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type. Because this is a beneficial use that is not related to recycled water supply, this number is tracked separately in each of the alternatives.
3 Existing 0.5 mg reservoir would be rehabilitated to provide recycled water system storage.

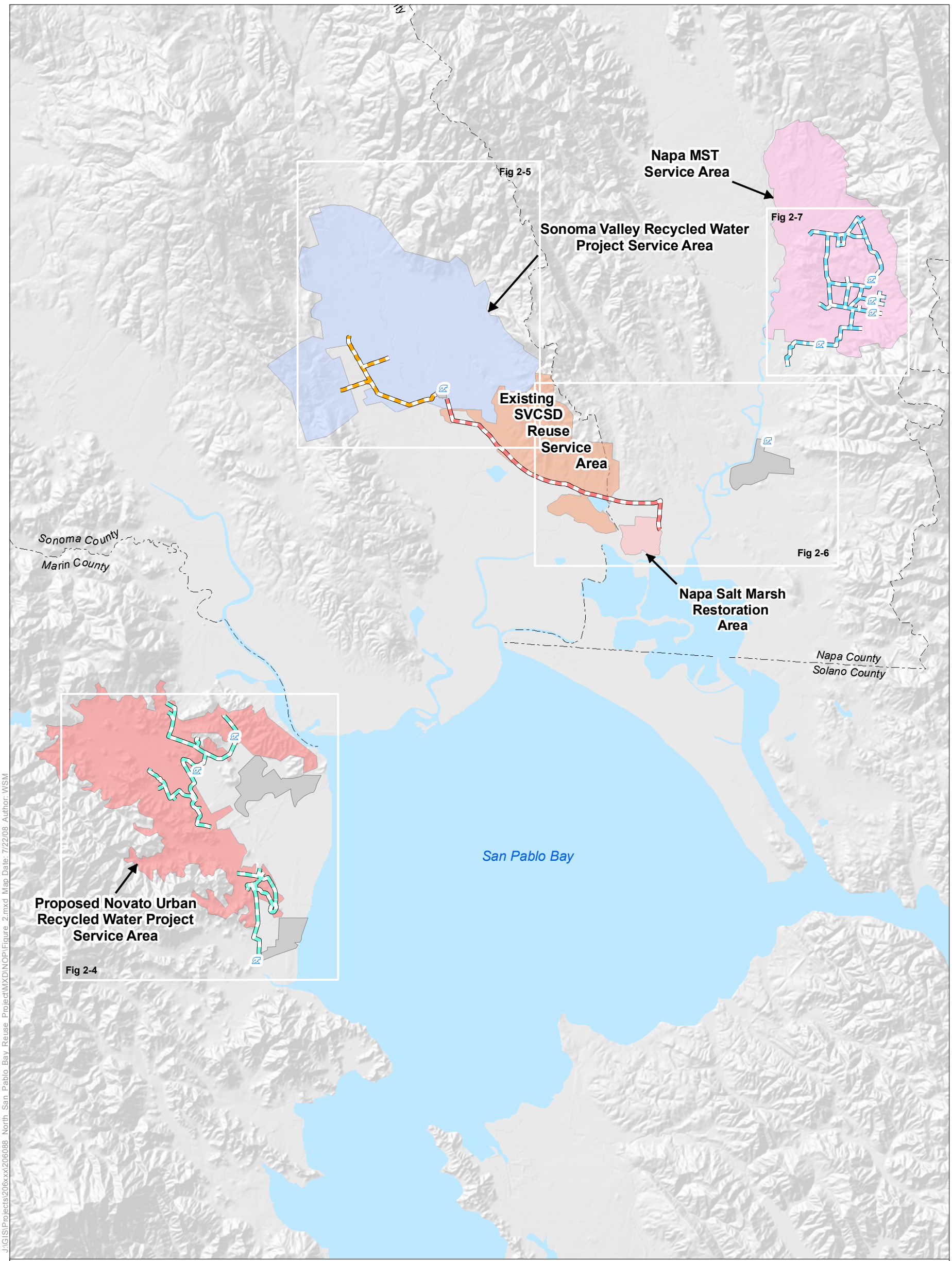
SOURCE: CDM, 2009, Napa SD, 2009.

Las Gallinas Valley Sanitary District/North Marin Water District

In 2006, the *Recycled Water Implementation Plan* (Nute Engineering, 2006) was developed to provide guidance and phasing for a recycled water system to serve the City of Novato and Hamilton Field urban areas. The intent of the implementation plan was to identify projects that could be implemented cooperatively by NMWD, Novato SD, and LGVSD in the near future in order to offset peak seasonal potable water supply demands. The *Recycled Water Implementation Plan* identified 3 service areas and facilities to most efficiently provide recycled water service: Novato South, Novato Central and Novato North. Under the Phase 1 Implementation Plan, service to the Novato South area would be provided by NMWD through construction of a pipeline distribution system. This system would be served by LGVSD through construction of a 0.7 mgd tertiary treatment facility at the existing LGVSD plant. This system would not be connected to the remainder of the NMWD recycled water system (Nute Engineering, 2006).

Novato South Service Area – Hamilton Field

Service to the Hamilton Field area would be established through implementation of a of 0.7 mgd tertiary treatment upgrade at the existing LGVSD WWTP, construction of a new booster pump station onsite, and construction by NMWD of a pipeline distribution system from the LGVSD WWTP north to serve the Hamilton Field area (**Figure 2-4**). This system would consists of a loop of 6-inch pipeline along South Oakwood Drive and Casa Grande Drive, a 12-inch pipe along



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Phase 1

Proposed Pump

Phase1

- Napa SD-MST Pipelines (Phase1)
- Napa Salt Marsh Restoration Pipelines (Phase 1)
- Novato Urban Recycled Water Pipelines (Phase 1)
- SVRW Pipelines (Phase 1)

- Existing SVCSD Reuse Service Area
- Sonoma Valley Recycled Water Project Service Area
- Napa MST Service Area
- Napa Salt Marsh Restoration Area
- Proposed Novato Urban Recycled Water Project Area
- Waste Water Treatment Plant

0 4
Miles

SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-3

Phase 1 Implementation Plan

Service Areas and Facilities

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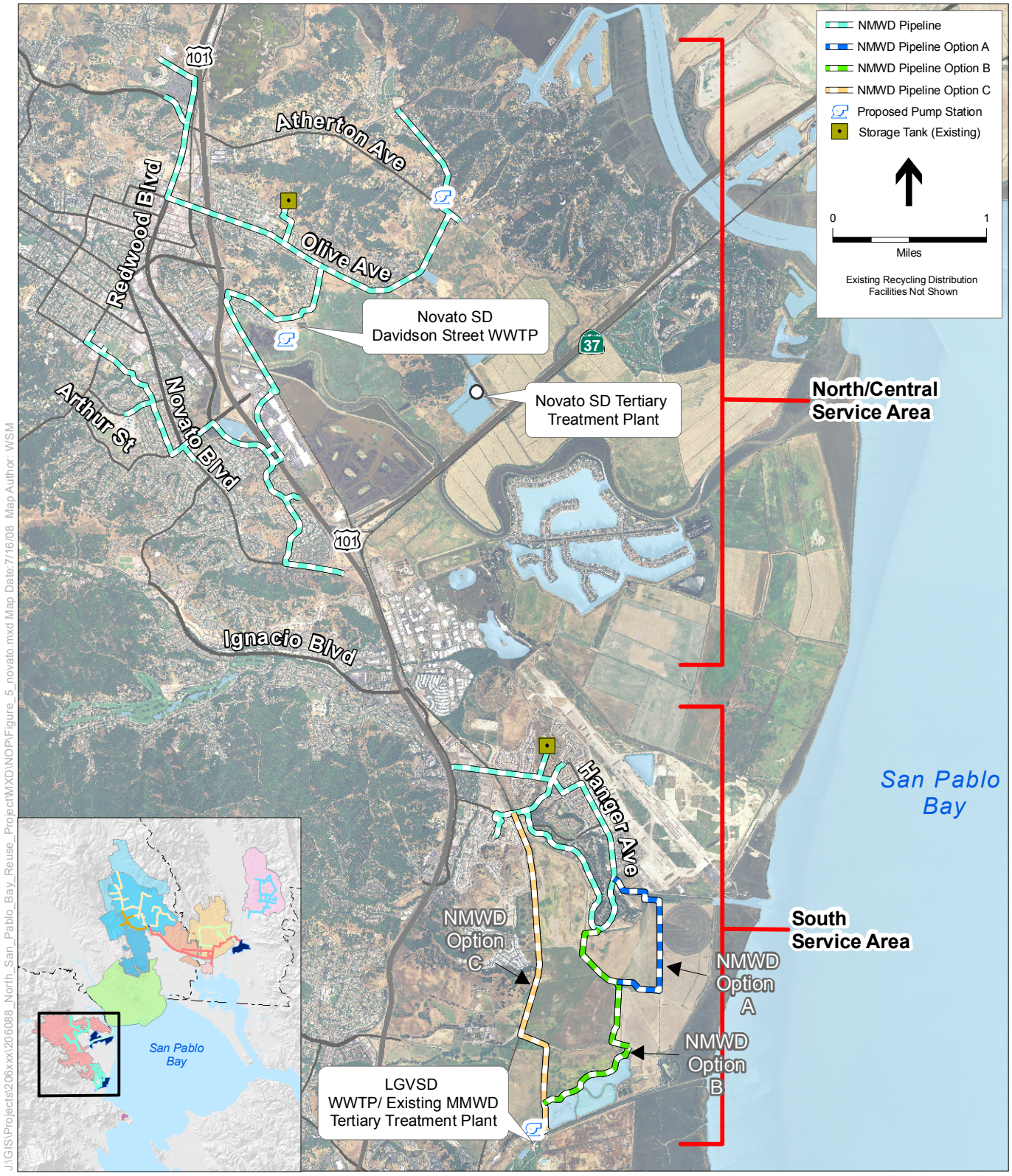


SOURCE: USDA, 2005; CDM, 2008; and ESA, 2008

Note: Existing Tank Facilities Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-4

Novato Service Area:
Phase 1 Projects

Hangar Avenue to South Palm Drive, and a 10-inch pipe on Palm Drive. Recycled water storage would be provided by retrofit of the existing 0.5-million gallon (MG) Reservoir Hill Tank.

To provide the additional 0.7 mgd treatment capacity, tertiary facilities would be constructed within the fenceline of the existing LGVSD WWTP, as shown in **Figure 2-4A**. NMWD would construct a pipeline from the LGVSD WWTP to the Hamilton Field area along three route options (Figure 2-4):

- **Option A:** This option would consist of approximately 2.75 miles of pipeline that would originate at the LGVSD WWTP, extend east adjacent to the WWTP ponds and northeast through grazing land to Hangar Avenue in the where it would connect to the Coast Guard Housing Distribution Loop.

- **Option B:** This option would consist of approximately 2.1 miles of pipeline that would originate at LGVSD WWTP, extend east adjacent to the WWTP ponds and north along agricultural access roads through grazing land. Option B would connect to the Coast Guard Housing Distribution Loop at Las Lomas Drive.

- **Option C:** This option would consist of approximately 2.15 miles of pipeline that would extend north from LGVSD WWTP through grazing land. The alignment would turn west along St. Vincent's Drive then north, adjacent to the Northwest Pacific Railroad (NWPRR) right-of-way. Option C would connect to the Coast Guard Housing Loop at Palm Drive.

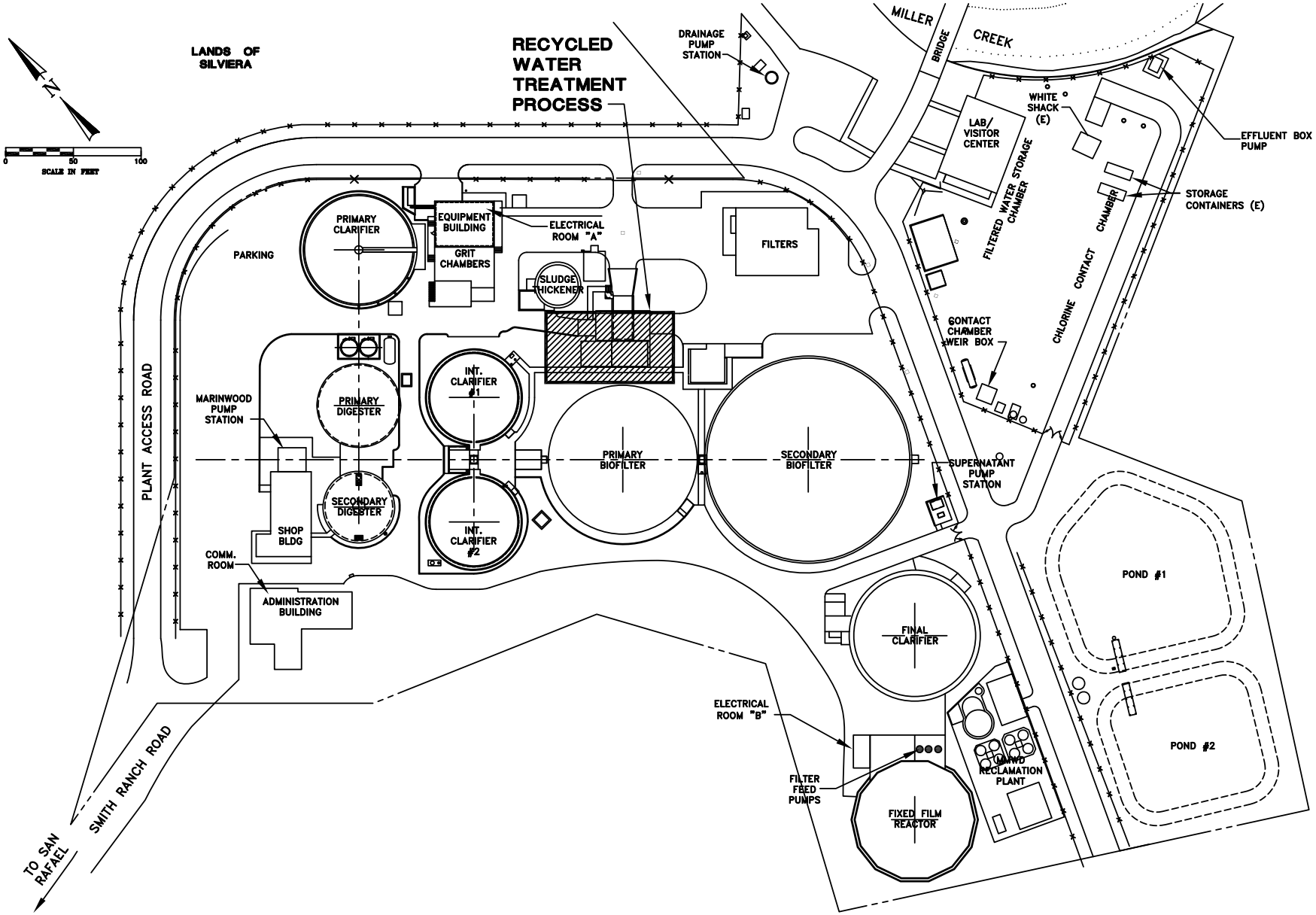
Novato Sanitary District/ North Marin Water District

Novato North Service Area

Under the *Recycled Water System Expansion Project*, NMWD and Novato SD would implement service in the Novato North Service Area by incrementally expanding tertiary capacity at the existing Novato Recycled Water Treatment Facility from 0.5 mgd to 1.2 mgd. The Recycled Water Treatment Facility 0.5 mgd upgrade would involve a new modular filter and expansion of the chlorination system. The recycled water pipeline would be routed from Atherton Avenue to Olive Avenue under Highway 101, and north on Redwood Boulevard to San Marin Drive (see Figure 2-4). A separate pipeline would be routed on H Lane to serve the Valley Memorial Park Cemetery. A booster pump would be installed at Atherton Avenue and the distribution system would be connected to the existing 0.5-MG Plum Street Tank, which would be rehabilitated to provide diurnal storage (Nute Engineering, 2006).

Novato Central Service Area

Under the *Recycled Water System Expansion Project*, Novato SD and NMWD would implement service in the Novato Central Service Area through construction of a recycled water distribution system from the Novato SD WWTP south to Rowland Boulevard and the Vintage Oaks shopping center, and across Highway 101 to serve urban users west of Highway 101. The treatment facilities at the Recycled Water Treatment Facility (see **Figure 2-4B**) would be decommissioned and relocated to the Novato SD WWTP. Tertiary treatment facilities are included in the Novato SD Master Plan for the WWTP. From the WWTP, an 18-inch pipeline would be installed along Novato SD's existing easement, with a jack and bore crossing of US 101 from Rowland



SOURCE: Nute Engineering, 2008

NBWRA North Bay Water Recycling Program. 206088

Figure 2-4A

LGVSD Tertiary Treatment Plan Upgrades

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SOURCE: GlobeXplorer, 2007

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2.4B

Novato San District Recycled Water Treatment Facility

Boulevard to Redwood Boulevard. An 18-inch recycled trunk line would then extend north through Novato to deliver recycled water to Novato High School and other irrigated playing fields, with a 10-inch line extending south along Redwood Boulevard (see Figure 2-4).

A new pipeline would connect the WWTP with the North Service Area pipeline in Olive Drive via Lea Drive or McClelland Drive. This would allow continuation of recycled water service to the Stone Tree Golf Course and the other customers in the North Service Area during the course of the relocation of the recycled water facility to the WWTP. This intertie would also incorporate the Plum Street Tank into the distribution system serving both the Novato North and Central Service Areas (Nute Engineering, 2006). **Table 2-4** summarizes the roadways that would be affected under this project.

TABLE 2-4
NMWD/NOVATO SD FACILITIES – MAJOR ROADWAYS AFFECTED

• Atherton Avenue	• Redwood Boulevard	• Novato Boulevard
• Olive Avenue	• DeLong/ Diablo Avenue	• S. Novato Boulevard
• Rowland Boulevard	• Arthur Street	• Hill Road

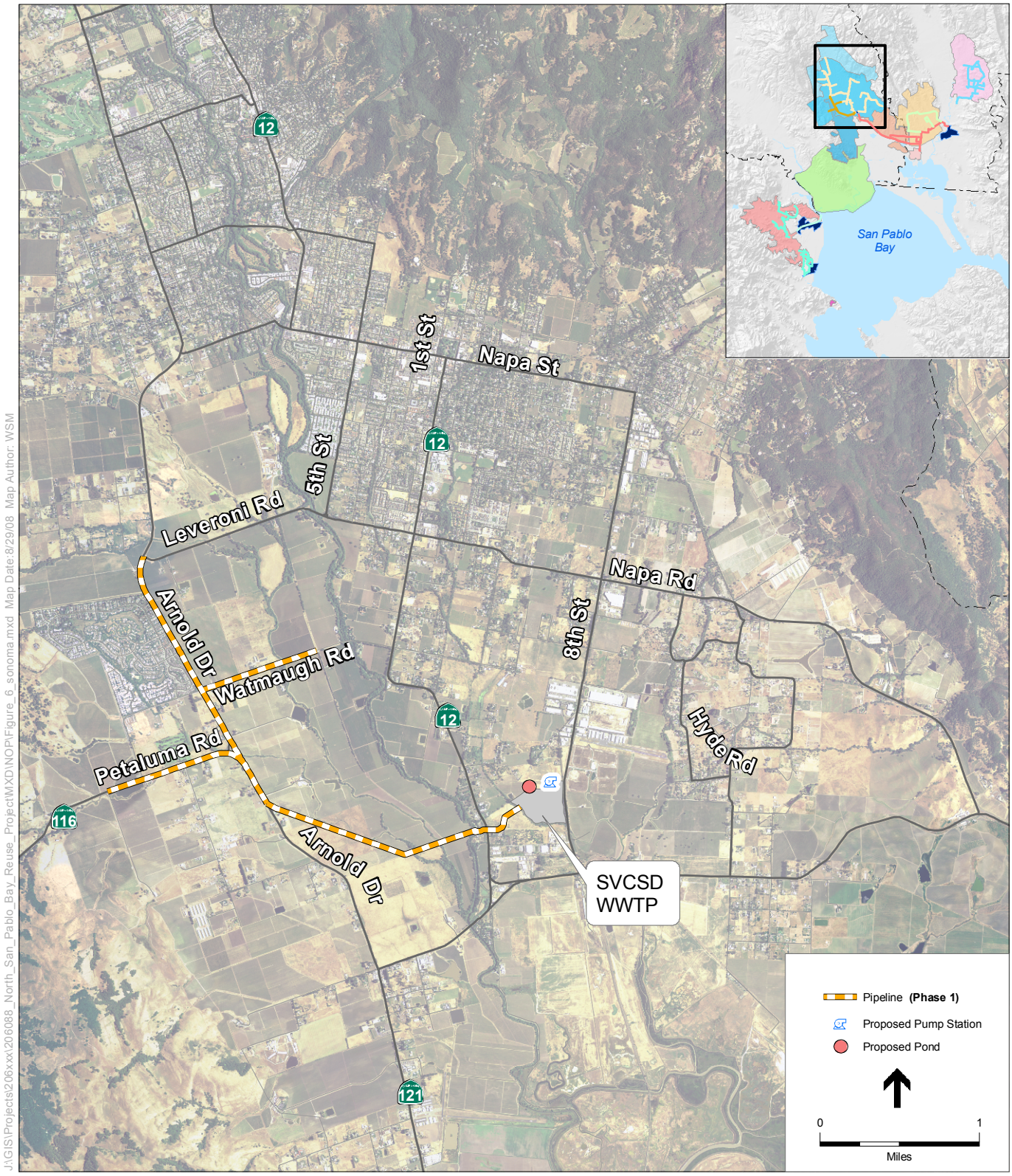
Sonoma Valley County Sanitation District

Sonoma Valley Recycled Water Project (SVRWP)

SVCSD completed an EIR in 2006 for the SVRWP, located in southern Sonoma Valley, including the City of Sonoma and unincorporated portions of the county. The SVRWP, as described in the EIR, involved extending the recycled water pipelines from the SVCSD WWTP to deliver recycled water to increased numbers of property owners. It was anticipated that if fully constructed, the SVRWP could provide up to approximately 2,750 AF per year of recycled water and expand the acreage currently irrigated with reclaimed water from 3,600 acres to approximately 9,100 acres. The SVRWP EIR included project-level analysis of 34 miles of pipeline, construction of operational and capacity storage reservoirs adjacent to the SVCSD WWTP, and construction of one booster pump station and one distribution pump station. The EIR also examined provision of additional pond storage within the Sonoma Valley at a program level. Although the SVRWP EIR was certified, SVCSD has elected to implement only one of the proposed pipeline alignments.

The Phase 1 Implementation Plan includes specific elements of the SVRWP, including construction of 5.2 miles of pipeline, additional storage at the SVCSD WWTP and construction of additional pumping capacity for distribution. These facilities are consistent with those analyzed in the SVRWP EIR. The EIR was certified in December 2006 by the SVCSD Board of Directors.

- The facilities proposed under the Phase 1 Implementation Plan are shown in **Figure 2-5**. SVRWP Alignment 1A would consist of approximately 5.2 miles of pipeline in western Sonoma Valley. The main pipeline would originate from the SVCSD WWTP, extend southwest and then northwest through a vineyard to Arnold Drive. The pipeline would continue north along Arnold Drive to Orange Avenue, and extend north on Orange Avenue



SOURCE: USDA, 2005; CDM, 2008; and ESA, 2008

Note: Existing Facilities Not Shown

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Figure 2-5

Sonoma Valley Recycled Water Project Area
Phase 1 Projects

to Elm Avenue. The pipeline would then continue east on Elm Avenue, cross a field to Arnold Drive, extend north on Arnold Drive, and end just north of Leveroni Road. Secondary pipelines or segments would extend from the main pipeline on the following roadways: Highway 116, Watmaugh Road, and Leveroni Road.

Major roadways affected are identified in **Table 2-5**.

TABLE 2-5
SONOMA VALLEY RECYCLED WATER PROJECT – MAJOR ROADWAYS AFFECTED

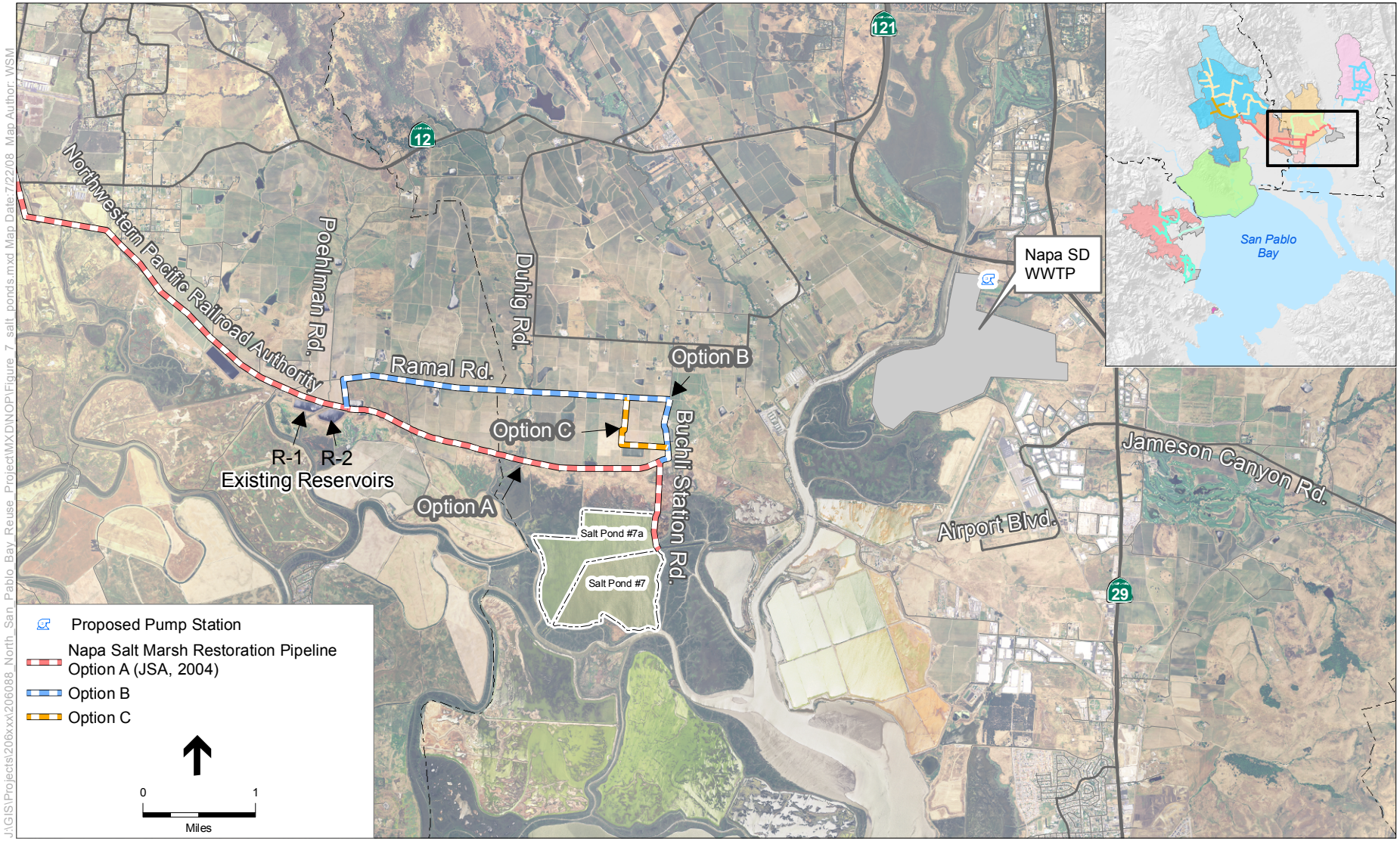
• Highway 116 (Stage Gulch Road)	• Broadway
• Arnold Drive (Orange Avenue)	• Petaluma Avenue
• Leveroni Road	• Grove Street
• W. Watmaugh Road	• Elm Avenue

SVCSD Napa Salt Pond Pipeline

The California Coastal Conservancy, U.S. Army Corps of Engineers, and California Department of Fish and Game have proposed and are implementing a salinity reduction and habitat restoration project for the 9,460-acre Napa River Unit of the Napa-Sonoma Marshes Wildlife Area. The Napa River Unit is located at the northeast edge of San Pablo Bay, adjacent to the Napa River. The purpose of the Napa River Salt Marsh Restoration Project, which was examined in an EIR/EIS that was approved in June 2004, is to restore a mosaic of habitats, including tidal habitats and managed ponds, and provide for better management of ponds in the Napa River Unit to support populations of fish and wildlife. An EIR/EIS was prepared and approved in June 2004. The Water Delivery Option examined as Phase 1 in the EIR/EIS at the project level includes the annual delivery of approximately 2,000 to 3,000 AF of tertiary recycled water from the SVCSD as an ongoing supply of non-saline water for restoration, with subsequent agricultural use.

Under Phase 1 of the NBWRP, SVCSD would construct a pipeline to provide recycled water to Pond 7 and 7A for habitat enhancement. Proposed facilities under the NBWRP's Phase 1 Implementation Plan include construction of a new pipeline from the existing SVCSD WWTP to the existing SVCSD storage reservoirs located near the intersection of the Northwestern Pacific Railroad Authority (NWPRA) and Ramal Road. Pumping would be provided by new pumps at the WWTP. The associated pipeline would include replacement of approximately 0.6 miles of aging pipe between the SVCSD WWTP and a junction structure along the NWPRA railroad line, and extending an 18-inch pipeline approximately 3.2 miles parallel to the existing 18-inch pipeline between the junction structure and the existing storage reservoirs. From the existing storage reservoirs, a new pipeline would be constructed approximately 4.0 miles (Option A) or 4.5 miles (Option B and C) to the existing salt pond mixing chamber (**Figure 2-6**). SCWA has identified three potential route options, which are described below.

- **Option A:** This option consists of installation of approximately 4.0 miles of 24-inch pipeline that would be installed from the reservoirs to Pond 7 and 7A. Approximately 1.0 mile of pipeline would extend from the reservoirs along the south side of NWPRA



SOURCE: USDA, 2005; CDM, 2008; and ESA, 2008

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-6

SVCSD Napa Salt Pond Pipeline
Phase 1 Project

railroad tracks to Skaggs Island Road, at which point the pipeline would cross to the south side of the railroad tracks and continue east along the south side of the railroad tracks for approximately 0.4 miles. At this point, the pipeline would cross to the north side of the railroad tracks and continue east along the north side of the railroad for approximately 0.9 miles, then cross to the south side of the railroad tracks. The pipeline would extend 1.7 miles until it reaches the access road for Ponds 7 and 7A, which includes pipeline installation south along the access road for approximately 4,200 feet, terminating at the mixing chamber. This option is consistent with the pipeline route reviewed in the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2004).

- **Option B:** This option consists of installation of 4.5 miles of a 24-inch pipeline from the reservoirs to the salt ponds. Approximately 0.25 miles of pipeline would be installed north along an access road to Ramal Road. The alignment would then extend 1.75 miles east along Ramal Road. At this point, the pipeline would transverse east along an agricultural access road for approximately 1.25 miles until it reaches Buchli Station Road. The pipeline would then run south on Buchli Station Road for approximately 1.25 miles, until it reaches the Huichica Creek entrance of the Napa-Sonoma Marshes Wildlife Area (NSMWA) and the access road for Ponds 7 and 7A.

- **Option C:** This option would consist of 4.7 miles, and would follow the above Option B route for approximately 3.0 miles (from the reservoir, east along the access road to Ramal Road, and along Ramal Road). However, the pipeline would then extend south approximately 0.3 miles to access an existing reservoir. At this point it would transverse 0.4 miles east to Buchli Station Road (Figure 2-6). The pipeline would run south on Buchli Station Road for approximately 1.0 mile, until it reaches the Huichica Creek entrance of the Napa-Sonoma Marshes Wildlife Area (NSMWA) and the access road for Ponds 7 and 7A.

Proposed facilities are shown in Figure 2-6. Major roadways affected are summarized in **Table 2-6**.

TABLE 2-6
NAPA SALT POND RESTORATION PIPELINES – MAJOR ROADWAYS AFFECTED

• Green Island Road	• Las Amigas Road
• Milton Road	• Buchlis Station Road
• Ramal Road	

Phase 1 would provide 889 AF of potable surface water offset: 147 AF in the Sonoma Valley Recycled Water Project, and 542 AF in the NMWD Urban Reuse Area, and 200 AF in Napa SD. This represents drinking water that will no longer be used for non-potable uses, thus ensuring the highest quality water is reserved for potable uses.

Napa Sanitation District

The *Recycled Water Expansion, Hydraulic and Preliminary Engineering Analysis, Phase 1 Report MST Area* (Brown and Caldwell, May 2007) provides a recycled water distribution system to address groundwater overdraft in the MST area of Napa County.

MST Area Project

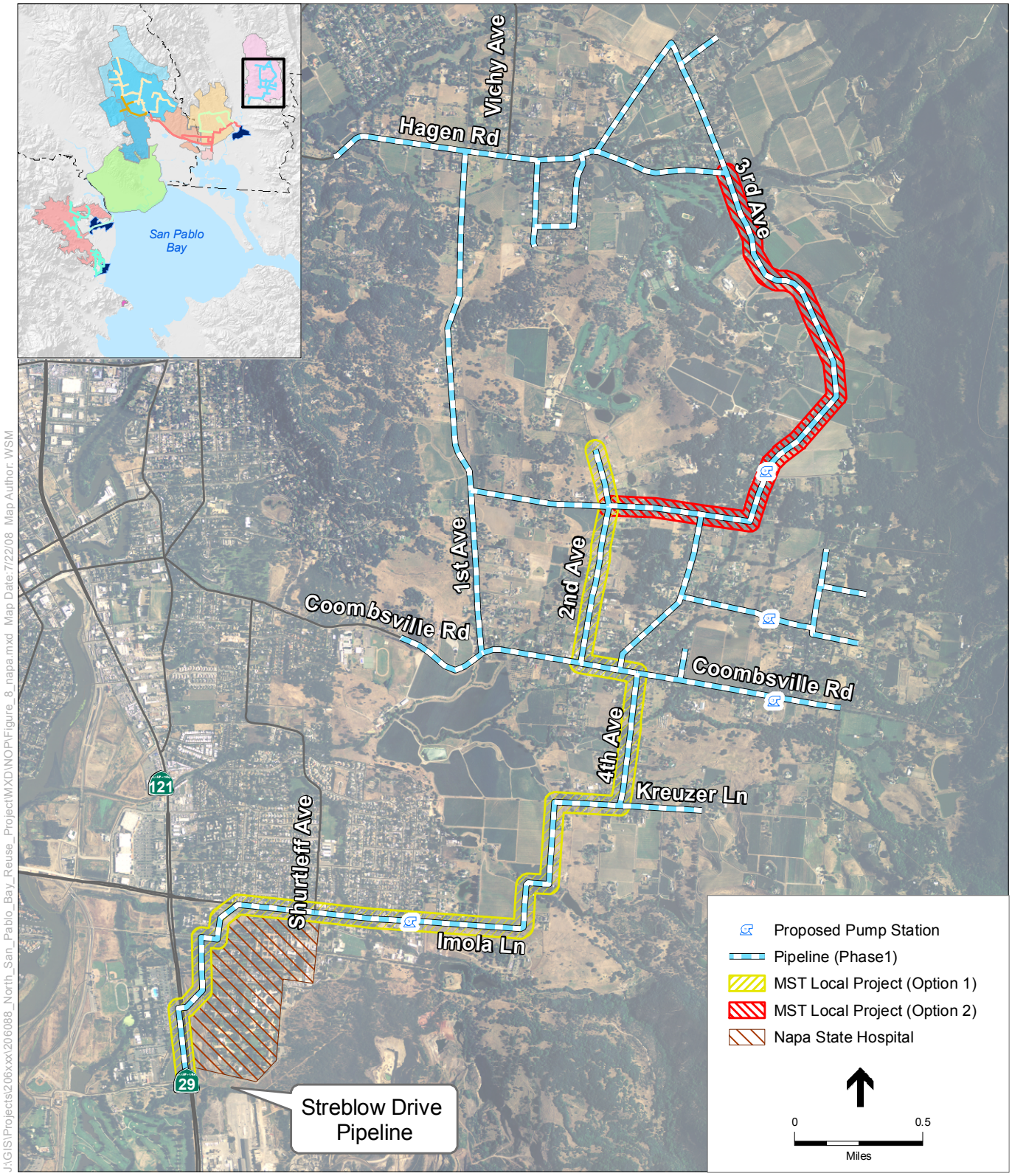
The MST Area Project would consist of 17.5 miles of new pipeline, four booster pump stations along the pipeline routes, and a new booster pump at the WWTP. The new pipeline would be installed from the end of the Streblow Drive pipeline through the Napa State Hospital grounds and north to the MST area (see **Figure 2-7**). A looped system using existing roadways would be constructed, with one segment extending west along First Avenue and the second segment extending east along Third Avenue; both segments would then merge along Hagen Road north of the Napa Valley Country Club. Four booster pump stations would be installed to maintain pressure throughout the distribution system, and an additional pump would be installed at the WWTP. Pump stations would be located on Imola, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Potential recycled water users include the Napa State Hospital, the Napa Valley Country Club, and agricultural and residential parcels along the proposed pipeline route. Major roadways that would be affected by pipeline installation are listed in **Table 2-7**.

TABLE 2-7
NAPA SD MST PIPELINE SYSTEM – MAJOR ROADWAYS AFFECTED

• Imola Avenue	• Second Avenue
• 4th Avenue	• Third Avenue
• Kreuzer Lane	• East 3rd Avenue
• Coombsville Road	• North Avenue
• Wild Horse Valley Road	• Olive Hill Lane
• First Avenue	• Loma Heights Road
• North 3rd Avenue	• Hagen Road

Implementation of service to the MST area would require expansion of the Napa SD WWTP's tertiary treatment capacity by 4.5 mgd. This would include expansion of the filtration system by installing parallel filter cells adjacent to the existing filter building at the Napa SD WWTP. The location of the existing and proposed filter facilities within the fence line of the existing WWTP is shown in **Figure 2-8**. No additional storage facilities would be required.

Under the MST Local Project, a more direct pipeline system extending north from Imola Avenue along 4th Avenue, Coombsville Road, and 2nd Avenue, terminating at the Napa Valley Country Club would be implemented. The MST Local Project includes two options: Option 1 would include installation of approximately 3.5 miles of pipeline, and one pump station. Option 2 would extend the pipeline an additional 2.2 miles to provide an alternate route to the County Club. These facilities are inclusive of those identified for the larger Phase 1 MST Project; as such, analysis of these facilities is included in the discussion of impacts relative to the Phase 1 MST Project.



SOURCE: USDA, 2005; CDM, 2008; and ESA, 2008

Note: Existing Facilities Not Shown

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Figure 2-7

Napa SD MST Area: Phase 1 Projects

0 400
Feet

SOURCE: GlobeXplorer

North Bay Water Reuse Authority . 206088

Figure 2-8
Napa MST Area - Soscol WWTP Tertiary
Filtration System Upgrade - Proposed Facilities

2.8 Action Alternatives

2.8.1 No Project Alternative

The No Project Alternative assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is identical to the No Action Alternative, identified below, and will be examined under that heading.

2.8.2 No Action Alternative

Analysis of a No Action Alternative provides decision makers with a benchmark against which to compare the magnitude of environmental effects of the action alternatives. The No Action Alternative represents a "future-without-project" scenario: a continuation of existing conditions for an estimation of the most reasonable future conditions that could occur without implementation of any action alternatives.

The "No Action Alternative" assumes that there would be no joint project among the member agencies. It represents the "current status" in which additional wastewater treatment capacity and water recycling occurs strictly from the implementation of local plans for expansion, and the potential need to develop additional potable water supplies continues to be a regional challenge. In general, each Member Agency would continue to implement individual recycling projects, subject to the availability of funding and completion of the CEQA process. The No Action Alternative would likely result in a smaller increment of water recycling projects within the region. For example, it is anticipated that SVCSD would implement only one of the four pipeline systems identified in the Sonoma Valley Recycled Water Master Plan EIR, based upon the ability to fund such construction. Similarly, it is anticipated that LGVSD and Napa SD would prioritize funding toward NPDES compliance, and would not implement recycled water projects. Additionally, the lack of federal funding may delay or preclude the implementation of individual planned projects, due to the need to increase user rates in order to provide funds for implementation. Specific projects that would have the greatest potential to be implemented under the No Action Alternative are below, and are shown in Figure 2-8:

- **LGVSD.** LGVSD would prioritize expenditures on projects that meet its NPDES permit requirements. For the purpose of this EIR/EIS, it is assumed that this strategy would result in no additional recycled water projects being implemented in the LGVSD service area.

- **Novato SD.** Novato SD and NMWD would pursue implementation of recycled water distribution facilities solely within the Novato North Service Area. This includes 4.4 miles of pipeline, a 0.5 mgd upgrade at the Recycled Water Treatment Facility, and one pump station at the intersection of Atherton and Olive.

- **SVCSD. Sonoma Valley Recycled Water Project – Alignment 1A:** This would include construction of approximately 5.2 miles of pipeline in the Sonoma Valley, with completion of a pump station at the SVCSD WWTP.

- **SVCSD. Napa Salt Pond Pipeline:** This would include construction of approximately 3.8 miles of pipeline from the SVCSD WWTP to the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds an additional 4.5 miles of new pipeline would be constructed to convey water to the salt pond mixing chamber. The pipeline and the pump station were discussed and analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2004) under the Water Delivery Project Component (Sonoma Pipeline) (see Figure 2-6). Potential route options would extend east along Ramal Road and south along Duhlig Road toward the ponds.

- **Napa SD.** Napa SD would prioritize expenditures on projects that meet its NPDES permit requirements. For the purpose of this EIR/EIS, it is assumed that this strategy would result in no additional recycled water projects being implemented in the Napa SD service area.

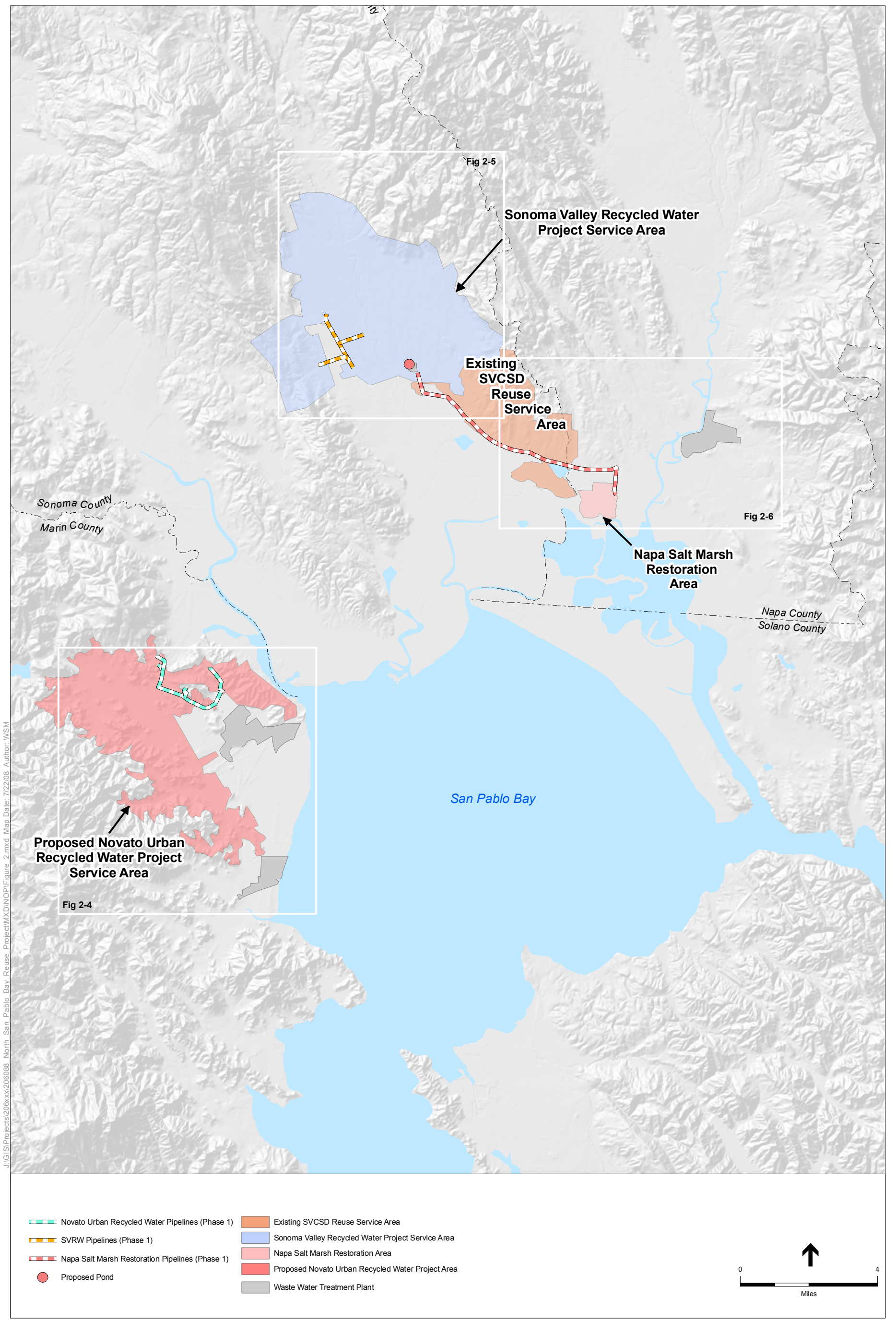
Facilities that would likely be implemented under the No Action Alternative are summarized in **Table 2-8**, and are shown in **Figure 2-9**. Planned treatment capacity levels are summarized in **Table 2-9** for each WWTP.

TABLE 2-8
NO ACTION ALTERNATIVE SUMMARY – FACILITIES BY MEMBER AGENCY

No Action		New Pipeline (miles)	New Demand (AFY)	Treatment Capacity Increase (mdg)	New Pump Station (HP)	New Storage (AF)
LGVSD	Peacock Gap	--	--	--	--	--
	NMWD URWP (South)	--	--	--	--	--
	Sears Point	--	--	--	--	--
Novato SD	NMWD URWP (North/Central)	4.4	193	0.5	250	x
	Sears Point	--	--	--	--	--
SVCSD	Southern Sonoma Valley	--	--	--	--	--
	Central Sonoma Valley	--	--	--	--	--
	Sonoma Valley (1A)	5.2	874	--	662	65
	Napa Salt Marsh[1]	7.9	--	--	--	--
Napa SD	Carneros East	--	--	--	--	--
	MST Area	--	--	--	--	--
	Napa (local)	--	--	--	--	--
	Napa Salt Marsh	--	--	--	--	--
Total		**17.5**	**1,067**	**0.5**	**912**	**65[1]**

1 Potential for 3,460 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type. Because this is a beneficial use that is not related to water supply, this number is tracked separately in each of the alternatives.
2 The total only represents new storage. The Proposed Action will rely on existing storage and retrofit existing facilities to accommodate storage needs, as identified in the Phase 3 Feasibility Report (CDM, 2008).

SOURCE: CDM, 2009.



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SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-9

No Action Alternative

Future Without the Project

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TABLE 2-9
SUMMARY OF WWTP DISCHARGE VOLUMES UNDER THE NO ACTION ALTERNATIVE (MGD)

	Napa	Sonoma	Novato	LGVSD	Total	Salt Ponds
Projected 2020 WWTP Discharge	6,338	3,644	6,658	2,257	18,897	0
No Action Discharge	6,338	2,882	6,574	2,257	18,052	3,460
No Action Reduction	**(0)**	**(762)**	**(84)**	**0**	**(845)**	**+ 3,460**

SOURCE: CDM, 2009; ESA, 2009.

As a joint EIR/EIS, this impact analysis will consider two baselines; the CEQA Baseline standard, which requires a project to review it impacts relative to "change from existing conditions," as well as the NEPA baseline standard, which requires a comparison between an Alternative and the conditions anticipated under the No Action Alternative, i.e., construction of the facilities identified above. Typically, the CEQA impact analysis will include the NEPA increment of impact, as the CEQA analysis requires a broader comparison between existing conditions and post-project conditions. Where appropriate, the NEPA increment of impact between the No Action Alternative and the Project Alternatives will be identified, and reviewed for significance.

2.8.2 Alternative 1 – Basic System

Alternative 1 – Basic System would expand recycled water programs currently in operation within each of the Member Agency service areas (see **Figure 2-10**). It puts greatest emphasis on the service of local demands by the individual WWTPs. Alternative 1 would provide 6,655 AFY of new recycled water for irrigation use and 5,825 AFY for habitat restoration, and would include installation of 83 miles of new pipeline, construction of facilities onsite at the existing WWTPs to provide an additional 7.5 mgd of tertiary treatment capacity, and development of approximately 1,020 acre-feet of new storage, primarily at existing or planned storage ponds at the WWTPs. The defining features of Alternative 1 are as follows:

- Each agency would put first priority on the delivery of recycled water to its local projects. Local projects include the NMWD Urban Reuse Project, the Sonoma Valley Recycled Water Project, and projects in the Napa Milliken-Sarco-Tulucay (MST) Creeks area, and the Carneros East areas. All WWTP treatment and distribution systems are sized and designed to serve their respective local users.

- Interconnectivity between WWTPs would only occur between SVCSD and Napa SD to serve the Napa Salt Marsh Restoration Area during the restoration period (less than 10 years); however, the two agencies do not plan to size or coordinate their facilities to share recycled water in other areas. After the restoration period has been completed, additional recycled water will be required for pond and habitat maintenance.

- LGVSD tertiary treatment capacity would be increased by 0.7 mgd through onsite improvements at the LGVSD treatment plant. Recycled water from LGVSD would be

supplied by NMWD to users in the southern portion of the Novato Urban Recycled Water Project area, including Hamilton Field. One existing 0.5-million-gallon (MG) water reservoir, Reservoir Hill Tank, in the southern portion of the Novato Urban Recycled Water Project area would be rehabilitated for recycled water use.

- Novato SD tertiary treatment would be increased by 1.2 mgd through onsite improvements at the Novato SD WWTP and decommissioning of the Novato SD Recycled Water Treatment Facility. Novato SD and NMWD would pursue implementation of recycled water distribution facilities within the Novato North and Central Service Areas. The Plum Street Tank is an existing 0.5 MG facility that would be rehabilitated for recycled water storage. The system includes 9.8 miles of pipeline.
- SVCSD would treat wastewater at its existing treatment plant and distribute recycled water to local users within its existing SVCSD reuse area (in Carneros West) in addition to the Sonoma Valley Recycled Water Project and Napa Salt Marsh Restoration areas. This alternative would include construction of a new recycled water storage reservoir near the SVCSD WWTP. Additionally, it is assumed that potential user reservoirs would also be utilized for recycled water storage. SVCSD would also implement additional 13.1 miles of SVRWP pipelines.
- Napa SD tertiary treatment would be increased by an estimated 5.9 mgd through onsite improvements at the WWTP. Recycled water from Napa SD would be supplied to users in the Napa MST Area, Carneros East Areas and Napa Salt Marsh Restoration Area. Existing ponds at the WWTP would be reconfigured for recycled water storage. Additionally, it is assumed that potential user ponds would also be utilized for recycled water storage.

Recycled Water Supply, Demand, and Discharge

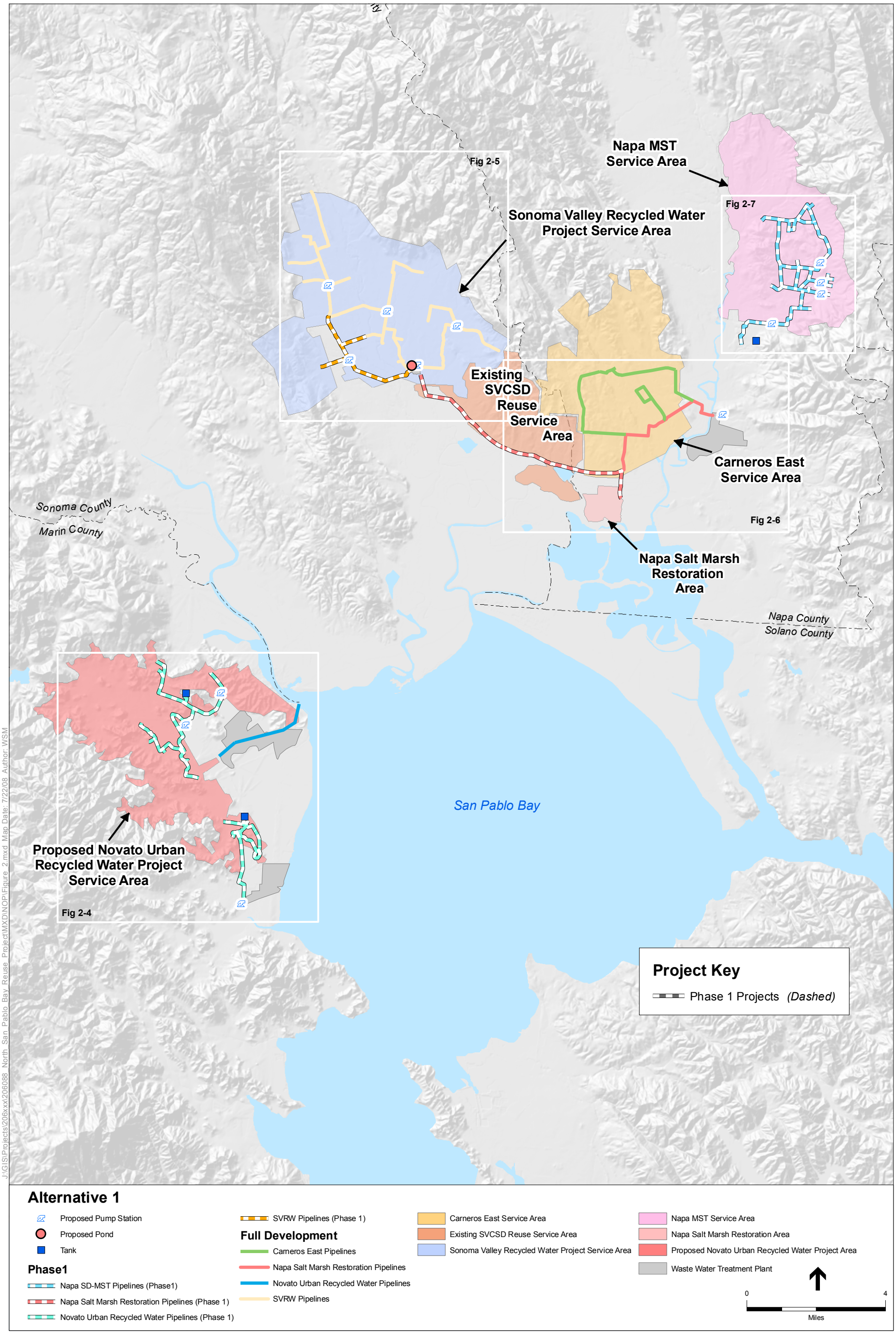
Table 2-10 summarizes the recycled water demand met in each WWTP service area and discharge to San Pablo Bay that would occur under Alternative 1. Each of the WWTPs currently serves some recycled water customers. **Table 2-10** presents this existing demand in acre feet (AF) for each service area, the additional demand that would be met under Alternative 1, and the total recycled water demand for Alternative 1.

TABLE 2-10
RECYCLED WATER SUPPLY, DEMAND, AND DISCHARGE UNDER ALTERNATIVE 1 (AFY)

WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand Developed for Alternative 1	Total Recycled Water Demand	Discharge to San Pablo Bay[(1)]
LGVSD WWTP	3,670	902	202	1,104	2,220
Novato SD WWTP	8,677	270	542	812	6,423
SVCSD WWTP	5,508	1,174	2,719	3,893	1,196
Napa WWTP	9,800	2,598	3,192	5,590	3,847
Total	**27,655**	**4,944**	**6,655**	**11,599**	**13,686**

1 Potential for 5,825 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

SOURCES: CDM, 2009; ESA, 2008



SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-10

Alternative 1: Basic System

Service Areas and Facilities

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System Requirements

Table 2-11 summarizes the proposed pipeline sizes and lengths for Alternative 1 that are shown in Figure 2-10.

TABLE 2-11
PROPOSED PIPELINES UNDER ALTERNATIVE 1

Pipeline Diameter (Inches)	LGVSD (miles)	Novato SD (miles)	SVCSD (miles)	Napa SD (miles)
4	--	--	4.92	--
6	2.25	0.60	9.42	3.39
8	0.81	2.15	4.43	7.68
10	--	2.60	4.10	1.81
12	2.81	0.67	0.53	7.21
14	--	--	2.20	--
16	--	0.71	--	1.67
18	--	5.72	3.54	1.27
24	--	--	0.97	3.53
30	--	--	--	4.57
36	--	--	3.61	--
48	--	--	--	--
Total	**5.88**	**12.44**	**33.72**	**31.14**

SOURCES: CDM, 2009; ESA 2008.

Table 2-12 presents the tertiary treatment capacity upgrades that would be implemented under Alternative 1. All WWTPs currently either have tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010. All WWTPs except SVCSD would need greater treatment capacity (approximately 32 million gallons per day (mgd) to meet the demands under Alternative 1.

TABLE 2-12
PROPOSED TREATMENT CAPACITY UPGRADES UNDER ALTERNATIVE 1

Facility	Tertiary Treatment Capacity without the Project (mgd)	Tertiary Treatment Capacity Required for Alternative 1 (mgd)	Tertiary Treatment Capacity Increase (mgd)
LGVSD	2.0	2.3	0.7
Novato SD	0.5	1.7	1.2
SVCSD	16.0	9.9	0.0
Napa SD	8.8	14.7	5.9
Total	**27.5**	**28.6**	**7.8**

SOURCES: CDM 2009; June 2008; ESA 2008

Table 2-13 summarizes the existing and additional recycled water storage needs (i.e., the volume in excess of existing available storage), which would be required under Alternative 1. The local project areas being served separately by LGVSD and Novato SD require less water during all months than will be treated at the two WWTPs; therefore, no storage of water is required to accommodate peak month demands, only the use of existing systems reservoirs as necessary for operational interests and system pressure management. The local project areas being served by SVCSD and Napa SD require more water during the peak summer months than each of the WWTPs is treating; additional water storage at the WWTPs, as anticipated by these Agencies' local project reports, is required to accommodate peak month demands. SVCSD will require additional new storage, and Napa SD will need to modify existing water storage basins for recycled water system use. Individual landowner ponds would be utilized throughout the reuse project areas to help offset the system storage required to serve users during peak-use periods.

TABLE 2-13
PROPOSED STORAGE FACILITIES UNDER ALTERNATIVE 1

	Volume (AF)			
Location	**Existing Storage**	**Proposed New Storage**	**Total**	**Comments**
LGVSD WWTP	0.0	0.0	0.0	None required at the WWTP
NMWD (South)	1.5	0.0	1.5	Retrofit of existing Plum Street Tank
Hamilton Field	1.5	0.0	1.5	Retrofit of existing Reservoir Hill Tank
Total for LGVSD	**3.0**	**0.0**	**3.0**	
Novato SD WWTP	0.0	0.0	0.0	
Total for Novato SD	**0.0**	**0.0**	**0.0**	
SVCSD WWTP	0.0	1,020.0	1,020.0	At the WWTP; requires land purchase
Existing SVCSD Reuse Area-1	625.0	0.0	625.0	Existing storage pond
Total for SVCSD	**625.0**	**1,020.0**	**1,645.0**	
Napa SD WWTP	950.0	0.0	950.0	Existing ponds at the WWTP to be reconfigured for recycled water storage; user ponds expected for some storage
Total for Napa SD	**950.0**	**0.0**	**950.0**	
Total	**1,578.0**	**1,020.0**	**2,598.0**	

SOURCES: CDM, 2009; ESA 2008.

Additional pump stations are needed throughout the system for distribution and to boost pressures to higher pressure zones. The locations of these pump stations are summarized below in **Table 2-14**.

Alternative 1 provides 1,183 AF of potable surface water offset in the project area: 147 AF in the Sonoma Valley Recycled Water Project, 746 AF in the NMWD Urban Reuse Area, and 200 AFY for Napa State Hospital and 90 AFY for Napa SD to deliver recycled water to a portion of Los Carneros currently served by the City of Napa potable water supply. This represents drinking water that will no longer be used for nonpotable uses, thus ensuring the highest quality water is reserved for potable uses.

TABLE 2-14
PROPOSED PUMP STATIONS UNDER ALTERNATIVE 1

Location (WWTP or Reuse Area)	Horsepower (hp)	Comments
LGVSD WWTP	71	
Total for LGVSD	**71**	
Novato WWTP	258	
Total for Novato SD	**258**	
SVCSD WWTP	872	
Existing SVCSD Reuse Area (Carneros West)	218	Existing pumps
Sonoma Valley Recycled Water Project	238	
Total for SVCSD	**1,328**	
Napa WWTP	663	
Napa WWTP	1,989	Existing pumps
MST Area	244	
Total for Napa SD	**2,896**	
Total	**4,553**	

SOURCES: CDM, 2009.

2.8.3 Alternative 2 – Partially Connected System

Alternative 2 – Partially Connected System involves development of a subregional recycled water system, taking advantage of increased storage capacity and additional pipelines under Alternative 1 to distribute recycled water more extensively throughout the project area (see **Figure 2-11**). Alternative 2 would provide 11,250 acre feet of new recycled water for irrigation uses and potentially 2,933 AFY for habitat restoration, and would include: installation of 140 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 15.9 mgd of tertiary treatment capacity, and development of approximately 2,220 acre-feet of storage, primarily at existing or planned storage ponds at the WWTPs. Alternative 2 would include those facilities previously identified for Alternative 1, in addition to the following features:

- Each agency would put first priority on the delivery of recycled water to its local projects. Additional local projects include the Peacock Gap Golf Course area, further development of the NMWD Urban Reuse Project, the Sonoma Valley Recycled Water Project, and projects in Napa MST, and the Carneros East areas.

- Interconnectivity between WWTPs would occur between SVCSD and Napa SD to serve the Napa Salt Marsh Restoration Area during the restoration period (less than 10 years) and into the maintenance period, and between Novato SD and LGVSD to serve the Sears Point Area.

- LGVSD would extend service to the Peacock Gap Golf Course Area, which would include: a new pipeline; use of additional conveyance capacity in the existing MMWD recycled water distribution system; use of existing available storage at the LGVSD WWTP, and rehabilitation of an existing 0.5-MG water reservoir near the Peacock Gap Golf Course.

- NMWD would install additional pipelines to serve to the northern, central, western, and Ignacio portions of the Novato Urban Recycled Water Project Area. An added recycled water pipeline from LGVSD would extend north to join a recycled water pipeline from Novato SD; the combined flow would continue east to jointly serve the Sears Point Area, with most of this flow originating from the Novato SD WWTP. One additional existing 0.5-MG drinking water reservoir (Norman Tank) would be modified for recycled water use, in the Ignacio portion of the Novato Urban Recycled Water Project Area. One new 0.5 MG storage reservoir would be constructed in the western portion of the service area.

- SVCSD would treat wastewater at its existing plant and distribute recycled water to local uses within its existing recycled water service area (Carneros West) in addition to the Sonoma Valley Recycled Water Project, Southern Sonoma Valley Service Area, and Napa Salt Marsh Restoration Area. This would include additional system storage in the Carneros West Area. Additionally, it is assumed that potential user ponds would also be utilized for recycled water storage.

- Napa SD would supply recycled water to an expanded Napa MST Area) to further help in reducing groundwater pumping in the region, deliver recycled water to potential users in southeast Napa, deliver recycled water to the expanded Carneros East Area (compared to Alternative 1), and to the Napa Salt Marsh Restoration Area. This alternative assumes existing ponds at the WWTP would be reconfigured for recycled water storage. Additionally, it is assumed that potential user ponds would also be utilized for recycled water storage.

Recycled Water Supply, Demand, and Discharge

Table 2-15 summarizes the recycled water demand met for each WWTP service area and discharge to San Pablo Bay that would occur under Alternative 2. Each of the WWTPs currently serves some recycled water customers. Table 2-15 presents this existing demand for each service area, the additional demand that would be met under Alternative 2, and the total recycled water demand met under Alternative 2.

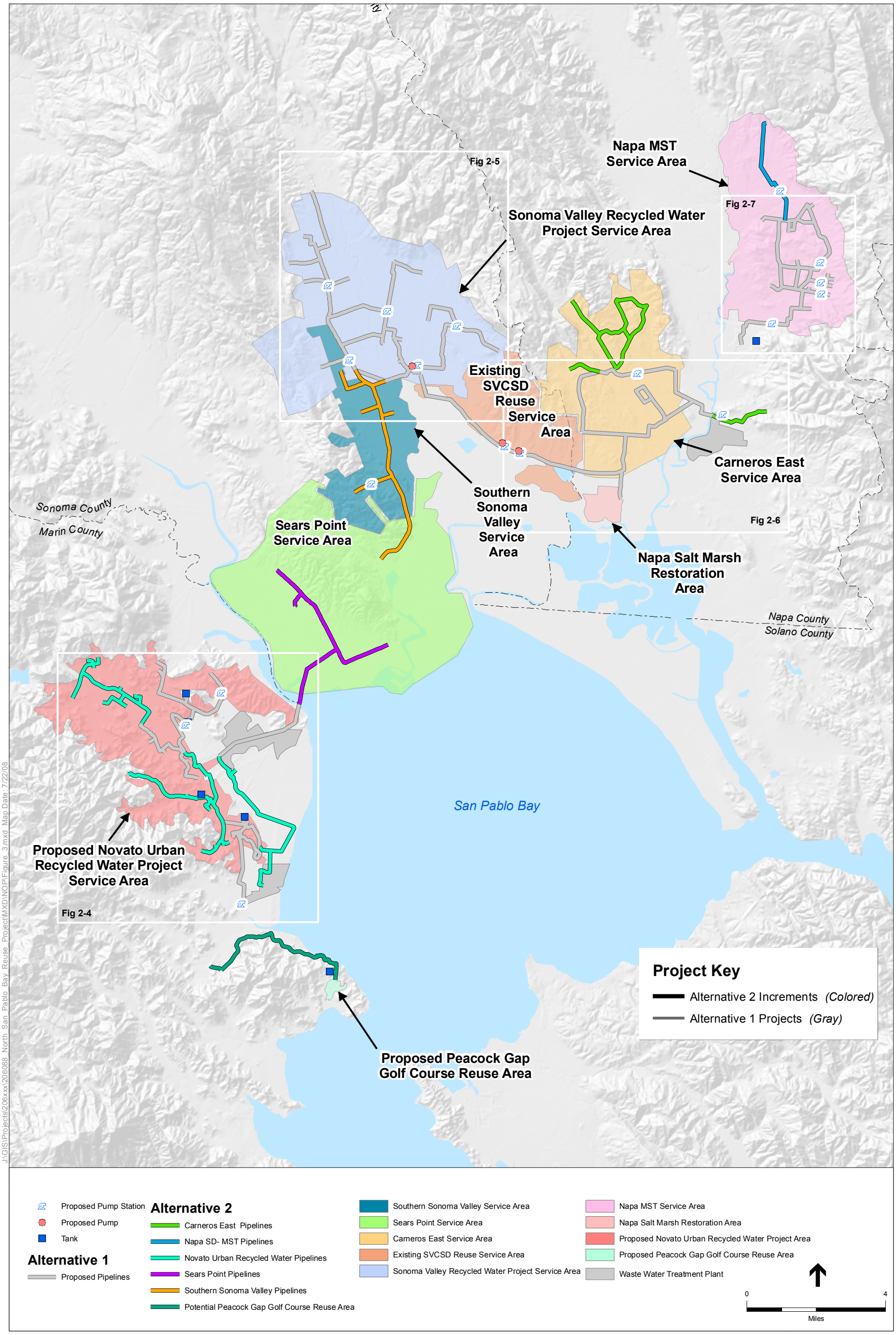
As shown in Table 2-15, assuming the provision of adequate storage, there is sufficient demand in the Sonoma areas such that those WWTPs could potentially recycled all WWTP inflow under Alternative 2.

TABLE 2-15
RECYCLED WATER SUPPLY, DEMAND, AND DISCHARGE FOR ALTERNATIVE 2 (AF)

WWTP Service Area	WWTP Inflow (2020)	Existing Recycled Water Demand	New Recycled Water Demand Developed for Alternative 2	Total Recycled Water Demand	Discharge to San Pablo Bay(1)
LGVSD WWTP	3,670	902	409	1,311	2,181
Novato SD WWTP	8,677	270	2,038	2,308	5,851
SVCSD WWTP	5,508	1,174	4,381	5,555	0
Napa SD WWTP	9,800	2,598	4,421	7,019	2,657
Total	**27,655**	**4,944**	**11,250**	**16,193**	**10,689**

1 Potential for 2,933 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

SOURCES: CDM, 2009; ESA 2008.



SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Recycled Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-11

Alternative 2: Partially Connected System

Service Areas and Facilities

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System Requirements

Table 2-16 summarizes the proposed pipeline sizes and lengths for Alternative 2 that are shown in Figure 2-5.

TABLE 2-16
PROPOSED PIPELINES UNDER ALTERNATIVE 2

Pipeline Diameter (Inches)	LGVSD (miles)	Novato SD (miles)	SVCSD (miles)	Napa SD (miles)
4	--	--	4.92	--
6	2.25	7.37	10.93	10.04
8	0.81	6.82	6.89	11.56
10	--	5.01	4.66	3.48
12	8.67	4.31	1.21	7.94
14	--	1.92	1.27	--
16	--	2.14	2.70	1.67
18	6.20	8.39	3.54	1.27
20	--	--	1.28	--
24	--	--	4.39	3.53
30	--	--	--	4.57
36	--	--	--	--
48	--	--	--	--
Total	**17.94**	**35.96**	**41.78**	**44.08**

SOURCES: CDM, 2009; ESA 2008.

Table 2-17 presents tertiary treatment capacity upgrades that would be implemented under Alternative 2, (Table 2-5). As stated earlier, all WWTPs currently either have some tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010. All WWTPs would need greater treatment capacity to meet the demands under Alternative 2.

TABLE 2-17
TREATMENT IMPROVEMENT REQUIREMENTS FOR ALTERNATIVE 2

Facility	Tertiary Treatment Capacity without the Project (mgd)	Tertiary Treatment Capacity Required for Alternative 2 (mgd)	Tertiary Treatment Capacity Increase (mgd)
LGVSD	2.0	3.3	1.2
Novato SD	0.5	5.4	5.1
SVCSD	16.0	16.2	0.0
Napa SD	8.8	18.4	9.6
Total	**27.3**	**43.2**	**15.9**

SOURCES: CDM, 2009; ESA 2009.

Table 2-18 summarizes the additional recycled water storage required under Alternative 2.

TABLE 2-18
PROPOSED STORAGE REQUIREMENTS FOR ALTERNATIVE 2

Location	Volume (AF) Existing Storage	Proposed New Storage	Total	Comments
LGVSD WWTP	200.0	0.0	200.0	Existing Site to be used
NMWD (South)	3.1	0.0	3.1	Rehabilitate existing reservoirs, Plum Street, Norman), plus new western service area 0.5 mgd tank
Hamilton Field	1.5	0.0	1.5	Rehabilitate existing Reservoir Hill Tank
Peacock Gap	1.5	0.0	1.5	Rehabilitate existing MMWD reservoir
Total for LGVSD	**206.2**	**0.0**	**206.2**	
Novato WWTP	3.1	0.0	3.1	Locate at existing WWTP
Total for Novato SD	**3.1**	**0.0**	**3.1**	
SVCSD WWTP	0.0	1,020.0	1,020.0	Requires land purchase
Existing SVCSD Reuse Area-1	00.0	1,200.0	1,200.0	New storage pond, requires land purchase
Existing SVCSD Reuse Area-1	625.0	0.0	625.0	Existing storage ponds
Total for SVCSD	**625.0**	**1,020.0**	**2,845.0**	
Napa WWTP	950.0	0.0	950.0	Existing ponds at the WWTP to be reconfigured for recycled water storage; user ponds expected for some storage.
Total for Napa SD	**950.0**	**0.0**	**950.0**	
Total	**1,784.3**	**2,220.0**	**4,004.3**	

SOURCES: CDM, 2009; ESA 2008

The addition of the Peacock Gap Golf Course to the areas served by LGVSD, compared to Alternative 1, increases the summer water demand to slightly above the flow treated at the WWTP during this season; therefore, LGVSD will need to utilize existing water storage basins at the WWTP for recycled water system use during the summer. An existing 0.5-MG reservoir near the Peacock Gap Golf Course will also be rehabilitated for recycled water storage and maintaining delivery pressure.

The local project areas being served separately by Novato SD require less water during all months than will be treated at the WWTP; therefore, no storage of water is required to accommodate peak month demands. An additional 1.0-MG reservoir is anticipated to be constructed at the WWTP; in combination with two other existing 0.5-MG system reservoirs, these tanks will be used as necessary for operational interests and system pressure management.

The local project areas being served by SVCSD and Napa SD require more water during the peak summer months than each of the WWTPs is treating; additional water storage at the WWTPs, as anticipated by these Agencies' local project reports, is required to accommodate peak month

demands. SVCSD will require additional new storage at the WWTP, as well as additional pond storage within the system to accommodate users added in the Southern Sonoma Valley Area. It is anticipated this additional pond storage would occur either at the WWTP or in the Carneros West area. Napa SD will need to modify existing water storage basins for recycled water system use.

Individual landowner ponds would be used throughout the reuse project areas. Figure 2-11 displays the recycled water system and locations for new storage development.

Additional pump stations are needed throughout the system for distribution and to boost pressures to higher pressure zones. The locations of these pump stations are summarized below in **Table 2-19**.

Alternative 2 provides 1,375 AF of potable surface water offset in the project area: 147 AF in the Sonoma Valley Recycled Water Project, and 938 AF in the NMWD Urban Reuse Area, 290 AFY in Napa SD. This represents drinking water that will no longer be used for nonpotable uses, thus ensuring the highest quality water is reserved for potable uses.

TABLE 2-19
PROPOSED PUMP STATIONS UNDER ALTERNATIVE 2

Location (WWTP or Reuse Area)	Horsepower (hp)	Comments
LGVSD WWTP	91	
Peacock Gap	0	Existing MMWD Pumps
Total for LGVSD	**91**	
Novato WWTP	586	
Total for Novato SD	**586**	
SVCSD WWTP	1,315	
Existing SVCSD Reuse Area (Carneros West)	52	New Pumps
Existing SVCSD Reuse Area (Carneros West)	218	Existing Pumps
Southern Sonoma Valley	260	
Sonoma Valley Recycled Water Project	192	
Total for SVCSD	**2,037**	
Napa WWTP	673	
Napa WWTP	2,020	Existing Pumps
Napa MST Area	382	
Carneros East	105	
Total for Napa SD	**3,180**	
Total	**6,115**	

SOURCES: CDM, 2009.

2.8.4 Alternative 3 – Regional System

Alternative 3 – Fully Connected System creates a regional system that connects all four WWTPs in the project area (see **Figure 2-12**). This alternative maximizes water reuse by allowing recycled water from any WWTP to be delivered to any area that needs recycled water. Since the majority of the demand for recycled water lies in the area near Sonoma and Napa, the regional interconnection achieved under Alternative 3 would allow the other WWTPs to help satisfy the

demand in this area. Alternative 3 would provide 12,761 acre feet of new recycled water for irrigation use and 3,085 AFY for habitat restoration, and would include: installation of 153 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 20.8 mgd of tertiary treatment capacity, and development of approximately 2,220 acre-feet of storage, primarily at existing or planned storage ponds at the WWTPs. Alternative 3 would consist of project elements proposed under Alternative 2 in addition to the following features:

- A series of pipelines would connect all four WWTPs to allow for potential maximum distribution and use of recycled water.
- Each agency would put first priority on the delivery of recycled water to its local projects. Local projects include the Peacock Gap Golf Course area, NMWD Urban Reuse Project, the Sonoma Valley Recycled Water Project, and projects in Napa MST and the Carneros East areas.
- Combined flow from Novato SD and LGVSD would serve the Sears Point Area and would be extended to the Southern Sonoma Valley. Most of this flow is anticipated to originate from Novato SD.
- SVCSD would extend service north of the Sonoma Valley Recycled Water Service Area to the Central Sonoma Valley Service Area.

Recycled Water Supply, Demand, and Discharge

Table 2-20 summarizes the recycled water demand that would be met in each WWTP service area and discharge to San Pablo Bay that would occur under Alternative 3. Each of the WWTPs currently serves some recycled water customers. Table 2-20 presents this existing demand for each service area, the additional demand that would be met under Alternative 3, and the total recycled water demand for Alternative 3.

TABLE 2-20
RECYCLED WATER SUPPLY, DEMAND, AND DISCHARGE FOR ALTERNATIVE 3 (AF)

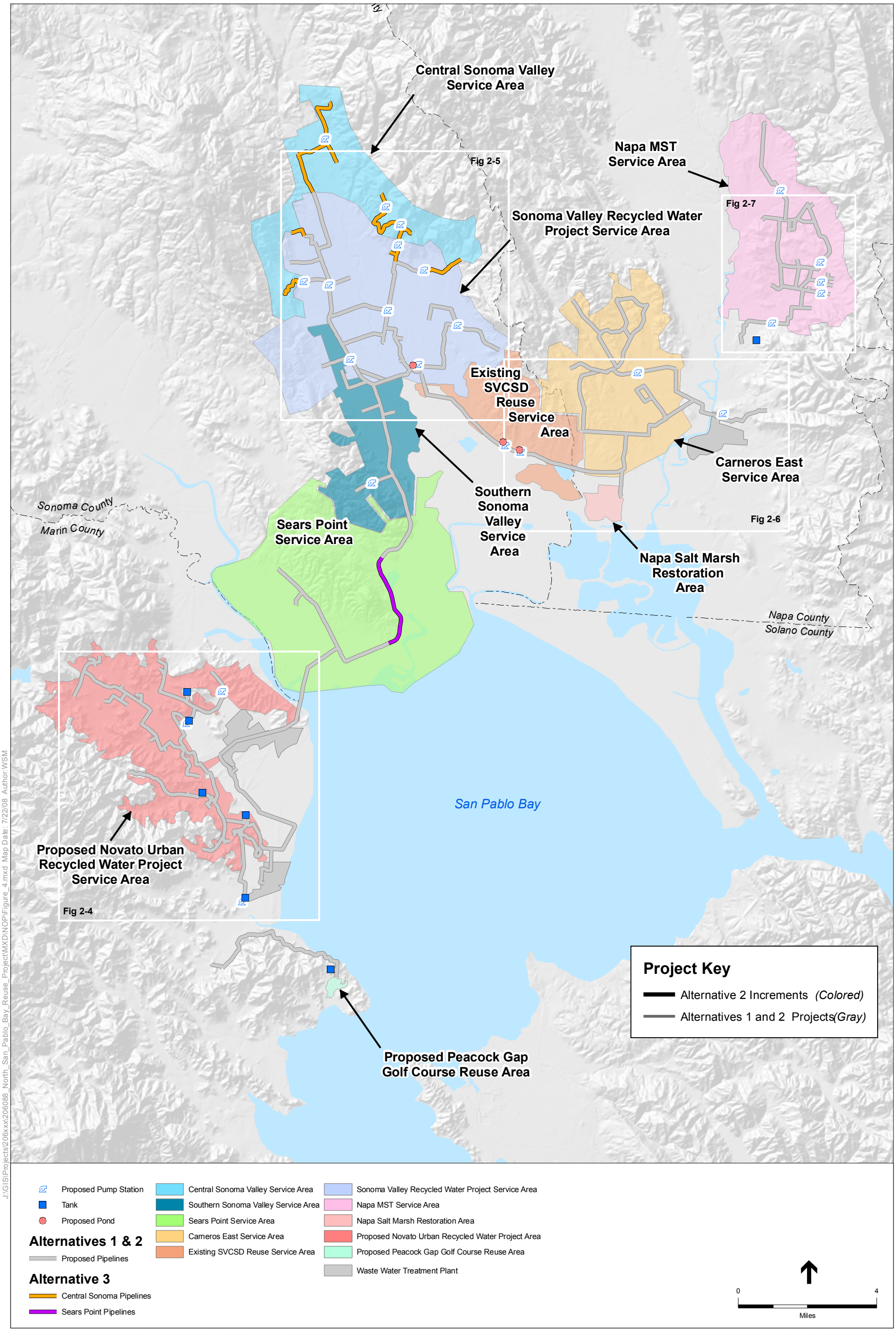
WWTP Service Area	WWTP Inflow	Existing Recycled Water Demand	New Recycled Water Demand Developed for Alternative 3	Total Recycled Water Demand	Discharge to San Pablo Bay(1)
LGVSD WWTP	3,670	902	409	1,311	2,181
Novato SD WWTP	8,677	270	3,701	3,971	4,706
SVCSD WWTP	5,508	1,174	4,230	5,404	0
Napa WWTP	9,800	2,598	4,421	6,819	2,657
Total	**27,655**	**4,944**	**12,761**	**17,705**	**9,543**

1 Potential for 3,085 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

SOURCES: CDM, 2009; ESA 2008.

System Requirements

Table 2-21 summarizes the proposed pipeline sizes and lengths for Alternative 3 shown in **Figure 2-12**.



J:\GIS\Projects\206xxx\206088_North_San_Pablo_Bay_Reuse_Project\MXD\NOP\Figure_4.mxd Map Date: 7/22/08 Author:WSM

SOURCE: CDM, 2008; ESRI, 2006; and ESA, 2008

Note: Existing Recycled Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 2-12

Alternative 3: Fully Connected

Service Areas and Facilities

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TABLE 2-21
PROPOSED PIPELINES ALTERNATIVE 3

Pipeline Diameter (Inches)	LGVSD (miles)	Novato SD (miles)	SVCSD (miles)	Napa SD (miles)
4	--	--	3.51	
6	2.25	7.69	12.51	9.72
8	0.81	5.70	5.43	11.88
10	--	5.57	4.40	3.48
12	8.67	12.56	4.56	7.94
14	--	1.92	2.97	--
16	--	4.84	1.47	1.67
18	6.20	8.39	3.83	1.27
20	--	0.41	0.87	0.92
24	--	--	4.39	3.53
30	--	--	--	4.57
36	--	--	--	--
48	--	--	--	--
Total	**17.94**	**47.08**	**43.94**	**43.72**

SOURCES: CDM, 2009; ESA 2008.

Table 2-22 presents figures on treatment upgrades required to implement Alternative 3. All WWTPs currently either have some tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010, and all but SVCSD will need to increase their treatment capacity to meet the demands of Alternative 3.

TABLE 2-22
TREATMENT IMPROVEMENT REQUIREMENTS FOR ALTERNATIVE 3

Facility	Tertiary Treatment Capacity without the Project (MGD)	Tertiary Treatment Capacity Required for Alternative 3 (MGD)	Tertiary Treatment Capacity Increase (MGD)
LGVSD	2.0	2.8	1.2
Novato SD	0.5	10.5	10.0
SVCSD	16.0	15.5	0.0
Napa SD	8.8	18.4	9.6
Total	**27.3**	**47.7**	**20.8**

SOURCES: CDM, 2009; ESA 2008.

The increased recycled water demands reflected in Alternative 3 requires that all WWTPs provide some amount of secondary effluent storage for treatment and use during the peak summer period. **Table 2-23** summarizes the recycled water storage needs required under Alternative 3.

TABLE 2-23
PROPOSED STORAGE FACILITIES UNDER ALTERNATIVE 3

Location	Volume (AF)			Comments
	Existing Storage	Proposed New Storage	Total	
LGVSD WWTP	200.0	0.0	200.0	Existing storage ponds to be used
NMWD (South)	3.1	0.0	3.1	Rehabilitated existing reservoirs
Hamilton Field	1.5	0.0	1.5	Rehabilitate existing reservoir
Peacock Gap	1.5	0.0	1.5	Rehabilitate existing reservoir
Total for LGVSD	**206.1**	**0.0**	**206.1**	
Novato WWTP	437.0	0.0	437.0	Existing storage ponds to be used
Novato WWTP	3.1	0.0	3.1	
Total for Novato SD	**440.1**	**0.0**	**440.1**	
SVCSD WWTP	0.0	1,020.0	1,020	Requires land purchase
SVCSD Reuse Area	625.0	0.0	625	Existing storage ponds
SVCSD Reuse Area	0.0	1,200.0	1,200	New Storage ponds; require land purchase
Total for SVCSD	**625.0**	**2,220.0**	**2845**	
Napa SD WWTP	950.0	0.0	950	Existing ponds at the WWTP to be reconfigured for recycled water storage; user ponds expected for some storage
Total for Napa SD	**950.0**	**0.0**	**950**	
Total	**2,221.3**	**2,220.0**	**4,441.2**	

SOURCES: CDM, 2009; ESA 2008

The addition of the Peacock Gap Golf Course to the areas served by LGVSD, compared to Alternative 1, increases the summer water demand to slightly above the flow treated at the WWTP during this season; therefore, LGVSD will need to utilize existing water storage basins at the WWTP for recycled water system use during the summer. An existing 0.5-MG reservoir near the Peacock Gap Golf Course will also be rehabilitated for recycled water storage.

The addition of the Sears Point and Southern Sonoma Valley Areas, compared to Alternatives 1 and 2, increases the summer water demand above the flow treated at the Novato SD WWTP during this season; therefore, Novato SD will need to utilize existing water storage basins for recycled water system use during the summer. An additional 1.0-MG reservoir is assumed to be constructed at the WWTP; in combination with the retrofit of two other existing 0.5-MG system reservoirs, these tanks will be used as necessary for operational interests and system pressure management.

The local project areas being served by SVCSD and Napa SD require more water during the peak summer months than each of the WWTPs is treating; additional water storage at the WWTPs, as anticipated by these Agencies' local project reports, is required to accommodate peak month demands. SVCSD will require additional new storage at the WWTP, as well as additional pond storage within the system to accommodate users added in the Central Sonoma Valley Service Area. It is anticipated this additional pond storage would occur either at the WWTP or in the

Carneros West area. Napa SD will need to modify existing water storage basins for recycled water system use.

Individual landowner ponds would be utilized throughout the reuse project areas. Table 2-23 displays the recycled water system and locations for new storage development.

Additional pump stations are needed throughout the recycled water system for distribution and to boost pressures to higher pressure zones. The locations of these pump stations are shown on Figure 2-12 and are summarized in **Table 2-24**.

TABLE 2-24
PROPOSED PUMP STATIONS UNDER ALTERNATIVE 3

Location (WWTP or Reuse Area)	Horsepower (hp)	Comments
LGVSD WWTP	203	
Peacock Gap	221	Existing MMWD Pumps
Total for LGVSD	**424**	
Novato WWTP	706	
Southern Sonoma Valley	260	
Total for Novato SD	**966**	
SVCSD WWTP	1,649	
Central Sonoma Valley	409	
Existing SVCSD Reuse Area (Carneros West)	61	New Pumps
Existing SVCSD Reuse Area (Carneros West)	218	Existing Pumps
Southern Sonoma Valley	0	
Sonoma Valley Recycled Water Project	575	
Total for SVCSD	**2,912**	
Napa WWTP	672	New Pumps
Napa WWTP	2,016	Existing Pumps
Napa MST Area	382	
Carneros East	105	
Total for Napa SD	**3,175**	
Total	**7,477**	

SOURCES: CDM, 2009; ESA 2008

Alternative 3 provides 1,375 AF of potable surface water offset in the project area: 147 AF in the Sonoma Valley Recycled Water Project, and 938 AF in the NMWD Urban Reuse Area, 290 AFY in Napa SD. This represents drinking water that will no longer be used for nonpotable uses, thus ensuring the highest quality water is reserved for potable uses.

2.9 Construction

For the purposes of this EIR/EIS, impact analysis assumes that pipeline installation associated with the implementation of individual projects would be within existing roadway or railroad rights-of-way. As appropriate those pipeline segments that would intersect potentially jurisdictional features and sensitive species habitat are identified in Section 3.0, Impact Analysis.

2.9.1 Recycled Water Pipelines

Construction of the proposed recycled water pipelines would involve one of the four potential methods: trenching; jack and bore tunneling; directional drilling; or suspending the pipe (such as in the presence of a bridge). These techniques are shown in **Figure 2-13**. In the first three methods, the proposed recycled water pipelines would be installed beneath the ground surface or underneath the existing roads, while in the fourth method the proposed recycled water pipeline might be attached to an existing bridge and would remain aboveground. Interruptions to existing utilities such as sewer lines or other pipelines would be minimized. In some areas, recycled water pipeline construction would require lane closures along roadways.

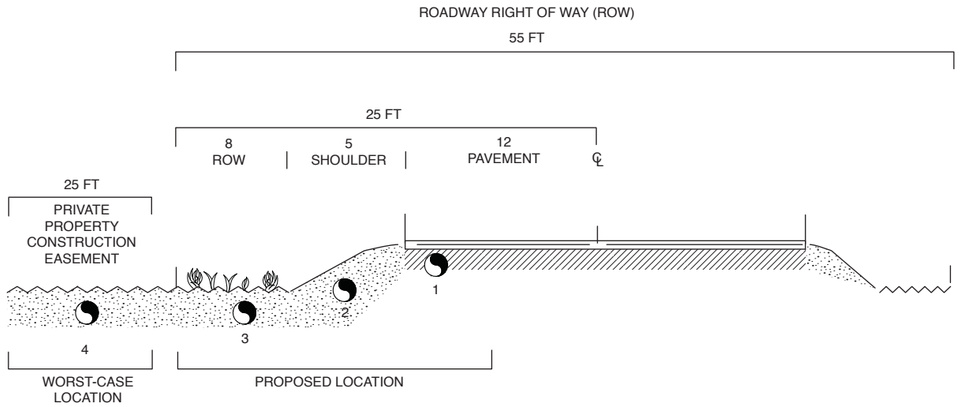
Trenching

Trenching is a conventional cut-and-cover construction technique. At sites with non-native species or no sensitive biological resources present, the recycled water pipelines would be installed using open-cut trenching. The trenching technique includes clearing of the construction site, saw cutting of the pavement where applicable, trench excavation, pipe installation, backfill operations, and re-paving where applicable. In undeveloped areas, an approximately 50-foot wide corridor for construction would be utilized to maximize construction efficiency. Sufficient space would be available to allow the contractor to store the excavated soil to the side of the trench, install the pipe, and backfill the trench reusing the soil. Pipes would be staged along the alignment in advance of the recycled water pipeline installation. In areas encumbered by existing improvements, high-volume roadways, or environmentally sensitive areas, a narrower construction corridor of approximately 25 feet would be used.

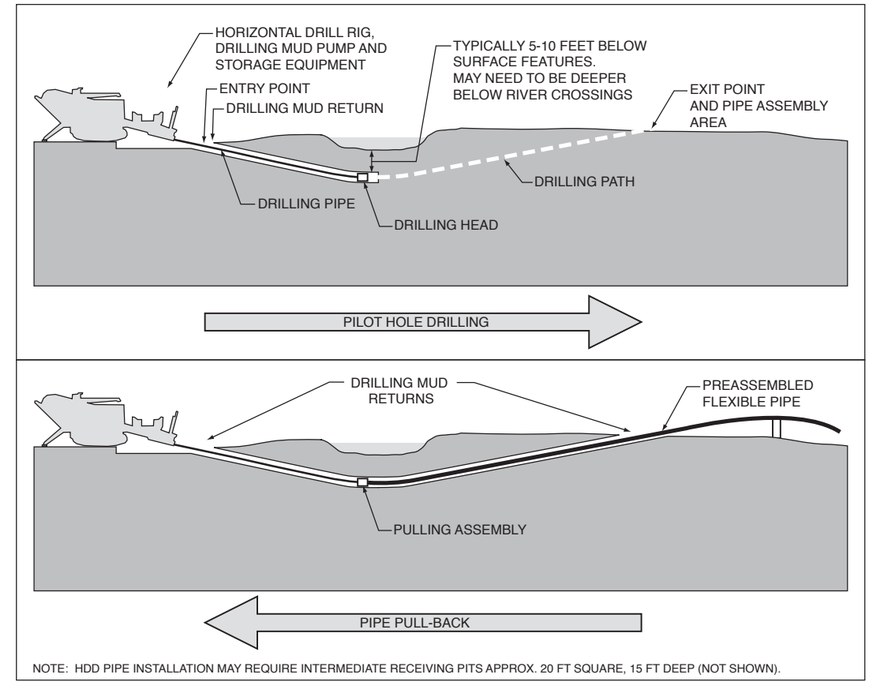
The estimated trench width for a 14-inch-diameter recycled water pipeline (average size) would be approximately 30 inches and estimated trench depth would be approximately 56 inches; however the dimensions would vary with the location along the route and the diameter of the pipeline. Recycled water pipeline construction would occur at a rate of approximately 300–400 feet per day where the pipelines would cross open land or low-use sections of roadways. In more developed areas, where there are narrow construction corridors, higher traffic volumes, and more utilities, the construction rate is expected to average approximately 100–200 feet per day.

Spoils, excluding asphalt and concrete, will be retained for replacement to avoid soil importation and reduce truck trips. Only contaminated spoils will be excavated along roadways and be hauled off site to appropriate disposal facilities. Backfill material would be imported if necessary. In open space areas, native excavated soils would be retained for backfill.

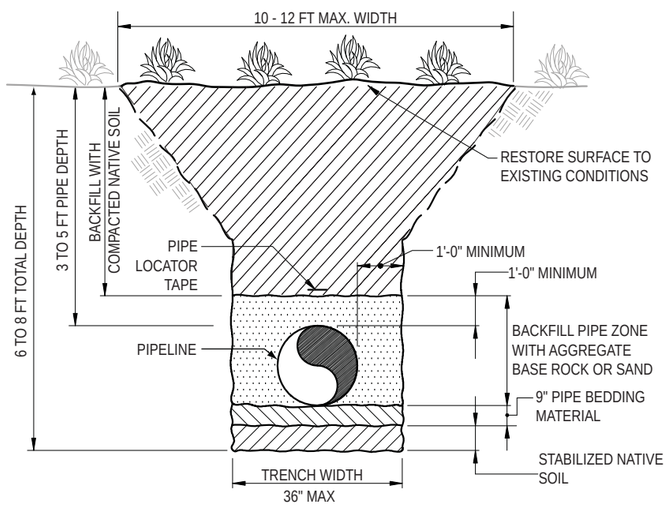
During construction, vertical wall trenches would be temporarily closed at the end of each work day, either by covering with steel trench plates, backfill material, or installing barricades to restrict access depending on physical conditions and conditions of the encroachment permit (along roadways). If the area is paved prior to construction, a temporary patch or covering would be used until final repaving of the affected area occurs. Final paving would occur approximately two to six weeks after recycled water pipeline construction is complete within a given road segment.



Example Pipeline Placement in Roadway Right of Way;
Local requirements may vary.

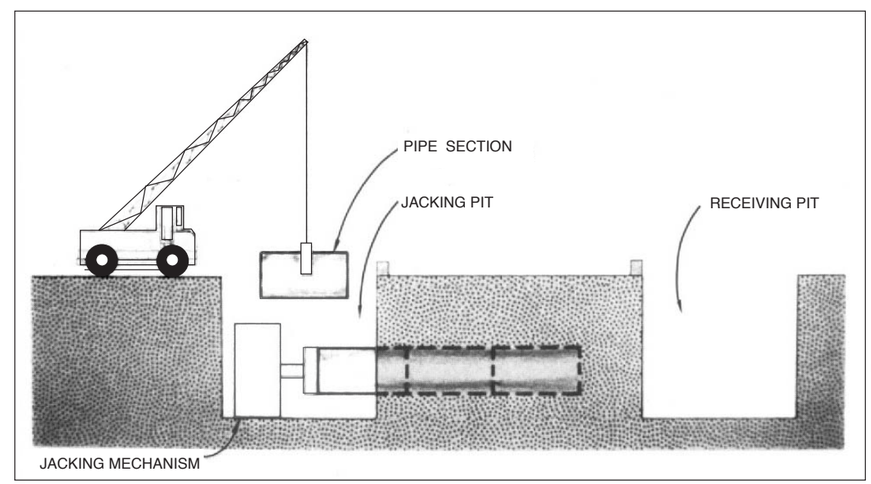


Typical Horizontal Directional Drill Operation



Example Open-cut Trench Section;
Local requirements may vary.

NOTE:
DEWATERING AND TRENCH SHORING NOT SHOWN



Typical Bore And Jack Pipeline Installation Special Construction Locations

SOURCE: RMC Inc.; Brown and Caldwell; Nolte

Figure 2-13
Construction Techniques

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Jack and Bore Tunneling

Jack and bore tunneling could be employed in areas where open cut trenching is not feasible due to limited construction area, geotechnical conditions, railroad crossings, major road crossings, or presence of sensitive biological resources such as wetlands or riparian habitat. Jack and bore tunneling is a trenchless construction method that would be utilized for installing underground pipelines for short distances without disturbing the ground surface. This method employs a horizontal boring machine or an auger that is advanced in a tunnel bore to remove material ahead of the pipe. Powerful hydraulic jacks are used to push pipe from a launch (jacking) pit to a receiving pit. As the tunneling auger is driven forward, a jacking pipe is added into the pipe string. Each bore and jack undercrossing would require a jacking pit measuring approximately 30 feet by 10 feet. The temporary pits typically would be excavated to a maximum depth of 20 feet. Recycled water pipeline installation by this method would require approximately one to two weeks per waterway crossing; excavated soils would be retained for backfill.

Directional Drilling

Horizontal directional drilling is another trenchless construction method that could be used for installing underground pipelines without disturbing the ground surface. Using a horizontal drill rig, the pipeline is installed in two stages: (1) a small diameter pilot hole is directionally drilled along a designed directional path, and (2) the pilot hole is then enlarged to a diameter that would accommodate the pipeline and the pipeline would be pulled back through the enlarged hole. Slurry, typically bentonite (an inert clay), is used as a drilling lubricant and processed by separating solids from the slurry and discharging the clear liquid to waterways or storm drains.

Recycled water pipeline installation by this method would require approximately one to two weeks per waterway crossing. Any unused excavated soils would be hauled off site.

Recycled Water Pipeline Suspension

Pipeline suspension is a fourth construction alternative for recycled water pipeline installation and could occur at locations with bridges that cross streams. Pipeline construction at these crossings could occur by installing the pipeline in the structural supports underneath or on the sides of the bridges. Design of a bridge crossing (e.g., pipe material and placement) would be determined during the design phase, once the engineers consult with the bridge’s proprietor and review the design specifications of the bridge.

Pipeline installation by this method would require approximately one to two weeks per bridge crossing. No excavation would be required.

Surface Restoration

The final phase of pipeline construction would be surface restoration. In areas where pipe is installed along roadways, repaving would be the final step. Where temporary patching was performed, permanent repaving would be the final step. Final repaving would be performed either after the entire pipe construction is complete or after segments of pipe construction are complete.

Unpaved surfaces would be restored by replanting native grasses. A permanent right-of-way of approximately 20-30 feet would be needed for the pipelines in areas outside of the roadways.

2.9.2 Storage Facilities

Construction of the new open storage reservoirs would include site preparation and clearing, excavation, earth movement, liner placement, embankment construction, and hydro-seeding. Assuming a surface storage facility of approximately 50 acre-feet, approximately 100,000 cubic yards of material would be excavated to a depth of approximately six feet. Approximately 20,000 cubic yards would be used to build embankments; the remaining 80,000 cubic yards would be balanced on-site. Approximately 10-15 crew members would be needed for construction. Construction of each storage reservoir is estimated to take approximately eight months..

2.9.3 Booster Pump Station and Distribution Pump Station

Survey staking would be used to define the limits of the construction for proposed booster pump stations. Following rough grading, additional excavation or filling would bring the site to final grade and prepare the soil for underground piping and structural slabs. Site work would involve installing manholes, valve pits, structural foundations, curbs, site drainage, fencing, and sidewalks. After the structure has been erected and roofed, electrical equipment (e.g., machinery control consoles, panels, switchboards, lighting, etc.) would be installed. Site work such as installing pull boxes, conduits, and cables would continue. Pumps would be installed and piped through the process facilities. Approximately five crew members would be needed for construction. Construction of each booster pump station is estimated to take approximately six months.

2.9.4 Staging Areas

At various locations within the construction zones, staging areas would be required to store pipe, construction equipment, and other construction related items. Staging areas would be established in areas near construction zones that are open and easily accessed (e.g., vacant lots). In some cases, staging areas may be used for the duration of the NBWRP. In other cases, as pipeline construction moves along the route, the staging area may also be moved along and within the route to minimize hauling distances and avoid disrupting any one area for extended periods of time. Contractors are expected to negotiate short-term temporary easements for staging areas. The location of the staging areas would be determined by the contractor and would typically be located every three miles along the pipeline alignment. Generally the staging areas would be located in previously disturbed or non-vegetated areas with protection barriers to adjacent sensitive areas. The maximum size of these staging areas would be approximately one acre. Additional staging areas could be located within the 25-foot construction corridor along the pipeline alignment. Staging areas would avoid wetlands and riparian areas, using them only as a last resort and fully restoring them after use.

2.9.5 Construction Equipment

Construction would involve grading, excavation, structural erection, and backfilling at the NBWRP sites. Energy efficient equipment would be used wherever feasible. Heavy construction could include the following equipment:

- Tunnel boring machine
- Pavement saw
- Jack hammers
- Back hoe
- Front-end loaders
- 10-wheel dump trucks
- Flat-back delivery truck
- Sweepers
- Crane
- Compactor
- Water truck
- Trench shields
- Air compressors
- Concrete trucks
- Concrete pumper trucks
- Welding trucks
- Side boom pipe handler tractor
- Earth movers
- Bulldozers
- Excavators
- Road grader (for widening at detours along shoulders
- Paving equipment: back hoe, asphalt hauling trucks, compactors, paving machine, rollers

2.10 Operation and Maintenance

Operation of the NBWRP would involve operation and maintenance of the proposed facilities in addition to the existing WWTPs.

2.10.1 Recycled Water Pipelines

The proposed recycled water pipelines would be primarily operated from May through October; in times of drought the pipelines may be in operation on a year-round basis. The recycled water would be provided from the WWTPs. In the event the existing recycled water users' demand is greater than the supply, additional recycled water would be supplied from the existing and proposed storage reservoirs.

2.10.2 Storage Reservoirs

Typically, the proposed reservoirs would store recycled water from the WWTPs in spring. The stored water would be delivered to users during summer and fall.

2.10.3 Pump Stations

The pump stations would generally operate from May through October; in times of drought, these facilities may operate on a year-round basis.

2.10.4 Maintenance

Currently the member agencies' staff performs daily inspections of the water recycling facilities including pump stations; electrical control equipment; tide and slide gates; motor control center; valves and appurtenances; and pond floats and cell sites. Through preventative maintenance, the inspections are conducted either annually, semi-annually, monthly, and/or weekly. The staff at the WWTPs would perform similar preventative maintenance of the proposed recycled water pipelines, storage reservoirs, and pump stations.

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CHAPTER 3

Affected Environment / Environmental Setting, Environmental Consequences / Impacts, and Mitigation Measures

This chapter provides the affected environment or environmental setting for different environmental resources and the applicable regulations on the federal, state, and local level that would apply to the North Bay Water Recycling Program (NBWRP). This chapter describes the environmental consequences or impacts that could result from the implementation of the NBWRP. A discussion is provided for the individual Member Agencies (i.e., LGVSD, Novato SD, SVCSD, and Napa SD).

The impacts are analyzed for construction and operation of the NBRWP for the individual member agencies in compliance with both CEQA and NEPA. Phase 1 impacts are discussed at project level and impacts from the Action Alternatives are discussed at program level. A generic impact discussion is followed by specific impacts discussed in the following format:

> *No Project Alternative*: The No Project Alternative assumes that the proposed project is not implemented, and reviews two scenarios: 1) consideration of existing conditions without the project, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the project. This second scenario is equivalent to the No Action Alternative, identified below, and throughout this EIR/EIS, will be examined under that heading.
>
> *No Action Alternative*: This alternative would review a future without the project scenario, and would include implementation of a subset of the recycled water projects proposed under the NBWRP. The No Action Alternative represents the NEPA baseline, against which the impacts of the Action Alternatives identified below will be compared.
>
> *Phase 1 (Project level)*: Phase I includes projects that each Member Agency has defined to a level of detail that allows for project-level environmental review.
>
> *Alternative 1: Basic System (Program level)* – Alternative 1 would involve projects that would be implemented under Phase 1 and additional components proposed by each Member Agency. These additional components will be analyzed at a program level.
>
> *Alternative 2: Partially Connected System (Program level)* – Alternative 2 would involve projects that would be implemented under Alternative 1 and additional components proposed by each Member Agency. These additional components will be analyzed at a program level.

Alternative 3: Fully Connected System (Program level) – Alternative 3 would involve projects that would be implemented under Alternative 2 and additional components proposed by each Member Agency. These additional components will be analyzed at a program level.

As discussed in Chapter 1, Introduction, the level of significance is provided for each impact as applicable under CEQA. In case of any potentially significant impact, mitigation measures are identified that would minimize the impact to less-than-significant level. Determinations of significant made in this EIR/EIS apply only to CEQA, not to NEPA, which does not require such determinations. While CEQA requires a determination of impact significance for each impact discussed in an EIR based on the significance criteria, NEPA does not require this for an EIS. Under NEPA preparation of an EIS is triggered if a federal action has the potential to "significantly affect the quality of the human environment," which is based on the context and intensity for each potential impact. The significance thresholds used in this EIS/EIR also encompass the factors taken into account under NEPA to evaluate the context and the intensity of the effects of an action.

NEPA and CEQA Baselines

As a joint EIR/EIS, the impact analysis considers two baselines; the CEQA baseline standard, which requires a project to review its impacts relative to "change from existing conditions," as well as the NEPA baseline standard, which requires a comparison of project impacts relative to future conditions without the project. Typically, the CEQA impact analysis will include the NEPA increment of impact, as the CEQA analysis requires a broader comparison between existing conditions and post-project conditions. Where appropriate, the NEPA increment of impact between the No Action Alternative and the Project Alternatives will be identified.

As noted above and in Chapter 2, Project Description, under the No Project Alternative, none of the project components would be implemented under current or future conditions. The CEQA impact discussion considers the difference between existing conditions (CEQA Baseline) and implementation of each Action Alternative. For the purposes of CEQA, for example, the analysis of Alternative 1 would disclose the impact difference between the existing conditions and construction of 83 miles of pipeline.

The No Action Alternative includes a subset of the recycled water projects that are contained in the Action Alternatives. For the purposes of NEPA, project impacts are defined as the difference between the No Action Alternative and an Action Alternative. As noted above and in Chapter 2, Project Description, it is likely that the Member Agencies would implement some portions of recycled water projects independently, even without the benefit of federal funding. In particular, it is estimated that under the No Action Alternative, 18 miles of recycled pipeline would be constructed. Under NEPA, the impacts from the Action Alternatives would be slightly reduced when compared to the identified CEQA impact, as the NEPA impact discussion would consider the difference between the No Action Alternative (18 miles of recycled water pipeline) and the Action Alternative (83 miles of recycled water pipeline). This would result in a discussion of the impacts associated with 65 miles of recycled water pipeline.

Because the impacts under NEPA are within the range of project impacts identified in the CEQA analysis, and would not exceed those impacts or result in additional mitigation measures beyond those already identified under CEQA, they have not been quantified or specifically called out in the majority of impact discussions. Where warranted, the NEPA impact increment is separately defined and discussed.

3.1 Geology and Soils

This section describes the existing geology, soil conditions, and seismicity in the action area and the state and local regulations that would apply to the North Bay Water Recycling Program (NBWRP). In general, this section provides an assessment of local geological and seismic conditions that could have an effect on the NBWRP. The Setting describes existing conditions in terms of local topography, geologic substrate, soil resources, and regional seismicity. In the context of the action area, the setting section also identifies local geologic and seismic hazards that could affect structures associated with the project. The Regulatory Framework describes pertinent state and local laws related to geologic and seismic considerations of the NBWRP. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.1.1 Affected Environment/Setting

Regional Setting

Geology

The action area is located within the geologically complex region of California referred to as the Coast Range Geomorphic Province. Much of the Coast Range Province is composed of marine sedimentary deposits and volcanic rocks that form northwest trending mountain ridges and valleys, running subparallel to the San Andreas Fault Zone. Bedrock geology in this region consists primarily of graywacke, shale, greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and sandstone that originated as ancient sea floor sediments. The Franciscan units are overlain in areas by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields.

The Coast Range Province is divided into a northern and southern half with the San Francisco Bay as the dividing boundary. The San Francisco Bay lies within a broad depression created from an east-west expansion between the San Andreas and the Hayward fault systems. The San Andreas fault zone runs roughly parallel to the Pacific coastline in western Marin County.

Seismicity

The seismic environment in Northern California and the San Francisco Bay Area is characterized by the San Andreas Fault system, which formed due to major forces occurring at the boundary of shifting tectonic plates. This fault system, and its northwest-trending folds and faults, control much of the geologic structure within the northern Coast Ranges. The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities estimated that there is a 21 percent chance of the San Andreas Fault experiencing an earthquake of magnitude 6.7 or greater in the next 30 years (USGS, 2008).

Regional Faults

The San Francisco Bay Area region contains both active and potentially active faults and is considered a region of high seismic activity.[1] Throughout the action area there is a potential of damage from movement along any one of a number of the active Bay Area faults. The USGS estimates that there is a 63 percent probability of at least one moment magnitude 6.7 or greater earthquake occurring in the San Francisco Bay region over the next 30 years.[2] Within the 63 percent probability, the Hayward-Rodgers Creek and San Andreas fault systems are the two most likely to cause such an event (USGS, 2008).[3]

Figure 3.1-1 depicts active faults in the vicinity of the NBWRP, including the Rodgers Creek fault zone. **Table 3.1-1** lists these faults along with other potentially active fault systems, and identifies the dates of their most recent activity and the estimated maximum moment magnitude of a characteristic future event. The distance listed to the various faults represents the shortest distance to the action area. Two of the regional active faults, the Rodgers Creek and West Napa fault, are located within the action area.

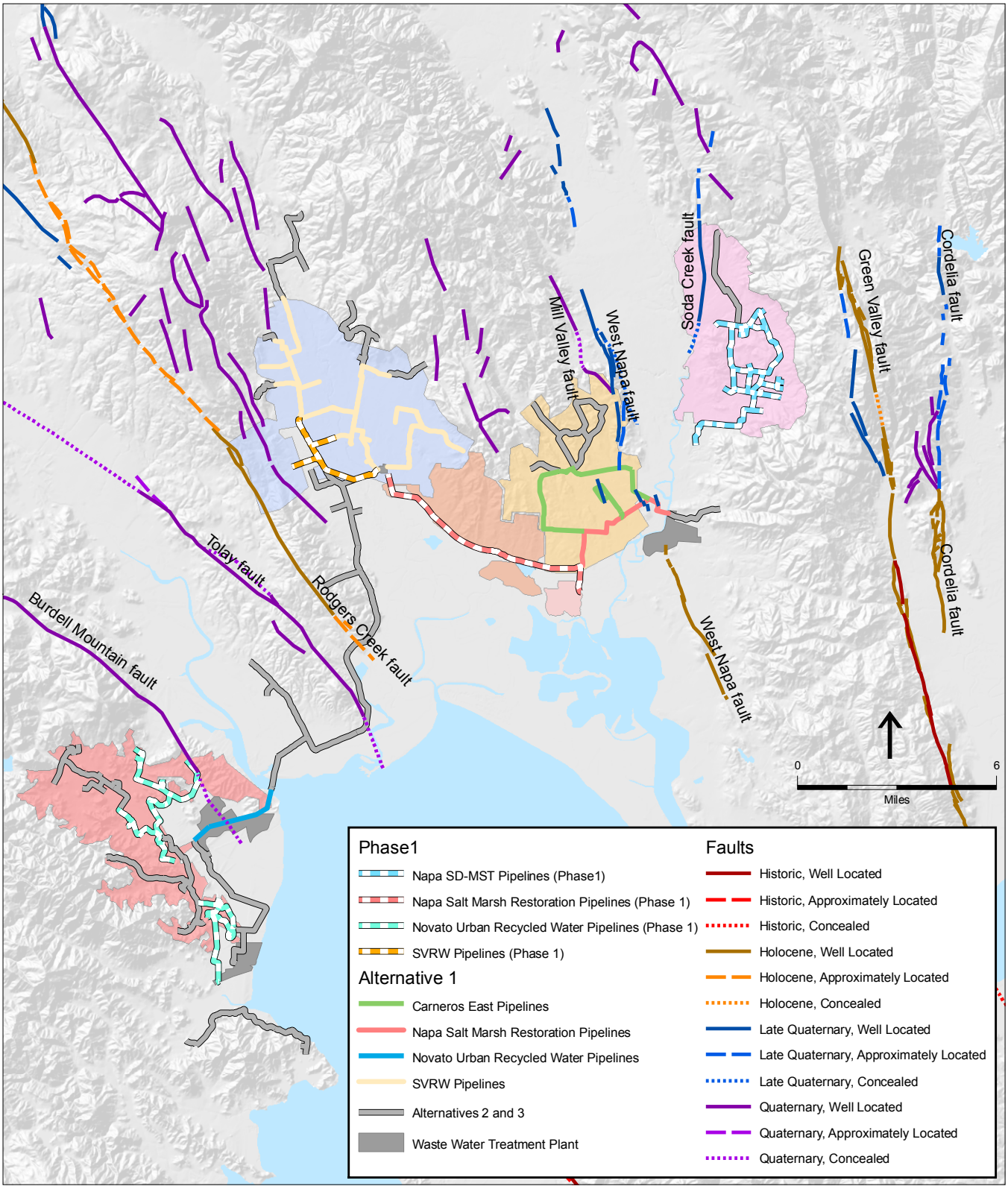
Large historic earthquakes (magnitude 6 and greater) on regional active faults have been responsible for generating significant ground shaking throughout the region including events on the Rodgers Creek fault (1886, 1965), San Andreas (1906, 1989) and the Maacama fault (1906). The Rodgers Creek fault is considered the northern extension of the Hayward fault and is capable of causing significant ground shaking from Vallejo to north of Healdsburg. The most recent significant earthquake on the Rodgers Creek fault occurred in October 1, 1969. On this date, two earthquakes of magnitude 5.6 and 5.7 occurred in an 83-minute period and caused serious damage to buildings in Santa Rosa. The last major earthquake (estimated Richter magnitude 6.7) was generated in 1898 with an epicenter near Mare Island at the north margin of San Pablo Bay. The USGS estimates the probability of a large earthquake (magnitude 6.7 or greater) on the Rodgers Creek fault (when considered together with the Hayward fault) during the period between 2002 and 2032 to be 31 percent (USGS, 2008). The expected ground shaking generated by a seismic event on the Rodgers Creek Fault is anticipated to cause significant damage and interruption of service for transportation (e.g., highways, railroads, and marine facilities) and lifeline (e.g., water supply, communications, and petroleum pipelines) facilities throughout Sonoma County.

---

1 An “active” fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A “potentially active” fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive (Hart and Bryant, 1997).

2 Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (California Geological Survey (CGS), 2002).

3 The Rodgers Creek fault is considered to be a northern extension of the Hayward fault which has not been mapped beneath San Pablo Bay.



SOURCE: CDM, 2008; ESRI, 2006; SWRCB, 2006; CGS, 2005; and ESA, 2008

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.1-1
Regional Faults

TABLE 3.1-1
ACTIVE AND POTENTIALLY ACTIVE REGIONAL FAULTS IN THE VICINITY OF THE NBWRP ACTION AREA

Fault Zone	Location Relative to Action Area	Recency of Faulting[a]	Historical Seismicity[b]	Maximum Moment Magnitude[d]
Burdell Mountain	Within Area	Potentially Active	NA	NA
Rodgers Creek (includes potentially active Healdsburg and Tolay fault zones)	Within Area	Historic – Active	M 6.7: 1898 M 5.6, 5.7: 1969	7.0
San Andreas (Peninsula and Golden Gate segments)	8 miles west	Historic – Active	M 7.1: 1989 M 8.25: 1906 M 7.0: 1838 Many <M 6	7.3
Hayward	4 miles east	Historic – Active	M 6.8: 1868 M 7.0: 1838 Many <M 4.5	6.9
West Napa	Within Area	Holocene –Active	NA	6.5
Americano Creek	12 miles northwest	Potentially Active	NA	NA
Bloomfield	11 miles northwest	Potentially Active	NA	NA
Carneros	Within Area	Potentially Active	NA	NA
Soda Creek	Within Area	Potentially Active	NA	NA
Concord-Green Valley (includes Cordelia Fault Zone)	3 miles east	Holocene – Active	Active creep[c]	6.9
Maacama	20 miles north	Holocene – Active	NA	7.1
Marsh Creek-Greenville	18 miles southeast	Historic – Active	M 5.6: 1980	6.9
Calaveras	30 miles southeast	Historic – Active	M 6.1: 1984 M 5.9: 1979 Many <M 6.5	6.8

[a] Recency of faulting from Jennings (1994). Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 10,000 years; Quaternary: evidence of displacement during the last 1.6 million years; Pre-Quaternary: no recognized displacement during the last 1.6 million years (but not necessarily inactive).
[b] Richter magnitude (M) and year for recent and/or large events.
[c] Slow fault movement that occurs over time without producing an earthquake.
[d] Maximum moment magnitude from Peterson *et al.* (1996). This is the maximum earthquake moment magnitude which could occur within the specified fault zone.

NA = Not applicable and/or not available.

SOURCES: Jennings, 1994, Hart and Bryant, 1997, and Peterson *et al,* 1996.

Shaking Intensity

While the moment and Richter magnitudes are a measure of the energy released in an earthquake, intensity is a measure of the earthquake ground shaking effects at a particular location. Intensity varies depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material underlying a particular area. The Modified Mercalli Intensity (MMI) scale (**Table 3.1-2**) is commonly used to express the earthquake intensity and damage severity

TABLE 3.1-2
MODIFIED MERCALLI SCALE (ABRIDGED)

Intensity Value	Intensity Description	Average Peak Acceleration[a]
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.014 g
III	Felt quite noticeably indoors; especially on upper floors of buildings, but many people do not recognize it as an earthquake.	< 0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound.	0.014–0.039 g
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned.	0.039–0.092 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; minor fallen plaster or damaged chimneys. Damage slight.	0.092–0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken.	0.18–0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls.	0.34–0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse.	0.65–1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

[a] g is gravity = 980 centimeters per second squared. Acceleration is scaled against acceleration due to gravity or the acceleration with which a ball falls if released at rest in a vacuum (1.0 g). Acceleration of 1.0 g is equivalent to a car traveling 100 meters (328 feet) from rest in 4.5 seconds.

SOURCE: CGS, 2003a.

caused by earthquakes because it expresses ground shaking relative to actual physical effects observed by people and therefore is a useful scale for comparing different seismic events. MMI values range from I (earthquake not felt) to XII (damage nearly total). Earthquakes on the various active and potentially active San Francisco Bay Area fault systems can produce a wide range of ground shaking intensities within the action area.

The closest active faults to the action area are the Rodgers Creek fault and the West Napa fault, both of which transect the action area. The Rodgers Creek fault trends to the northwest from

San Pablo Bay (east of where the Petaluma River enters the Bay) to Healdsburg. The West Napa fault is located east of the Napa River and trends northwest across the Napa County Airport. The most recent significant earthquakes on the Rodgers Creek fault both occurred on October 1, 1969. On this date, two earthquakes of Richter magnitude 5.6 and 5.7 occurred within an 83-minute period. Buildings in Santa Rosa sustained serious damage during these quakes. Prior to these events, the last major earthquake (estimated Richter magnitude 6.7) was generated in 1898 with an epicenter near Mare Island at the north margin of San Pablo Bay (see Table 3.1-2).

Potentially active faults within the action area include the Burdell Mountain, the Americano Creek, the Bloomfield, Carneros and Soda Creek faults. Geologic evidence suggests that there may have been relatively recent movement on the Burdell Mountain fault zone, suggesting that it might be considered active rather than potentially active (County of Marin, 2005). However, no official change has been made. Seismic events along any of these potentially active faults could possibly be triggered by activity within other active faults in the region, such as the Hayward-Rodgers Creek, San Andreas, West Napa, and/or Concord-Green Valley fault zones.

Seismic Ground Shaking

Strong ground shaking from earthquakes generated by active faults in the Bay Area is a hazard to the action area. During project operation, it is likely that at least one moderate to severe earthquake will cause strong ground shaking within the project vicinity. Ground shaking intensity is related to the size (i.e., magnitude) of an earthquake, the distance from the epicenter to the project's location, and the response of the geologic materials that underlie the site. As a rule, the greater the earthquake magnitude and the closer the fault rupture to the site, the greater the intensity of ground shaking. Violent shaking is generally expected at and near the epicenter of a large earthquake, although studies of recent earthquakes, such as those conducted after the 1992 Landers earthquake, indicate that directional ground motion along a fault can cause strong ground shaking farther away from the epicenter. Seismic hazards due to ground shaking can cause the greatest amounts of damage to structures and utilities and unsecured equipment.

The composition of underlying soils can be a primary determining factor of ground shaking because loose or soft alluvial sediments or fill, even those relatively distant from earthquake epicenters, can intensify ground shaking. Non-engineered artificial fill, if present, could intensify ground shaking effects in the event of an earthquake on one of the aforementioned faults. Areas directly underlain by bedrock would likely experience less-severe ground shaking due to the ability of the bedrock to attenuate seismic waves.

Strong ground shaking or ground motion is described as motion of sufficient strength to affect people and their environment. The common way to describe ground motion during an earthquake is with the motion parameters of acceleration and velocity in addition to the duration of the shaking. A common measure of ground motion is the peak ground acceleration (PGA), which is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g) which is approximately 980 centimeters per second squared. In terms of automobile accelerations, one "g" of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from a stopped position in 4.5 seconds. For

comparison purposes, the maximum PGA value recorded during the Loma Prieta earthquake of 1989 was in the vicinity of the epicenter, near Santa Cruz, at 0.64 g. The highest value measured in the East Bay was 0.29 g, recorded at the Oakland Wharf near the Naval Supply Center. Soils at the wharf are artificial fill over bay mud. The lowest values recorded were 0.06 g in the bedrock on Yerba Buena Island. Recorded ground motion at the Stafford Dam south abutment in Novato resulting from the Loma Prieta event was 0.04 g.

Geologists and engineers attempt to predict earthquake ground acceleration at sites to improve the structural design of buildings and underground utilities to enable them to withstand earthquake motion. A probabilistic seismic hazard assessment describes seismic hazard from earthquakes that geologists and seismologists agree could occur. It is "probabilistic" in that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The results of probabilistic analyses are typically more realistic because it accounts for the full range of possible earthquakes, their location, frequency of occurrence, size, and the propagation of the earthquake motion from the rupture zone to the site of interest; the results take into account certainty in the vulnerability of structures. The fundamental difference between deterministic and probabilistic analyses is that deterministic analyses do not consider the probability associated with the earthquake hazard.

In 1999, the California Geological Survey (CGS) completed the Seismic Shaking Hazard Maps for California to describe the statewide distribution of estimated ground motion throughout the state. These maps provide a conservative estimate, through probabilistic analysis, of the peak ground acceleration for all regions of California. Based on estimates of this seismic hazards assessment, the PGA in the region of the NBWRP could reach or exceed 0.5 to 0.8 g (1 chance in 475 of being exceeded each year) (CGS, 2009; Petersen *et al.*, 1996). Seismic ground shaking is discussed further in the impacts analysis below.

Potential Geologic / Seismic Hazards

The action area could experience the effects of a major earthquake from one of the active or potentially active faults located within 100 miles of the action area. The four major hazards associated with earthquakes are fault surface rupture (ground displacement), ground motion (or ground shaking, discussed above), ground failure (e.g., liquefaction), and differential settlement. Considering the geologic context of the action area and nature of the project, the typical geologic hazards could include slope instability, soil erosion, settlement, and the potential to encounter expansive and/or corrosive soil materials. These hazards are discussed briefly below and provide the initial context for further evaluation in the impact analysis.

Seismic Hazards

Surface Fault Rupture

Surface fault rupture is typically observed and is expected on or within close proximity to the causative fault trace.[4] The Rodgers Creek and West Napa fault zones are the closest active faults

4 Fault rupture is displacement at the earth's surface resulting from fault movement associated with an earthquake.

to the action area zoned under the Alquist-Priolo Earthquake Fault Zoning Act. As mentioned above, both of these faults transect the action area. However, none of the project elements are located within an Alquist-Priolo Earthquake Fault Zone. Surface fault rupture would not necessarily be limited to the boundaries of the Alquist-Priolo Fault Zones, however the risk of surface rupture outside these zones would be considered very low. Therefore, there is very low risk of surface fault rupture within the action area.

Liquefaction

Liquefaction is the sudden temporary loss of shear strength in saturated, loose to medium dense, granular sediments subjected to ground shaking. Liquefaction generally occurs when seismically-induced ground shaking causes pore water pressure to increase to a point equal to the overburden pressure. Liquefaction can cause foundation failure of buildings and other facilities due to the reduction of foundation bearing strength. The potential for liquefaction depends on the duration and intensity of earthquake shaking, particle size distribution of the soil, density of the soil, and elevation of the groundwater. Areas at risk due to the effects of liquefaction are typified by a high groundwater table and underlying loose to medium-dense, granular sediments, particularly younger alluvium and artificial fill. Liquefaction hazard maps produced by USGS for the Bay Area Region indicate that there is a high to very high hazard for liquefaction in several locations within the action area especially in the low lying areas that lie close to the Bay or other major drainages (USGS OFR 00-444, 2000). Specific liquefaction hazards zones with the general action area are illustrated in **Figure 3.1-2**. Based on the relative hazard, this issue is discussed further under the impacts analysis below.

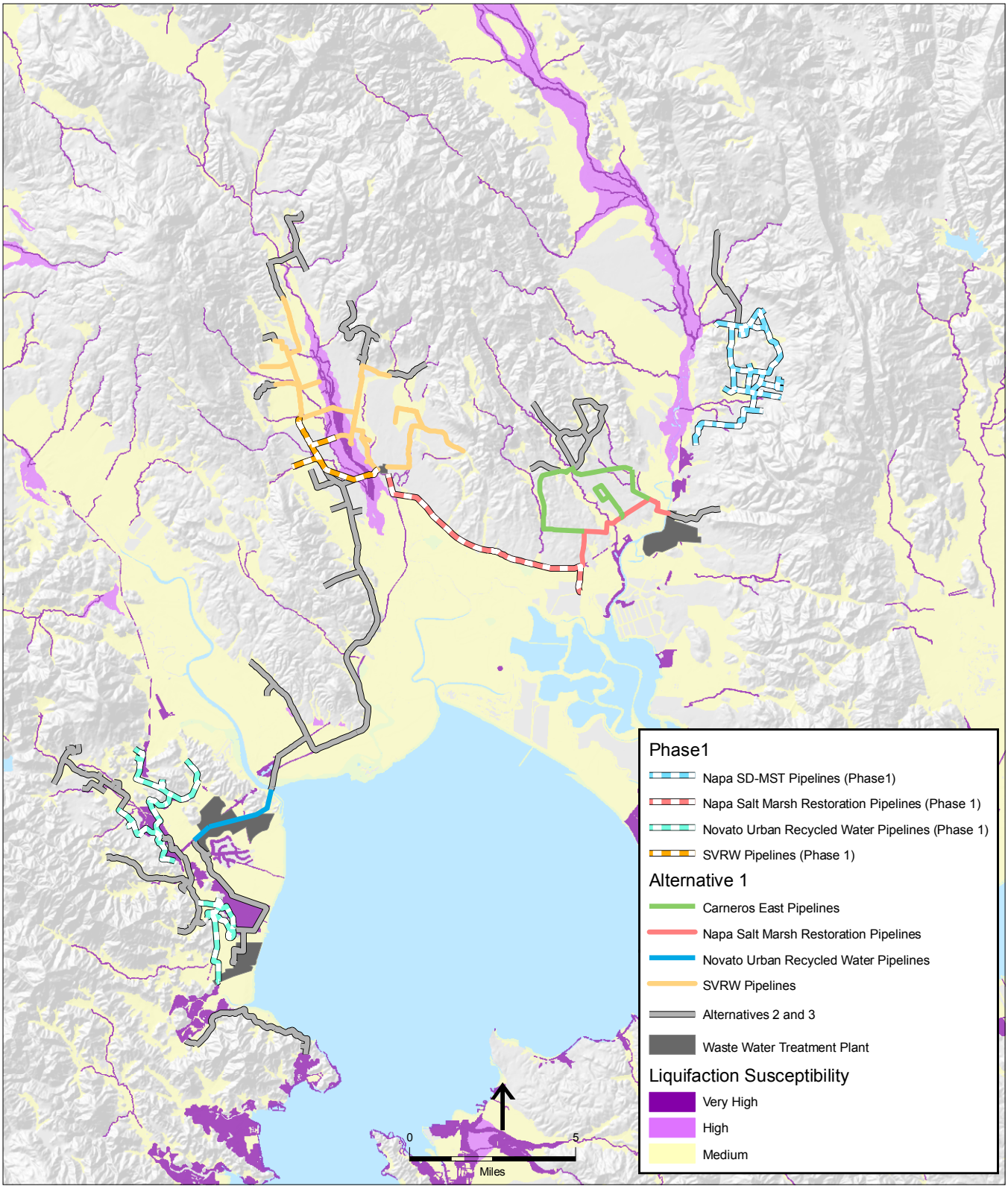
Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, non-compacted, and variable sandy sediments) due to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Typically, areas underlain by artificial fills, unconsolidated alluvial sediments, slope wash, and areas with improperly engineered construction fills are susceptible to this type of settlement. In recognition of the variability of underlying material in the action area, earthquake-induced settlement is discussed further under the impacts analysis below.

Other Geologic Hazards

Slope Instability and Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Rock slopes exposed to either air or water can undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and/or deep-seated rotational slides. As previously indicated, the action area contains areas that are generally level but also some upland areas with steeper inclines. The issues related to potential landslides are discussed further under the impacts analysis below.



SOURCE: CDM, 2008; ESRI, 2006; USGS 2006; and ESA, 2008

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.1-2
Liquefaction Susceptibility

Soil Erosion

Soil erosion is the process whereby soil gets dislodged and transported downslope either by wind or water. Rates of erosion can vary depending on the surface soil material and structures, slope angle and length, and human activity. The erosion potential for soils in the action area will vary according to the type of soil and its characteristics as identified by the National Resource Conservation Service in their soil surveys. In general terms, soils containing high amounts of fine sand or silt can be easily eroded while clayey soils are generally less susceptible. Based on the disturbance area anticipated under the project, soil erosion is discussed further under the impacts analysis below.

Settlement

Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. The process whereby soil materials settle at varying rates depending on the load weight is referred to as differential settlement. Differential settlement can be a greater hazard than total settlement if there are variations in the thickness of previous and new fills or natural variations in the thickness and compressibility of soils across a building footprint. Settlement commonly occurs as a result of building construction or other large projects that involve soil stockpiling. The NBWRP would entail the construction of new structures which could introduce new loads thereby resulting in the potential for settlement. This issue is addressed in the impacts analysis below.

Expansive Soils

Expansive soils are characterized by a shrink-swell characteristic.[5] Structural damage may result over a long period of time, usually resulting from inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Expansive soils are largely comprised of clays, which expand in volume when water is absorbed and shrink when dried. Soil materials within the action area are generally comprised of fine sands, silts and in some locations finer clay materials. In recognition that a Geotechnical Investigation will be required for the NBWRP in conjunction with the incorporation of standardized engineering practices for areas identified as containing expansive soil materials, this issue is discussed further in the impacts analysis below.

Corrosive Soils

Corrosive soils can damage underground utilities including pipelines and cables, and can weaken roadway structures. Given that some of the action area is comprised of reclaimed marshland protected from tidal influx, the soil resource base is characterized by a higher than normal sodium content. This generally increases the susceptibility of steel and concrete structures to the effects of corrosion. However, current construction materials and practices provide engineering designs to prevent the potential for corrosion therefore, this issue is not discussed further in this section.

5 "Shrink-swell" is the cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying. Structures located on soils with this characteristic may be damaged over a long period of time, usually as the result of inadequate foundation engineering.

Local Geology

LGVSD

The LGVSD project service area lies within the city of San Rafael and also includes unincorporated areas of Marin County. Regional geologic mapping by the CGS identifies four distinct geologic units in the San Rafael area: bedrock (various units within the Franciscan complex), colluvium, alluvium, and marine/estuary deposits such as Bay mud. In general the marine estuary deposits are likely found in the near shore flat lying areas and bedrock in the upland areas. However, San Pedro Hill which is located close to the Bay contains a massive graywacke deposit from the Franciscan Complex, which is currently being mined for aggregate resources. Colluvium is a general term that refers to loose soil or rock fragments typically found at the base of gentle slopes or hillsides. Alluvium is a general term for loose clays, silt, sand, or gravels that have been deposited by a surface water body during recent geologic time.

Novato SD

The Novato SD service area is located along the northwestern shore of San Pablo Bay. Just north of the service area is where the Petaluma River flows into the Bay. Most of the area lies within low lying marine and marsh deposits. The estuarine deposits are overlain by artificial fill beneath the Novato wastewater treatment plant (WWTP) site. Typically these deposits consist of Bay mud and varying amounts of organic material, silty mud, silt, and sand. Further north in the service area, the underlying geology consists primarily of alluvial deposits that include loose sand, gravel, silt, and clay (Blake *et al.*, 2000).

SVCSD

Sonoma Valley is a northwest trending alluvial valley typical of the Coast Ranges Geomorphic Province. The valley is bound on the west by the Sonoma Mountains and on the east by the Arrowhead Mountains. The basement rocks of this area consist primarily of the Franciscan Assemblage, which is overlain with more recent volcanic flows of the Sonoma Volcanics. The Franciscan Assemblage contains primarily greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and sandstone that originated as ancient sea floor sediments. The Sonoma Volcanics represent more recent flows and are typically a more weather resistant rock which form most of the ridges and upper regions of the area. The northern section of the action area, in the vicinity of Glen Ellen, is underlain by alluvial deposits that are younger than the Sonoma Volcanics and referred to as the Huichica and Glen Ellen Formations. The formations consist of gravel, silt, sands, and clays and can be quite thick (Ford, 1975).

The youngest geologic units underlying the action area are surficial deposits made up of unconsolidated sediments eroded from the surrounding bedrock units. These units are locally mapped as Older Alluvium and Younger Alluvium (Wagner and Bortugno, 1982). The Older Alluvium consists of alluvial deposits. The Younger Alluvium consists of unconsolidated stream, channel, levee, flood plain, basin, terrace, and fan deposits ranging in size from boulder to clay. Younger Alluvium underlies areas along Sonoma Creek and the Older Alluvium is found throughout the broader Sonoma Valley. The alluvial deposits can be divided into alluvial fan

deposits located along the margins of the valley and finer-grained fluvial basin deposits that occur near the center of the valley and underlie the city of Sonoma. The alluvial fan deposits underlying the action area are approximately 200-foot thick and vary from dissected, highly weathered gravels, to deeply weathered, poorly sorted sand and gravel (Ford, 1975).

Napa SD

Napa Valley is another northwest trending valley similar to Sonoma Valley that is typical of the Coast Ranges Geomorphic Province. The alluvial basin that is drained by the Napa River is bounded by mostly marine sedimentary and metamorphic rocks on the west side, and lava flows and other eruptive volcanic materials on the east. The valley floor is filled with thick alluvium which represents a combination of sediments derived from both sides of the valley although the volcanic rocks known as the Sonoma Volcanics constitute the principal rock source of the soils of Napa Valley. These volcanic deposits include many silica-rich materials that represent the product of explosive eruptions and deposition from a hot volcanic cloud (pyroclastic deposits). Short-lived lakes and redistribution of volcanic rocks by stream action locally formed interlayered sandstones, conglomerates, and siltstones. The source region of the Sonoma Volcanic rocks is uncertain; the region was possibly near the northern end of Napa Valley not far from the town of Calistoga.

Topography

LGVSD

The topography of the Coast Range Geomorphic Province is characterized by northwest–southeast trending mountain ridges and intervening valleys that were formed by extensive faulting activity approximately 7 to 18 million years ago. More recent activity in the region is concentrated along the San Andreas Fault zone, which consists of a complex group of generally parallel faults. As a result of the tectonic activity, the topography of San Rafael varies greatly with relatively flat lowland areas near the bayshore to hilly slopes that reach up to over 1,000 feet above mean sea level (msl).

Novato SD

Much of the action area is level and resides within the floodplain of Novato Creek, which is situated along the inter-tidal margin of San Pablo Bay. In the southern portion of the action area, near the Ignacio WWTP, surface elevations range near or just below mean sea level (msl). Several levee embankments in the vicinity of the Ignacio WWTP rise to approximately ten feet above msl. Surface elevations along the proposed force main alignment also range from just below or at sea level. Near the Novato WWTP, surface elevations begin to rise gradually towards a low-gradient hill feature, which rises to approximately 270 feet msl north of the WWTP.

SVCSD

The majority of the action area is located within the Sonoma Valley which is drained by Sonoma Creek. Sonoma Valley is a relatively flat-lying sediment-filled valley flanked on either side by

the more resistant ridges. The Sonoma Creek flows south from the uplands near Glen Ellen and enters the Sonoma Valley at an elevation of approximately 200 feet above amsl. Continuing south, Sonoma Creek enters the broad Sonoma Valley that extends from the city of Sonoma at 80 feet above msl, to the tidal lands of the San Pablo Bay at sea level.

Napa SD

Napa County is part of the California Coast Range. The county is characterized by a number of northwesterly parallel mountain ridges and intervening valleys of varying widths (Lambert, 1978). The county is bisected by the Napa Valley from Calistoga to San Pablo Bay. The soils in Napa Valley generally are very deep and have high potential productivity and are used for vineyards, orchards, and pastures. The soils in the southern part of the valley have lower production potential because they are limited by strongly developed subsoil. The soils are used mainly for dry land pasture and for oats and hay (Lambert, 1978).

Maacama Mountain is located on the west side of Napa Valley. The soils in this area are moderately deep to very shallow over sandstone and shale, and they are used mainly for range, wildlife habitat, and watersheds (Lambert, 1978).

The mountain ridges on the west side of the valley extend as far south as Napa, where the landscape consists of rolling hills and dissected terraces. The soils in this area are moderately deep over sandstone and shale or are shallow to a claypan and are used for range, pasture, and vineyards (Lambert, 1978).

Howell Mountain borders Napa Valley on the east and rises abruptly from the valley floor. The soils in this area are moderately deep to shallow over rhyolitic tuff and basic igneous rock and are used for timber, range, wildlife habitat, and watersheds. Where the ridge broadens to a plateau near Angwin, some areas of soils are used for vineyards and orchards (Lambert, 1978).

The plateau drops off to the northeast into Pope Valley, and Vaca Mountain rises abruptly to the east. The soils in the northern and eastern part of the county are moderately deep to shallow over sandstone, shale, and serpentine. They are used for range, wildlife habitat, and watersheds (Lambert, 1978).

Soils

LGVSD

The Soil Survey prepared by the Natural Resources Conservation Service identifies a variety of soil units within the city of San Rafael. The more prominent units include the Tocaloma-McMullin series in the upland areas where slopes range up to 75 percent and the Novato and Reyes Clays in the low lying flat areas (USDA, 2008). Developed areas are mapped as an urban complex which usually refers to the reworking of topsoils associated with development including roads and structures. In the LGVSD WWTP area, the Reyes Clays are the predominant soils in addition to some Saurin series soils and urban complex soils. The Reyes Clays typically occur on

relatively flat bayshore areas that range from 0 to 10 feet above msl. In general, the soil resource base has varying hazards of erosion from water and varying potential for shrink-swell behavior.

Reyes Clay. These clays are somewhat poorly drained, have a high shrink-swell potential, and very slow runoff rates, are very acidic at depth, and represent little to no hazard of water erosion. These clays are commonly found along the flat areas of the Bay margin on slopes that range from 0 to 2 percent.

Tocaloma-McMullin. This series of loams and clays are somewhat excessively drained, have a very low available water capacity, low shrink-swell potential, associated with rapid runoff, and have a high hazard of water erosion. These soils are commonly found on slopes that range from 15 to 30 percent.

Saurin-Bonnydoon Complex. This soil complex is comprised of soils that are generally excessively drained to well drained, with very low to moderate available water capacity, have a moderate shrink-swell potential, show medium runoff rates, and have a moderate hazard of water erosion. These soils are generally found on gentle slopes ranging from 2 to 15 percent.

Xerorthents and Xerorthents-Urban Land Complex. This soil unit is comprised of fills and reworked soils associated with developed areas. Urban land soils have been altered to the extent that their original characteristics are no longer present. The soils are well drained, have varying water capacities, prone to very rapid runoff, and have a high hazard of water erosion. These soils are generally found on graded areas that are relatively flat or gently sloping ranging from 0 to 10 percent.

Novato SD

The Soil Survey for Marin County identifies five soil map units across the action area, which include: the Bonnydoon gravelly loam (15 to 30-percent slopes), Reyes clay (0 to 2-percent slopes), Saurin-Bonnydoon complex (2 to 15-percent slopes), Xerorthents (fill), and Xerorthents-Urban land complex (0 to 9-percent slopes). These soil units occur on slopes ranging between 0 and 30-percent. The Reyes clay (0 to 2-percent slopes) and Xerorthents (fill) occupy most of the forcemain alignment and the Ignacio WWTP site towards the south. The Xerorthents-Urban land complex (0 to 9-percent slopes) is limited to areas in the vicinity of the Novato WWTP. In general, the soil resource base has varying hazards of erosion from water and varying potential for shrink-swell behavior.

SVCSD

Soils in the area have been mapped as “soil associations,” which are a broad grouping of soils with common characteristics such as similar management uses or slope steepness. Three soil associations occupy the terrain crossed by the action area and are described below. Surficial soils exhibit various characteristics dependent on location, slope, parent rock, climate, and drainage. Certain soils may have characteristics that if not appropriately engineered can be problematic to buildings and infrastructure. These characteristics can include low permeability or susceptibility to expansion or soil erosion. The United States Department of Agriculture (USDA) defines the following major soil associations underlying the action area (USDA, 1972):

Huichica-Wright-Zamora Association. This association underlies the majority of the action area. These soils are generally located on low bench terraces and alluvial fans and are comprised of nearly-level to moderately-sloping soils that are well drained to excessively-drained[6] loams to silty clay loams. Slopes range from 0 to 15 percent.

Yolo-Cortina-Pleasanton Association. This association lies in the northern portion of the action area just south of Kenwood on flood plains, alluvial fans, and low terraces. Slopes range from 0 to 9 percent. Soils in this association are well drained to excessively drained, nearly level to moderately sloping, and very gravelly sandy loams to clay loams.

Goulding-Toomes-Guenoc Association. This association lies further to the east and west of the action area, mainly on ranges of hills that extend nearly the length of the central-eastern third of the county. Slopes range from 2 to 75 percent. This soil formation is located on uplands and comprises of generally well drained with gently sloping to very steep loams and clay loams to loams.

Soils associated with the Napa Salt Marsh Restoration Action area are assigned to the Clear Lake-Reyes, Haire-Diablo, and Huichica-Wright-Zamora associations.

Huichica-Wright-Zamora Association. This association underlies the majority of the action area in the 3 pipeline alternative routes. See the above for a detailed description.

Haire-Diablo Association. This association underlies the area surrounding the SVCSD WWTP. The Haire-Diablo association soils are characterized as moderately well drained and well drained, gently sloping to steep fine sandy loams to clays on terraces and uplands.

Clear Lake-Reyes Association. The soil transitions to this association after the pipeline crosses SR 12/121. Clear Lake-Reyes Association is characterized as poorly drained, nearly level to gently sloping clays to clay loams in basins and on tidal flats. (JSA, 2003)

Napa SD

The soils within the Napa SD service area also include a wide range of soil types as mapped by the Natural Resources Conservation Service. The soil series that are most prominent in the action area are described below. Surficial soils exhibit various characteristics dependent on location, slope, parent rock, climate, and drainage. Certain soils may have characteristics that if not appropriately engineered can be problematic to buildings and infrastructure. These characteristics can include low permeability or susceptibility to expansion or soil erosion. The USDA defines the following major soil associations underlying the action area (USDA, 1978):

Coombs Gravelly Loam. This gravelly loam underlies the majority of the action area. These soils are generally located on alluvial fans and terraces found on nearly-level slopes. The loams are well drained and derived from sedimentary or igneous parent rock materials. Slopes range from 0 to 2 percent.

Egbert Silty Clay Loam. This silty clay loam is typically found at the rim of basin floors and on nearly-level slopes. Slopes range from 0 to 2 percent. These soils are poorly drained and are derived from alluvium.

[6] Well drained soils are generally soils that allow water to easily pass through.

Haire Loam. Haire loam is found on terraces and alluvial fans, this soil series lies on gentle slopes ranging from 2 to 9 percent. This soil formation is derived from sedimentary rocks and is generally moderately well drained and includes loams, sandy clays, and clays.

Hambright Rock-Outcrop. Typically found on more moderate slopes of upland areas, this weathered volcanic rock material is found on hills and some plateaus. The loamy upper layer is underlain by weathered bedrock that is well drained. Slopes range from 2 to 30 percent.

Mineral Resources

The CGS classifies the regional significance of mineral resources in accordance with the California SMARA of 1975. Mineral Resource Zones (MRZ) have been designated to indicate the significance of mineral deposits. The MRZ categories are as follows and are discussed for each Member Agency below:

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

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

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

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

LGVSD

The primary mineral resources just outside the city of San Rafael limits, in unincorporated Marin County, are sand and gravel. The CGS (formerly the Division of Mines and Geology) has designated one site as a Resource Sector in the LGVSD area (MRZ-2 zone) at San Pedro Hill (Marin County, 2007). Franciscan Complex Sandstone, consisting of aggregate (suitable for Portland cement and concrete), rip rap, and shale resources, is utilized at San Pedro Hill.

Novato SD

Within the city of Novato, the primary mineral resources are sand and gravel. The CGS has designated three sites as Resource Sectors in the Novato area (MRZ-2 zones): Black Point, Burdell Mountain, and Bowman Canyon (City of Novato, 1996. Crushed rock and decorative fieldstone quarries are located on the southeast slopes of Mt. Burdell; however, extractive operations in this area have not been active for some time. Sand and gravel quarries are located in the Black Point area; however operations have not been active since the 1950s.

SVCSD

The action area has areas classified as MRZ-1, MRZ-2, and MRZ-3a. The MRZ-2b area is roughly linear and related to Sonoma Creek deposits (Sonoma County, 1998). Aggregate

resources associated with river deposits are the dominant mineral mined in this area (Sonoma County, 1998). In this area, aggregate material can be found at or below ground level.

Napa SD

The CGS has only mapped aggregate resource zones for southern Napa County and has designated one MRZ-2 zone associated with the active Napa Quarry located southeast of the city of Napa (Napa County, 2005). However, there has been a history of mining in the county for a variety of commodities including asbestos, mercury, clay, copper, manganese, magnesite, gold, silver, and quarry rock. The market for most of these resources no longer exists. Aggregate and building stone resources remain as the most significant resource in the county, although as mentioned above the potential resources are not clearly known from the lack of detailed mapping by the CGS.

3.1.2 Regulatory Framework

State

Alquist-Priolo Earthquake Fault Zoning Act

The purpose of the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) is to regulate development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. The Alquist-Priolo Act requires the delineation of fault rupture zones along all active faults in California. Cities and counties must regulate certain development projects within the zones, which include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an area covered by the Alquist-Priolo Act.

California Building Code

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

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

California Department of Water Resources, Division of Safety of Dams

Since 1929, the State of California has supervised the construction and operation of dams to prevent failure, safeguard life and protect property. The California Department of Water Resources, Division of Safety of Dams (DSOD) oversees the construction of dams that are over 25 feet high and impound over 15 acre-feet of water, or over 6 feet high and impound over 50 acre-feet of water (DSOD, 2008; California Water Code §6002).

The DSOD reviews permit applications to evaluate the safety of dams and reservoirs. DSOD staff provides independent review of facilities design and safety calculations. The DSOD requires the collection of data concerning subsoils, foundation conditions, availability of construction materials, and geologic hazards to assess the potential for seepage, earth movement, and other conditions that may occur in the vicinity of a dam or reservoir. Investigations usually include exploratory pits, trenches, drilling, coring, geophysical survey, tests to determine leakage rates, and physical tests to measure properties of foundation materials. During construction or repair of a dam or reservoir, the DSOD makes continuous or periodic inspections to verify that construction is proceeding in accordance with approved plans.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation must be conducted and appropriate mitigation measures incorporated into the project's design. The California Geological Survey has not at this time completed seismic hazard mapping within any of the North San Pablo Bay topographic quadrangles.

Local

The local general plans, policies, and regulations associated with impacts to geology and soils within the affected jurisdictions are presented in **Appendix 3.1** of this EIR/EIS.

3.1.3 Environmental Consequences/ Impacts

Significance Criteria under CEQA

Geology, Soils, and Seismicity

Based on the Appendix G of the CEQA Guidelines, project implementation would have significant impacts and environmental consequences related to geology, soils, and seismicity if it would:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving earthquake rupture, strong seismic ground shaking, seismic related ground failure including liquefaction, and landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse; or
- Be located on expansive soil creating substantial risks to life or property.

Mineral Resources

For this EIR, a project is considered to have a significant impact related to mineral resources if it would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Based on the NBWRP characteristics and existing conditions of the action area, there is no potential for the project to result in the loss of mineral resources. The NBWRP would largely consist of the construction of various pipelines which would mostly occur within existing roadways. The improvements to the WWTPs and construction of pump stations and storage facilities would occur either within or immediately adjacent to existing facilities and would not interfere with the availability of any known mineral resources. Therefore, no impact is expected and this issue is not discussed further.

Environmental Consequences/Impact Analysis

Impact 3.1.1: Seismicity. In the event of a major earthquake in the Bay Area Region, the proposed facilities could be subject to fault rupture, severe ground shaking, liquefaction, or earthquake induced landslides capable of causing injury, structural damage, pipeline rupture and service interruption. (Less than Significant with Mitigation)

The NBWRP would include new construction, modification, and expansion of existing facilities. The proposed facilities would extend over a range of geologic materials and environments from saturated, unconsolidated Bay mud deposits of the Bay shore to bedrock

deposits as described above in the setting section. According to the California Working Group on Earthquake Probabilities, a major earthquake, defined as being a magnitude 6.7 M or greater, has a 63 percent probability of occurring some time over the next 30 years. Seismic effects such as landslides, ground shaking, and liquefaction could vary depending on underlying geologic materials and conditions and distance to the epicenter of the seismic event.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 horsepower (HP) of pumping capacity, treatment facilities providing 0.5 million gallons per day (mgd) of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.1-1, No Action**).

Under future baseline (2020) conditions, geologic conditions within the region would be unchanged from existing conditions. Proposed facilities would be subject to the seismic hazards. However implementation of **Mitigation Measure 3.1.1**, which includes designing the proposed facilities by a California licensed geotechnical engineer or engineering geologist and constructing according to California Building Code (CBC) and industry standard geotechnical practices, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

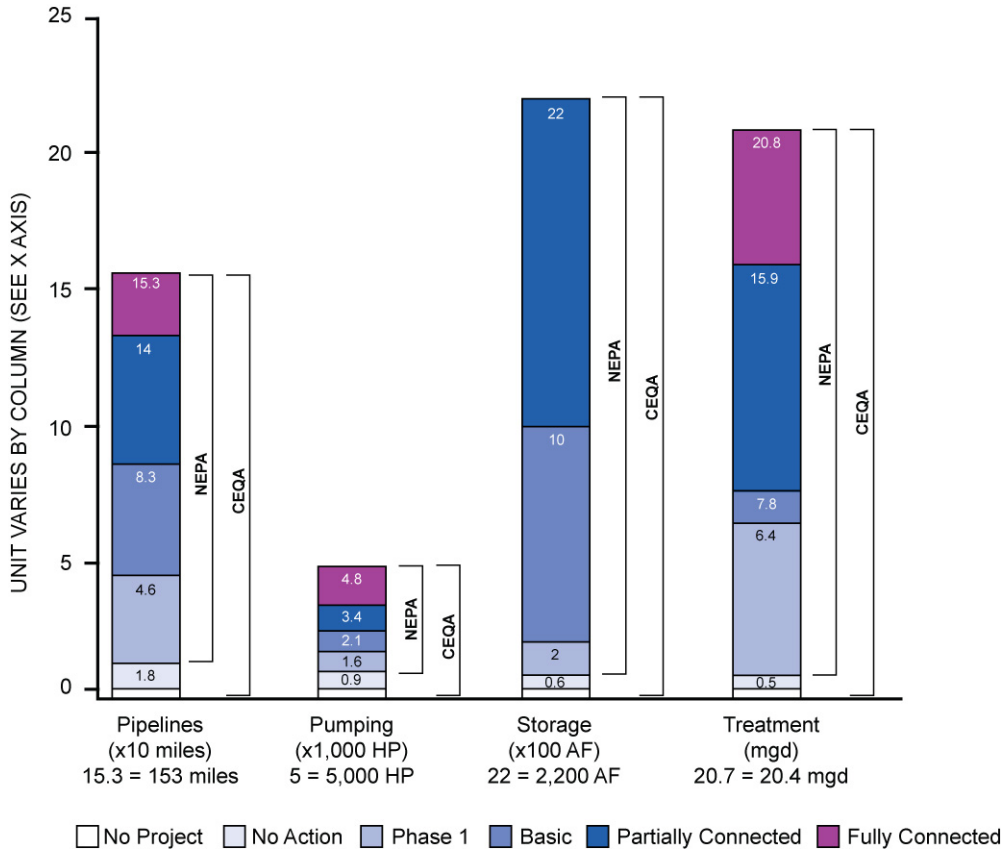
LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/ NMWD

Under the No Action Alternative, recycled water facilities would be implemented in the Novato North Service Area. The majority of the proposed facilities (treatment upgrades, pipeline, storage, and pump station) would not be located within or near any active faults that would be susceptible to fault rupture; however the Novato SD/ NMWD pipeline near Atherton Avenue and Olive Avenue would potentially be located within 100 feet of the Burdell Mountain fault zone. Pipelines crossing active fault zones would have the potential for pipeline rupture and release of recycled water. Structural design measures at fault crossings, as required in **Mitigation Measure 3.1.1**, would reduce potential impacts to a less-than-significant level. In addition, the relatively flat topography

CHART 3.1-1
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

would make the earthquake-induced landslide potential very low. According to Association of Bay Area Governments (ABAG), the ground shaking potential is moderate to high (ABAG, 2003). In general the higher potential for ground shaking is found east of U.S. 101 and the moderate potential is west of U.S. 101.

The liquefaction potential varies from very low to high within the Novato SD project service area (ABAG, 2004). As a result, some of the proposed pipelines would be located in areas considered to have a high potential for liquefaction, as shown in Figure 3.1-2. However, as discussed above, implementation of **Mitigation Measure 3.1.1** would reduce the impact to less-than-significant level.

SVCSD

The No Action Alternative would include installation of Alignment 1A (5.2 miles of pipeline) in Sonoma Valley and one booster pump station at the SVCSD WWTP. Installation of the Alignment 1A pipeline would predominantly occur along existing roadways and additional storage and pumping capacities would occur within or adjacent to the existing WWTPs.

According to the Sonoma Valley Recycled Water Project (SVRWP) EIR (ESA, 2006), the proposed facilities would not be located within close proximity of an active fault where surface fault rupture would be considered a hazard and the relatively flat topography makes the potential for earthquake induced landslides also very low. In addition, the EIR similarly identified the regional seismic hazard, which could be a significant impact. However implementation of **Mitigation Measure 3.1.1** would reduce the impact to less-than-significant-level.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of pipeline parallel to an existing pipeline that extends between SVCSD WWTP and the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds, additional new pipeline would be constructed to convey water to the salt pond mixing chamber in one of three alternative pipeline routes (see **Chapter 2, Project Description**).

Installation of the Napa Salt Marsh pipeline (under Options A, B, or C) would occur mostly in existing roadways and access roads. The proposed facilities would not be proximate to an active fault where surface fault rupture would be considered a hazard and the relatively flat topography makes the potential for earthquake induced landslides also very low. The facility could be exposed to regional seismic hazard, which could be a significant impact. However implementation of **Mitigation Measure 3.1.1** would reduce the impact to less-than-significant-level.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below. **Table 3.1-3** summarizes the amount of Phase 1 pipelines that would potentially be affected by seismic events, liquefaction, or landslides.

LGVSD/ NMWD

Implementation of Phase 1 would require construction of one of the three pipeline options, described in **Chapter 2, Project Description**, which would connect the Recycled Water Treatment Facility (RWTF) at LGVSD WWTP to the Hamilton Field area and the existing 0.5-million gallon (MG) Reservoir Hill Tank.

TABLE 3.1-3
SUMMARY OF PHASE 1 PIPELINES POTENTIALLY AFFECTED BY LANDSLIDES LIQUEFACTION, OR SEISMIC EVENTS

Service Area	Amount of Pipeline (miles) within 100 ft of landslide areas	Amount of Pipeline (miles) within 100 ft of very high or moderate liquefaction areas	Amount of Pipeline (miles) within 100 ft of faults/ Fault Name
LGVSD	--	--	--
Novato SD	0.484	23	0.015/ Burdell Mountain Fault
SVCSD	--	--	--
Napa SD	--	--	--

SOURCE: ESA, 2009

Installation of the pipelines for the Coast Guard Housing Distribution Loop would occur predominantly along existing roadways. Pipeline Options A, B, and C are proposed primarily along open, undeveloped areas. None of these proposed pipeline routes are located within or in the immediate vicinity of any active fault, therefore the potential for surface fault rupture to affect these pipelines is considered very low. These pipelines are also located in the flatlands that are not typically susceptible to earthquake induced landslides (ABAG, 1997). However, according to shaking potential maps compiled by the ABAG, which is derived from a probabilistic seismic hazard map produced by the California Geological Survey (CGS), the proposed pipelines are located in an area that is mapped as “near major, active faults that will on average experience stronger earthquake shaking more frequently” (ABAG, 2003). In general, the completion of pipelines within compacted engineered fill makes them less susceptible to damage from ground shaking alone. However, the secondary seismic effects such as ground displacement from liquefaction can be more damaging to pipelines.

As illustrated in **Figure 3.1-2**, the proposed pipelines in this area would be located in areas mapped as having high to very high susceptibility to liquefaction, according to ABAG (ABAG, 2004). The project facilities have a potential for damage related to ground shaking and ground failure such as liquefaction, which would be a significant impact. Implementation of **Mitigation Measure 3.1.1** would minimize the impact. Therefore, the potential impact from strong seismic ground shaking or seismic-related ground failure, including liquefaction and landslides, would be less than significant. As compared to the No Action Alternative, the impact would be greater under Phase 1 and would be proportional to the new proposed facilities.

Novato SD/NMWD

The Phase 1 improvements for the Novato Central service area would include additional recycled pipelines. Please refer to the impacts discussed for the No Action Alternative above. Incorporation of **Mitigation Measure 3.1.1** would reduce the potential rupture impact to a less-than-significant. As compared to the No Action Alternative, the impact would be equivalent to and greater under Phase 1 and would be proportional to the additional facilities.

SVCSD

The Phase 1 plan for SVCSD includes elements of the SVRWP, such as 5.2 miles of proposed new pipelines, additional storage at the WWTP, and construction of additional pumping capacity for distribution. The Napa Salt Marsh Restoration Project would also be implemented including installation of one of the three options of proposed pipelines (approximately 8 miles), and installation of a new pump station at the reservoirs. The impacts would be similar to those discussed above under Novato SD and would be less than significant. As compared to the No Action Alternative, the impact would be equivalent to and greater under Phase 1 and would be proportional to the additional facilities.

Napa SD

A total of 17.5 miles of new pipeline and four booster pump stations would be constructed under Phase 1 for Napa SD although a smaller local project may become the preferred option. The local project would include a more direct pipeline system extending north from Imola Avenue and ending at the Napa Valley Country Club, with a second option following North Avenue and North 3rd Avenue. All of these options have similar ranges of seismic related hazards. No active faults are located within the immediate vicinity of any of the NBWRP elements for Phase 1. The Phase 1 facilities are located in relatively flat areas that would not be subject to the effects of earthquake-induced landslides. In addition, the Phase 1 facilities are located within areas that have relatively moderate potential for groundshaking (ABAG, 2003). The liquefaction potential would generally be low, however there are areas, typically those adjacent to surface waters, where the liquefaction potential is high (ABAG, 2004). However, as discussed above implementation of **Mitigation Measure 3.1.1** would reduce the impact to less-than-significant level. As compared to the No Action Alternative, the impact would be equivalent to and greater under Phase 1 and would be proportional to the additional facilities.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The geologic impacts to proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD

The impacts associated with the Basic System would, in general, be equivalent to the impacts discussed for Phase 1 above. The Basic System would include the construction of additional facilities and that would result in an overall increased potential for impacts related to seismic activity. The additional pipelines and facilities required to provide the increased delivery of recycled water, interconnectivity between the SVSCD and Napa SD, and increased treatment

capacities at LGVSD, Novato SD, and Napa SD would be constructed to the same standards as discussed under Phase 1. The additional facilities are similarly not located within areas susceptible to fault rupture or earthquake-induced landslides. The impacts would be similar to those discussed under the Basic System and would apply to the additional components. Despite the potential for seismic hazards such as severe ground shaking and liquefaction, the incorporation of **Mitigation Measure 3.1.1** for the additional facilities would have a less-than-significant impact for all the service areas under the Basic System. As compared to the No Action Alternative, the impact would be greater in the case of LGVSD than other Member Agencies and proportional to the additional facilities under the Basic System.

Napa SD

The majority of the proposed facilities (treatment upgrades, pipeline, storage, and pump station) would not be located within or near any active faults that would be susceptible to fault rupture; however the Carneros East pipeline and portions of the Napa Salt Marsh pipeline would potentially be located within 100 feet of the West Napa fault zone. Pipelines crossing active fault zones would have the potential for pipeline rupture and release of recycled water. Structural design measures at fault crossings, as required in **Mitigation Measure 3.1.1**, would reduce potential impacts to a less-than-significant level.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, Napa SD

The Partially Connected System would include all of the facilities described under the Basic System in addition to delivery of recycled water to the Peacock Gap Golf Course, interconnectivity between Novato SD and LGVSD to serve the Sears Point Area, additional pipelines and facilities within Novato SD, and additional facilities within Napa SD. The Partially Connected System would require the construction of additional facilities over a range of geologic materials which would be susceptible to seismic hazards such as ground shaking and, in some areas, liquefaction. The proposed additional facilities would not be located within areas that are susceptible to fault rupture or earthquake-induced landslides (Jennings, 1994 and ABAG, 1997). The impacts would be similar to those discussed under the Basic System and would apply to the additional components. Incorporation of **Mitigation Measure 3.1.1** for the additional facilities would reduce impacts to less than significant. As compared to the No Action Alternative, the impact would be greater for all the

Member Agencies and proportional to the additional facilities under the Partially Connected System.

SVCSD

The majority of the proposed facilities (treatment upgrades, pipeline, storage, and pump station) would not be located within or near any active faults that would be susceptible to fault rupture; however portions of the Sears Point pipeline would potentially be located within 100 feet of the Rodgers Creek fault zone and the Tolay fault zone. Pipelines crossing active fault zones would have the potential for pipeline rupture and release of recycled water. Structural design measures at fault crossings, as required in **Mitigation Measure 3.1.1**, would reduce potential impacts to a less-than-significant level.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD, Napa SD

The Fully Connected System would result in the impacts equivalent to those discussed under the Partially Connected System in addition to the impacts associated with the additional components proposed under the Fully Connected System. The impacts would be similar to those discussed under the Partially Connected System and would apply to the additional components. Incorporation of **Mitigation Measure 3.1.1** for the additional facilities would have a less-than-significant impact for all the service areas. As compared to the No Action Alternative, the impact would be greater for all the Member Agencies and proportional to the additional facilities under the Fully Connected System.

Mitigation Measures

Mitigation Measure 3.1.1: The Member Agencies will implement the following measures:

- All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria, including the California Building Code (CBC) and American Waterworks Association (AWWA) criteria.
- The project construction materials and backfill materials will be designed according to a geotechnical investigation by a California-licensed geotechnical engineer or

engineering geologist to address landslide, subsidence, liquefaction, and expansive soils and seismic hazards such as ground shaking and liquefaction.

- Implementation of industry standard geotechnical measures such as replacing excavated soils with engineered fill materials are effective means to overcome the potential for subsidence. If excavated soils are to be reused for backfill, they would still be appropriately compacted to mitigate the potential for subsidence or settlement and evaluated for expansion and amended, if necessary, to reduce the potential for expansion in accordance with accepted geotechnical practices.

- Proposed facilities will be designed to include flexible connections, where deemed necessary, along with backfill requirements that minimize the potential for significant damage. All other associated improvements will employ standard design and construction using the most recent geotechnical practices and California Building Code (CBC) seismic criteria, which would provide conservative design criteria.

Impact Significance after Mitigation: Less than Significant.

Impact 3.1.2: Erosion. Project construction activities could result in short-term erosion and loss of topsoils. (Less than Significant with Mitigation)

Construction for the NBWRP would require significant ground disturbing activities that include excavation, stockpiling removed soils, and placement of imported fill materials or reuse of excavated soils. Construction of the pipelines would primarily use the open-trench and/or trenchless techniques, which would involve excavation of existing soils and stockpiling them in dedicated areas. If not managed correctly, the soils disturbed by project earthwork and construction activities as well as stockpiled materials for use in the construction would be susceptible to the effects of wind or water induced erosion and loss of topsoil. However, the NBWRP would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) that would include best management practices (BMPs) that are designed to minimize the potential for erosion and sedimentation of stormwater runoff. The SWPPP will be consistent with Regional Water Board requirements. Treatment upgrades within the existing WWTPs could include groundbreaking activities and therefore could be susceptible to erosion or loss of topsoil; however BMPs defined in **Mitigation Measure 3.1.2** would minimize impacts from erosion on topsoil.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact associated with erosion and loss of topsoils would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an

individual basis, without the benefit of regional coordination or federal funding. Future baseline conditions (2020) for erosion and sedimentation are assumed to be equivalent to current conditions.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis.

LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact associated with erosion and loss of topsoils would occur.

Novato SD/ NMWD

Under the No Action Alternative, recycled water facilities would be implemented in the Novato North Service Area to provide service to Stone Tree Golf Course, large commercial/ industrial campuses, and Valley Memorial Park Cemetery. Installation of the proposed pipelines would predominantly occur along existing roadways and additional storage and pumping capacities would occur within or adjacent to the existing WWTP facilities. Soils along these roadways may or may not contain native topsoils and may be comprised of engineered fill associated with the construction of the roadway. Refer to the discussion under No Action Alternative. BMPs would be installed including erosion control measures such as covering stockpiles, use of straw bales, silt fences, etc. that would minimize the potential for erosion and loss of topsoils. As required by **Mitigation Measure 3.1.2** below, the NBWRP would be required to prepare a SWPPP that would include BMPs that are designed to minimize the potential for erosion and sedimentation of stormwater runoff. Implementation of these BMPs, as required by **Mitigation Measure 3.1.2**, would reduce the potential for erosion and loss of topsoil to less-than-significant levels.

SVCSD

Under the No Action Alternative, Alignment 1A (5.2 miles of pipeline) of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented, as well as one of three alternative pipeline routes for the Napa Salt Marsh Restoration Project (see **Chapter 2, Project Description**).

The impacts would be similar to construction effects described above for facilities within Novato SD service area, and would apply to the additional components. The impact would be less than significant with implementation of **Mitigation Measure 3.1.2**.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact associated with erosion and loss of topsoils would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The erosion impact to under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD

Implementation of Phase 1 would require construction of one of three pipeline options, described in **Chapter 2, Project Description**, from the RWTF at LGVSD WWTP to the Hamilton Field area and Reservoir Hill Tank, as well as an additional booster pump station.

Installation of these pipelines for the Coast Guard Housing Distribution Loop System would occur predominantly along existing roadways, while pipelines for Options A, B, and C would occur primarily along open undeveloped areas. Soils along these roadways may or may not contain native topsoils and may be comprised of engineered fill associated with the construction of the roadway. However, under Option C, a total of 5.9 miles of pipeline would be installed using open trench methods of construction. In general, the construction of pipelines using open trench methods includes BMPs that include erosion control measures such as covering stockpiles, use of straw bales, silt fences, etc. that minimize the potential for erosion and loss of topsoils. As required by **Mitigation Measure 3.1.2** below, the NBWRP would be required to prepare a SWPPP that would include BMPs that are designed to minimize the potential for erosion and sedimentation of stormwater runoff. Implementation of these BMPs, as required by **Mitigation Measure 3.1.2,** would reduce the potential for erosion and loss of topsoil to less-than-significant levels for the additional facilities. As compared to the No Action Alternative, the impact would be greater under Phase 1 and would be proportional to the new proposed facilities.

Novato SD/NMWD

The impacts would be similar to those discussed under No Action Alternative in addition to the impacts in the Novato Central Service Area. The impacts under Phase 1 would be similar to those discussed above and would apply to the additional components. The impact would be less than significant with implementation of **Mitigation Measure 3.1.2** for the additional facilities. As compared to the No Action Alternative, the impact would be greater under Phase 1 and would be proportional to the additional facilities.

SVCSD

Please refer to the discussion under the No Action Alternative. The impacts would be similar to those discussed above and would apply to the additional components and occur in the larger SVRWP area in addition to the Alignment 1A route. Impacts under Phase 1 for the Napa Salt

Marsh Restoration Project would be equivalent to those under the No Action Alternative. The impact would be less than significant with implementation of **Mitigation Measure 3.1.2**. As compared to the No Action Alternative, the impact would be greater under Phase 1 and would be proportional to the additional facilities.

Napa SD

Phase 1 requires 17.5 miles of pipeline, which would occur predominantly along existing roadways, Soils along these roadways may or may not contain native topsoils and may be comprised of engineered fill associated with the construction of the roadway. In general, the construction of pipelines using open trench methods includes BMPs that include erosion control measures such as covering stockpiles, use of straw bales, silt fences, etc. that minimize the potential for erosion and loss of topsoils. As required by **Mitigation Measure 3.1.2** below, the NBWRP would be required to prepare a SWPPP that would include BMPs that are designed to minimize the potential for erosion and sedimentation of stormwater runoff. Implementation of these BMPs, as required by **Mitigation Measure 3.1.2,** would reduce the potential for erosion and loss of topsoil to less-than-significant levels for the additional facilities. As compared to the No Action Alternative, the impact would be greater under Phase 1 and would be proportional to the additional facilities.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The geologic impacts under the Basic System would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The impacts associated with the Basic System would, in general, be equivalent to the impacts discussed for Phase 1 above and would apply to the additional components. The Basic System would include the construction of additional facilities and that would result in an overall increased potential for erosion and loss of topsoil. However, **Mitigation Measure 3.1.2** would apply to the additional components under the Basic System, therefore the impact would be less than significant impact. As compared to the No Action Alternative, the impact would be greater under the Basic System and would be proportional to the additional facilities.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the

Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts under the Partially Connected System would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Partially Connected System would include all of the facilities described under the Basic System in addition to facilities for delivery of recycled water to the Peacock Gap Golf Course, interconnectivity between Novato SD and LGVSD to serve the Sears Point Area, additional pipelines and facilities within Novato SD, and additional facilities within Napa SD. The impacts would be similar to those discussed under the Basic System and would apply to the additional components. Implementation of **Mitigation Measure 3.1.2** for the additional facilities would have a less than significant impact. As compared to the No Action Alternative, the impact would be greater under the Partially Connected System and would be proportional to the additional facilities.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Fully Connected System would require the most construction as compared to the other alternatives. Considering the additional facilities under this alternative, there is an increased potential for erosion and loss of topsoil, if not managed appropriately. The impacts would be similar to those discussed above and would apply to the additional components. The impact would be less than significant with implementation of **Mitigation Measure 3.1.2** for the additional facilities. As compared to the No Action Alternative, the impact would be greater under the Fully Connected System and would be proportional to the additional facilities.

Mitigation Measures

Mitigation Measure 3.1.2: The Member Agencies will implement the following measures:

- Consistent with SWPPP requirements, the construction contractor shall be required to implement BMPs for erosion control onsite. The use of construction BMPs will

minimize the potential for erosion and loss of topsoil, and shall include, without limitation, the following:

- Avoid scheduling construction activities during a rain event, but be prepared for sudden changes in conditions;
- Construct berms, silt fences, straw bales, fiber rolls, and/or sand bags around stockpiled soils;
- Cover stockpiled soils during a rain event and monitor perimeter barriers, repair as necessary;
- Stabilize entrances to work area to prevent tracking of dirt or mud onto roadways; and
- Implement dust control practices as appropriate on all stockpiled material.

Impact Significance after Mitigation: Less than Significant.

Impact 3.1.3: Unstable Soils. Project improvements could be located on a geologic unit or soil that is unstable that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse causing damage to structures and service disruptions. (Less than Significant)

The proposed facilities for all service areas would cover a range of geologic materials that have varying geotechnical engineering properties. In general, the proposed facilities are not located in areas that are susceptible to landslides. As discussed above, the majority of improvements would be located along existing roadways or within or near existing WWTPs that have been previously graded or are in relatively flat locations. In addition, the potential for earthquake-induced landslides is discussed above in Impact 3.1.1, and found to be less than significant. Therefore, the potential impact of landslides is not discussed further in this impact analysis.

Lateral spreading is a secondary effect related to seismicity and liquefaction. As such, the discussion of liquefaction is found in Impact 3.1.1, above, and would apply to the potential for lateral spreading. The use of geotechnical engineering practices and findings through **Mitigation Measure 3.1.1** to mitigate the potential for liquefaction would reduce the potential for lateral spreading to less-than-significant levels. Collapse of subsurface soils or geologic units is not typically associated with materials in this region. Collapsible soils are most often encountered in arid climates, where wind and intermittent streams deposit loose low-density materials. When placed under new loading or the addition of water that reaches deeper than under normal conditions, these soils can collapse causing structural damage. However, these conditions or soils are not found in the action area and therefore there is no potential for collapsible soils and it is not discussed further in this section.

Some of the proposed pipeline routes are located relatively close to the Bay shore areas that contain marsh and intertidal deposits that are generally soft and compressible. Placement of additional loads to these soils, if not engineered appropriately, could result in subsidence or settlement that can

damage structures and appurtenances. Therefore, the following discussion focuses on the potential for subsidence and settlement to impact from the NBWRP and alternatives.

No Project Alternative

No project components would be implemented under the No Project Alternative. No impact associated with unstable soils and specifically with subsidence would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.1-1, No Action Alternative).

Under future baseline (2020) conditions, geologic conditions within the region would be unchanged from existing conditions. Proposed facilities would be subject to unstable soils. However implementation of **Mitigation Measure 3.1.1**, which includes designing the proposed facilities by a California licensed geotechnical engineer or engineering geologist and constructing according to CBC and industry standard geotechnical practices, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact associated with unstable soils and specifically with subsidence would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be implemented in the Novato North Service Area to provide service to Stone Tree Golf Course, Fireman's Fund Campus, and Valley Memorial Park Cemetery. The proposed pipelines routes include a variety of different soil types including Reyes clays, Tocaloma-McMullin series, Los Osos soils, and urban land complex soils. Please refer to the discussion above. The potential impact for subsidence would be less than significant with incorporation of **Mitigation Measure 3.1.1**.

SVCSD

Under the No Action Alternative, Alignment 1A of the SVRWP and the Napa Salt Marsh Restoration Project would be implemented. Soils in the SVCSD area primarily include the Huichica-Wright-Zamora Association**.** These soils are generally comprised of nearly-level to moderately-sloping soils that are well drained to excessively-drained loams to silty clay loams. The susceptibility to subsidence cannot be determined on information from the soil survey,

however the inland location may be an indication that they may be less susceptible to subsidence than Bay shore deposits. Regardless, the roadways where the pipelines are proposed have likely been sufficiently compacted to prevent subsidence. The potential impact for subsidence would be less than significant with incorporation of **Mitigation Measure 3.1.1**.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact associated with unstable soils and specifically with subsidence would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Implementation of Phase 1 would require construction of one of three pipeline options, described in **Chapter 2, Project Description**, from the RWTF at LGVSD WWTP to the Hamilton Field area and Reservoir Hill Tank, as well as an additional booster pump station.

The underlying geologic materials in the area of the proposed pipeline options for Phase 1 include a Reyes clays and urban land complex soils (USDA, 2004). The Reyes clays, based on their close proximity to the Bay, likely consist of soft saturated sediments that are susceptible to subsidence if not engineered appropriately. The urban land complex soils could consist of artificial fill materials that have either been appropriately compacted or not. The roadways have likely been sufficiently compacted to prevent subsidence. Implementation of **Mitigation Measure 3.1.1** would minimize any potentially significant impact to the additional components. The impact would be less than significant.

Novato SD/NMWD

The impact would be similar to that discussed under No Action Alternative and would occur in the Novato Central Service Area. The potential impact for subsidence would be less than significant with incorporation of **Mitigation Measure 3.1.1**.

SVCSD

Refer to the impacts discussed above and under No Action Alternative. As discussed above, industry standard geotechnical measures and **Mitigation Measure 3.1.1** would overcome the potential for subsidence for the additional components. The impact would be less than significant.

Napa SD

Implementation of Phase 1 would require construction of 17.5 miles of pipeline and four booster pump stations. Soils in the area of the proposed pipeline route options for Phase 1 include a number of soil units which likely vary in their engineering characteristics. The potential impact for subsidence is then less than significant with incorporation of **Mitigation Measure 3.1.1**.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The impacts associated with the Basic System would, in general, be equivalent to the impacts discussed for Phase 1 above. The Basic System would include the construction of additional facilities which could potentially result in an overall increased potential for subsidence. However, the additional pipelines and facilities required to provide the increased delivery of recycled water, interconnectivity between the SVSCD and Napa SD, and increased treatment capacities at LGVSD, Novato SD, and Napa SD would be constructed to the same standards as discussed under Phase 1. The impacts would be similar to that discussed above for the Member Agencies. The Basic System would have a less than significant impact with incorporation of **Mitigation Measure 3.1.1**.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage..

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Partially Connected System would include all of the facilities described under the Basic System in addition to delivery of recycled water to the Peacock Gap Golf Course, interconnectivity between Novato SD and LGVSD to serve the Sears Point Area, additional pipelines and facilities within Novato SD, and additional facilities within Napa SD. The Partially Connected System would

require the construction of additional facilities compared to Phase 1 above, and would therefore have an increased potential for subsidence. However, the additional pipelines and facilities would be constructed to the same standards as discussed under Phase 1 and the Basic System. The impact would be less than significant with incorporation of **Mitigation Measure 3.1.1**.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Fully Connected System would require the most construction of new pipelines, additional tertiary treatment capacity, and storage facilities compared to the Partially Connected System. Considering the additional facilities under this alternative, there is an increased potential for subsidence, if not designed and engineered appropriately. However, the additional pipelines and facilities would be constructed to the same standards as discussed above. The impact would be less than significant with incorporation of **Mitigation Measure 3.1.1**.

Impact 3.1.4: Expansive Soils. Project improvements could be located on expansive soils that over time could cause damage to foundations and pipelines resulting in service disruptions. (Less than Significant)

The proposed facilities cover a range of soil types that have varying shrink-swell properties. In general, the proposed facilities would not be located in areas that are susceptible to landslides. As discussed above, the majority of improvements are located along existing roadways or within or near existing WWTPs that have been previously graded or are in relatively flat locations. The potential effects of expansive soils is often mitigated through the use of standard geotechnical engineering practices which routinely evaluate backfill soils and foundation soils for their expansion potential. If not engineered appropriately, any expansive soils left beneath proposed improvements could, over time, result in damage to structures or pipelines through cyclical changes in soil volumes from the shrink-swell characteristics of expansive soils. Typical geotechnical mitigation efforts include replacement of soils with engineered fills that have low expansion properties or the addition of soil treatments to existing soils that reduces the expansion potential.

No Project Alternative

No project components would be implemented under the No Project Alternative. No impact associated with expansive soils would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.1-1).

Under future baseline (2020) conditions, geologic conditions within the region would be unchanged from existing conditions. Proposed facilities would be subject to the seismic hazards. However implementation of **Mitigation Measure 3.1.1**, which includes designing the proposed facilities by a California licensed geotechnical engineer or engineering geologist and constructing according to CBC and industry standard geotechnical practices, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact associated with expansive soils would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be implemented in the Novato North Service Area to provide service to Stone Tree Golf Course, Fireman's Fund Campus, and Valley Memorial Park Cemetery. The proposed pipelines routes include a variety of different soil types including Reyes clays, Tocaloma-McMullin series, Los Osos soils, and urban land complex soils. These soils vary in their shrink-swell behaviors. The roadways where the pipelines are proposed have likely been backfilled with fills that have a low potential for expansion. However, the impact could be significant and implementation of **Mitigation Measure 3.1.1** would reduce the impact to less-than-significant.

SVCSD

The impacts under the No Action Alternative, would be associated with the Alignment 1A (5.2 miles of pipeline) of the SVRWP, as well as one of three alternatives for the Napa Salt Marsh Restoration Project. Soils in the SVCSD area of the proposed pipelines primarily include the Huichica-Wright-Zamora Association**.** These soils are generally comprised of nearly-level to moderately-sloping soils that are well drained to excessively-drained loams to silty clay loams. Their susceptibility to expansion cannot be determined on information from the soil survey,

however they are primarily comprised of alluvial deposits that may or may not have the potential for expansion. The impact associated with expansive soils would be similar to that discussed under LGVSD above, and could be a significant impact. Incorporation of **Mitigation Measure 3.1.1** for the additional components would ensure a less than significant impact.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact associated with expansive soils would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Implementation of Phase 1 would require construction of one of three pipeline options, described in **Chapter 2, Project Description**, from the Recycled Water Treatment Facility at LGVSD WWTP to the Hamilton Field area and Reservoir Hill Tank, as well as an additional booster pump station.

Soils in the area of the proposed pipeline options for Phase 1 include a number of soil units vary in their shrink-swell potential. The Reyes clays have a high shrink-swell potential whereas the Tocaloma-McMullin series have low potential. The roadways where the Coast Guard Housing Distribution Loop pipelines are proposed have likely been backfilled with fills that have a low potential for expansion. However, there is a potential for a significant impact, which would be reduced by implementation of **Mitigation Measure 3.1.1** for the additional components. The impact would be less than significant.

Novato SD/NMWD

The impact would be similar to those discussed under LGVSD and would be less than significant with incorporation of **Mitigation Measure 3.1.1** for the additional components.

SVCSD

Please see the impacts discussed above. The impact would be less than significant with incorporation of **Mitigation Measure 3.1.1** for the additional components.

Napa SD

Implementation of Phase 1 would require construction of 17.5 miles of pipeline and four booster pump stations. Soils in the area of the proposed pipeline options for Phase 1 include a number of soil units, which likely vary in their shrink-swell potential. The impact would be less than significant with incorporation of **Mitigation Measure 3.1.1 for the additional components**.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The impacts associated with the Basic System would, in general, be equivalent to the impacts discussed for Phase 1 above. The Basic System would include the construction of additional facilities which could potentially result in an overall increased potential for subsidence. However, the additional pipelines and facilities required to provide the increased delivery of recycled water, interconnectivity between the SVSCD and Napa SD, and increased treatment capacities at LGVSD, Novato SD, and Napa SD would be constructed to the same standards as discussed under Phase 1. Implementation of **Mitigation Measure 3.1.1** would ensure a less-than-significant impact for the additional components under the Basic System.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Partially Connected System would include all of the facilities described under the Basic System in addition to delivery of recycled water to the Peacock Gap Golf Course, interconnectivity between Novato SD and LGVSD to serve the Sears Point Area, additional pipelines and facilities within Novato SD, and additional facilities within Napa SD. The Partially

Connected System would require the construction of additional facilities compared to Phase 1 above, and would therefore have an increased potential for subsidence. However, the additional pipelines and facilities would be constructed to the same standards as discussed under Phase 1. Implementation of **Mitigation Measure 3.1.1** would ensure a less-than-significant impact for the additional components under the Partially Connected System.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The geologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Fully Connected System would require the most construction of new pipelines, additional tertiary treatment capacity, and storage facilities compared to the other alternatives. Considering the additional facilities under this alternative, there is an increased potential for subsidence, if not designed and engineered appropriately. Implementation of **Mitigation Measure 3.1.1** for the additional components under the Fully Connected System would have a less than significant impact.

3.1.4 Impact Summary by Service Area

Table 3.1-4 provides a summary of potential project impacts related to geology and soils.

TABLE 3.1-4
POTENTIAL IMPACTS AND SIGNIFICANCE – GEOLOGY AND SOILS

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.1.1: Seismicity.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.1.2: Erosion.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.1.3: Unstable Soils.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.1.4: Expansive Soils.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM

NI = No Impact
LSM = Less than Significant with Mitigation

3.1.5 References

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3.2 Surface Hydrology

This section describes the existing surface hydrology in the project area and the federal, state, and local regulations that would apply to the North Bay Water Recycling Program (NBWRP). This section evaluates the potential impacts related to hydrology, drainage, and flooding that could result from implementation of the NBWRP. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.2.1 Affected Environment/Setting

Regional Setting

The project area lies within the San Pablo Bay watershed. The watershed is approximately 900 square miles in area; **Figure 3.2-1** shows the watershed and its sub-watersheds. Mount St. Helena is located to the north of the watershed with the Howell Mountains in Napa and Solano Counties, the Carquinez Strait, and the Franklin Ridge, the Briones Hills, and the northern portion of the East Bay Hills in Contra Costa County to the east. The western border is defined by a series of small mountains and hilltops including: Loma Alta and Red Hill in Marin County; Meacham Hill, Sonoma Mountain, Bennet Mountain, and Mt. Hood in Sonoma County; and the Mayacamas Mountains along the northern border of Napa and Sonoma Counties. San Pablo Bay receives freshwater inflow from this watershed as well as from the Sacramento-San Joaquin Delta. San Pablo Bay has brackish water and receives tidal inflows of salt water twice daily from San Francisco Bay.

Surface water runoff creates the majority of freshwater flows within the rivers and streams. Consequently, stream flow in all of the creeks and rivers varies greatly with the season and the year depending on precipitation. Several smaller tributaries are naturally dry during the summer, while in others flows vary between wet and dry years. The withdrawal of water from streams for both agricultural and domestic uses has affected flow rates in the streams. Lower base flow rates occur in the streams as a result of water storage in reservoirs and direct withdrawals from the streams and aquifers.

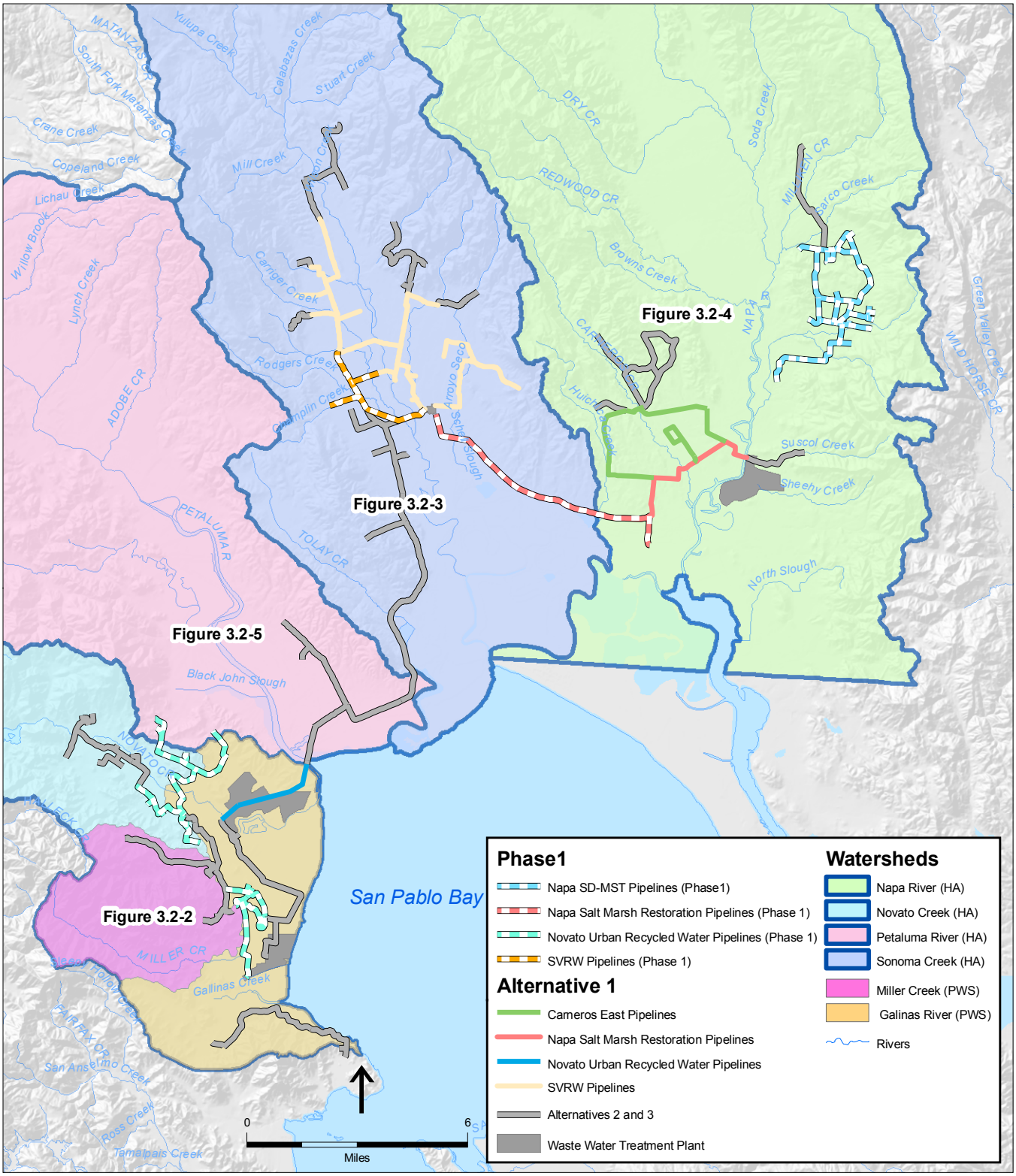
The WWTPs within the region contribute treated effluent to major tributaries, with discharge restricted to wet months of the year. Estimated 2002 monthly discharge provides the best available dataset from all of the dischargers, and is provided in **Table 3.2-1**.

Local Setting

LGVSD

Miller Creek/Gallinas Creek Watershed

The Miller Creek/Gallinas Creek watershed covers approximately 44 square miles. The watershed reaches from the coastal mountain ridges on the west, including the Terra Linda-Sleepy Hollow



SOURCE: CDM, 2008; ESRI, 2006; SWRCB, 2006; and ESA, 2008

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.2-1
Regional Watersheds

TABLE 3.2-1
EXISTING 2002 MONTHLY WATER DISCHARGE BY WWTP (AF/MONTH)

	Napa	Sonoma	Novato	LGVSD	Total
January	1,115	612	786	371	2,884
February	837	375	567	255	2,035
March	1,030	396	595	275	2,297
April	521	139	495	160	1,315
May	0	0	499	143	641
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	407	0	407
October	0	0	424	0	424
November	983	603	477	201	2,264
December	1,028	680	1,016	502	3,226
TOTAL	**5,515**	**2,805**	**5,267**	**1,906**	**15,492**

SOURCE: USGS, 2008.

Divide Open Space Preserve, to San Pablo Bay on the east. The upper subwatershed for Miller Creek is largely undeveloped park or open space. The valley area of the Miller Creek watershed and most of the Gallinas Creek watershed primarily includes urban development, with some parks and open space (San Francisco Estuary Institute, 2008).

The LGVSD service area is located in the Miller Creek and Gallinas Creek watershed. During the wet season (November 1 through May 31), treated wastewater is discharged to the tidal portion of Miller Creek, which flows into San Pablo Bay. During the non-discharge dry season (June 1 through October 31), treated wastewater is stored in ponds and used to irrigate local pasture and maintain freshwater wetland habitat.

Novato SD

Novato Creek Watershed

Novato Creek extends approximately 17 miles in the 55-square mile-Novato Creek watershed (California Coastal Commission, 2006). The watershed extends from the western border in the coastal mountains just west of Stafford Lake east to San Pablo Bay. The upper watershed primarily includes agricultural areas and open space. The valley floor includes residential development with parks (Lewis and Lattanzio, 2006). Tributaries to Novato Creek include Arroyo San Jose and Arroyo Avichi (Oakland Museum of California, 2008). Based on the data for Novato Creek (USGS, 2008), flows in the creek are heavily influenced by precipitation, with higher flows during the wet season and very low flows during the dry season.

The Novato Creek watershed has experienced significant flooding in 1955, 1982, 1983, 1986, and 2005-2006. The creek was formerly dredged for navigation and is now dredged for flood control (Lewis and Lattanzio, 2006).

The Novato SD service area lies within the Novato Creek watershed. Discharge from the WWTP is restricted during summer months (May through September); during this time, secondary effluent from the Novato SD WWTP is conveyed through a pipeline that extends through the reclamation area to three Novato SD-owned irrigation parcels (totaling approximately 820 acres), two treated water storage ponds, and 15 acres of wildlife habitat. The effluent discharge occurs in the wet season (i.e., September through May) and is subject to lower limits for biochemical oxygen demand and suspended solids. The effluent discharge is restricted from June 1 to August 31.

Petaluma River Watershed

The Petaluma River watershed covers approximately 146 square miles (Southern Sonoma County Resource Conservation District (SSCRCD), 2008). The watershed extends from upstream mountain peaks, including Sonoma Mountain, Mecham Hill, Weigand's Hill, and Mt. Burdell, south to San Pablo Bay. The land use in the area includes 56 percent mountainous or hilly uplands, 33 percent valley, and 11 percent salt marshes (SSCRCD, 2008). The valley area includes the urban and suburban development in the city of Petaluma, pasture and grazing, and vineyards. The lower 12 miles of the Petaluma River flow through Petaluma Marsh, the largest salt marsh in the San Pablo Bay watershed (SSCRCD, 2008). Major tributaries include Black John Slough, Basalt Creek, Rush Creek, San Antonio Creek, Adobe Creek, Lichau Creek, Willow Brook, and Lynch Creek (Oakland Museum of California, 2008).

The U.S. Army Corps of Engineers dredges the Petaluma River approximately once every four years because of high siltation rates. The Petaluma River has experienced recent flood events in 1982, 1986, 1997, and 1998, of which the flood in 1982 was the most damaging and the most damage experienced in the upstream segments of the river. The areas most prone to flooding were the residential areas from Lynch Creek to Payran Street and upstream of the old Lakeville Street and railroad bridges. The City of Petaluma and the U.S. Army Corps of Engineers have collaborated to implement a flood control project in Petaluma (City of Petaluma, 2003).

SVCSD

Sonoma Creek Watershed

The Sonoma Creek watershed drains an area of approximately 170 square miles between ridges of the Sonoma Mountains. Sonoma Creek begins on Sugarloaf Ridge and flows 31 miles to North San Pablo Bay. The watershed is bounded by the Petaluma River watershed on the west, the Napa River watershed on the east, and the Russian River watershed on the north (McKee, et al., 2000). Land use within the watershed is predominantly rural with open space, grazing and agriculture, especially viticulture (wineries). Sonoma Creek is the principal drainage for the Sonoma Valley sub-basin. The southern Napa and Sonoma Valley basins receive an average of 20 to 24 inches of precipitation a year and the highest runoff occurs shortly after rainfall (USGS, 2008). Levels of precipitation and soil permeability affect the volume of creek and river flow into the Bay (Jones and Stokes, 2003). Some of the creeks and tributaries to Sonoma Creek include Dowdall Creek, Malone Creek, Carriger Creek, Felder Creek, Champlin Creek, Fowler Creek, Rodgers, Schell Creek, west and east Arroyo Seco, and unnamed tributaries.

Flooding in the city of Sonoma largely stems from two major streams, Nathanson Creek and Fryer Creek, which flow southward and lie on the east and west of the city respectively. Fryer Creek, the smaller of the two creeks, has a narrow and shallow 100–year flood plain. The most extreme flooding from Fryer Creek produces only nuisance street inundation, and historic flooding problems have been corrected through storm drain improvements. The 100–year flood plain for Nathanson Creek is also fairly narrow within the city, although flooding along the creek can threaten a few houses with minor interior inundation (City of Sonoma, 2004).

The SVCSD service area lies in the Sonoma Creek watershed. Wastewater discharge from the SVCSD WWTP is restricted from May 1 through October 1 and is treated further for reuse in local irrigation and habitat projects. SVCSD discharges treated wastewater from November 1 to April 30 into Schell Slough and Hudeman Slough, which ultimately flow into San Pablo Bay.

Napa SD

Napa River Watershed

The Napa River watershed covers an approximately 426 square-mile-area surrounding the 55 mile-long Napa River (Napa County Resource Conservation District (RCD), 2008). The watershed extends from Mount St. Helena in the north to San Pablo Bay in the south. The watershed is bordered on the west by the Mayacama Mountains and by a northwest-trending ridge on the east. The watershed includes undeveloped areas, such as forests in the hills, riparian vegetation near rivers and creeks, and grasslands in the valley. Much of the valley floor is developed including urban development in cities such as Calistoga, St. Helena, Rutherford, Oakville, Yountville, Napa, and American Canyon. Vineyards comprise 98 percent of the approximately 37,000 acres of agricultural land in the valley (Napa County, 2005). Major tributaries to Napa River include Huichica Creek, Carneros Creek, Browne Valley Creek, Redwood Creek, Dry Creek, Conn Creek, Rector Creek, Soda Creek, Sarco Creek, Tulucay Creek, Murphy Creek, Spencer Creek, Suscol Creek, Fagan Creek, and American Canyon Creek (Oakland Museum of California, 2008).

The Napa River has experienced serious flood events 21 times since 1862. In response to the damage from the flood in 1986, the Napa County Flood Control and Water Conservation District (FCWCD) and the U.S. Army Corps of Engineers are implementing the Napa River Flood Protection Project. The purpose of the project is to create a “Living River” by incorporating multiple goals that include reducing flood damage, restoring wetlands and reconnecting the river to the floodplain, providing river-related economic development opportunities, and expanding recreational opportunities. Multiple elements are complete, with remaining elements scheduled for completion in 2011 (pending federal funding availability) (Napa County FCWCD, 2006).

The Napa SD service area lies in the Napa River watershed. Wastewater discharge from the Napa SD WWTP to Napa River occurs from November 1 to April 30. Between May 1 and October 31, the wastewater is stored in reservoirs onsite and some portion of the stored water is treated and distributed to recycled water users.

3.2.2 Regulatory Framework

State

California Fish and Game Code Sections 1600-1616

California Fish and Game Code Sections 1600-1616 (Lake or Streambed Alternation Agreement Program) require notification of the California Department of Fish and Game (CDFG) for any project that may substantially modify a river, stream, or lake. Specifically, project proponents must notify DFG if a project could:

- "Substantially divert or obstruct the natural flow of any river, stream or lake;
- Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake." (DFG, 2008)

If CDFG determines that the project has the potential to adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement would be required for the NBWRP to establish conditions to protect these resources. See Section 3.5, Biological Resources for additional information.

Local

The local general plans, policies, and regulations associated with impacts to surface hydrology within the affected jurisdictions are presented in **Appendix 3.2** of this EIR/EIS.

3.2.3 Environmental Consequences/ Impacts

Significance Criteria for Impact Analysis

Based on the Appendix G of the CEQA Guidelines, the NBWRP would have significant impacts and environmental consequences on surface hydrology if it would:

- Substantially alter the existing drainage pattern of the site or area (including through the alteration of the course or by substantially increasing the rate or amount of surface runoff) in a manner that would result in flooding on- or offsite;
- Create or contribute substantial runoff that would exceed the capacity of existing or planned stormwater drainage systems;
- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;

- Expose people or structures to a substantial risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Inundation by seiche, tsunami, or mudflow.

Water Quality impacts are discussed in Section 3.4, Water Quality. The NBWRP would not involve housing, therefore the impact related to the 100-year flood hazard area is not discussed further.

Environmental Consequences/Impact Analysis

Impact 3.2.1: Changes in drainage patterns. Project construction could modify existing drainage patterns. (Less than Significant with Mitigation)

Treatment upgrades would occur within the existing WWTPs and would not add to impervious surfaces or change the existing drainage patterns. Construction of pump stations would involve paving and construction of building structures resulting in increases in impervious surface. This could affect the existing drainage patterns. However, the new impervious surfaces would not be as extensive as to cause significant changes in the downstream hydrology or flow rates. Further, the pump stations would be designed to include appropriate drainage infrastructure to convey flows generated onsite and from upstream areas. Drainage designs would be integrated with existing drainage systems, and would be designed to avoid or minimize effects to downstream areas and infrastructure.

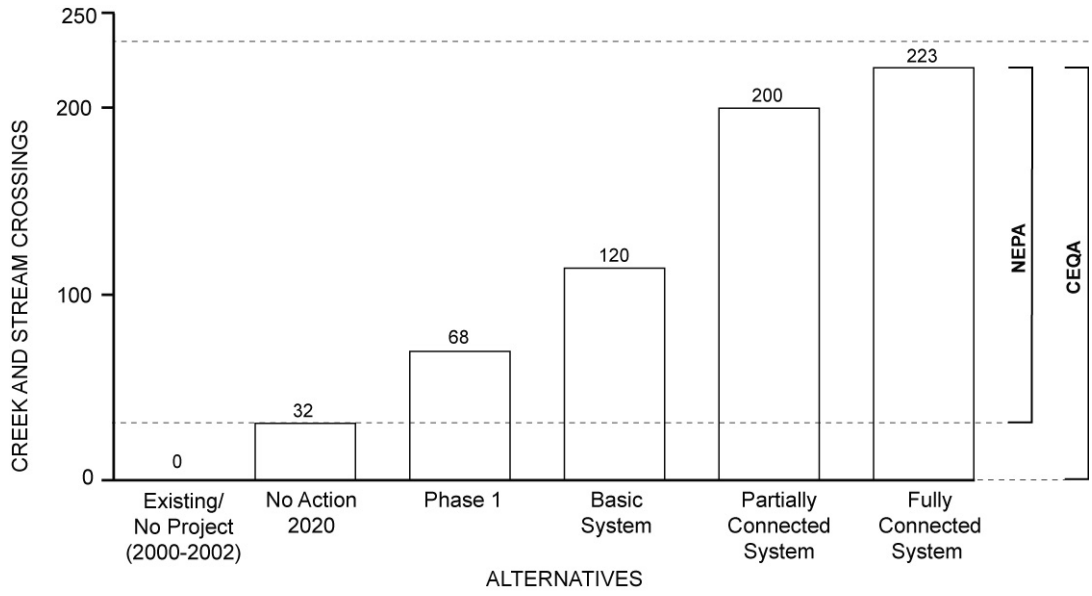
In general, pipelines would be constructed within roadway rights-of-way, and would only cross drainages where necessary. In these instances, construction of the proposed pipelines would involve activities such as grading, excavation, and trenching, which could alter existing surface drainage patterns. However, such activities would be temporary and limited to areas of active construction within the 25 foot construction corridor. The excavated areas would be returned to the pre-existing condition; therefore the impacts would be less than significant. Construction of pipelines would occur at stream crossings, which could temporarily alter drainage patterns at locations where pipelines cross local waterways. A summary of the number of stream crossings by alternative is provided in **Chart 3.2-1**.

Construction activities for pump stations and storage facilities, would involve excavation, grading and building activities that could alter surface drainage patterns. The impacts associated with these facilities in different areas are discussed further. Construction associated with treatment upgrades would not involve excavation or other activities that would alter drainage patterns, therefore is not discussed further.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action alternative below.

CHART 3.2-1
SUMMARY OF STREAM CROSSINGS BY ALTERNATIVE



SOURCE: ESA, 2009

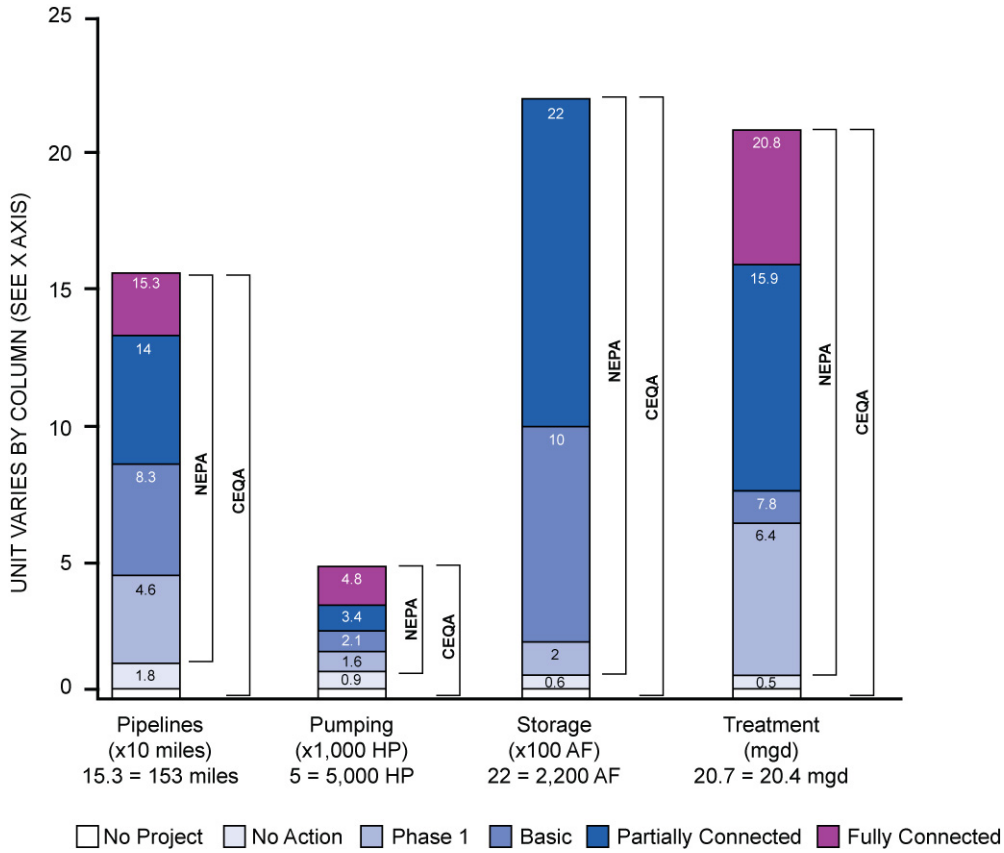
No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison with the Action Alternatives, it is estimated that approximately 18 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.2-2**, **No Action**).

Under future baseline (2020) conditions, it is anticipated that surface hydrologic conditions within the region would be generally unchanged from existing conditions. Construction of the project facilities particularly pipelines could affect the drainage patters at stream crossings. However, implementation of **Mitigation Measure 3.2.1**, which incorporates measures to protect the stream from construction activities, would reduce the impact to less-than-significant-level. The No Action Alternative would include elements within the Novato Creek, Sonoma Creek, and Napa River watersheds, and involve a total of 32 stream crossings. A discussion of individual Member Agencies is provided below.

CHART 3.2-2
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



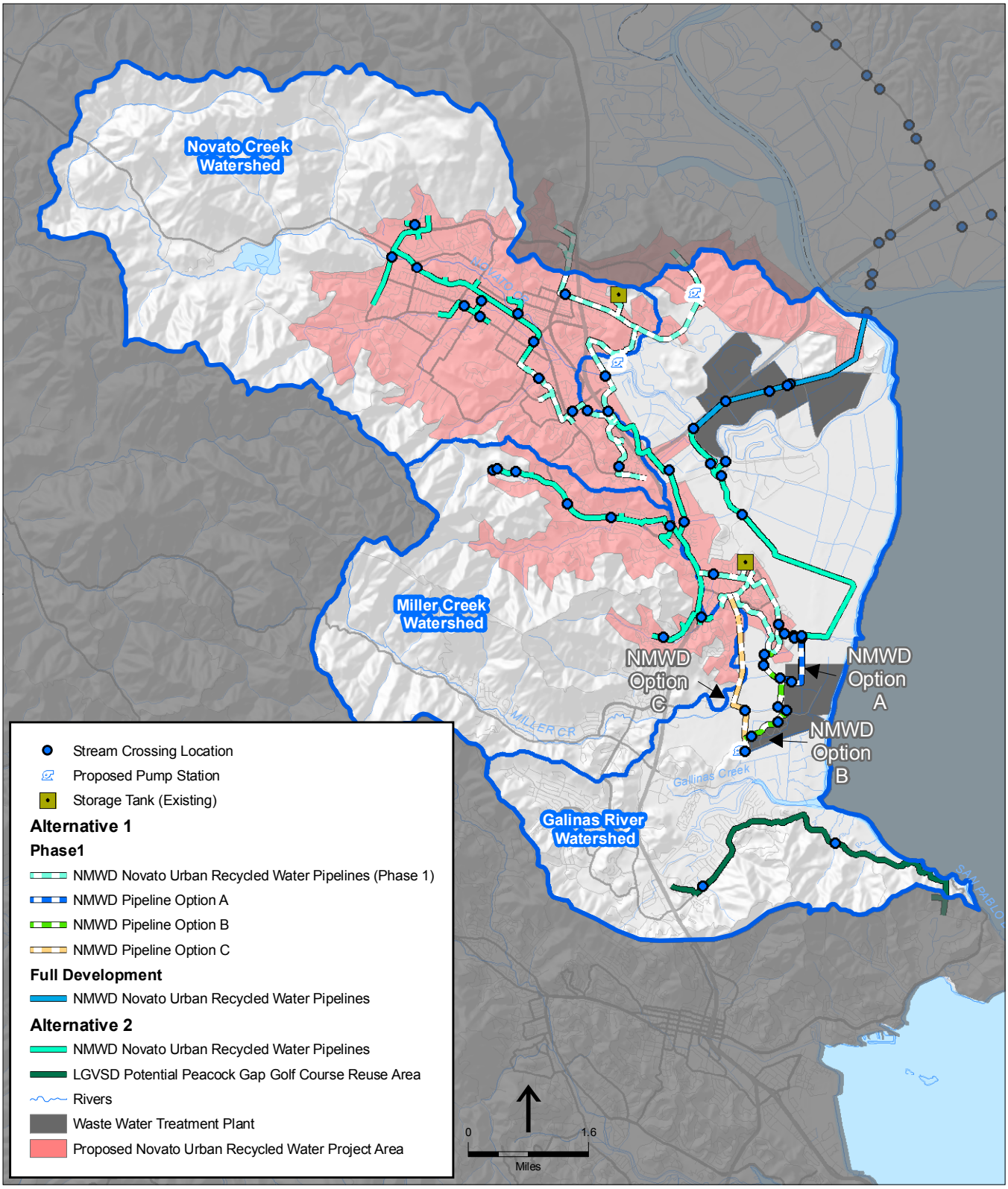
SOURCE: CDM, 2009

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

Construction under the No Action Alternative would involve a total of seven stream crossings. This includes one stream crossing at a small, intermittent creek in the Novato Creek Watershed (see **Figure 3.2-2**). The drainage pattern at the stream crossing could get altered during construction. The NMWD Novato Urban Recycled Water Pipeline (North) would involve 6 stream crossings. Although the impact would be temporary, Novato SD would implement **Mitigation Measure 3.2.1** to ensure a less-than-significant impact. The No Action Alternative would include one new booster pump station near the intersection of Olive Avenue and Atherton Avenue that would add approximately 1,000 square feet of impervious surface. The site runoff would flow to the local storm drain system or nearby ditches.



SOURCE: CDM, 2007; ESRI, 2006; SWRCB, 2006; ESA, 2008; Field Collected Stream Data, 2008; DWR NHD Stream Data, 2007

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088

Figure 3.2-2
Novato Creek, Miller Creek, and Galinas River Watershed Stream Crossings

Given the size of the pump station, the runoff would not be significant and would not result in significant changes to drainage in the area.

The No Action Alternative would include retrofitting an existing storage facility (the Plum Street Tank). These improvements would occur on existing disturbed sites and would not substantially change the drainage patterns.

SVCSD

Construction under the No Action Alternative would include approximately 8 stream crossings (see **Figure 3.2-3**) for installing the pipelines for the Sonoma Valley Recycled Water Project (SVRWP). The Napa Salt Marsh pipeline would involve 17 stream crossings and could alter existing surface drainage patterns on a temporary and localized basis. Such alteration of drainage patterns would occur when sandbags, dikes, pumps, or other means are used to divert surface runoff around open-trench areas, pipe-jacking pits and receiving areas, and other such work areas. Such diversion generally would be short-term (typically 1–5 days) and limited to areas of active construction (i.e., pipeline construction segments would typically be about 200 to 300 feet long).

To the extent feasible, construction activities related to trenching or jack and bore tunneling, would be timed to avoid storm events/periods. It may be necessary on occasion, however, to employ short-term drainage diversion and control measures such as those described above.

The SVRWP pipelines would cross Sonoma Creek and Felder Creek at multiple locations. The pipelines would also cross Carriger Creek, Rodgers Creek, Fowler Creek, and a tributary to Felder Creek. Refer to the impact discussion under Novato SD. The impact would be less than significant with implementation of **Mitigation Measure 3.2.1**.

The No Action Alternative would include construction of new pumping and storage facilities at the SVCSD WWTP. These facilities would be on a disturbed site and would not substantially change the drainage patterns.

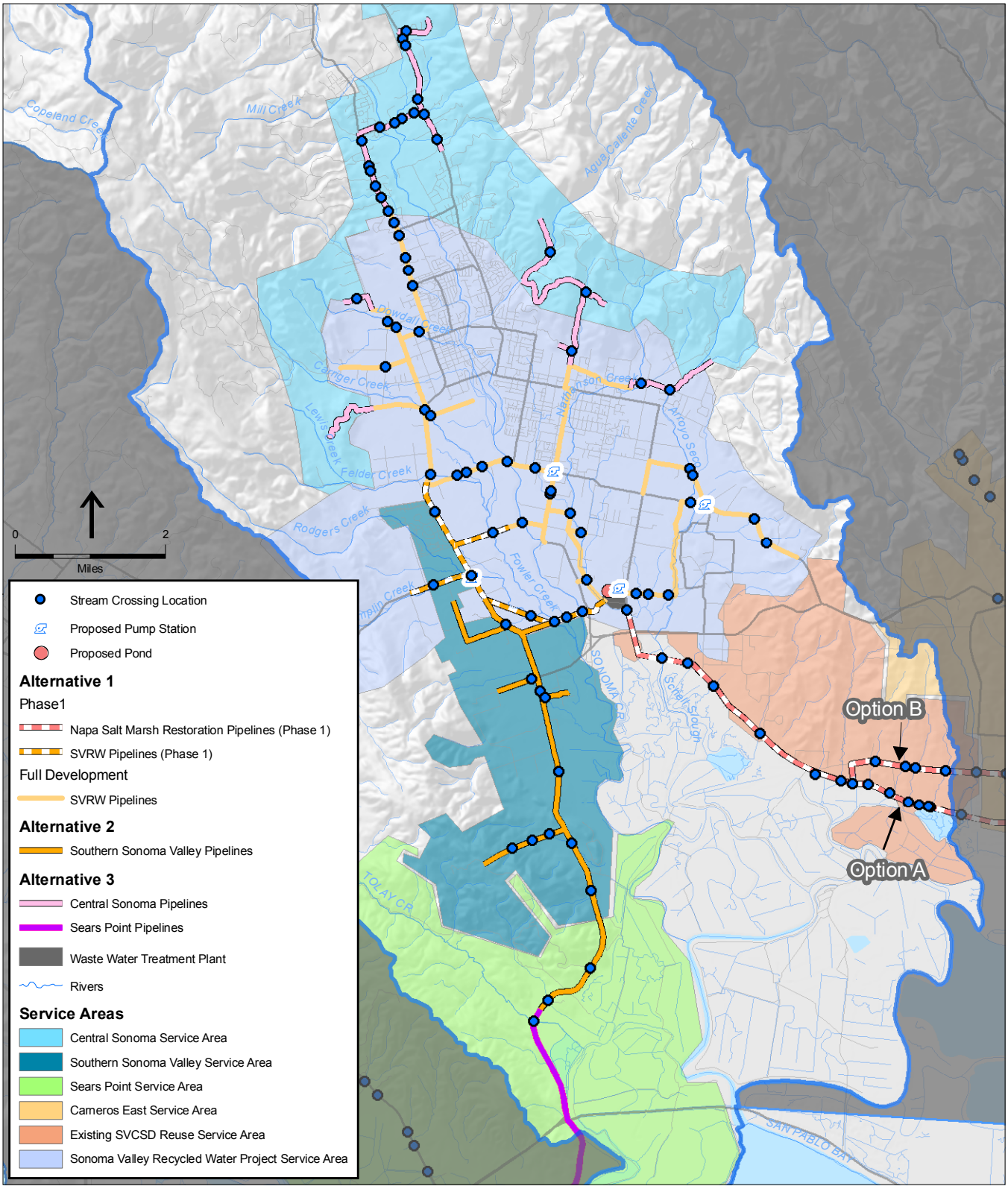
The impacts from the No Action Alternative on drainage patterns for SVCSD would be less than significant.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

For comparison with the Action Alternatives, it is estimated that approximately 18 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis.



SOURCE: CDM, 2008; ESRI, 2006; SWRCB, 2006; and ESA, 2008
Field Collected Stream Data, 2008; DWR NHD Stream Data, 2007

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.2-3
Sonoma Creek Watershed Stream Crossings

The hydrologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative (see Chart 3.2-2, Phase 1). Elements of Phase 1 would involve a total of 68 stream crossings (see **Table 3.2-2**). A discussion of impacts by Member Agency is provided below.

TABLE 3.2-2
STREAM CROSSING DATA BY ALTERNATIVE

Pipeline Location	No Project Alternative	No Action Alternative	Phase 1	Basic System	Partially Connected System	Fully Connected System
LGVSD						
Peacock Gap	0	0	0	0	2	0
NMWD URWP (South)			2			
Option A	--	--	10	--	--	--
Option B	--	--	8	--	--	--
Option C	--	--	2	--	--	--
LGVSD Total	**0**	**0**	**4**[1]	**0**	**2**	**0**
Novato SD						
NMWD URWP (North)	0	7	7	5	24	0
Sears Point	0	0	0	0	18	0
Novato SD Total	**0**	**7**	**7**	**5**	**42**	**0**
SVCSD						
Southern Sonoma Valley	0	0	0	0	11	0
Central Sonoma	0	0	0	0	0	22
Sonoma Valley Recycled Water Project	0	8	8	31	1	0
Sears Point	0	0	0	0	0	1
Napa Salt Marsh	0	17	17[2]	5	5	0
Option A	--	--	17	--	--	--
Option B	--	--	14	--	--	--
Option C	--	--	14	--	--	--
SVCSD Total	**0**	**25**	**25**	**36**	**17**	**23**
Napa SD						
Napa MST	0	0	32	0	4	0
Carneros East	0	0	0	11	15	0
Napa SD Total	**0**	**0**	**32**	**11**	**19**	**0**
Alternative Total	**0**	**32**	**68**	**52**	**80**	**23**

1 Assumes Novato Option C
2 Assumes Napa Option A
-- = no pipelines are proposed for this project phase/alternative in this Recycled Water Service Area

SOURCE: ESA, 2009

LGVSD/NMWD

Additional impacts under Phase 1 would occur from pipeline construction in the Novato South service area. NMWD URWP pipelines in the Hamilton Field area would involve four stream crossings. Pipeline Options A would be installed adjacent to an agricultural canal as it runs north, perpendicular to Perimeter Road, and would involve 10 stream crossing. The pipeline under Option B would extend through grazing land and under Option C the pipeline would extend north from LGVSD WWTP through grazing land, parallel to Highway 101 and continue along existing roadways, and would involve 8 and 2 stream crossings, respectively (see Figure 3.2-2). Please refer to the impacts discussed above, which would be similar to the construction activities in the open grazing lands. The impact would be less than significant with mitigation, which would apply to the open lands.

Novato SD/ NMWD

Additional impacts under Phase 1 would occur during construction of pipelines, which would include seven stream crossings (see Figure 3.2-2), including two crossings of tributaries to Novato Creek. The larger stream crossings would be accomplished using a jack and bore, directional drilling, or suspension on bridges to prevent alteration of the stream course or waters therein. Please refer to the impacts discussed above. The impact would be less than significant with implementation of **Mitigation Measure 3.2.1**.

Phase 1 would include one new booster pump station near the intersection of Olive Avenue and Atherton Avenue that would add approximately 1,000 square feet of impervious surface. The addition of the booster pump station would not substantially change the amounts or timing of drainage contributing the system. A booster pump station in this location would increase the impervious surface, hence the storm runoff (see also Impact 3.2.3 below); however, given the size of the pump station, the increase would not be substantial and would not likely result in noticeable changes to drainage in the area. Please refer to the discussion under Novato SD under No Action Alternative. The impact would be less than significant**.**

SVCSD

Additional impacts under Phase 1 would occur during construction of SVRWP pipelines at 25 additional stream crossings (shown on Figure 3.2-3). The pipelines would cross Champlin Creek, Felder Creek, Rodgers Creek, and Arroyo Seco at multiple locations. The pipelines would also cross Carriger Creek, Rodgers Creek, Fowler Creek, Huichica Creek, and a tributary to Felder Creek, and a tributary to Arroyo Seco. Additional impacts would be associated with portions of the pipelines for the Napa Salt Marsh Restoration Project that would cross two small unnamed creeks or ditches. Refer to the discussion under Novato SD above. Impacts under Phase 1 for the Napa Salt Marsh Restoration Project would be equivalent to those discussed under the No Action Alternative. Implementation of **Mitigation Measure 3.2.1** would ensure a less-than-significant impact.

Phase 1 would also include construction of new pumping and storage facilities at the SVCSD WWTP. Refer to the discussion above under Novato SD.

Napa SD

Additional impacts under Phase 1 would occur during construction of the pipelines in the MST Creeks area at 32 stream crossings (shown on **Figure 3.2-4**). Pipelines would cross Tulucay Creek, Murphy Creek, and Kreuse Creek. Pipeline crossings also include two crossings of tributaries to Tulucay Creek, nine crossings of tributaries to Sarco Creek, and 17 crossings of smaller, unnamed creeks. Portions of the pipelines for the Napa Salt Marsh Restoration Project would cross Huichica Creek and two small channels. The impacts would be similar to those discussed for Novato SD and SVCSD above.

Additional impacts under Phase 1 would occur from increasing the pumping capacity at the Napa SD WWTP, and constructing four booster pump stations along the pipelines. The four pump stations would be on Imola Avenue, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Due to the developed nature of the pump station site, the addition of booster pump stations would not substantially change the amounts or timing of drainage contributing the system. However, booster pump stations on undeveloped sites would increase the impervious surface runoff. The sizes of the pump stations, however, are relatively small (approximately 1,000 square feet at each site), and would not likely result in noticeable changes to drainage in the area.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

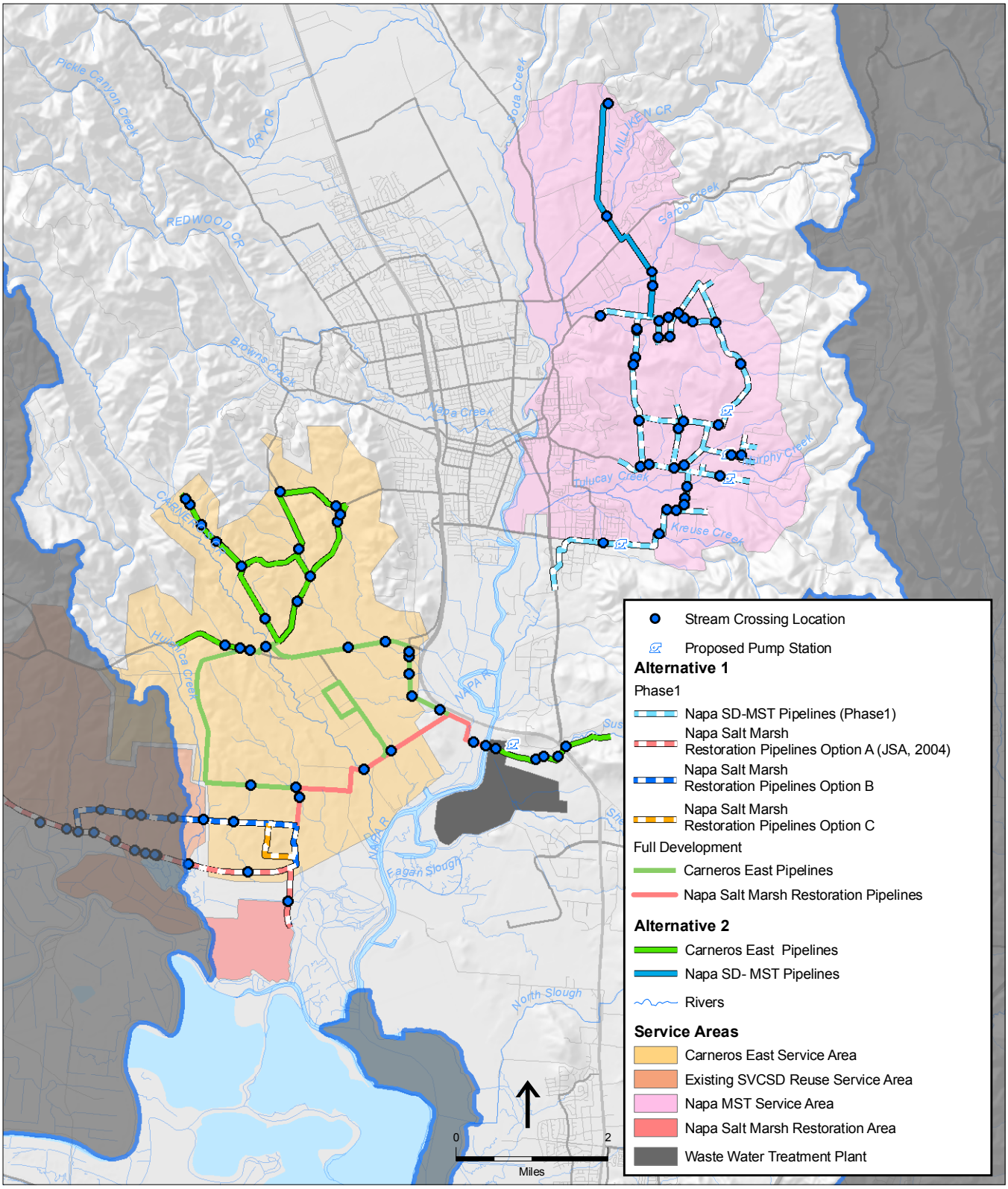
The hydrologic impacts to proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative (see Chart 3.2-2, Basic System). The Basic System would involve 33 additional stream crossings. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Implementation of the NBWRP components under the Basic System would not involve additional stream crossings, and therefore would not contribute to a change in drainage patterns.

Novato SD/NMWD

In addition to the impacts discussed under Phase 1, pipeline in the Novato SD service area would involve five additional stream crossings, including the pipeline from Novato to the Petaluma River which would cross two creeks (Figure 3.2-2). Please refer to the discussion under Novato SD for Phase 1.The impact would be less than significant with implementation of **Mitigation Measure 3.2.1**.



SOURCE: CDM, 2008; ESRI, 2006; SWRCB, 2006; ESA, 2008; Field Collected Stream Data, 2008; DWR NHD Stream Data, 2007

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.2-4

Napa River Watershed Stream Crossings

SVCSD

In addition to the impacts discussed under Phase 1, the impacts from SVRWP would be associated with 31 crossings at streams including multiple crossings at Nathanson Creek and single crossings at Sonoma Creek, Dowdall Creek and other small creeks (see Figure 3.2-3). All of these creeks are intermittent. Impacts to drainage patterns would also occur from construction of a pipeline from SVCSD to the salt marsh under the Napa Salt Marsh Restoration Project, which would cross Schell Slough and four other small, unnamed creeks. Please refer to the discussion for Napa SD under Phase 1 and the Basic System. The impact would be less than significant with mitigation. Impacts under the Basic Alternative for the Napa Salt Marsh Project would be equivalent to those under the No Action Alternative. The impact would be less than significant with mitigation.

Additional impacts from the Basic System would occur from increased pumping and storage capacity construction at the SVCSD WWTP compared to Phase 1. As in Phase 1, these improvements would be on disturbed sites and would not substantially change the drainage patterns. Refer to the discussion under Phase 1. The SVRWP would include additional pumping in the Basic System. The exact site for this pumping has not yet been identified; however, preference would be given to disturbed sites to minimize impacts.

Napa SD

Additional impacts associated with the Basic System would be associated with additional pipelines in the MST area, a pipeline from the Napa SD WWTP to the Napa Salt Marsh, and distribution pipelines to the Carneros East area, which would involve 11 additional stream crossings (see Figure 3.2-4). The pipelines in the MST area would cross Sarco Creek, Tulucay Creek, a tributary to Sarco Creek, and a tributary to the Napa River. The Napa Salt Marsh pipeline would cross two unnamed creeks. The Carneros East pipelines would include eight stream crossings, including Carneros Creek and other unnamed creeks. The impacts would be similar to those discussed under Phase 1 and implementation of **Mitigation Measure 3.2.1** for the additional stream crossings would minimize the impact to less than significant.

Increasing pumping capacity at the Napa SD WWTP would involve constructing a pump station at the existing WWTP site. The drainage patterns onsite would not change substantially. The impact would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The hydrologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities

constructed under this alternative (see Chart 3.2-2, Partially Connected). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Additional impacts under the Partially Connected System would occur from construction of the Peacock Gap Golf Course pipeline that would involve two additional stream crossings, including the crossing of an unnamed tributary (**Figure 3.2-5**). Refer to the impact discussion under Novato SD above for Phase 1 and the Basic System. Implementation of **Mitigation Measure 3.2.1** at the additional crossings in the Peacock Gap Golf Course area would ensure a less-than-significant impact.

Additional impacts would occur from construction of storage facility in the Peacock Gap area and at the LGVSD WWTP. The activity would involve rehabilitating an existing reservoir and constructing storage on an existing disturbed site. Therefore the impact is not considered to be significant.

Novato SD/NMWD

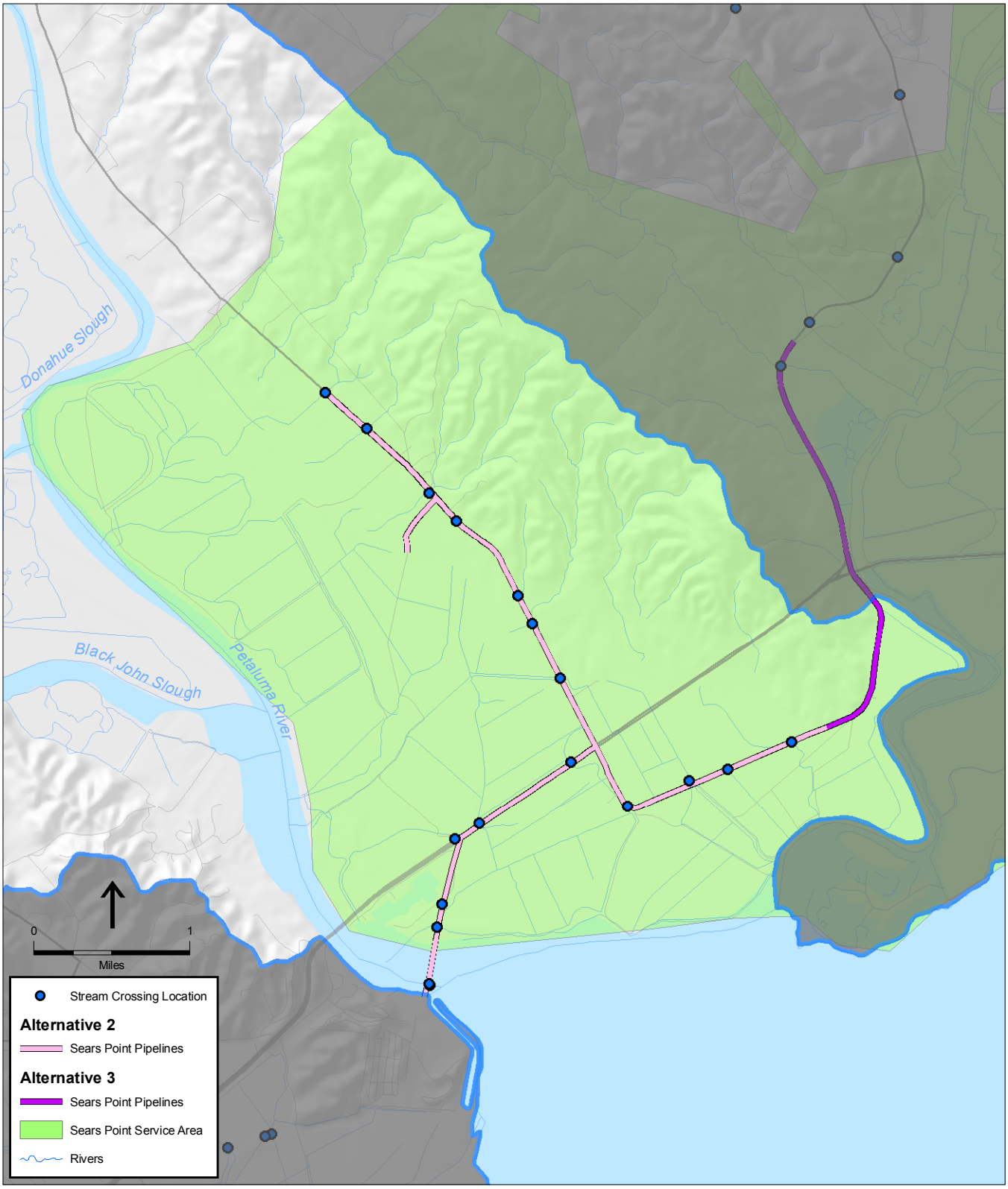
Additional impacts would occur from construction of pipelines at 24 additional stream crossings, including Novato Creek and tributaries to Novato Creek (see Figure 3.2-2) and Petaluma River, Tolay Creek, and 10 unnamed creeks. Refer to the discussion under the Basic System. The NMWD Novato Urban Recycled Water Pipeline that connects to the Sears Point area would involve 18 stream crossings. Implementation of **Mitigation Measure 3.2.1** at the additional stream crossings would minimize the impact to less-than-significant level.

Additional storage for the Partially Connected System would include rehabilitation of existing reservoirs. As in Phase 1, these improvements would be on disturbed sites and would not substantially change the drainage patterns.

SVCSD

Additional impacts would occur from construction of pipelines that would involve 17 additional stream crossings, including Nathanson Creek and Arroyo Seco (Figure 3.2-3). Refer to the discussion above under the Basic System. The impact would be minimized by implementation of **Mitigation Measure 3.2.1** at the additional stream crossings. Impacts under the Partially Connected Alternative for the Napa Salt Marsh Project would be equivalent to those under the No Action Alternative. The impact would be less than significant with mitigation.

Additional impacts would occur from construction of pumping facilities at the SVCSD WWTP and pump stations and new storage ponds in the existing SVCSD service area. The exact locations for the pump stations and ponds have not yet been identified; preference would be given to disturbed areas. The impact would be similar to those discussed under the Basic System and is expected to be less than significant.



SOURCE: CDM, 2008; ESRI, 2006; SWRCB, 2006; ESA, 2008
Field Collected Stream Data, 2008; DWR NHD Stream Data, 2007

Note: Existing Water Distribution Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.2-5
Petaluma Creek Watershed Stream Crossings

Napa SD

Additional impacts would occur from construction of pipelines in the Carneros East and MST service areas, and a new pipeline to the east of the Napa SD WWTP, which would involve 19 additional stream crossings (see Figure 3.2-4), including Milliken Creek, a tributary to Milliken Creek, Soscol Creek, and a tributary to Carneros Creek. Refer to the discussion above under the Basic System. The impact would be minimized by implementation of **Mitigation Measure 3.2.1** at the additional stream crossings.

No additional impacts would occur from increasing the pumping capacity at the Napa SD WWTP, which would not affect the drainage patterns at the existing developed WWTP site. Pump stations would be constructed in the Carneros East and MST service areas. The exact locations for the pump stations have not yet been identified, but preference would be given to already disturbed areas to minimize associated changes to drainage patterns. The impact is expected to be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The hydrologic impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative (see Chart 3.2-2, Fully Connected). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Minimal drainage impacts would occur as a result of construction of pumping facilities at the LGVSD WWTP, which is an existing disturbed site. The impact would be less than significant.

Novato SD/NMWD

Minimal drainage impacts from implementation of the Fully Connected System are anticipated. There would be one additional stream crossing as a result of construction of the pipeline extending to Sears Point; however the impact would be minimized by implementation of **Mitigation Measure 3.2.1**. Additional impacts would occur from increased pumping capacity at the Novato SD WWTP. As in Phase 1, and Basic and Partially Connected Systems, these improvements would be on disturbed sites and would not substantially change the drainage patterns. The impact from increased pumping would be less than significant.

SVCSD

Additional impacts would occur from construction of additional pipelines that would involve 22 additional stream crossings in central Sonoma, including Sonoma Creek and Wilson Creek

(see **Figure 3.2-3**). Refer to the discussion under the Partially Connected System above. There would be one additional stream crossing as a result of construction of the pipeline extending to Sears Point. Implementation of **Mitigation Measure 3.2.1** at the additional stream crossings would minimize the impact to less-than-significant level. Impacts under the Fully Connected Alternative for the Napa Salt Marsh Project would be equivalent to those under the No Action Alternative. The impact would be less than significant with mitigation.

Additional impacts could occur from construction of new pump stations. Construction of pump stations at the SVCSD WWTP would have minimal impact due to the existing developed nature of the WWTP site. The locations of the pump stations in the Central Sonoma Valley service area, SVRWP area, and the existing SVCSD reuse area have not yet been determined. Preference would be given to already disturbed areas to minimize associated changes to drainage patterns. The impact would likely be less than significant.

Napa SD

Minimal drainage impacts from implementation of the Fully Connected System are anticipated. There would be no additional stream crossings, and therefore a less than significant impact.

Mitigation Measure

Mitigation Measure 3.2.1: The Member Agencies would implement the following measure during pipeline installation at stream crossings:

- Schedule construction so as to avoid storm events to the extent feasible ;
- Use trenchless techniques such as jack and bore tunneling to avoid direct impacts to the streams;
- Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means; and
- Following construction, restore the construction area to pre-existing conditions
- Implement **Mitigation Measure 3.5.1** (see Section 3.5).

Impact Significance after Mitigation: Less than Significant.

Impact 3.2.2: Flooding and Effects to Surface Waters. The proposed action could expose public or structures to the risk of flooding due to placement of facilities within the 100-year flood plain. The proposed action would also change the amount of discharge to local surface waters. (Less than Significant)

Implementation of the proposed action would result in construction of facilities that would be located within existing 100-year flood plains. In general, construction of facilities within 100-year flood plains would be limited to pipeline installation across drainages, as noted in Impact 3.2.1, or

where pipelines, pump stations, or storage facilities are located with mapped 100-year flood plains. The only pump station that lies within the 100-year flood plain is the one at the Novato SD WWTP in Marin County, which is located close to the edge of the 100-year flood plain. Placement of structures within the mapped 100-year flood plain would have the potential to expose structures to periodic flooding and water damage. However, the design of proposed facilities to convey recycled water would reduce the potential for these facilities to be impacted by flood waters. Pipelines would be installed below-grade, and design of stream crossings would take into account streambed scour potential. Pump stations would be located to avoid mapped flood plains, or would be constructed at an elevation that provides adequate freeboard to avoid impacts.

The NBWRP would deliver recycled water that is currently either discharged to tributaries to North San Pablo Bay or is used for irrigation. Current practices vary with each Member Agency. Typically, a portion of the wastewater generated is stored during the dry season.

With the NBWRP, the agencies would recycle and deliver some of the water that they now discharge in the fall. Reduced discharge have the potential to reduce flooding; however, any beneficial effects would be very minor because the facilities discharge very close to San Pablo Bay and downstream of areas that generally experience flooding.

Irrigation would occur during the dry season and irrigators would be required to avoid over-application of reclaimed water in order to avoid direct runoff and ponding. Therefore, no adverse impacts to drainage or flooding are anticipated as a result of recycled water irrigation.

Some water users in the project area rely on diverting local surface water, often from smaller creeks or streams that may not be reliable sources throughout the year or in dry years. The NBWRP would deliver recycled water to users; in some areas, this water would offset local surface water supplies. This surface water would stay in the small creeks and streams during the irrigation season, and could increase base flows. However, because of the timing of this offset, base flows are not anticipated to affect stream conditions relative to flood stage.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative; therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. For comparison to the Action Alternatives, it is estimated that approximately 18 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis to deliver 1,067 AFY of recycled water (see Chart 3.2-2, No Action).

It is estimated that WWTP inflow will increase over time, with a corresponding increase in discharge of treated effluent by the year 2020 (**Table 3.2-3**). Provision of 1,067 AFY of recycled water for use as irrigation and release of 3,460 AFY to the Napa Salt Ponds as envisioned under the No Action Alternative would reduce WWTP discharges, as shown in Table 3.2-3. Provision of this amount of recycled water would result in a discharge reduction of 4,860 AFY to receiving waters tributary to North San Pablo Bay at 2020, with approximately 3,460 AFY redirected to Napa Salt Ponds, depending upon year type. Reduced discharge would have the potential to incrementally reduce flows during flood events; however, any beneficial effects would be very minor because the facilities discharge very close to San Pablo Bay and downstream of areas that generally experience flooding.

TABLE 3.2-3
COMPARISON OF NO PROJECT (2002, 2020) AND NO ACTION ALTERNATIVE – PROJECTED MONTHLY DISCHARGE (2020) (AFY)

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
2020 Discharge Increase	1,887	1,529	3,139	862	7,499	0
No Action (2020) Discharge	6,338	2,882	6,574	2,257	18,051	3,460
No Action (2020) Reduction	**(1,064)**	**(1,452)**	**(1,832)**	**(511)**	**(4,860)**	**+3,460**

SOURCE: CDM, 2009

LGVSD/NMWD

The No Action Alternative would not include any new recycled water facilities by LGVSD; however, future conditions would include development within the LGVSD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge to Miller Creek, and eventually San Pablo Bay, under future 2020 discharge conditions would increase by an estimated 862 acre-feet per year (AFY). Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 511 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Novato SD/NMWD

Under the No Action Alternative, Novato SD would deliver 193 AFY of tertiary treated recycled water to the Novato North Service Area. Future conditions would include development within the Novato SD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 3,139 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated

1,832 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

SVCSD

Under the No Action Alternative, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project. Future conditions would include development within the SVCSD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 1,529 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,452 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Napa SD

The No Action Alternative, would not include any new recycled water deliveries by Napa. Future conditions would include development within the Napa service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 1,887 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,062 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Phase 1 (Project level)

Compared to existing conditions (CEQA Baseline), Phase 1 projects would include 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage to provide 3,755 AFY of recycled water. This would result in a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in estimated discharge assumed 2020 inflow and discharge conditions for the WWTP, which include increased inflow over time. Implementation of Phase 1 projects would have an estimated 2020 discharge reduction of 6,121 AFY for all the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 2,688 AFY of recycled water, 28.9 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and 0 AF of additional storage. When implemented, Phase 1 would result in an estimated total discharge reduction of 1,073 AFY for all the WWTPs combined, compared to the No Action Alternative. (see **Table 3.2-4**).

The reduction in discharge, and any resulting benefit to flooding, associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

TABLE 3.2-4
PHASE 1 DISCHARGE COMPARED TO
CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Phase 1 Discharge	5,265	2,882	6,423	2,220	16,790	3,460
Phase 1 Discharge vs 2002 Discharge	**-250**	**+77**	**+1,156**	**+314**	**+1,298**	**+3,460**
Phase 1 Discharge vs 2020 Discharge	**-2,137**	**-1,452**	**-1,983**	**-548**	**-6,121**	**+3,460**
No Action Discharge (2020)	6,338	2,882	6,574	2,257	18,051	3,257
Phase 1 Discharge	5,265	2,882	6,423	2,220	16,790	3,460
Phase 1 Discharge NEPA Increment	**-1,073**	**+0**	**-151**	**-38**	**-1,261**	**+203**

SOURCE: CDM, 2009

LGVSD/NMWD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 202 AFY of recycled water, with a corresponding decrease in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 548 AFY.

Compared to the No Action Alternative (NEPA baseline), Phase I would result in the same reduction in discharge; however, when compared to the No Action Alternative, estimated net discharge reduction would be 38 AFY. LGVSD discharges into the tidal portion of Miller Creek, near San Pablo Bay. Changing the discharge at this downstream location is unlikely to have an effect on flooding, which typically occurs upstream on the river. Therefore, the change in discharge from LGVSD WWTP in Phase 1 would have a less-than-significant impact on flooding under both CEQA and NEPA baselines.

Novato SD/NMWD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 542 AFY of recycled water. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 1,983 AFY.

Compared to the No Action Alternative (NEPA baseline), Phase 1 would reduce discharge by 151 AFY. Novato WWTP discharges into the San Pablo Bay mudflats. This change in discharge

is not likely to affect flooding on Novato Creek which typically occurs upstream. Therefore, the change in discharge from Novato WWTP in Phase 1 would have a less-than-significant impact on flooding under both CEQA and NEPA baselines.

SVCSD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 874 AFY of recycled water. Additionally, SVCSD would provide flows to the Napa Salt Ponds, of up to 3,460 AFY (depending upon year type). Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 1,452 AFY.

Compared to the No Action Alternative (NEPA baseline), Phase 1 would not reduce SVCSD discharge, as these projects would likely be implemented by SVCSD under the No Action Alternative.

SVCSD discharges into Schell Slough and Hudeman Slough, which are close to San Pablo Bay and downstream of the City of Sonoma and other areas prone to flooding. This decrease in discharge would have no effect on flooding on Sonoma Creek. Therefore, the change in discharge from SVCSD in Phase 1 would have a less-than-significant impact on flooding under both CEQA and NEPA baselines.

Napa SD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 2,137 AFY of recycled water, with a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by and estimated 2,137 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would reduce Napa SD discharge by an estimated 1,073 AFY.

Napa SD discharges into the Napa River close to San Pablo Bay and downstream of the City of Napa and other areas prone to flooding. This decrease in discharge would have no effect on flooding in the Napa River watershed.

Recycled water from Napa SD would be used in the MST area for agricultural and landscape irrigation. These uses are currently supplied from groundwater; therefore, to the extent that recycled water would eventually replenish some of the groundwater system, recycled water would not change surface water patterns. Recycled water would not substantially change surface water flows in the watershed. Phase 1 use of recycled water would have no effect on flooding in the Napa River watershed.

Alternative 1: Basic System (Program level)

Compared to existing conditions (CEQA Baseline), the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. **Table 3.2-5** provides a summary of discharge change by WWTP. The Basic System would result in a total discharge reduction of 1,806 AFY compared to the CEQA Baseline. Compared to 2020 discharge conditions, the Basic System would result in an estimated total discharge reduction of 9,305 AFY from all of the WWTPs combined.

TABLE 3.2-5
BASIC SYSTEM DISCHARGE (2020) COMPARED TO CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002 Data)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Basic System Discharge	3,847	1,196	6,423	2,220	13,686	5,825
Basic System Discharge vs. 2002 Discharge	**-1,668**	**-1,609**	**+1,156**	**+314**	**-1,806**	**+5,825**
Basic System Discharge vs 2020 Discharge	**-3,555**	**-3,138**	**-1,983**	**-546**	**-9,305**	**+5,825**
No Action Discharge (2020)	6,338	2,693	6,574	2,257	17,863	3,257
Basic System Discharge	3,847	1,196	6,423	2,220	13,686	5,825
Basic System Discharge NEPA Increment	**-2,491**	**-1,497**	**-151**	**-38**	**-4,177**	**+2,568**

SOURCE: CDM, 2009

Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage. The Basic System would result in an estimated total discharge reduction of 4,177 AFY from all of the WWTPs combined, compared to the No Action Alternative (NEPA Baseline).

The reduction in discharge under Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative (see Chart 3.2-2, Basic System). A discussion of impacts by Member Agency is provided below.

The impacts associated with the Basic System would be equivalent to the impacts discussed for Phase 1 above for the Miller Creek/Gallinas Creek watershed, Novato Creek, and Sonoma Creek because increased recycled water use would not change the impacts to flooding. The Basic System also includes recycled water use in the Carneros area of the Napa River watershed. The

sections below describe the impacts from the Basic System that are in addition to those described above for Phase 1.

Napa SD

The Basic System would include recycled water use in the Carneros East service area and the provision of recycled water to Napa Salt Marsh. Compared to existing conditions (CEQA baseline), the Basic Alternative would reduce Napa SD discharge by an estimated 3,555 AFY compared to 2020 discharge conditions. Compared to the No Action Alternative (NEPA baseline), the Basic Alternative would reduce Napa SD discharge by an estimated 2,491 AFY.

Because Napa SD discharges close to San Pablo Bay and downstream of flood-prone areas, this decrease in discharge is not likely to benefit flooding on the Napa River. Therefore, the change in discharge from Napa SD in Phase 1 would have a less-than-significant impact on flooding under both CEQA and NEPA baselines.

As discussed above, the release of recycled water in the Napa Salt Marsh would not offset other supplies and therefore would not affect surface water flows. In the Carneros East service area, recycled water would replace existing uses of groundwater and surface water (Napa SD, 1995). These uses are primarily supplied from groundwater, imported surface water and some local surface water diversion. Use of recycled water use to offset surface water uses would provide some benefit to both local and imported surface water resources**.** Use of recycled water would allow some surface water to stay in creeks during the irrigation season of April through September, and could increase base flow. However, because of the summer timing of this offset, base flows are not anticipated to affect stream conditions relative to flood stage.

Alternative 2: Partially Connected System (Program level)

Compared to existing conditions (CEQA Baseline), the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Provision of this amount of recycled water would result in a total discharge reduction of 4,803 AFY from existing conditions for all of the WWTPs (**see Table 3.2-6**). Compared to 2020 discharge conditions, the Partially Connected System would result in an estimated total 2020 discharge reduction of 12,222 AFY from all of the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), Partially Connected System would provide 122 miles of new pipeline, 2,542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage. The Partially Connected System would result in an estimated total 2020 discharge reduction of 7,174 AFY from all of the WWTPs combined, compared to the No Action Alternative (NEPA Baseline).

The Partially Connected System would include recycled water use in the Sears Point area. Compared to the Basic System, the Partially Connected System would increase the amounts of recycled water used, but the increase would not change the mechanisms of how the recycled water could affect flooding. The increase in recycled water would not increase the likelihood of

TABLE 3.2-6
PARTIALLY CONNECTED SYSTEM DISCHARGE (2020) COMPARED TO CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002 Data)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Partially Connected Discharge	2,657	0	5,851	2,181	10,689	2,933
Partially Connected Discharge vs 2002 Discharge	**-2,875**	**-2,805**	**+584**	**+275**	**-4,821**	**+2,933**
Basic System Discharge vs 2020 Discharge	**-4,745**	**-4,334**	**-2,555**	**-587**	**-12,222**	**+2,993**
No Action Discharge (2020)	6,338	2,693	6,574	2,257	17,863	3,257
Partially Connected Discharge	2,657	0	5,581	2,181	10,689	2,933
Partially Connected Discharge NEPA Increment	**-3,681**	**-2,693**	**-723**	**-76**	**-7,174**	**-324**

SOURCE: CDM, 2009

flooding impacts; therefore, the impact discussion for the Basic System in these areas is also applicable for the Partially Connected System. The new reuse area in the Petaluma River watershed is discussed below.

Novato SD/NMWD

Recycled water from Novato SD would be used within the Sears Point area of the Petaluma River watershed for agricultural irrigation. Most agricultural uses are supplied from groundwater (DWR, 1999); therefore, replacing groundwater with recycled water would not change surface water patterns. The Partially Connected System would have no effect on flooding in the Petaluma River watershed.

Alternative 3: Fully Connected System (Program level)

Compared to existing conditions (CEQA Baseline), the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Provision of this amount of recycled water would result in a total discharge reduction of 5,949 AFY from existing conditions for all of the WWTPs (see **Table 3.2-7**). Compared to 2020 discharge conditions, the Fully Connected System would result in an estimated total 2020 discharge reduction of 13,368 AFY from all of the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage. Provision of this amount of recycled water would result in an estimated total discharge reduction of 8,320 AFY from all of the WWTPs combined (see Table 3.2-7).

TABLE 3.2-7
FULLY CONNECTED SYSTEM DISCHARGE (2020) COMPARED TO CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002 Data)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Fully Connected Discharge	2,657	0	4,706	2,181	9,543	3,085
Fully Connected Discharge CEQA Increment	**-2,858**	**-2,805**	**-561**	**+275**	**-5,949**	**+3,085**
Fully Connected Discharge vs 2020 Discharge	**-4,745**	**-4,334**	**-3,700**	**-587**	**-13,368**	**+3,085**
No Action Discharge (2020)	6,338	2,693	6,574	2,257	17,863	3,257
Fully Connected Discharge	2,657	0	4,706	2,181	9,543	3,085
Fully Connected Discharge NEPA Increment	**-3,681**	**-2,693**	**-1,868**	**-76**	**-8,320**	**-172**

SOURCE: CDM, 2009

The Fully Connected System, would introduce additional reuse in the Sonoma Creek watershed in addition to the areas included in the Partially Connected System. Compared to the reuse areas in the Partially Connected System, the Fully Connected System would increase the amounts of recycled water used, but the increase would not change the mechanisms of how the recycled water could affect flooding. The increase in recycled water would not increase the likelihood of flooding impacts; therefore, the impact discussion for the Partially Connected System in these areas is also applicable for the Fully Connected System. The new reuse area in the Sonoma Creek River watershed is discussed below.

SVCSD

Recycled water from SVCSD would be used within the Central Sonoma Valley area of the Sonoma Creek watershed for agricultural irrigation. Most agricultural uses are supplied from groundwater (DWR, 1999); therefore, replacing groundwater with recycled water would not change surface water patterns. The Fully Connected System would have no effect on flooding in the Sonoma Creek watershed.

Mitigation Measure

No Mitigation Measures are required.

Impact Significance after Mitigation: Less than Significant.

Impact 3.2.3: Increased storm runoff. New impervious surfaces for the NBWRP would result in an increase in storm runoff. (Less than Significant)

The project components would include treatment upgrades, pipelines, pump stations, and storage facilities. Treatment upgrades would involve installing new filters and process units at the existing WWTP facilities, therefore no new impervious surfaces would be added. Pipelines would be installed under ground, therefore following construction the areas would be restored to pre-existing conditions and there would be new impervious surfaces. Storage facilities would consist of open reservoirs, typically at existing disturbed sites, therefore no impact is expected. Therefore, impacts from treatment upgrades, pipelines, and storage facilities are not discussed further.

Impervious surfaces would be added as part of the proposed pump stations. Some pump stations would be constructed on existing WWTP sites, therefore the increase in impervious surfaces would be minor, if any, thus the runoff would be significant.

The sections below describe impacts that would occur from construction of new booster pump stations that could add impervious surfaces, which would increase the associated storm runoff.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that the No Action Alternative would result in 1,067 AFY of water reuse, with a corresponding reduction in the amount of treated effluent discharged at each Member Agency WWTP (see Chart 3.2-2, No Action). Additionally, it is estimated that proposed facilities would result in an increase in impervious surface area, which is discussed in Impact 3.2.1. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

The No Action Alternative would include a new 1,000-square foot booster pump station. Given that the pump station would be located within the change in the impervious surface would not be significant. However, Implementation of **Mitigation Measure 3.2.2** would ensure a less than significant impact.

SVCSD

Impacts would be associated with the approximately 1,000-square foot pump station in the SVRWP area. Refer to the discussion under Novato SD. Implementation of **Mitigation Measure 3.2.2** in the SVCSD service area would ensure a less-than-significant impact.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and no additional storage.

The runoff from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative (Chart 3.2-1, Phase 1). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

The impacts that would occur under Phase 1 would be equivalent to those discussed under the No Action Alternative and would include additional impacts associated with additional pump station. Please refer to discussion above.

Novato SD/NMWD

Refer to the impact discussion under Novato SD for No Action Alternative.

SVCSD

The booster pump stations for both the SVRWP and the Napa Salt Marsh Pipeline would be primarily constructed at the SVCSD WWTP, therefore as discussed above, the impact would be less than significant. Impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Impacts associated with the MST area would include increased runoff from four booster pump stations located on Imola Avenue, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Each pump station would have a footprint of approximately 1,000 square feet that would increase the storm runoff from the sites. Implementation of **Mitigation Measure 3.2.2** at the four pump stations in the MST area would ensure a less-than-significant impact.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The runoff from proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative (Chart 3.2-2, Basic System). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

The impacts that would occur under Phase 1 would be equivalent to those discussed under the No Action Alternative and would include impacts associated with additional pump station. Please refer to discussion above.

Novato SD/NMWD

Refer to the impact discussion under Novato SD for No Action Alternative.

SVCSD

The Basic System would include additional pumping capacity as a part of the SVRWP. The exact site for this pumping has not yet been identified; however, preference would be given to disturbed sites to minimize impacts. The impacts would be less than significant with implementation of **Mitigation Measure 3.2.2** discussed above. Impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative, as pump stations for this pipeline would be located at the SVCSD WWTP.

Napa SD

The impacts that would occur under the Basic System would be equivalent to those discussed under the Phase 1 and would include impacts associated with additional pump stations. Please refer to discussion above.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The runoff from the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the

facilities constructed under this alternative (see Chart 3.2-2, Partially Connected). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Please refer to discussion above. The additional pump station would be installed at the WWTP, therefore there would be no additional impacts.

Novato SD/NMWD

Please refer to discussion above. The additional pump station would be installed at the WWTP, therefore there would be no additional impacts.

SVCSD

The Partially Connected System would include additional pumping capacity in the existing SVCSD reuse area, the SVRWP area, and Southern Sonoma Valley service area. The exact locations for the pump stations have not yet been identified, but preference would be given to already disturbed areas. The impacts would be less than significant with implementation of **Mitigation Measure 3.2.2** discussed above. Impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

The Partially Connected System would include additional pumping capacity in the Carneros East and MST service areas. The exact locations for the pump stations have not yet been identified, but preference would be given to already disturbed areas to minimize associated changes to drainage patterns. The impacts would be less than significant with implementation of **Mitigation Measure 3.2.2** discussed above.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The runoff impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative (see Chart 3.2-2, Fully Connected). A discussion of impacts by Member Agency is provided below.

The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for Partially Connected System above in addition to the following impacts.

LGVSD/NMWD

Please refer to the discussion above. The additional pump station would be installed at the WWTP, therefore there would be no additional impacts.

Novato SD/NMWD

The Fully Connected System would include increased pumping capacity at Novato SD and LGVSD WWTPs. As in Phase 1, the pump stations would be on the WWTP site where most surfaces are already impervious. The impacts would be less than significant with implementation of **Mitigation Measure 3.2.2** discussed above.

SVCSD

The Fully Connected System would include additional pump stations at the SVCSD WWTP and in the Central Sonoma Valley, SVRWP area, and the existing SVCSD reuse area. The pump station at the WWTP would be on a site where most surfaces area already impervious. The exact locations for the remaining pump stations have not yet been identified, but preference would be given to already disturbed areas to minimize associated changes to drainage patterns. The impacts would be less than significant with implementation of **Mitigation Measure 3.2.2** discussed above. Impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Please refer to the discussion above. The additional impacts would occur from the proposed pump stations in the MST area.

Mitigation Measure

Mitigation Measure 3.2.3: The Member Agencies will implement the following measures:

- Comply with the local storm drainage requirements;
- Incorporate site design features to control any site runoff onsite; and
- Install storm runoff, collection, and treatment system, as applicable, to control the runoff flow offsite.

Impact 3.2.4: Flooding - Sea level rise. Sea-level rise could affect operation of project facilities. (Less than Significant)

In recent years, the scientific community has generally reached consensus that climate change and sea level rise are likely to occur. California's position on climate change was formalized in Assembly Bill (AB 32), the California Global Warming Solutions Act of 2006, which states that: Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California.

While scientists agree that sea level rise is likely to occur in the future, the rate of sea level rise is uncertain. The CALFED Independent Science Panel used empirical models based on historic sea level rise to estimate a sea level rise ranging from 20 to 55 inches by 2100 (CALFED Independent Science Board, 2007). A sea level rise of this magnitude would impact areas that are involved in the NBWRP if no actions are taken to create flood protection structures (such as levees). The San Francisco Bay Conservation and Development Commission (BCDC) is in the process of developing a strategy to address sea level rise in the future (San Francisco BCDC, 2008). This strategy will identify urban areas that should be protected, other areas that would flood, and how to replace some of the tidal marsh that would be impacted. This strategy is not yet developed, therefore it is speculative at this point to describe which areas may be impacted.

The Department of Geosciences at the University of Arizona created the Environmental Studies Laboratory (DGESL) in 1999 to facilitate development of technology and research of past, present and future environmental variability. In response to concerns about climate change and sea level rise, the Department of Geosciences conducted research on factors that determine the degree to which a coastal area is susceptible to sea level rise. This discussion of flooding impacts as a result of sea level rise is based on review of the Department of Geosciences Environmental Studies Laboratory Climate Change map relative to the proposed NBWRP facilities. This analysis assumes a one meter rise in sea level as the worst-case-scenario, and identifies potential impacts to the NBWRP facilities.

Some portions of the action area could be impacted in the future, which would reduce the demand for the recycled water produced by the NBWRP. The timing and quantity of the changes in demand are uncertain.

Areas in Marin, Sonoma, and Napa Counties that would be susceptible to impact based on elevation and proximity to San Pablo Bay include:

- the eastern portion of Marin County, north of the community of Santa Venetia, south of State Route 37, east of U.S. 101 and the Railroad;
- areas along the Petaluma River, north of the City of Novato;
- areas along the southern portion of Sonoma Creek in Sonoma County; and
- the majority of Napa County, predominantly south of the Northwestern Pacific Railroad, west of the airport, and along the Napa River corridor.

This information is presented here in the interest of public disclosure, as it would be highly speculative to impose mitigation on the NBWRP for an event that is uncertain both in time and extent, and for which the NBWRP itself would not cause or measurably contribute. Water and wastewater agencies in coastal areas of California, including the Member Agencies will need to review potential future impacts to their facilities and protect them accordingly. Discussion of the analysis and impact from sea level rise is provided by Member Agency below. Facilities located outside of the potential impacted areas are not analyzed further, but a discussion of potentially impacted facilities is included.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 18 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.2-1, No Action).

Under future baseline (2020) conditions, sea level rise could occur. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

The No Action Alternative would consist of installation of a pump station and portions of the Novato Urban Recycled Water Pipeline from the Novato SD WWTP north to Olive Avenue, then extend along Olive Avenue to serve areas north of Atherton and along Redwood Boulevard and San Marin Avenue west of U.S. 101. According to the DGESL, these facilities occur south of the projected impacted areas in the Rush Creek Marsh area, therefore would not be affected by a one meter rise in sea level**.** The existing Novato SD Tertiary Treatment Facility is located just north of SR 37, and would be at risk of potential impact as a result of a one meter sea level rise due to the topography, elevation, and proximity to San Pablo Bay.

SVCSD

Under the No Action Alternative, SVCSD would implement Alignment 1A, described in the SVWRP. No impact on NBWRP facilities from sea level rise is anticipated.

If a one meter rise in sea level occurs, the SVCSD Napa Salt Marsh Pipeline that extends from the SVCSD service area to the Napa Salt Ponds 7 and 7a is likely to be affected at the terminal point in the Napa-Sonoma Marshes Wildlife Area.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and no additional storage.

The sea level rise impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

The existing storage tank near Palm Drive, the proposed pump station at the LGVSD WWTP, and all three options for the Novato Urban Recycled Water Pipeline extending from the LGVSD WWTP north to the South Novato service area near Hamilton Air Field would be at risk of potential impact as a result of a one meter sea level rise due to the topography, elevation, and proximity to San Pablo Bay.

Novato SD/NMWD

Review of the DGESL and the proposed Novato SD facilities shows that the proposed pipelines and pump stations in the vicinity of the Novato SD Davidson WWTP are proximate to, but not within the projected area that would be affected by a one meter increase in sea level.

SVCSD

Review of the DGESL Map shows there is minimal impact from a one meter rise in sea level to areas in Sonoma County. In the small area that would be affected, the impacts are concentrated along the banks of the Sonoma Creek. No impact to proposed facilities in the SVCSD is anticipated. Under Phase 1, impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Projects under Phase 1 are located north of the inundated areas illustrated on the DGESL map; therefore they would not be affected by a one-meter rise in sea level.

Alternative 1: Basic System

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The sea level rise impacts to proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

There are no additional facilities to those discussed under Phase 1 proposed under the Basic System; therefore there are no additional impacts from sea level rise.

Novato SD/NMWD

Areas east of U.S. 101 and south of Highway 37 are potentially vulnerable to a one meter sea level rise; therefore, the portion of the Novato Urban Water Pipeline extending service to Sear's Point would be affected by a one meter rise in sea level.

SVCSD

There are no additional facilities proposed under the Basic System that would be affected by a one meter rise in sea level.

Napa SD

The DGESL data illustrates potential areas of inundation along the Napa River based on topography and elevation. The proposed pump station at the Napa SD WWTP and the north eastern portion of the Napa Salt Marsh Restoration Pipeline that extends through the Carneros East area from the WWTP southwest to Cuttings Wharf is vulnerable to impact as a result of a one meter rise in sea level based on topography, elevation, and proximity to the Napa River.

Alternative 2: Partially Connected System

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The sea level rise impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

The conveyance pipeline to Peacock Gap will not be affected by projected one meter sea-level rise.

Novato SD/NMWD

Portions of the proposed Novato Urban Recycled Water Pipeline extending north from the LGVSD WWTP north and east of Hamilton Air Field and through the Bel Marin Keys area in the Southern Novato service area, south of State Route 37, east of U.S. 101 will be affected by a one meter rise in sea level based on topography, elevation, and proximity to San Pablo Bay and adjacent wetland areas.

SVCSD

No additional impact from sea level rise on proposed facilities in the SVCSD service area is anticipated.

Napa SD

A portion of the Carneros East pipeline that extends east from the Napa SD WWTP may be affected by a one meter rise in sea level, based on topography, elevation, and proximity to the Napa River.

Alternative 3: Fully Connected System

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts of sea level rise under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, Napa SD

No additional construction is proposed in these service areas. No additional impact from a one meter rise in sea level is expected.

SVCSD

SVCSD would extend service north of the Sonoma Valley Recycled Water Service Area to the Central Sonoma Service Area and south to the Sear's Point area. According to DGESL data, these facilities will not be affected.

Mitigation Measure

> **Mitigation Measure 3.2.4:** Design of proposed facilities shall consider sea level rise potential, and shall include appropriate measures in facility siting and design to address potential impacts related to sea level rise, similar to those applied to facility installation within 100-year flood plains. Design measures may include, but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.

Impact Significance after Mitigation: Less than Significant.

3.2.4 Impact Summary by Service Area

Table 3.2-8 provides a summary of potential project impacts related to surface hydrology. The impacts analysis is separated by watershed, but Table 3.2-8 reclassifies impacts into Member Agency service areas. This organization will assist the agencies in approving the elements of the project within their jurisdiction because they will fully understand the impacts. Additionally, the analyses of the Alternatives specify the incremental impacts above Phase 1 or other alternatives. The tables below include all impacts in the impact finding.

TABLE 3.2-8
POTENTIAL IMPACTS AND SIGNIFICANCE – SURFACE HYDROLOGY

	Impact by Member Agency Service Areas			
Proposed Action	**LGVSD/ NMWD**	**Novato SD/ NMWD**	**SVCSD**	**Napa SD/ Napa County**
Impact 3.2.1: Changes in Drainage Patterns				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.2.2: Flooding				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LTS	LTS	LTS	NI
Alternative 1: Basic System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.2.3: Increased Storm Runoff				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.2.4: Flooding - Sea Level Rise				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LSM	LSM	LSM	LTS
Alternative 1: Basic System	LSM	LSM	LSM	LTS
Alternative 2: Partially Connected System	LSM	LSM	LSM	LTS
Alternative 3: Fully Connected System	LSM	LSM	LSM	LTS

NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

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3.3 Groundwater Resources

This section describes existing groundwater resources within the action area and evaluates potential groundwater impacts that could result from implementation of the North Bay Water Recycling Program (NBWRP). The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.3.1 Affected Environment/Setting

Groundwater is the main supply for the majority of agricultural users in the action area. In addition, several entities, including Sonoma County Water Agency (SCWA), the City of Sonoma, and Valley of the Moon Water District (VOMWD), rely on groundwater to supplement surface water supplies. Groundwater use is limited in the Marin Municipal Water District (MMWD) and North Marin Water District (NMWD) service areas due to a lack of substantial underlying groundwater aquifers and poor groundwater quality. Neither NMWD nor MMWD use groundwater for community drinking water supplies. However, private domestic wells exist within Marin. The City of Napa does not use groundwater for drinking water supplies; however, unincorporated areas of Napa County (including the Milliken-Sarco-Tulucay Creeks [MST] basin area and the Carneros East service area) rely almost solely on groundwater for domestic uses.

Regional Conditions

The principal groundwater-bearing aquifers in the action area are comprised of alluvial deposits and cover most of the Sonoma, Napa, and Petaluma Valleys. These aquifers are largely continuous, and generally flow toward San Pablo Bay. In the area adjacent to the Bay, local flow has been reversed, likely due to an increase in groundwater pumping (Farrar and Metzger, 2003; Farrar et al., 2006). Groundwater levels in the alluvial deposits vary by region, but are generally between 5 and 75 feet below the ground surface (CDM, 2008). In the valley areas and lowlands bordering San Pablo Bay, groundwater is often considered shallow, and can often be found less than 15 feet below the ground surface (bgs).

Groundwater quality in most of the action area is generally considered adequate for domestic and irrigation uses; however, localized areas experience poor groundwater quality. The groundwater aquifer in parts of Sonoma and Napa Counties has high concentrations of boron, iron, total dissolved solids and chloride concentrations (DWR, 2003). A 2003 study by the USGS found arsenic, boron, iron, and manganese in concentrations above drinking water standards in groundwater wells in southern Napa County (Farrar and Metzger, 2003). Saline intrusion continues to be an issue in areas bordering San Pablo Bay.

Increased groundwater pumping, low rainfall, saline intrusion from San Pablo Bay, low soil permeability, and geothermal upwelling are believed to contribute to declining groundwater levels and poor groundwater quality in portions of the action area. Although the clay content

holds water in the soil, it can restrict water percolation to the water table and can, therefore, reduce the volume of groundwater available for irrigation in certain areas. Groundwater pumping in Sonoma and Napa counties has increased in the past 20 years because of population growth and an increase in agriculture. Several pumping depressions are now evident within Sonoma and Napa Counties, and groundwater levels have generally declined in these areas (Farrar et al., 2006; Farrar and Metzger, 2003). The MST groundwater basin has been designated as a groundwater deficient basin by Napa County because of declining groundwater levels.

Local Conditions

This section describes the local groundwater conditions in each service area by groundwater basin. Several groundwater basins have been identified in the NBRWP action area. Descriptions of the groundwater basins have been obtained from the following sources:

- California Department of Water Resources' (DWR) *Bulletin 118 Update 2003* (DWR, 2003).
- *Geohydrologic Characterization, Water Chemistry, and Ground Water Flow Simulation Model of the Sonoma Valley Area, Sonoma County, California.* U.S. Geological Survey (USGS) Scientific Investigations Report 2006-5092 (Farrar et al., 2006).
- *Ground-Water Resources in the Lower Milliken–Sarco–Tulucay Creeks Area, Southeastern Napa County, California, 2000–2002.* USGS Water-Resources Investigations Report 03-4229 (Farrar and Metzger, 2003).
- *Sonoma Valley Final Groundwater Management Plan* (Sonoma County Water Agency [SCWA], 2007).
- *Napa County Baseline Data Report* (County of Napa, 2005).

LGVSD

MMWD and NMWD provide water service within this area of Marin County. As described above, groundwater use in the MMWD and NMWD service area is limited because they do not have substantial underlying groundwater aquifers. DWR Bulletin 118 identifies one groundwater basin in the LGVSD service area that is discussed below.

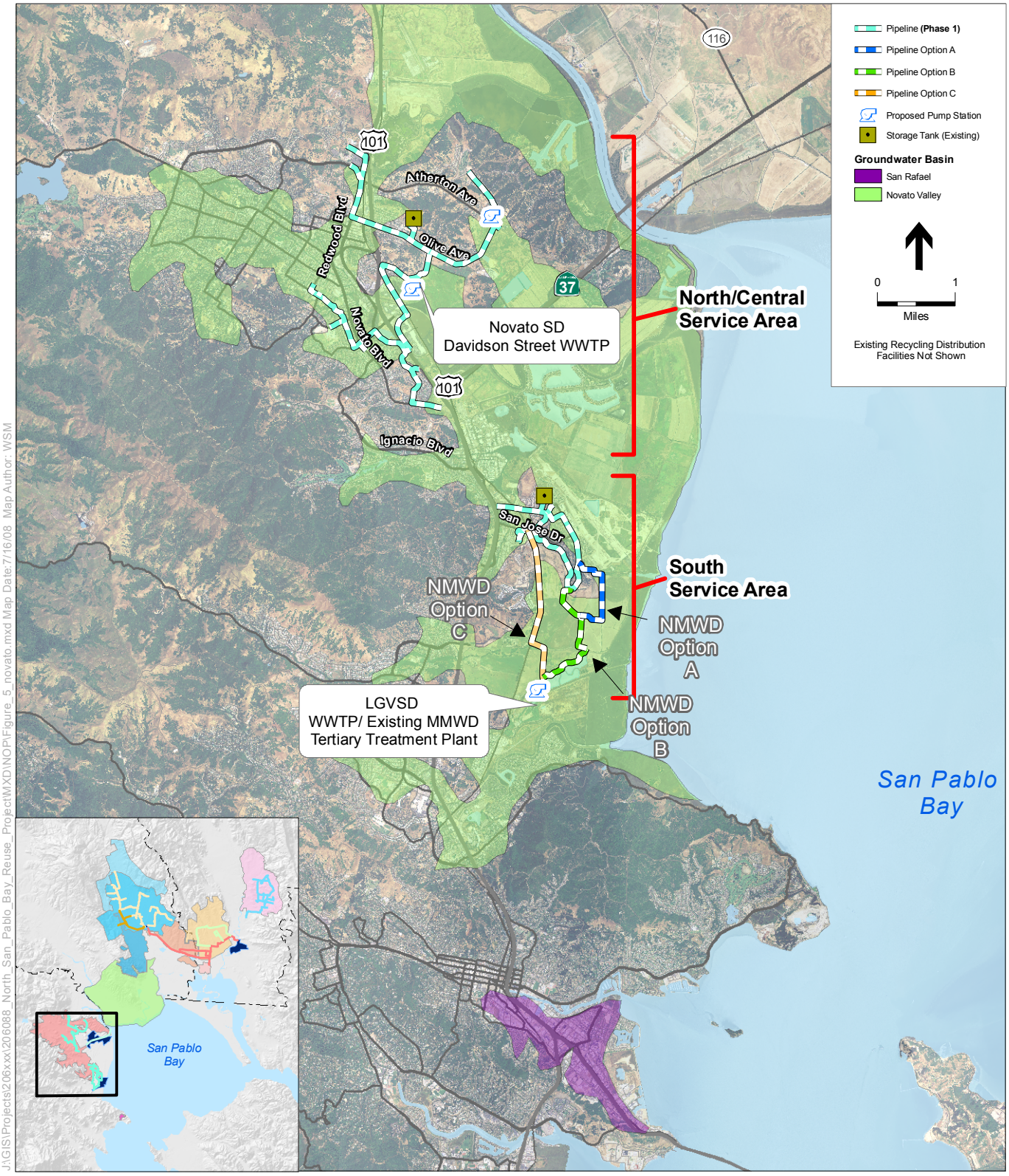
San Rafael Groundwater Basin

The San Rafael Groundwater Basin is a 1.4-square mile coastal basin that underlies the city of San Rafael, in Marin County (see **Figure 3.3-1**). The San Rafael Bay forms the eastern boundary of the basin (DWR, 2004a).

Geology and Hydrogeology. Primary water bearing units in the basin are unconsolidated Quaternary Alluvium. Annual precipitation in the basin averages 33 inches (DWR, 2004a).

Groundwater Production. No groundwater production information is available.

Groundwater Levels. No information is available for groundwater levels in this basin.



J:\GIS\Projects\206xxx\206088_North_San_Pablo_Bay_Reuse_Project\MXD\NOP\Figure_5_novato.mxd Map Date:7/16/08 Map Author: WSM

SOURCE: USDA, 2005; CDM, 2008; DWR, 2006; and ESA, 2008

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.3-1

Phase 1 Projects with Novato Valley and San Rafael Groundwater Basins

Groundwater Quality. Although no recent water quality data is available, data collected in 1954 from a well east of the basin showed chloride concentrations exceeding 100 parts per million. It is unknown whether this data is typical of the area or if it indicates potential sea-water intrusion (DWR, 2004a). Data collected in 1972 suggested the possibility of sea-water intrusion from San Francisco Bay (DWR 1975 *in* DWR 2004a).

Novato SD

MMWD and NMWD provide water service within this area of Marin County. DWR's *Bulletin 118* identifies one groundwater basin in the Novato SD service area that is discussed below.

Novato Valley Groundwater Basin

The Novato Valley is a depression in Marin County in the Coast Ranges west of San Pablo Bay and north of San Rafael (see **Figure 3.3-1**). San Antonio Creek forms the northern boundary of the groundwater basin and the Mendocino Range forms the western and southern boundary. The Novato Valley groundwater basin encompasses approximately 32 square miles.

Geology and Hydrogeology. Water bearing formations in the Novato Valley groundwater basin are mainly in alluvial deposits of Pleistocene to Holocene age that overlie non-water bearing rocks of the Franciscan assemblage (Cardwell, 1958 *in* DWR, 2004). Alluvial deposits consist of unconsolidated clay, silt, and sand with discontinuous lenses of gravel. Pleistocene alluvium is exposed in a small area in the northern side of the valley (Cardwell, 1958 *in* DWR, 2004). Alluvial deposits range in thickness from 60 feet near the City of Novato to 200 feet near San Pablo Bay (DWR, 1975 *in* DWR, 2004). Semi-confined conditions generally occur in the water bearing formations (Cardwell, 1958 *in* DWR, 2004).

Groundwater recharge occurs mainly from infiltration of streambeds and through direct percolation of precipitation that falls on the valley floor. Annual precipitation in the basin ranges from less than 20 inches near San Pablo Bay to more than 40 inches in upland areas of the Mendocino range (DWR, 2004).

Wells in sand and gravel layers 25 to 50 feet deep within the basin have an average yield of 50 gallons per minute (DWR, 1975 *in* DWR, 2004).

Groundwater Production. No groundwater production information is available.

Groundwater Levels. No information is available for groundwater levels in this basin; however, groundwater depth information from DWR is available for the Sears Point area and is discussed below.

Table 3.3-1 presents available groundwater data for the Sears Point area. Average water depth is 2.5 to 58.6 feet bgs, with a minimum depth of 1.5 feet and a maximum depth of 117.7 feet bgs.

TABLE 3.3-1
GROUNDWATER DEPTHS IN THE SEARS POINT AREA

Well Location/ID	Period of Record		Below Ground Surface (feet)		
	Start	End	Average Water Depth	Minimum Depth	Maximum Depth
03N06W11L001M	11/1/1995	10/12/1989			
04N06W21A001M	12/1/1989	3/18/2002	58.6	54	70.2
04N06W27B001M	10/13/1980	3/18/2002	28.1	7	117.7
04N06W36N001M	12/1/1989	11/30/1999	19.1	16.6	21.9

SOURCE: DWR, 2008

Groundwater Quality. Groundwater in the basin is high in calcium bicarbonate. Groundwater in the tidal areas of the basin has higher levels of sodium chloride and total minerals than groundwater farther away from San Pablo Bay (Cardwell, 1958; DWR, 1975 *in* DWR, 2004). Brackish water intrusions into the groundwater from tidal fluctuations are a main concern in the area around San Pablo Bay and can degrade groundwater quality (Cardwell, 1958 *in* DWR, 2004). In general, groundwater production for domestic uses within the basin is limited.

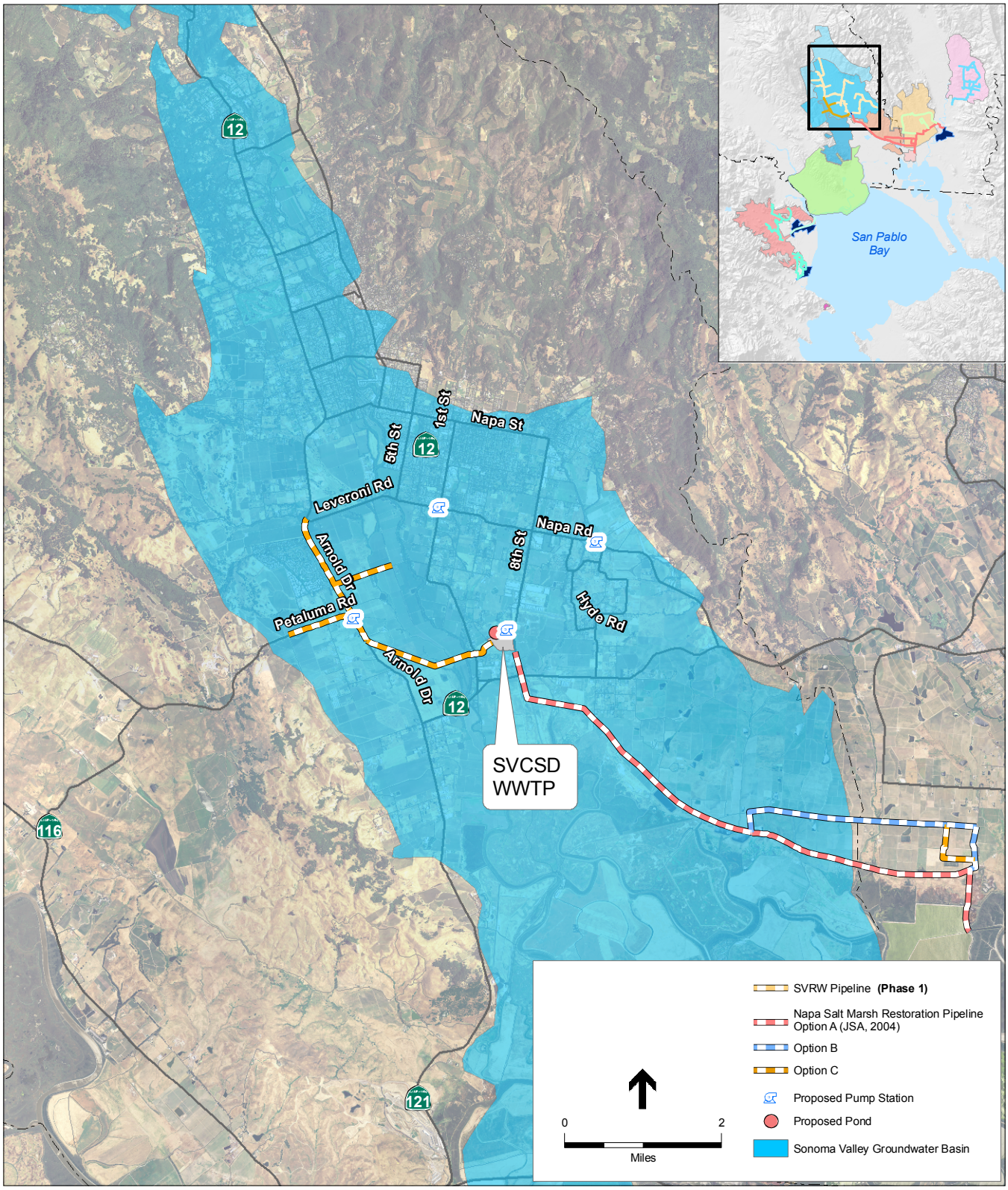
SVCSD

Groundwater makes up approximately 57 percent of all water used within the Sonoma Valley. The majority of all groundwater used in the Sonoma Valley is for agricultural irrigation (72 percent), followed by domestic uses (19 percent), and urban uses (9 percent) (SCWA, 2007). Groundwater provided less than 1 percent of the City of Sonoma's water supply and 27 percent of VOMWD supply in 2000 (Booker, 2006; SCWA, 2001a *in* CDM, 2008).

Sonoma Valley Groundwater Basin

Located in the southeastern portion of Sonoma County, the Sonoma Valley is a northwest trending depression between the Sonoma and Mayacmas Mountains (**Figure 3.3-2**). The Sonoma Creek watershed encompasses approximately 166 square miles and discharges to San Pablo Bay via Sonoma Creek. Water demand in the area is met with a combination of imported surface water from the Russian River, groundwater, and recycled water. Over the past 30 years, an increase in irrigated agriculture and rapid population growth have led to an increase in groundwater pumping and localized declining groundwater levels in some areas (SCWA, 2007; Farrar et al., 2006). Current groundwater issues for the Sonoma Valley groundwater basin include declining groundwater levels, saline intrusion, upwelling of geothermal waters, and groundwater/surface water interaction.

Previous studies by USGS (Farrar et al., 2006) and the Sonoma Valley Groundwater Management Plan (SCWA, 2007) describe groundwater resources in Sonoma Valley as a whole and do not differentiate between the two basins within it; therefore this discussion will describe groundwater resources for the entire valley, including the Sonoma Valley groundwater basin (a sub-basin of the Napa-Sonoma Valley groundwater basin) and the portion of the Kenwood groundwater basin that lies within the valley.



SOURCE: USDA, 2005; CDM, 2008; DWR, 2006; and ESA, 2008

Note: Existing Facilities Not Shown

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Figure 3.3-2

Phase 1 Projects with Sonoma Valley Groundwater Basin

Geology and Hydrogeology. All geologic formations in the Sonoma Valley contain groundwater, but differ in their water bearing properties. The four primary geologic units include Quaternary Alluvial Units, the Glen Ellen Formation, the Huichica Formation, and the Sonoma Volcanics. **Table 3.3-2** presents the characteristics of these water bearing formations. Bay Mud deposits cover the southern area of the valley to San Pablo Bay. Due to low permeability and high salinity, Bay Mud is not considered an aquifer for water supply (SCWA, 2007).

TABLE 3.3-2
WATER BEARING FORMATIONS OF THE SONOMA VALLEY GROUNDWATER BASIN

Formation	General Characteristics	Yield (gallons per minute)
Quaternary Alluvial Units	• Consist of cobbles, sand, silt, and clay interlaced with coarse-grained stream channel deposits near Sonoma Creek. • Unconfined.	100
Glen Ellen Formation	• Clay-rich stratified deposits of poorly sorted sand, silt, and gravel, interbedded with minor beds of conglomerate and volcanic tuffs. • Interspersed with the Huichica Formation and lies on top of the Sonoma Volcanics and Franciscan Complex in certain regions. • Confined to semi-confined.	20
Huichica Formation	• Thick silt and clay with interbedded lenses of sands, gravels, and tuff beds. • Overlies the Sonoma Volcanics. • Confined to semi-confined.	2 to 20, higher yields in the lower part of the unit.
Sonoma Volcanics	• Volcanic rocks interbedded with sedimentary deposits derived from volcanic rocks and lake beds. • Overlies sedimentary rock. • Confined to semi-confined.	10 to 50, up to 100.

SOURCE: SCWA, 2007; Farrar et al., 2006.

Groundwater recharge in Sonoma Valley occurs mainly through precipitation, by way of seepage from creeks, lakes, reservoirs, and direct infiltration of precipitation. Minor recharges can occur from infiltration from septic tanks, leaking water supply infrastructure, and irrigation (Farrar et al., 2006). It is assumed that no groundwater from outside the area can migrate into the valley because the basement rocks that form the sides of the valley and the surrounding mountains have low permeability (SCWA, 2007). Precipitation in the valley occurs as rain, with almost 90 percent occurring during November through April. Annual precipitation for the City of Sonoma had an average of 29.8 inches for water year 1953 through 2002, but can vary significantly from the 50-year average (National Oceanic and Atmospheric Administration 2003 *in* Farrar et al., 2006). Groundwater movement is generally from the mountain ridges down toward the valley axis and from the northwest end of the valley southeast toward San Pablo Bay (Farrar et al., 2007).

Groundwater pumping is assumed to be the main source of groundwater discharge, although groundwater also discharges from springs and to streams. Groundwater also discharges to the marshlands near San Pablo Bay by evaporation and transpiration from plants, and some water discharges to several sloughs that drain the marsh (Farrar et al., 2006).

Groundwater Production. In 2000, there were about 2,000 domestic, agricultural, and public supply wells within the Sonoma Valley. More than half of all water demand in the valley was met with groundwater (SCWA, 2007). Groundwater production in Sonoma Valley was estimated at 8,400 acre-feet (AF) in 2000, an increase of 2,200 AF since 1974 (Farrar et al., 2006).

Groundwater Levels. Groundwater levels in Sonoma Valley have fluctuated over the last 100 years as major changes in recharge or discharge have occurred. In the 1880s to 1930s, a large area of salt marshes was drained and groundwater levels dropped in the southern portion of Sonoma Valley. When groundwater pumping increased substantially in the 1960s, groundwater levels declined and some wells were even reported to go dry (Farrar et al., 2006; SCWA, 2007). After deliveries of imported surface water from the Russian River began in 1965, groundwater levels appeared to recover and stabilize through the 1980s (DWR, 1982 in SCWA, 2007).

Since the 1980s, an increase in irrigated agriculture and rapid population growth have led to an increase in groundwater pumping and localized declining groundwater levels in some areas (SCWA, 2007). Currently there are two areas, one southeast of Sonoma and one southwest of El Verano, that show pumping depressions (Farrar, 2007). An increase in groundwater production and low precipitation in the last several years is the likely cause of this decline in groundwater levels in the valley (Farrar et al., 2006). There is currently no evidence to indicate any land subsidence in the Sonoma Valley (SCWA, 2007).

As shown in **Table 3.3-3** below, available data from DWR (2008) suggests average groundwater depths in the Sonoma Valley range between 3 feet and 78 feet bgs. The minimum groundwater depths recorded range from 0.4 to 33.6 feet bgs, and the maximum groundwater depths range from 10.6 to 178.3 feet bgs.

Groundwater Quality. Water quality samples taken by USGS from 75 wells in 2002 to 2004 indicate that groundwater quality in the Sonoma Valley is generally acceptable for potable use (Farrar et al., 2006). From 1964 to 2004, both DWR and USGS have conducted groundwater and surface water sampling in the Sonoma Valley in streams, springs, and groundwater wells. Wells with concentrations of arsenic, boron, iron, manganese, and total dissolved solids (TDS) above drinking water standards were found in the northern portion of Sonoma Valley (SCWA, 2007). TDS values ranged from 137 to 702 milligrams per liter (mg/L), with 3 wells exceeding the secondary maximum contaminant level (MCL), which is not a health based value, but may impact hardness, deposits, or taste. Wells with depths from 200 to 500 feet had a higher percentage of samples that exceeded drinking water standards than wells screened above and below this interval. Sampling results have also indicated potential upwelling of geothermal water beneath the east side of Sonoma Valley along fractures and faults along the margin of the Bay Mud deposits (Farrar et al., 2006).

TABLE 3.3-3
GROUNDWATER DEPTHS IN SONOMA VALLEY BASIN

	Period of Record		Below Ground Surface (feet)		
Well Location/ID	**Start**	**End**	**Average Water Depth**	**Minimum Depth**	**Maximum Depth**
Central Sonoma Valley					
06N06W09Q001M	10/9/1980	7/3/2008	10.8	6.2	29.4
06N06W10M002M	10/31/1974	4/8/2008	25.4	4.4	58
06N06W22R002M	10/9/1980	11/1/2007	3.8	0.4	10.6
06N06W23M002M	10/6/1980	3/13/2002	10.3	2.4	59.3
Sonoma Valley					
05N05W08P002M	4/3/1974	4/9/2008	78.8	8	178.3
05N05W17B002M	10/13/1980	4/9/2008	58.3	33.6	79.7
05N05W17C001M	1/18/1950	8/18/1994	14.6	5.2	29.8
05N05W18R001M	2/15/1966	7/3/2008	8.1	1.7	34.3
05N05W30J003M	10/22/1965	3/13/2002	11.6	3.4	69
05N06W02N002M	4/3/1974	7/3/2008	70	20	122.5
05N06W13C001M	10/8/1980	4/7/2004	37.8	23.8	63
Southern Sonoma Valley					
04N05W06E001M	11/29/1973	4/5/2004	21.6	17.6	29.6
04N05W06M001M	10/13/1980	4/10/2008	15.0	10.8	22.5

SOURCE: DWR, 2008

Areas of saline groundwater have been identified between San Pablo Bay shore and Schellville. This saline groundwater is likely associated with seawater intrusion, connate groundwater associated with evaporate or marine sedimentary deposits, and/or thermal waters (SCWA 2007).

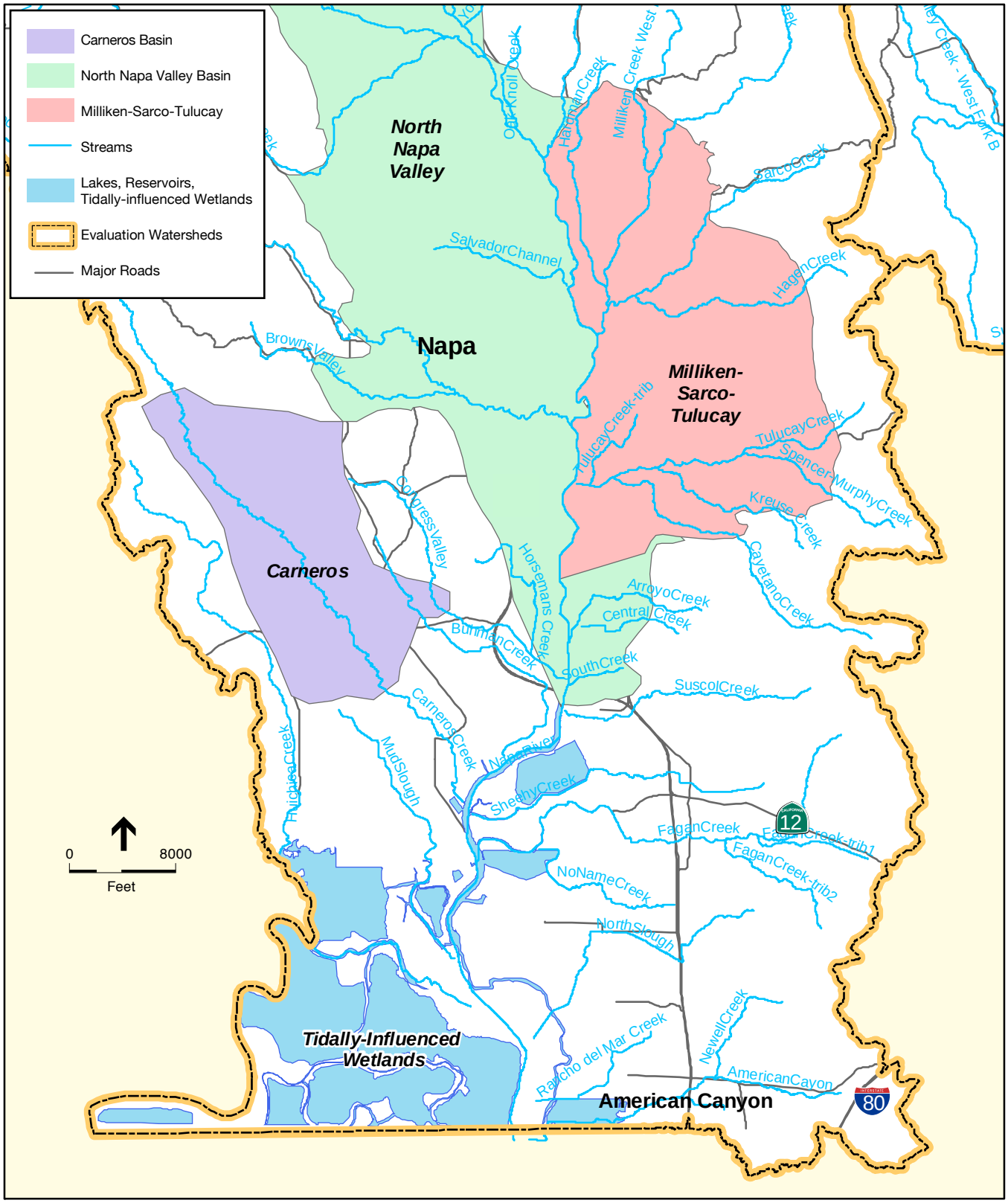
The area of saline groundwater south of Highway 12/121 did not change substantially from the 1940s through 1982. Surveys conducted in 2003 indicate that the saline groundwater may have shifted north of Highway 12/121 toward a groundwater depression southeast of the City of Sonoma. In the area of the intersections of Highways 12 and 121 and Sonoma Creek, the saline groundwater has receded (Farrar et al., 2007).

Napa SD

The City of Napa does not use groundwater for drinking water supplies. Unincorporated areas of Napa County that are not served by the City, including the MST area, rely on groundwater for domestic use as well as agriculture and open-space irrigation. Two groundwater basins have been identified in the Napa SD service area that could be affected by the NBRWP, the MST and Carneros groundwater basins. **Figure 3.3-3** shows the location of the Carneros and MST groundwater basins.

MST Groundwater Basin

The Lower MST Basin area is located on the eastern edge of the Napa Valley floor in southern Napa County, between the City of Napa and the Howell Mountains. The MST Basin covers an



SOURCE: USDA, 2005; CDM, 2006; Napa County, 2006; and ESA, 2008

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Figure 3.3-3

Milliken-Sacro-Tulocay and Carneros Goundwater Basins

area of about 15 square miles and has an estimated usable storage capacity of 200,000 AF (Napa Valley Flood Control District, 1991 in County of Napa, 2007). The MST Basin is the only basin designated as deficient by Napa County (County of Napa, 2007). The County of Napa has enacted an ordinance to protect groundwater in the MST deficient area.

Approximately 4,800 people in the MST area rely solely on groundwater from private wells. The majority of all groundwater pumped in the area (about 45 percent) is used for agriculture, with the remainder pumped for improved open-space irrigation (about 29 percent) and domestic use (about 27 percent) (Farrar and Metzger, 2003). Population growth and an increasing number of irrigated vineyards have resulted in declining groundwater levels.

Geology and Hydrogeology. The MST Basin lies in a northwest-trending valley in the Howell Mountains of the North Coast Range. The area is underlain by alluvial deposits and volcanic rocks that exceed 1,000 feet in thickness in some areas. Principal water bearing units in the area include alluvial deposits west of the Soda Creek Fault and the tuffaceous member of the Sonoma Volcanics east of the fault (Farrar and Metzger, 2003). Groundwater occurs primarily under confined conditions within the tuffaceous units of the Sonoma Volcanics (County of Napa, 2007).

Groundwater recharge in the MST Basin occurs from precipitation and infiltration on the valley floor and from infiltration in the Howell Mountains. Seepage from the three creeks also contributes to recharge. Agricultural irrigation has a minor contribution to recharge as the predominant crops are vineyards that use water-efficient irrigation techniques. Annual precipitation in the basin occurs almost exclusively from November through April. Annual precipitation averaged about 24.5 inches per year from 1918 through 2000 (National Oceanic and Atmospheric Association 2002 *in* Farrar and Metzger, 2003). Annual precipitation can deviate up to 200 percent from the 85-year average. Precipitation increases from south to north as the elevation increases. Average annual precipitation is highest in the Howell Mountain, almost 65 percent higher than the area with the lowest average annual precipitation (Farrar and Metzger, 2003).

Surface water resources in the area include the Milliken, Sarco, and Tulucay Creeks, which originate in the Howell Mountains and drain into the Napa River. The three creeks have a combined drainage area of approximately 41 square miles.

Groundwater generally moves laterally from the Howell Mountains into the MST area and towards the Napa River. Surface water runoff to the Napa River and high evapotranspiration rates make it difficult to accurately estimate potential groundwater recharge (Farrar and Metzger, 2003). A previous study estimated average annual recharge to be 5,400 AF per year (AFY) in 1975, with 3,050 AFY from streamflow infiltration, 2,100 AFY from subsurface inflow from the Howell Mountains, and 250 AFY from infiltration of precipitation (Farrar and Metzger, 2003). USGS estimates annual recharge to be approximately 6,000 AFY, but this number is uncertain due to the difficulty in estimating precipitation, runoff, and evapotranspiration for the region (Farrar and Metzger, 2003).

Groundwater discharges mainly occur from groundwater pumping and underflow in a westward direction, with a smaller quantity of discharges to streams (Farrar and Metzger, 2003). The USGS estimates underflow to be about 600 AFY in the area, about 2,050 AF less than estimated in 1975 (Farrar and Metzger, 2003).

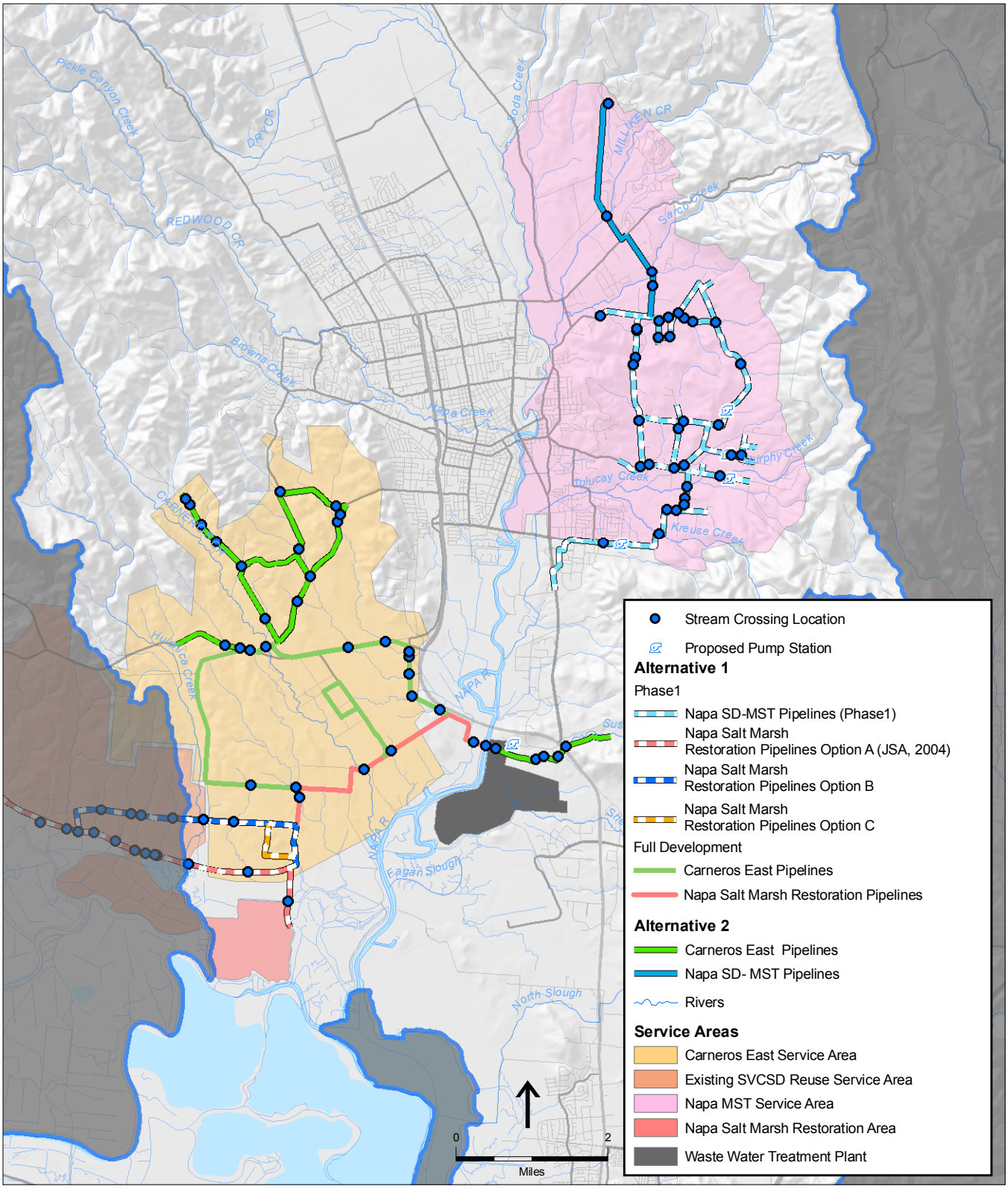
Groundwater Production. Based on driller logs and the number of parcels in the area, USGS estimates there are approximately 1,595 domestic wells and 185 irrigation wells in the MST area (Farrar and Metzger, 2003). About one-third of all domestic wells were constructed from 1975 to 2002. Groundwater production from 2000-2002 ranged from 3,600 to 7,100 AFY and averaged 5,350 AFY. This production is an increase of 2,350 AFY compared to 1975 estimates which average 3,000 AFY (Farrar and Metzger, 2003). Annual groundwater pumping has been estimated at 5,350 AF from 2000-2002, an 80 percent increase since 1975 (Farrar and Metzger, 2003).

Groundwater Levels. As described above, prior to pumping, groundwater in the area flowed west toward the Napa River from recharge areas in the mountains to the north, east, and south. Increased groundwater pumping since 1975 has changed the groundwater gradients in the area, resulting in a decrease in underflow towards the Napa River. Three large groundwater depressions are present in the MST Basin; one in the eastern portion, one in the central portion, and one in the northwestern portion of the basin. The groundwater deficient area is shown in **Figure 3.3-4**. Groundwater around the depressions that would normally have flowed in a southwest direction towards the Napa River now flows towards these depressions. From 1975 to 2001, some water levels increased in the area, but groundwater levels around the central and eastern depressions decreased from 50 to 124 feet bgs (Farrar and Metzger, 2003). The two largest groundwater depressions are located in regions with the largest number of active or potentially active wells (Farrar and Metzger, 2003). In the third depression in the northwest region, the greatest rate of groundwater decline occurred after 1970, when the largest numbers of new wells were drilled. The decrease in groundwater levels at the three depression areas has occurred even during periods of average annual precipitation. The general decline in groundwater levels suggest that groundwater pumping currently exceeds recharge (Farrar and Metzger, 2003).

According to available data from DWR, average groundwater depths in the MST basin range from 14.1 to 227.5 feet bgs (see **Table 3.3-4**). The minimum groundwater depth recorded ranges from 0.3 feet to 180.0 feet bgs, while the maximum depth ranges from 59.4 to 285.9 feet bgs.

Groundwater Quality. In the fall of 2001, USGS sampled 15 wells throughout the MST Basin. Several wells exceeded drinking water standards for various constituents. Dissolved oxygen (DO) concentrations in the wells ranged from less than 0.1 to 6.6 mg/L. The pH for all 15 wells ranged from 6.3 to 8.6; two wells did not meet the State secondary drinking water standard of 6.5 to 8.5 for taste, odor, or appearance (Farrar and Metzger, 2003). Specific conductance ranged from 124 to 1,220 microsiemens per centimeter (µS/cm) and one well exceeded the State secondary drinking water standard of 900 µS/cm (USGS, 2003).

Boron standards were exceeded in two wells, and arsenic standards were exceeded in three wells. Several wells had concentrations of dissolved iron and manganese that exceeded drinking water



SOURCE: CDM, 2008; ESRI, 2006; SWRCB, 2006; ESA, 2008; Field Collected Stream Data, 2008; DWR NHD Stream Data, 2007

Note: Existing Water Distribution Facilities Not Shown

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Figure 3.2-4

Napa River Watershed Stream Crossings

TABLE 3.3-4
GROUNDWATER DEPTHS IN THE MST BASIN

Well Location/ID	Period of Record		Depth Below Ground Surface (feet)		
	Start	End	Average Water Depth	Minimum Depth	Maximum Depth
05N03W05M001M	6/15/1949	4/22/2008			
05N03W06B002M	11/9/1992	4/22/2008	227.5	180	285.9
05N03W07C003M	10/17/1978	4/23/2008	46.6	11.4	130
05N03W07P001M	10/17/1978	11/6/1992	77.6	1.7	213
05N04W12F001M	1/30/1950	3/20/1978	61.2	30.5	98.5
05N04W12H001M	4/4/1963	1/30/1978	48.3	10	88.6
05N04W13H001M	4/4/1963	4/23/2008	15.4	3.1	149.6
05N04W13H002M	7/17/1962	3/21/1972	14.1	11.8	20.8
05N04W14J003M	7/15/1920	4/24/2008	77	48.8	199.2
06N03W31B001M	4/6/1992	12/15/1949	137.4	69	230
06N03W31F001M	12/15/1919	10/15/1973	26.2	0.3	64.8
06N03W31H001M	12/15/1949	3/20/1978	67.4	14.6	145.9
06N03W31N001M	11/15/1937	10/1/1974	46.8	16.7	59.4
06N03W31N002M	4/4/1963	3/20/1978	60.6	24.9	98.2
06N04W23J001M	2/1/1950	4/21/2008	74.6	0.7	119.6
06N04W23Q003M	10/17/1978	4/21/2008	83.6	12	114.2
06N04W26G001M	10/13/1978	4/21/2008	56.1	30.8	95.1
06N04W35G003M	1/31/1950	10/24/1988	35.4	4	85.5
06N04W36G001M	10/17/1978	4/22/2008	121.7	74	179.5
06N04W36H001M	3/10/1950	3/20/1978	28.8	15.4	127

SOURCE: DWR, 2008

standards. The source of the arsenic, boron, iron, and manganese is most likely minerals in the volcanic rocks or from the rocks of the Franciscan Complex or Great Valley Sequence. Groundwater from three wells in the central part of the basin, ranging in total depth from 228 to 260 ft, had the highest dissolved solids (greater than 400 mg/L) and highest chloride concentrations (54 to 175 mg/L) (Farrar and Metzger, 2003). Temperatures in the wells were fairly high, ranging from 17.5 degrees Celsius (°C) to 27 °C, with a temperature gradient almost double that of the national average at approximately 0.02°C per foot. All wells with depths greater than 400 feet had a temperature over 22 °C (Farrar and Metzger, 2003).

Carneros Groundwater Basin

The Carneros groundwater basin underlies the Carneros Valley in the southwestern portion of Napa County.

Geology and Hydrogeology. The valley floor in the area consists of alluvium underlain by Pleistocene Huichica Formation and the Sonoma Volcanics. Alluvium is thin in the area and the majority of it is located above the saturated zone. The Huichica Formation is the primary water-bearing material in the basin. No estimates of storage are available. Lower well yields in the area

indicate storage is likely less than the MST Basin (County of Napa, 2005). Recharge to the basin is primarily from infiltration of precipitation along the hillside bordering the Carneros Valley and from infiltration from streambeds.

Groundwater Production. While no detailed information is available for the Carneros Basin, groundwater production is estimated at 1,500 AF based on 2000 to 2002 pumping estimates for the region (County of Napa, 2005).

Groundwater Levels. While no recent data is available for groundwater levels, groundwater depths for eight wells in the Carneros East area are presented below in **Table 3.3-5**. Average groundwater depths in the wells ranged from 7.7 feet to 41.4 feet bgs, with a minimum depth of 0.2 to 28.2 feet bgs and a maximum of 16.5 feet to 96.2 feet bgs (DWR, 2008).

Groundwater Quality. No groundwater quality data is available for the Carneros groundwater basin (County of Napa, 2005).

TABLE 3.3-5
GROUNDWATER DEPTHS IN THE CARNEROS BASIN

	Period of Record		Below Ground Surface (feet)		
Well Location/ID	Start	End	Average Water Depth	Minimum Depth	Maximum Depth
04N04W04C001M	7/19/1962	3/20/1978			
04N04W05B001M	7/18/1962	3/20/1978	17.4	3.7	54.1
04N04W05D002M	3/13/1951	3/20/1978	7.7	0.2	16.5
05N04W19R002M	7/18/1962	3/20/1978	21.2	0.5	62.7
05N04W20R002M	7/18/1962	3/20/1978	12.5	0.2	96.2
05N04W22M001M	11/1/1949	3/20/1978	41.4	0.2	64.1
05N04W28R001M	6/20/1918	3/20/1978	40.7	28.2	60.9
05N04W29H001M	2/25/1930	3/20/1978	28.7	13.2	44.2

SOURCE: DWR, 2008

3.3.2 Regulatory Framework

State

Groundwater use is generally not regulated by the State of California. Groundwater use is typically managed at the local level. The State's role in groundwater management is mainly to provide financial assistance to local agencies to aid in groundwater management (DWR 2003).

Assembly Bill 3030 (AB3030), Water Code Section 10750 (commonly referred to as the Groundwater Management Act), encourages local agencies to develop groundwater management plans that cover certain aspects of management. Subsequent legislation has amended this chapter to make the adoption of a management program mandatory if an agency is to receive public funding for groundwater projects, creating an incentive for the development and implementation

of plans. The Groundwater Management Act lists 12 elements that should be included within the groundwater management plans to ensure efficient use, good groundwater quality, and safe production of water. These 12 elements are (State Water Code, Section 10753):

- Control of saline water intrusion;
- Identification and management of well head protection areas and recharge areas;
- Regulation of the migration of contaminated groundwater;
- Administration of a well abandonment and destruction program;
- Mitigation of conditions of overdraft;
- Replenishment of groundwater extracted by water producers;
- Monitoring of groundwater levels and storage;
- Facilitation of conjunctive use operations;
- Identification of well construction policies;
- Construction and operation (by the local agency) of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects;
- Development of relationships with State and Federal regulatory agencies; and
- Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination.

Senate Bill 1938 (SB 1938), Water Code Section 10753.7, requires local agencies seeking State funds for groundwater construction or groundwater quality projects to have the following: 1) a developed and implemented groundwater management plan that includes basin management objectives[1] (BMOs) and addresses the monitoring and management of groundwater levels, groundwater quality degradation, inelastic land subsidence, and surface water/groundwater interaction; 2) a plan addressing cooperation and working relationships with other public entities; 3) a map showing the groundwater subbasin the project is in, neighboring local agencies, and the area subject to the groundwater management plan; 4) protocols for the monitoring of groundwater levels, groundwater quality, inelastic land subsidence, and groundwater/surface water interaction; and 5) groundwater management plans with the components listed above for local agencies outside the groundwater subbasins delineated by the DWR Bulletin 118, published in 2003.

Local

The local general plans, policies, and regulations associated with impacts to groundwater within the affected jurisdictions are presented in **Appendix 3.3** of this EIR/EIS.

[1] BMOs are management tools that define the acceptable range of groundwater levels, groundwater quality, and inelastic land subsidence that can occur in a local area without causing significant adverse impacts.

3.3.3 Environmental Consequences / Impacts

Significance Criteria under CEQA

Based on the Appendix G of the *CEQA Guidelines*, project implementation would result in significant impacts and environmental consequences on groundwater resources if it would:

- Substantially degrade groundwater quality;
- Result in an increase in the potential for flooding; or
- 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.

Environmental Consequences/Impact Analysis

This section analyzes the potential environmental consequences/impacts of the NBWRP alternatives on groundwater resources. With the exception of the MST area, this analysis assumes that water use (in areas that currently use groundwater) would not change as a result of implementation of the NBWRP alternatives. Provision of recycled water would be used to offset groundwater use; it would not contribute to an increase in water use.

Because specific recycled water users were not identified at the time of this document, the analysis assumes all irrigated lands currently rely on groundwater and therefore the use of recycled water would result in a corresponding offset in the existing use of groundwater supplies. In reality, there may be small areas of irrigated lands that rely on surface water or other municipal sources. In these instances, the offset provided would not be solely applicable to existing groundwater use, but would in fact provide a corresponding offset to what ever combination of irrigation supplies are currently in use at an existing user site.

Impact 3.3.1: Long-term groundwater levels. The NBWRP would provide an alternative irrigation supply to existing groundwater pumping; offset of groundwater pumping could maintain or raise groundwater levels in portions of the action area. (Beneficial)

The NBWRP would create a new source of water that would offset the use of surface and groundwater supplies for urban and agricultural irrigation. **Table 3.3-6** shows the quantity of recycled water that would be available under each alternative. **Charts 3.3-1** and **3.3-2** summarize the potential maximum reduction in groundwater pumping[2] within the Sonoma Valley and MST Area associated with each of the Action Alternatives, including comparison to the No Project Alternative (CEQA baseline) and No Action Alternative (NEPA baseline). This reduction in pumping would occur within the Sonoma Valley and MST irrigation areas, which currently use groundwater for irrigation. The use of recycled water to offset groundwater would allow

[2] The potential maximum reduction in groundwater pumping assumes that 100 percent of the recycled water would be used to off-set groundwater.

TABLE 3.3-6
RECYCLED WATER AVAILABLE UNDER EACH OF THE ALTERNATIVES

Service Area	Specific Region	No Project	No Action Alternative	Phase 1	Basic System	Partially Connected System	Fully Connected System
		(Acre-Feet Per Year)					
LGVSD	Peacock Gap	0	0	0	0	207	207
	NMWD URWP (South)	0	0	202	202	202	202
	Sears Point	0	0	0	0	0	0
Novato SD	NMWD URWP (northern central, and west portions)	0	193	542	542	1,070	1,070
	Sears Point	0	0	0	0	968	1,044
	Southern Sonoma Valley	0	0	0	0	0	1,587
SVCSD	Central Sonoma Valley	0	0	0	0	0	1,511
	Sonoma Valley	0	874	874	2,719	2,719	2,719
	Southern Sonoma Valley	0	0	0	0	1,662.5	0
	Napa Salt Marsh[1]	0	--	--	--	--	--
Napa SD	Carneros East and Salt Marsh	0	0	0	1,055	1,440	1,440
	MST	0	0	2,137	2,137	2,826	2,826
	Napa (local)	0	0	0	0	155	155
	Napa Salt Marsh[1]	0	--	--	--	--	--
Total	**Compared to No Project**	**0**	**1,067**	**3,757**	**6,655**	**11,250**	**12,761**
Total	**Compared to No Action**	**--**	**1,067**	**2,690**	**5,588**	**10,182**	**11,694**

[1] Releases to Napa Salt Ponds 7 and 7A, are estimated as follows: No Project Alternative – 0 AFY; No Action Alternative – 3,460 AFY; Basic Alternative – 5,824 AFY; Partially Connected – 2,933 AFY; Fully Connected – 3,085 AFY. Actual releases will depend upon year type. Because this is a beneficial use that is not related to recycled water supply, this number is tracked separately in each of the alternatives.

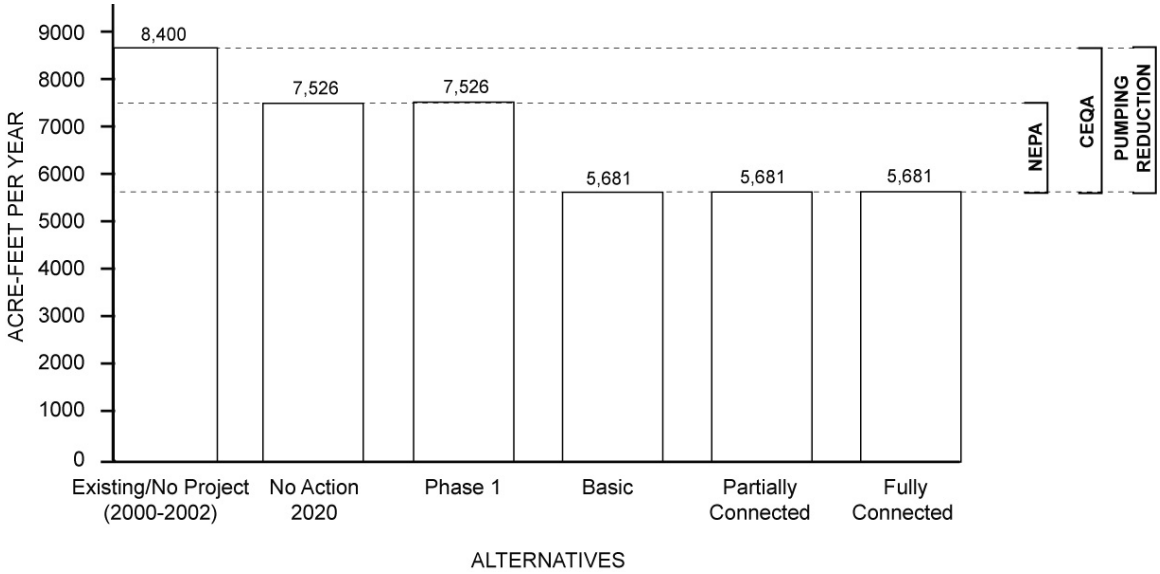
SOURCE: CDM, 2009; ESA 2009.

groundwater to remain in storage in the aquifers and over the long term could help to maintain or even raise groundwater levels. This would help to reduce the risk of saline intrusion from San Pablo Bay, and is considered a beneficial impact. A discussion of potential impacts for the Action Alternatives by Member Agency is provided below. Please refer to Section 3.4, Water Quality, for a discussion of potential impacts to groundwater quality.

No Project Alternative

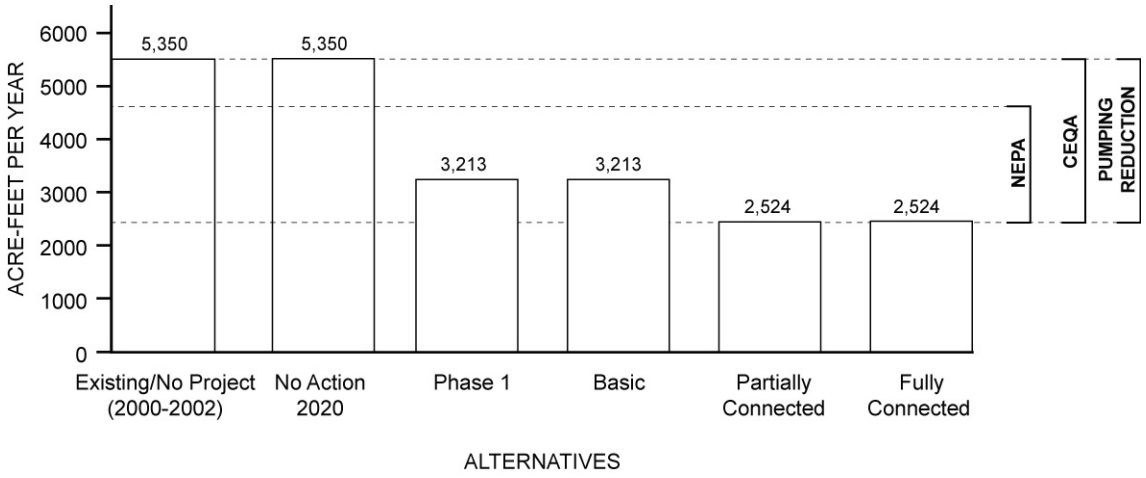
The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

CHART 3.3-1
POTENTIAL MAXIMUM OFFSET IN SONOMA VALLEY GROUNDWATER PUMPING BY ALTERNATIVE



SOURCE: CDM, 2009; ESA, 2009.

CHART 3.3-2
POTENTIAL MAXIMUM OFFSET IN MST AREA GROUNDWATER PUMPING BY ALTERNATIVE



SOURCE: CDM, 2009; ESA, 2009.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available from projects implemented by Member Agencies on an individual basis (see Table 3.3-6). This recycled water supply would be available to offset groundwater pumpage.

Under 2020 conditions, it is likely that groundwater pumpage within the Sonoma Valley area would continue at or near current levels, and that groundwater conditions would be further reduced in terms of groundwater levels and groundwater quality. Future levels of groundwater pumpage and resulting groundwater conditions are difficult to predict, although it is likely that current trends would continue. These conditions would be slightly reduced through the implementation of recycled water projects, which would provide 1,067 AFY of recycled water to offset groundwater pumpage. Within areas where groundwater is currently used for irrigation, this would result in 874 AFY available in the Sonoma Valley (approximately 14% reduction in current pumpage). This would allow groundwater to remain in storage in the aquifers and over the long term could help to maintain or even raise groundwater levels. This would help to reduce the risk of saline intrusion from San Pablo Bay. This impact would be considered beneficial, and would occur in service areas where groundwater is currently used for irrigation.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide approximately 3,757 AFY within the action area to offset potable water. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 2,690 AFY of recycled water.

The beneficial impacts related to groundwater offset associated with Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the additional recycled water available under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD

Phase 1 projects would provide approximately 202 AFY of recycled water to Hamilton Field to offset potable water use. Although these are private wells within the LGVSD and NMWD service areas, Hamilton Field is served by surface water supplies from NMWD. Therefore, there would be no offset of groundwater pumping, with beneficial effects to groundwater levels in this area. Please refer to Section 3.4, Water Quality for a discussion of potential impacts to groundwater quality.

Groundwater is the main water supply used for irrigation in the portion of the action area. Therefore, it is assumed that a portion of the recycled water would be used for agricultural

irrigation and would offset groundwater pumping. Localized groundwater depressions are evident within the Sonoma Valley. The use of recycled water to offset groundwater would help to maintain or even increase groundwater levels in the area over the long-term. When compared to both the No Project and No Action baseline conditions, this impact would be considered beneficial.

Novato SD/ NMWD

Phase 1 projects would provide approximately 542 AFY of recycled water to the NMWD north and central areas to offset potable water use. The Novato area is served by surface water supplies from NMWD. Therefore, there would be no impact on groundwater levels in this area.

SVCSD

Phase 1 projects would provide approximately 874 AFY of recycled water to Sonoma Valley to offset potable water use. Land use in the Sonoma Valley portion of the action area is both urban and agricultural. Groundwater is the main water supply used for irrigation in the portion of the action area that contains dairy/pasture lands and vineyards. Therefore, it is assumed that a portion of the recycled water would be used for agricultural irrigation and would offset groundwater pumping. Localized groundwater depressions are evident within the Sonoma Valley. The use of recycled water to offset groundwater would help to maintain or even increase groundwater levels in the area over the long-term. When compared to both the No Project and No Action baseline conditions, this impact would be considered beneficial.

Phase 1 of the Napa Salt Marsh Restoration Project would provide approximately 3,460 AFY, depending upon year type, of recycled water to the Napa Salt Marsh Wildlife Area to assist in habitat restoration. This would offset potable water uses for restoration.

Napa SD

Phase 1 projects would provide a total of approximately 2,137 AFY of recycled water to the MST area. About 1,416 AFY of this recycled water would be used primarily for the irrigation of existing vineyards. Because groundwater is the only water supply within the MST area, recycled water would help to reduce groundwater pumping by providing alternate water source for irrigation. The MST groundwater basin has been designated by Napa County as a deficient basin because of declining groundwater levels. The use of recycled water would help to maintain and may even raise groundwater levels in the MST area over the long term. This impact would be considered beneficial.

Phase 1 projects would have the ability to provide 521 AFY of recycled water beyond the irrigation demands of existing vineyard uses in the MST area. This additional recycled water would be generated by the Napa SD, and would be available to serve varying types of land uses within the MST area. Because this recycled water is above the amount needed to offset existing groundwater pumpage, it would not contribute to further reduction in groundwater pumpage.

This recycled water would be available to support irrigation of various land uses, and could contribute to currently un-irrigated lands within the MST area converting to irrigated agriculture

uses consistent with their General Plan designations. Assuming a use rate of 0.25 acre-feet/acre for vineyards in Napa (CDM, 2008), this amount of recycled water would be capable of supporting approximately 2,086 acres of vineyard. Assuming a use rate of 2.5 acre-feet/acre for dairy (CDM, 2008), this amount of recycled water would be capable of supporting approximately 208 acres of dairy. It should be noted that existing un-irrigated parcels within the MST area are not restricted from agricultural uses that are consistent with their General Plan and Zoning designations, and that are in conformance with the Napa County Groundwater Conservation Ordinance, which provides for a usage rate of 0.3 acre-feet/acre per year, over a 3-year average. Therefore, it is unlikely that provision of recycled water in and of itself would directly result in the conversion of these parcels to irrigated agricultural uses. However, the availability of an alternative supply to groundwater could be one of several contributing factors that would allow lands that are currently un-irrigated to be placed in irrigated agriculture, consistent with their General Plan land use designations. Please refer to **Chapter 5, Growth Inducement**, for further discussion of land use within the MST area. In the event that un-irrigated lands are converted to vineyard uses, the availability of recycled water would offset the need for additional groundwater pumpage. Therefore, vineyard conversion would not contribute to further reduction in groundwater pumpage.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System would provide approximately 6,655 AFY of recycled within the action area. Compared to the No Action Alternative (NEPA Baseline), the Basic System would provide approximately 5,588 AFY within the action area.

The beneficial impacts related to groundwater offset associated with the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the additional recycled water available under this alternative. The amount of recycled water provided under each alternative is provided in Table 3.3-6. The potential corresponding offset in groundwater pumpage within the Sonoma Valley and MST Areas under the Basic System is provided Charts 3.3-1 and 3.7-2.

LGVSD/NMWD

The impacts of the Basic System would be the same as those described for Phase 1. There would be no impact on groundwater.

Novato SD/NMWD

The impacts of the Basic System would be the same as those described for Phase 1. There would be no impact on groundwater.

SVCSD

Under the Basic System, approximately 2,719 AFY of recycled water would be delivered to Sonoma Valley and a portion of this is expected to offset groundwater use. This is an increase of 1,845 AFY from Phase 1. The impact would result in additional recycled water that could offset groundwater. This impact would be beneficial.

Under the Basic System, the beneficial impacts of Napa Salt Marsh Restoration Project would be equivalent to Phase 1.

Napa SD

Under the Basic System, 2,137 AFY of recycled water would be delivered to the MST area to offset groundwater water use, and would result in a beneficial impact, as described above for Phase 1. In addition, approximately 1,055 AFY would be delivered to the Carneros East area to offset groundwater use by existing agricultural irrigators. A large portion of the Carneros East area relies on groundwater for agricultural irrigation and therefore recycled water would offset groundwater use. The use of recycled water in the Carneros East and MST areas would decrease the reliance on groundwater supplies and would help to maintain or raise groundwater levels in the area over the long term. This impact would be considered beneficial.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide approximately 11,250 AFY of recycled water within the action area. Compared to the No Action Alternative (NEPA Baseline), the Basic System would provide approximately 10,183 AFY within the action area.

The beneficial impacts related to groundwater offset associated with the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the additional recycled water available under this alternative. The amount of recycled water provided under each alternative is provided in Table 3.3-6. The potential corresponding offset in groundwater pumpage within the Sonoma Valley and MST Areas under the Partially Connected System is provided Charts 3.3-1 and 3.3-2.

LGVSD/NMWD

Under the Partially Connected System, approximately 202 AFY would be delivered to Hamilton Field and would result in the same impact as described above for the Basic System. In addition, 207 AFY would be delivered to the Peacock Gap area. The Peacock Gap area receives water from MMWD and does not use groundwater. There would be no impact on groundwater levels.

Novato SD/NMWD

Under the Partially Connected System, NMWD north and central areas would receive a total of 1,070 AFY (an increase of 528 AFY from the Basic System), and Sears Point would receive 968 AFY of recycled water. As described above, recycled water use in the NMWD service area would not affect groundwater, as it would replace only surface water supplies. Recycled water would be used in Sears Point to irrigate dairy/pasture land, irrigated farm land, and vineyards. This would help to reduce the use of groundwater and could maintain or even increase groundwater levels over the long term. This would be a beneficial impact.

SVCSD

Under the Partially Connected System, approximately 2,719 AFY would be delivered to Sonoma Valley and a portion of this water would offset groundwater use. This would result in a beneficial impact, as described for the Basic System. In addition, 1,662.5 AFY -feet per year of recycled water would be delivered to the Southern Sonoma Valley service area. Use of recycled water for agricultural irrigation would help to reduce existing groundwater pumping, and would help to maintain or even increased groundwater levels over the long term. This would be a beneficial impact.

Under the Partially Connected System, the beneficial impacts of Napa Salt Marsh Restoration Project would be equivalent to Phase 1.

Napa SD

Under the Partially Connected System, the recycled water that would be delivered to the MST and Carneros East areas would increase compared to the Basic System. The groundwater deficient MST area would receive a total of 2,826 AFY, of which 1,416 AFY would offset existing irrigation. Therefore, an additional 1,210 AFY would be available for other uses, or approximately 689 AFY more recycled water available for other uses than provided under the Basic Alternative. This additional recycled water supply would not be anticipated to offset or affect groundwater pumpage, because the maximum groundwater offset in the MST area would be accomplished under the Basic Alternative. However, this additional recycled water could increase groundwater levels over the long term. This would be a beneficial impact.

Assuming a use rate of 0.25 acre-feet/acre for vineyards in Napa, this amount of recycled water would be capable of supporting an additional 2,756 acres of vineyard compared to the Basic Alternative. Assuming a use rate of 2.5 acre-feet/acre for dairy, this amount of recycled water would be capable of supporting an additional 275 acres of dairy compared to the Basic Alternative. It should be noted that existing un-irrigated parcels within the MST area are not restricted from agricultural uses that are consistent with their General Plan and Zoning designations, and that are in conformance with the Napa County Groundwater Conservation Ordinance, which provides for a usage rate of 0.3 acre-feet/acre per year, over a 3-year average. Therefore, it is unlikely that provision of recycled water in and of itself would directly result in the conversion of these parcels to irrigated agricultural uses.

Carneros East area would receive an additional 1440 AFY. This recycled water would help to offset groundwater use and could maintain or even increase groundwater levels over the long term. This would be a beneficial impact.

Approximately 155 AFY would be delivered to irrigation customers close to the Napa SD WWTP. This recycled water would help to offset groundwater use and could maintain or even increase groundwater levels over the long term. This would be a beneficial impact.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide approximately 12,761 AFY of recycled within the action area. Compared to the No Action Alternative (NEPA Baseline), the Fully System would provide approximately 11,694 AFY within the action area.

The beneficial impacts related to groundwater offset associated with the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the additional recycled water available under this alternative. The amount of recycled water provided under each alternative is provided in Table 3.3-6. The potential corresponding maximum offset in groundwater pumping within the Sonoma Valley and MST Areas under the Fully Connected System is provided Charts 3.3-1 and 3.3-2.

LGVSD/NMWD

No additional recycled water would be provided; impacts would be identical to the Partially Connected Alternative.

Novato SD/NMWD

For the Fully Connected System, NMWD and Sears Point would receive the same amount of recycled water as the Partially Connected System and impacts would be similar. Southern Sonoma Valley would also receive the same amount of recycled water (1,587 AFY) although under the Fully Connected System, it would be supplied by Novato SD and LGVSD, rather than SVCSD. The beneficial impacts to groundwater of the Fully Connected System would be the same as those discussed for the Partially Connected System.

SVCSD

Under the Fully Connected System, Sonoma Valley would receive the same quantity of recycled water as described for the Partially Connected System (2,719 AFY). In addition, Central Sonoma Valley would receive 1,511 AFY. The majority of this water would be used for agricultural irrigation by existing groundwater pumpers and would offset groundwater pumpage. The use of recycled water would help to reduce groundwater pumping and could maintain or even increase groundwater levels over the long term. This impact would be beneficial.

Under the Fully Connected System, the beneficial impacts of Napa Salt Marsh Restoration Project would be equivalent to Phase 1.

Napa SD

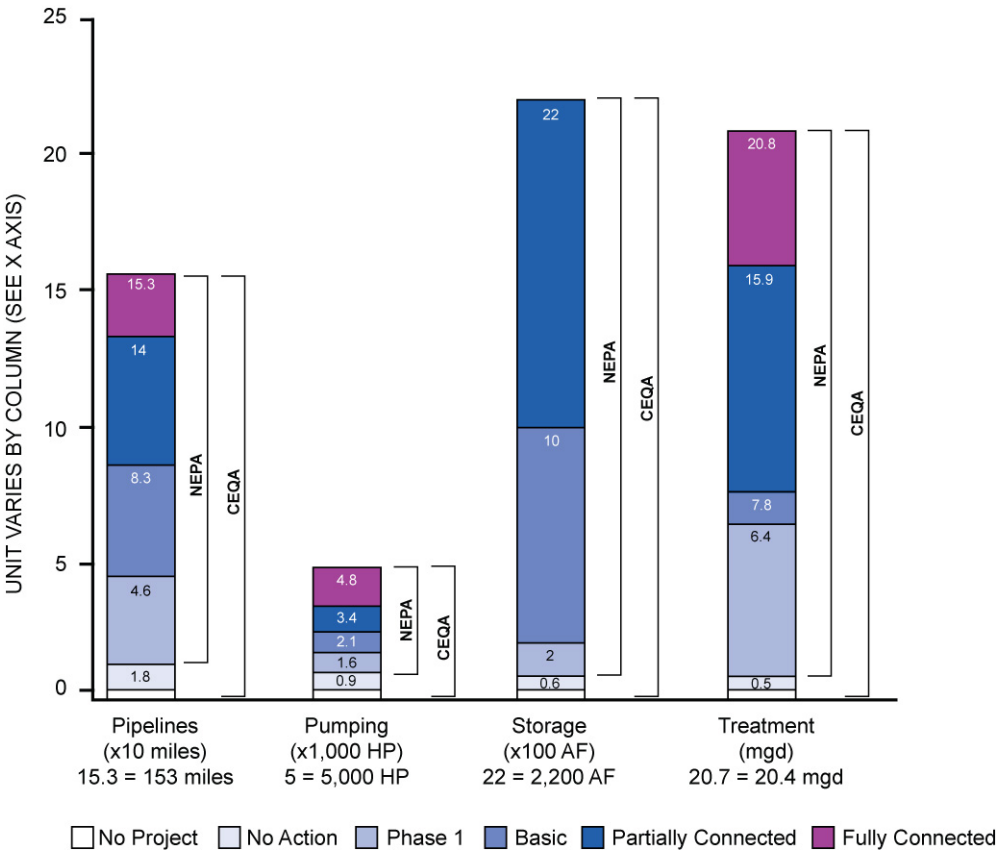
No additional recycled water would be provided; impacts would be identical to the Partially Connected Alternative

Impact 3.3.2: Hydrostatic Pressure. Proposed facilities may be affected by shallow groundwater levels and natural groundwater fluctuations. (Less than Significant Impact)

As described under Section 3.3.1, there may be regions in the action area that could have shallow groundwater (less than 15 feet below the ground surface). Proposed facilities, including pipelines, pump stations, and storage facilities, would be constructed several feet below the ground surface and therefore would be subject to hydrostatic pressure relating to groundwater.

Proposed facilities for each Alternative are summarized in **Chart 3.3-3**. Standard design features would be implemented to reduce the potential for damage due to fluctuating groundwater levels. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.

CHART 3.3-3
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

Implementation of **Mitigation Measure 3.3.1**, which includes incorporation of such design features, the impacts of shallow groundwater on the proposed storage facilities would be considered less than significant; therefore potential impacts would be reduced to a less than significant level.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. Therefore, a subset of the impacts identified for the NBWRP would likely occur irrespective of the NBWRP.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.3-3, No Action).

Groundwater impacts common to all below grade facilities include effects of groundwater fluctuation and hydrostatic pressure. All recycled water storage and pumping facilities located below grade would have the potential to encounter fluctuating groundwater conditions, and would incorporate standard engineering measures to ensure that facilities are not adversely affected. Under the No Action Alternative, it is anticipated that one 65 AF storage reservoir would be constructed at the SVCSD WWTP.

Phase 1 (Project level)

Compared to the CEQA Baseline Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The groundwater impacts to proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Proposed facilities for each Alternative are summarized in Chart 3.3-3. Standard design features would be implemented to reduce the potential for facilities to be affected by fluctuating

groundwater levels. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios. Implementation of **Mitigation Measure 3.3.1** for the proposed storage facilities would ensure that the impacts are less than significant

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The groundwater impacts to proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Proposed facilities for each Alternative are summarized in Chart 3.3-3. The impacts associated with the Basic System would be equivalent to the impacts discussed for Phase 1, although more facilities would be constructed. This additional impact would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The groundwater impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Proposed facilities for each alternative are summarized in Chart 3.3-3. The impacts associated with the Partially Connected System would be equivalent to the impacts discussed for the Basic System, although more facilities would be constructed. This additional impact would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary

capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The groundwater impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Proposed facilities for each alternative are summarized in Chart 3.3-3. The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for the Partially Connected System, although more facilities would be constructed. This impact would be less than significant.

Mitigation Measures

Mitigation Measure 3.3.1: The Member Agencies will implement the following measures:

- All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria.
- Implement industry standard geotechnical measures to address high groundwater conditions as appropriate to reduce the potential for impacts related to groundwater fluctuation, in accordance with accepted geotechnical practices. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.3 High Groundwater Conditions. The NBWRP could result in localized increases in groundwater levels over the long term that could effect structures or contribute to flooding. (Less than Significant)

The NBWRP would potentially maintain or even increase groundwater levels over the long term because recycled water would be used to offset groundwater pumping. However, the majority of the recycled water would offset groundwater in areas with declining groundwater levels. The quantity of recycled water used to offset groundwater is not expected to increase the potential for high groundwater conditions that could affect structures or contribute to flooding. Therefore, this impact is considered less than significant.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. Therefore, a subset of the impacts identified for the NBWRP would likely occur irrespective of the NBWRP.

For a comparison baseline to the Action Alternatives, it is estimated that these individual recycled water projects would provide approximately 1,067 AFY of recycled water, providing a potential corresponding offset in groundwater pumpage. Recycled water is expected to be mainly used in the areas experiencing declining groundwater levels. Overall, the quantity of recycled water is not expected to be enough to raise groundwater levels to the extent that they could cause localized flooding.

LGVSD/ NMWD and Novato SD/ NMWD

Recycled water would only offset surface water supplies in this area. Groundwater levels are not expected to change as a result of the NBWRP and therefore there would be no increase in the potential for flooding from shallow groundwater. There would be no impact.

SVCSD and Napa SD

Although the use of recycled water would offset groundwater and could potentially maintain or even increase groundwater levels over the long term, this is not expected to increase the potential for localized flooding. Recycled water would be used in areas that are experiencing declining groundwater levels. The quantity of recycled water available is not expected to increase groundwater to levels that could result in localized flooding. This impact would be less than significant.

Phase 1 (Project level)

Compared to the CEQA Baseline the Phase 1 projects would provide 3,757 AFY of recycled water. Compared to the No Action Alternative (NEPA Baseline), the Phase 1 projects would provide 2,690 AFY of recycled water. These supplies would offset existing groundwater pumpage within the action area.

The potential for groundwater offset to contribute to flooding under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the amount of recycled water constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The amount of recycled water available under each Alternative is summarized in Table 3.3-6. The impacts associated with the Basic System would be equivalent to the impacts discussed for Phase 1, although more recycled water would be available resulting in a corresponding reduction in groundwater use. However, as previously noted, it is expected that most recycled water would be used in areas that are currently experiencing declining groundwater levels. The quantity of recycled water used to offset groundwater in these areas is not expected to substantially raise groundwater levels or cause localized flooding. This impact would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 6,655 AFY of recycled water. Compared to the No Action Alternative (NEPA Baseline), the Basic System would provide 5,588 AFY of recycled water. These supplies would offset existing groundwater pumpage within the action area.

The potential for groundwater offset to contribute to flooding under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the amount of recycled water constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The amount of recycled water available under each alternative is summarized in Table 3.3-6. The impacts associated with the Basic System would be equivalent to the impacts discussed for Phase 1, although more recycled water would be available resulting in a corresponding reduction in groundwater use. However, as previously noted, it is expected that most recycled water would be used in areas that are currently experiencing declining groundwater levels. The quantity of recycled water used to offset groundwater in these areas is not expected to substantially raise groundwater levels or cause localized flooding. This impact would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 11,250 AFY of recycled water. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 10,183AFY of recycled water.

The groundwater impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The amount of recycled water available under each alternative is summarized in Table 3.3-6. The impacts associated with the Partially Connected System would be equivalent to the impacts discussed for the Basic System, although more recycled water would be available resulting in a

corresponding reduction in groundwater use. However, as previously noted, it is expected that most recycled water would be used in areas that are currently experiencing declining groundwater levels. The quantity of recycled water used to offset groundwater in these areas is not expected to substantially raise groundwater levels or cause localized flooding. This impact would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline the Fully Connected System would provide 12,761 AFY of recycled water. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 11,694 AFY of recycled water.

The groundwater impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The amount of recycled water available under each Alternative is summarized in Table 3.3-6. The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for the Partially Connected System, although more recycled water would be available, with a corresponding reduction in groundwater use. However, as previously noted, it is expected that most recycled water would be used in areas that are currently experiencing declining groundwater levels. The quantity of recycled water used to offset groundwater in these areas is not expected to substantially raise groundwater levels or cause localized flooding. This impact would be less than significant.

Mitigation Measures

No Mitigation Measures are required.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.4: Groundwater Quality. The use and storage of recycled water could affect groundwater quality for potable and agricultural uses. (Less than Significant)

The use of recycled water in close proximity to domestic groundwater wells may result in adverse water quality effects that could have health risks. Recycled water use is expected to have a less than significant effect within urban areas as most urban water users within the action area rely on imported surface water rather than groundwater. As noted above, urban use of groundwater in the LGVSD service area is limited, while 9 percent of groundwater is used for urban uses in the SVCSD service area, and small percentage of groundwater is used for domestic purposes in the Napa SD service area. Any recycled water that infiltrates into the groundwater would not be expected to pose a health risk. Compliance with Title 22 standards, for tertiary treated water, would ensure recycled water could not be used within 50 feet of any existing domestic groundwater well.

Many rural areas that would use recycled water for irrigation also rely on groundwater wells for domestic water use. Use of recycled water in these areas is not expected to pose a water quality risk to existing groundwater. At least half of the recycled water available under each of the alternatives would be used to irrigate existing vineyards in Napa and Sonoma Valleys. Agricultural growers in these areas mainly use drip irrigation systems, which have an 80 to 95 percent use efficiency[3] when used correctly (Vickers 2001). Additionally, some premium wine producers practice a Reduced Demand Irrigation (RDI), a technique that decreases irrigation at certain times of the season to increase the quality of the fruit (CDM, 2008). Due to the efficiency of vineyard irrigation systems, it is unlikely that a substantial amount of recycled water would be able to percolate through the soils and into the groundwater aquifer. Recycled water that does percolate into the ground below the root zones would generally improve in quality as it reaches the groundwater aquifer because the soils act as natural filters.

The use of recycled water for agricultural irrigation or urban landscape irrigation under the NBWRP is not expected to contribute to adverse water quality impacts associated with existing groundwater wells. Title 22 provides specific requirements for the separation of areas irrigated with recycled water from domestic groundwater supply wells. All users of disinfected tertiary recycled water would be required to adhere to the following Title 22 minimum distance requirements for recycled water use near domestic groundwater wells:

- 50 feet for disinfected tertiary recycled water unless additional conditions are met; and
- 100 feet for impoundments of disinfected tertiary recycled water (Title 22).

The storage of recycled water is not expected to cause adverse water quality effects associated with seepage. As described in the sections above, new storage facilities would generally be compacted at the bottom to prevent leakage. Existing storage facilities are expected to have very low seepage rates, if any, due to the predominantly clay soils in the region, especially in the flat areas where storage ponds are typically constructed. The amount of the groundwater actually infiltrating to subsurface levels and thus affecting the groundwater quality would be negligible (SVCSD, 2006). Additionally, the storage facilities would be located at least 100 feet from any domestic groundwater well.

No Project Alternative

No project would be implemented under the No Project Alternative. No impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

[3] Efficiency refers to the amount of water that would be taken up by the plant rather than lost through percolation into the ground or surface water run-off.

For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available and 65 AF of storage would be provided from projects implemented by Member Agencies on an individual basis (see Table 3.3-6 and Chart 3.3-3).

All storage facilities would be designed to prevent leakages. The amount of recycled water in storage facilities that could infiltrate to subsurface levels would be considered negligible. In addition, storage facilities would adhere to Title 22 requirements and would be located 100 feet away from any domestic groundwater wells to reduce the potential risk of adverse water quality effects.

The majority of the recycled water under this alternative would be used for vineyard irrigation, followed by urban landscaping. These uses are not expected to result in a large quantity of recycled water that could percolate into the soils or impact groundwater quality. As required by Title 22, no recycled water would be used within 50 feet of any domestic groundwater well. Overall, groundwater quality impacts from the use and storage of recycled water are expected to be less than significant.

LGVSD/NMWD

Under the No Action Alternative, no recycled water would be used or stored in the LGVSD service area. There would be no impact.

Novato SD/NMWD, SVCSD and Napa SD

Under the No Action Alternative, recycled water would be used for urban irrigation in the Novato SD service area, for urban and agricultural irrigation in the SVCSD and Napa SD service area, and for habitat restoration in the SVCSD Napa Salt Marsh area. A storage facility (65 AF) would be constructed at the SVCSD WWTP. All storage facilities would be designed and operated to prevent leakages. The amount of recycled water in storage facilities that could infiltrate to subsurface levels would be considered negligible. In addition, storage facilities would adhere to Title 22 requirements and would be located 100 feet away from any domestic groundwater wells to reduce the potential risk of adverse water quality effects. Less than 200 AFY of recycled water under this alternative would be used for landscaping. These uses are not expected to result in a large quantity of recycled water that could percolate into the soils. As required by Title 22, no recycled water would be used within 50 feet of any domestic groundwater well. Overall, groundwater quality impacts from the use and storage of recycled water are expected to be less than significant.

Phase 1 (Project level)

Compared to the CEQA Baseline the Phase 1 projects would provide 3,757 AFY of recycled water and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Phase 1 projects would provide 2,690 AFY of recycled water and no additional storage.

The potential for groundwater use or storage to adversely affect groundwater quality under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the amount of recycled water provided and stored under this alternative (see Table 3.3-6 and Chart 3.3-3). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Under Phase 1, existing storage facilities would be used to store recycled water with the exception of new storage at SVCSD WWTP. As described above, these facilities would be designed to minimize or prevent leakage, and would be located at least 100 feet from any domestic groundwater well. No adverse groundwater quality impacts are expected from storage facilities. This impact would be less than significant.

Recycled water used in urban areas would be for landscape irrigation. Recycled water use agricultural areas would be used to irrigate vineyards, with smaller quantities used for landscaping, dairy pasture, and irrigation of farmlands. Use of this small quantity of water is not expected to affect groundwater quality. Any recycled water that percolates into the groundwater aquifer would be of a small quantity and would be naturally filtered during percolation through the soils. Adherence to Title 22 standards would ensure no recycled water is used within 50 feet of a domestic well. Groundwater quality impacts from the use and storage of recycled water would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 6,655 AFY of recycled water, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Basic System would provide 5,588 AFY of recycled water and 955 AF of storage. These supplies would offset existing groundwater pumpage within the action area.

The potential for groundwater use or storage to adversely affect groundwater quality under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the amount of recycled water constructed under this alternative (see Table 3.3-6 and Chart 3.3-3). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Under the Basic System, existing storage facilities would be used to store recycled water with the exception of new storage at SVCSD WWTP and within the Southern Sonoma Valley. As described above, these facilities would be designed to minimize or prevent leakage, and would be located at least 100 feet from any domestic groundwater well. No adverse groundwater quality impacts are expected from storage facilities. This impact would be less than significant.

Recycled water used in urban areas would be for landscape irrigation. Recycled water use agricultural areas would be used to irrigate vineyards, with smaller quantities used for landscaping, dairy pasture, and irrigation of farmlands. Recycled water irrigation practices, which

are regulated by Title 22, are not expected to affect groundwater quality. Any recycled water that percolates into the groundwater aquifer would be of a small quantity and would be naturally filtered during percolation through the soils. Adherence to Title 22 standards would ensure no recycled water is used within 50 feet of a domestic well. Groundwater quality impacts from the use and storage of recycled water would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 11,250 AFY of recycled water and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 10,183 AFY of recycled water and 2,155 AF of storage.

The potential for groundwater use or storage to adversely affect groundwater quality facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative (see Table 3.3-6 and Chart 3.3-3). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Under the Basic System, existing storage facilities would be used to store recycled water with the exception of new storage at SVCSD WWTP and within the Southern Sonoma Valley. As described above, these facilities would be designed to minimize or prevent leakage, and would be located at least 100 feet from any domestic groundwater well. No adverse groundwater quality impacts are expected from storage facilities. This impact would be less than significant.

Recycled water used in urban areas would be for landscape irrigation. Recycled water use agricultural areas would be used to irrigate vineyards, with smaller quantities used for landscaping, dairy pasture, and irrigation of farmlands. Recycled water irrigation practices, which are regulated by Title 22, are not expected to affect groundwater quality. Any recycled water that percolates into the groundwater aquifer would be of a small quantity and would be naturally filtered during percolation through the soils. Adherence to Title 22 standards would ensure no recycled water is used within 50 feet of a domestic well. Groundwater quality impacts from the use and storage of recycled water would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 12,761 AFY of recycled water and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 11,694 AFY of recycled water and 2,155 AF of storage.

The groundwater impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative (see Table 3.3-6 and Chart 3.3-3). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Under the Basic System, existing storage facilities would be used to store recycled water with the exception of new storage at SVCSD WWTP and within the Central Sonoma Valley. As described above, these facilities would be designed to minimize or prevent leakage, and would be located at least 100 feet from any domestic groundwater well. No adverse groundwater quality impacts are expected from storage facilities. This impact would be less than significant.

Recycled water used in urban areas would be for landscape irrigation. Recycled water use agricultural areas would be used to irrigate vineyards, with smaller quantities used for landscaping, dairy pasture, and irrigation of farmlands. Recycled water irrigation practices, which are regulated by Title 22, are not expected to affect groundwater quality. Any recycled water that percolates into the groundwater aquifer would be of a small quantity and would be naturally filtered during percolation through the soils. Adherence to Title 22 standards would ensure no recycled water is used within 50 feet of a domestic well. Groundwater quality impacts from the use and storage of recycled water would be less than significant.

Mitigation Measure

No Mitigation Measures are required.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.5: Groundwater recharge. Impervious surfaces constructed under the NBWRP could affect groundwater recharge in the action area. (Less than Significant)

Impervious surfaces are generally designed and constructed to collect and discharged precipitation directly to waterways or runs offsite. The construction of impervious surfaces can therefore reduce the potential for percolation and groundwater recharge. The NBWRP is not expected to substantially affect groundwater recharge in the action area. The pipelines would not change the impervious surfaces in any watershed because the pipelines would be covered with the same type of surface after construction as was present before construction. Pump stations would create some additional impervious surfaces. Some pump stations would be constructed on existing WWTP sites that are already impervious, so these pump stations would not affect groundwater recharge. See Section 3.2, Surface Water, for additional discussion of pump station locations. Booster pump stations would be small and often sited on areas that are already impervious. Treatment facilities would be constructed as part of existing WWTP sites that are already impervious; therefore, they would not affect groundwater recharge and are not discussed further. Storage facilities would

increase impervious areas, but the new storage facilities would be constructed in areas that would not substantially alter existing groundwater recharge.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. Therefore, a subset of the impacts identified for the NBWRP would likely occur irrespective of the NBWRP.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.3-3, No Action).

All proposed facilities have the potential to introduce impervious surface areas, which when installed over large areas, has the potential to effect local groundwater recharge. As described in Section 3.2, Surface Water, the majority of the infrastructure would be constructed in previously disturbed areas, such as existing paved parking lots or areas of compacted earth. The pipelines would not change the impervious surfaces in any watershed because the pipelines would be covered with the same type of surface after construction as was present before construction. The total footprint of the booster pump stations would be relatively small (1,000 square feet each) and would be unlikely to substantially affect groundwater recharge. Treatment facilities and pump stations at the WWTPs would be constructed as part of existing WWTP sites that are already impervious; therefore, they would not affect recharge. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

The No Action Alternative would include one new booster pump station near the intersection of Olive Avenue and Atherton Avenue that would add approximately 1,000 square feet of impervious surface. The size of the pump station, however, is relatively small, and would not likely result in noticeable changes to groundwater recharge. Therefore, impacts to groundwater recharge would be less than significant.

SVCSD

The No Action Alternative would include a new pump station at the existing WWTP that would be constructed within a disturbed area and would therefore have no effect on groundwater recharge. This alternative would also include one new booster pump station near the intersection of State Route 116 and Arnold Drive that would add approximately 1,000 square feet of impervious surface. The size of the pump stations, however, is relatively small, and would not likely result in noticeable changes to groundwater recharge. Therefore, impacts to groundwater recharge would be less than significant. The SVCSD Napa Salt Marsh Project would not include a pump station and would have no impacts to groundwater.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The potential effect to groundwater recharge from installation of impervious surface areas under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No new storage would be constructed in the LGVSD service area. There would be no impacts on groundwater recharge.

Novato SD/NMWD

Phase 1 would include the same new booster pump station as included in the No Action Alternative. Similarly, the small increase in impervious area would not substantially affect groundwater recharge. Phase 1 impacts on groundwater recharge would be less than significant.

SVCSD

The new pump station and storage facility proposed under Phase 1would be constructed at the existing WWTP on existing impervious surfaces. There would be no impact on groundwater recharge. Impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Phase 1 would include booster pump stations in the MST service area located on Imola, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Each pump station would have a footprint of approximately 1,000 square feet; the small change in impervious area would not substantially affect groundwater recharge. Phase 1 impacts on groundwater recharge in the Napa SD service area would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The potential effect to groundwater recharge from installation of impervious surface areas under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No new structures would be constructed in the LGVSD service area. There would be no impacts on groundwater recharge.

Novato SD/NMWD

Impacts to groundwater recharge in the Novato SD service area would be the same as those described under Phase 1. The impacts would be less than significant.

SVCSD

As part of the Basic System, a new storage facility would be constructed at the existing WWTP in a disturbed area. This would not affect groundwater recharge. In addition, the Basic System would include additional pumping capacity within the Sonoma Valley Recycled Water Project. The exact site for this pump station has not yet been identified; however, preference would be given to disturbed sites to minimize impacts. The Basic System impacts on groundwater recharge in the SVCSD service area would be less than significant.

Napa SD

Impacts to groundwater recharge in the Novato SD service area would be the same as those described under Phase 1. The impacts would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary

capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The potential effect to groundwater recharge from installation of impervious surface areas under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No new structures would be constructed in the LGVSD service area. There would be no impacts on groundwater recharge.

Novato SD/NMWD

Impacts to groundwater recharge in the Novato SD service area would be the same as those described under the Basic System. The impacts would be less than significant.

SVCSD

The Partially Connected System would include additional pumping capacity in the existing SVCSD reuse area, the Sonoma Valley Recycled Water Project, and Southern Sonoma Valley service area. The exact locations for the pump stations and ponds have not yet been identified, but preference would be given to already disturbed areas. Additionally, a new storage facility would be built that would result in a new impervious surface. The storage facility would be located in an area that would not substantially affect groundwater recharge. The Partially Connected System impacts on groundwater recharge the SVCSD service area would be less than significant.

Napa SD

The Partially Connected System would include additional pumping capacity in the Carneros East and MST service areas. The exact locations for the pump stations have not yet been identified, but preference would be given to already disturbed areas to minimize impacts. The Partially Connected System impacts on groundwater recharge in the Napa SD service area would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3,907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The potential effect to groundwater recharge from installation of impervious surface areas under Fully Connected System would be equivalent to and greater than the impacts discussed for the

Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No new structures would be constructed in the LGVSD service area. There would be no impacts on groundwater recharge.

Novato SD/NMWD

No additional pump stations would be constructed in the LGVSD service area. The Fully Connected System impacts on groundwater recharge would be less than significant.

SVCSD

The Fully Connected System would include additional pump stations at the SVCSD WWTP and in the Central Sonoma Valley, Sonoma Valley Recycled Water Project, and the existing SVCSD reuse area. The pump station at the WWTP would be on a site where most surfaces area already impervious and would therefore have no impact on groundwater recharge. The exact locations for the remaining pump stations have not yet been identified, but preference would be given to already disturbed areas. A new storage facility would be constructed that would result in a new impervious surface. The storage facility would be located in an area that would not substantially affect groundwater recharge. The Fully Connected System impacts on groundwater recharge in the SVCSD service area would be less than significant.

Napa SD

The impacts on groundwater recharge would be the same as those discussed under the Partially Connected System. The impacts on groundwater recharge would be considered less than significant.

Mitigation Measure

No Mitigation Measures are required.

Impact Significance after Mitigation: Less than Significant.

3.3.4 Impact Summary by Service Area

Table 3.3-7 provides a summary of potential project impacts related to groundwater resources.

TABLE 3.3-7
POTENTIAL IMPACTS AND SIGNIFICANCE – GROUNDWATER RESOURCES

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.3.1: Localized groundwater impact.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	B	B
Phase 1	B	NI	B	B
Alternative 1: Basic System	NI	NI	B	B
Alternative 2: Partially Connected System	NI	B	B	B
Alternative 3: Fully Connected System	NI	B	B	B
Impact 3.3.2: Local groundwater levels.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.3.3: Flooding.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	NI
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.3.4: Groundwater quality.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.3.5: Groundwater recharge.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	NI	NI
Phase 1	NI	LTS	NI	LTS
Alternative 1: Basic System	NI	LTS	LTS	LTS
Alternative 2: Partially Connected System	NI	LTS	LTS	LTS
Alternative 3: Fully Connected System	NI	LTS	LTS	LTS

NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

3.3.5 References

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3.4 Water Quality

This section describes the existing water quality conditions in the action area and applicable regulatory requirements for the proposed action. The section presents an analysis of potential impacts to water quality resulting from project operation, including potential public health impacts related to recycled water use. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA. Refer to **Section 3.2, Surface Hydrology,** for impacts related to drainage, and flooding, and **Section 3.3, Groundwater Resources,** for impacts related to groundwater.

3.4.1 Affected Environment/Setting

Regional Conditions

Creek and river flows in the action area are generated primarily by stormwater runoff within each watershed. The mix of urban, rural, agricultural, and undeveloped land uses within the action area contributes to varied pollutant types and concentrations that currently exist in each creek and river. Urban pollutants can include sediment, oil and grease, heavy metals, pesticides, and debris. Agricultural pollutants can include contaminants from livestock manure and chemical fertilizers. Rural residential land uses can potentially contribute pollutants through malfunctioning septic tanks in areas without access to municipal wastewater treatment systems. **Table 3.4-1** presents the waterways in the action area that have been identified by either the U.S. Environmental Protection Agency (USEPA) or the San Francisco Bay Regional Water Quality Control Board (RWQCB) as not meeting the water quality standards necessary for each water bodies' stated beneficial use under Section 303(d) of the Clean Water Act (CWA).

Recycled Water Use

The member agencies of the North Bay Water Reuse Authority have all developed recycled water use programs that distribute recycled water for irrigation of local vineyards, dairies, hay growers, golf courses, and parks. During the dry season, the agencies send treated wastewater that is in excess of their agreed recycled water commitments to holding ponds, wetlands, or rely upon the spreading and evapotranspiration of recycled water on local grassland. The member agencies do not produce recycled water for drinking or recreational purposes.

Recycled Water Quality

Recycled water is used for numerous agricultural applications throughout California and the United States. In addition to the filtration and disinfection requirements that recycled water must meet for allowed disinfected tertiary treated uses under Title 22, additional water quality parameters should also be reviewed relative to a given plant or crop's tolerance to certain constituents sometimes found in recycled water. The chemical constituents to consider for agricultural irrigation are salinity, sodium, trace elements, chlorine residual, and nutrients. Recycled water may have higher concentrations of these constituents than the groundwater or

TABLE 3.4-1
SECTION 303(d) WATER QUALITY IMPAIRED WATERWAYS

Location/ County	Water Body	Pollutant	Source
Action area	San Pablo Bay	Chlordane	Nonpoint Source
		DDT	Nonpoint Source
		Dieldrin	Nonpoint Source
		Dioxin Compounds	Atmospheric Deposition
		Exotic Species	Ballast Water
		Furan Compounds	Atmospheric Deposition
		Mercury	Municipal Point Sources; Resource Extraction; Atmospheric Deposition; Natural Sources; Nonpoint Source
		Nickel	Source Unknown
		PCBs	Unknown Nonpoint Source
		PCBs (dioxin-like)	Unknown Nonpoint Source
		Selenium	Industrial Point Sources; Agriculture; Natural Sources; Exotic Species
Marin	Gallinas Creek	Diazinon	Urban Runoff/ Sewer
	San Antonio Creek	Diazinon	Urban Runoff/ Sewer
	Miller Creek	Diazinon	Urban Runoff/ Sewer
	Novato Creek	Diazinon	Urban Runoff/ Sewer
Sonoma	Petaluma River	Diazinon	Urban Runoff/Storm Sewers
		Nutrients	Agriculture; Construction/Land Development; Urban Runoff/Storm Sewers
		Pathogens	Agriculture; Construction/Land Development; Urban Runoff/Storm Sewers
		Sedimentation /Siltation	Agriculture; Construction/Land Development; Urban Runoff/Storm Sewers
	Sonoma Creek	Nutrients	Agriculture; Construction/Land Development; Land Development; Urban Runoff/Storm Sewers
		Pathogens	Agriculture; Construction/Land Development; Land Development; Urban Runoff/Storm Sewers
		Sedimentation /Siltation	Agriculture; Construction/Land Development; Land Development; Urban Runoff/Storm Sewers
Napa	Napa River	Nutrients	Agriculture
		Pathogens	Agriculture; Urban Runoff/Storm Sewers
		Sedimentation /Siltation	Agriculture; Construction/Land Development; Land Development; Urban Runoff/Storm Sewers

SOURCE: RWQCB, 2007

surface water sources from which the water supply is originally drawn. However, the recycled water can also have lower concentrations of these constituents than the local or imported water currently used for irrigation.

The types and concentrations of constituents in recycled water depend upon the municipal water supply, the influent waste streams (i.e., domestic, commercial, and industrial contributions), amount and composition of infiltration in the wastewater collection system, the wastewater treatment process, and type of storage facilities. A description of the constituents that should be considered when addressing agricultural or landscaping irrigation is provided below.

Salinity: Salinity is an important parameter in determining the suitability of the water to be used for irrigation. High levels of salinity can reduce growth and production of grapevines and other plants. As the salt concentration of the water in the root zone increases above a threshold level the plant must expend more energy to absorb water, and both the growth rate and ultimate size of the crop progressively decrease. However, the threshold and the rate of growth reduction vary widely among different crop species. In addition, the amount of infiltrated water that drains below the root zone affects the whether the salinity in the recycled water causes a potential impact (USEPA 2004 and University of California Agriculture and Natural Resources, 2006).

Sodium: Excessive sodium in irrigation water could contribute to soil dispersion and structural breakdown, where the finer soil particles fill many of the smaller pore spaces, sealing the surface and greatly reducing water infiltration rates (USEPA 2004).

Trace elements: Nickel and zinc have visible adverse effects in plants at lower concentrations than the levels harmful to animals and humans. Although boron is an essential element required for plant growth, it is nonetheless potentially harmful in the soil should the concentrations become too high. Grapes are particularly sensitive to boron in irrigation water and can develop injury to leaves and shoots if concentrations exceed certain limits (USEPA 2004).

Chlorine Residual: Free chlorine residual at concentrations of less than 1 milligram per liter (mg/L) usually poses no problem to plants. However, some sensitive crops may be damaged at levels as low as 0.05 mg/L. Some woody crops may accumulate chlorine in the tissue to toxic levels. Excessive chlorine has a similar leaf-burning effect as sodium and chloride when sprayed directly on foliage (USEPA 2004).

Nutrients: The nutrients most important to a crop’s needs are nitrogen, phosphorus, potassium, zinc, boron, and sulfur. Recycled water usually contains enough of these nutrients to supply a large portion of a crop’s needs. The most beneficial nutrient is nitrogen. Both the concentration and form of nitrogen need to be considered in irrigation water. While excessive amounts of nitrogen stimulate vegetative growth in most crops, it may also delay maturity and reduce crop quality and quantity. The nitrogen in recycled water may not be present in concentrations great enough to produce satisfactory crop yields, and some supplemental fertilizer may be necessary In addition, excessive nitrate in forages can cause an imbalance of nitrogen, potassium, and magnesium in grazing animals. This could be an issue if the forage is used as a primary feed source for livestock; however, such high concentrations are usually not expected with municipal recycled water (USEPA 2004).

Microconstituents: Microconstituents is a term currently used to describe a variety of natural and manmade substances, including pharmaceuticals, household cleaning products, personal care products, plastics, packaging, and other products of a developed society. Microconstituents have been observed in surface and groundwater sources, municipal drinking water supplies and in treated wastewater streams. The degree to which the presence of these compounds in treated wastewater is contributing to their accumulation in surface water and groundwater resources is unknown. The human toxicological significance of microconstituents in drinking water or in recycled water for landscaping use is an ongoing area of research, and regulatory agencies have not yet developed standards due to insufficient availability of data to evaluate potential effects of exposure to humans. Potential health effects for humans from exposure to microconstituents at concentrations detected in reclaimed water is not scientifically known but is suspected to range from an extremely low risk to unassignable risk. The availability of research data on the potential uptake of microconstituents by crops irrigated with recycled water is also insufficient to support conclusive determination of the significance of any potential affect generated at this time.

The University of California (UC) Division of Agriculture and Natural Resources completed a study in 2006 which examined the quality of Napa SD's recycled water and its appropriateness for vineyard applications. The study concluded that Napa SD recycled water is satisfactory for vineyards with respect to salinity, chloride, sodium, boron, calcium to magnesium ratio, 24 trace elements (mostly metals), nitrogen, phosphorus, and potassium. The study also concluded that long-term salinity accumulation is not expected to occur when using Napa SD recycled water. Nitrogen levels in recycled water can be beneficial for vineyards and other crops. For vineyards that do not currently fertilize with nitrogen additives, the use of appropriate cover crops and additional irrigation sources can offset the low amount of nitrogen present in recycled water. The study also stated that recycled water use is consistent with the National Organic Program standards for certified organic vineyards (UC Division of Agriculture and Natural Resources, 2006).

Summaries of water quality data for the participating wastewater treatment plants' (WWTP) effluent from 2005 to 2007 are presented in this section. The descriptions also present the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture and the North Bay Watershed Association (NBWA).

As is presented in this section, in almost all cases the effluent of the participating WWTPs meets the recommended water quality guidelines for agricultural application. The constituents that are present at levels higher than those recommended by the NBWA study are chlorine residual, sodium, and specific conductance (as measured at Napa SD for chlorine residual, and SVCSD and Napa SD for sodium and specific conductance); however, these constituents have no recommended maximum level by USEPA or the UC Division of Agriculture. Under this project, each agency would be upgrading its tertiary treatment capacity (except for Sonoma Valley County Sanitation District which already has a significant tertiary treatment capacity). It is likely that as the tertiary treatment capacity is increased, the constituent levels in the effluent would also be reduced due to the improved filtration requirements of California Code of Regulations (CCR) Title 22 tertiary treated recycled water.

LGVSD

During the wet season (November 1 through May 31), LGVSD's treated wastewater is discharged to the tidal portion of Miller Creek and ultimately to San Pablo Bay. During the non-discharge dry season (June 1 through October 31), treated wastewater is stored in ponds and used to irrigate local pasture and maintain wetlands. LGVSD also provides secondary treated wastewater in the summer to the Marin Municipal Water District (MMWD) for further treatment prior to reuse.

During the dry season, LGVSD sends approximately 1.0 to 1.5 million gallons per day (mgd) (3.1 to 4.6 AF per day) of its secondary effluent to an MMWD facility where it is treated to Title 22 disinfected tertiary levels (SCWA & Reclamation, 2008). MMWD distributes the recycled water for use in local car washes, laundries, and cooling towers, and the irrigation of ballparks, business parks, and residences. LGVSD applies the remainder of the secondary treated effluent to 385 acres of adjacent land, which includes 20 acres of wildlife marsh, 40 acres of storage ponds, 10 acres of salt marsh, 20 acres of irrigated landscaping, and 200 acres of irrigated pasture. **Table 3.4-2** presents the WWTP effluent quality data from 2005 to 2007 provided by LGSVD, and the corresponding USEPA, NBWA and University of California Division of Agriculture and Natural Resources guidelines for the use of recycled water.

Novato SD

During the discharge season (September 1 through May 31), Novato SD's treated wastewater is either recycled, or discharged directly to San Pablo Bay. During the non-discharge period, treated wastewater is conveyed to three District-owned irrigation parcels (totaling approximately 820 acres), two treated water storage ponds, and 15 acres of wildlife habitat. These parcels are on Route 37, approximately 1 mile northeast of the Ignacio pump station. In 2008, Novato SD began operating a new 0.5 mgd (1.5 AF per day) facility, the Recycled Water Facility, east of the Novato WWTP that is able to provide treatment to Title 22 tertiary levels. The facility is operational and is expandable to 1.0 mgd. It is located near the WWTP's discharge pipeline in the current irrigation fields and is designed to supply approximately 269 AF per year (AFY) of recycled water to the local Stone Tree Golf Course and other users (SCWA & Reclamation, 2008). **Table 3.4-3** presents the WWTP effluent quality data from 2005 to 2007 provided by Novato SD, and the corresponding USEPA, NBWA and University of California Division of Agriculture and Natural Resources guidelines for the use of recycled water.

SVCSD

Currently, the treated wastewater from the SVCSD wastewater treatment facility is discharged into Schell Slough (waters of the U.S.) from November 1 through April 30. Between May 1 and October 31, treated wastewater is either stored in SVCSD's reservoirs R1, R2, R3, and R4 or used for local irrigation of agricultural areas and wetland enhancement in southern Sonoma Valley.

SVCSD has a well-established system and significant infrastructure for the conveyance, storage, and distribution of recycled water to local users. SVCSD delivers approximately 1,200 AF of recycled water to local users annually. Existing recycled water users are along Highway 121 and

TABLE 3.4-2
LGVSD WWTP EFFLUENT WATER QUALITY

		Water Quality Guidelines					LGVSD[4]		
				NBWA Values, Suggested Restrictions on Use[3]					
Constituent	**Units**	**UC Davis Recommended Maximum Level for Vineyard Water Quality Needs[1]**	**USEPA Recommended Constituent Limits in Recycled Water for Irrigation[2]**	**None**	**Slight to Moderate**	**Severe**	**Minimum**	**Average**	**Maximum**
Arsenic	mg/L	0.1	0.10		NA[5]		0.0001	0.0008	0.0015
Beryllium	mg/L	0.1	0.10		NA		0.00006	0.00008	0.0002
Copper	mg/L	0.2	0.2		NA		0.006	0.008	0.011
Lead	mg/L	5.0	5.0		NA		0.0002	0.0003	0.0007
Nickel	mg/L	0.2	0.2		NA		0.0003	0.004	0.006
pH		NA	NA		6.5 - 8.4		6.9	7.4	7.9
Selenium	mg/L	0.02	0.02		NA		0.001	0.001	0.005
Zinc	mg/L	2.0	2.0		NA		0.036	0.063	0.081

1 Source: University of California Division of Agriculture and Natural Resources 2006.
2 Source: Guidelines for Water Reuse, USEPA, 2004
3 North Bay Watershed Association (NBWA) Recycled Water Characterization.
4 Values are a compilation of sampling data for 2005-2007.
5 No guideline exists.

TABLE 3.4-3
NOVATO SD WWTP EFFLUENT WATER QUALITY

		Water Quality Guidelines					Novato SD[4]		
				NBWA Values, Suggested Restrictions on Use[3]					
Constituent	**Units**	**UC Davis Recommended Maximum Level for Vineyard Water Quality Needs[1]**	**USEPA Recommended Constituent Limits in Recycled Water for Irrigation[2]**	**None**	**Slight to Moderate**	**Severe**	**Minimum**	**Average**	**Maximum**
Arsenic	mg/L	0.1	0.10		NA[5]		0.0004	0.0007	0.0010
Cadmium	mg/L	0.01	0.01		NA		<0.00003	0.00011	0.00030
Chromium	mg/L	0.1	0.1		NA		0.0004	0.00094	0.00190
Lead	mg/L	5.0	5.0		NA		0.00013	0.00033	0.00140
Nickel	mg/L	0.2	0.2		NA		0.0033	0.0047	0.0074
Selenium	mg/L	0.02	0.02		NA		0.0005	0.0007	0.0010
Zinc	mg/L	2.0	2.0		NA		0.0110	0.0238	0.0460

1 Source: University of California Division of Agriculture and Natural Resources 2006.
2 Source: Guidelines for Water Reuse, USEPA, 2004
3 North Bay Watershed Association (NBWA) Recycled Water Characterization.
4 Values are a compilation of combined effluent data for 2005-2007.
5 No guideline exists.

Highway 12, Thiodoro Road, Millerick Lane, Ramal Road, and Skaggs Island Road in the western part of the Los Carneros American Viticultural Area. The remaining treated wastewater discharges to wetlands owned by SVCSD in Sonoma Valley and the California Department of Fish and Game. The discharge wetlands are approximately 3.5 miles southeast of the treatment plant.

Table 3.4-4 presents the WWTP effluent quality data from 2004 to 2007 provided by SCVSD, and the corresponding USEPA, NBWA and University of California Division of Agriculture and Natural Resources guidelines for the use of recycled water.

Napa SD

During the wet season (November 1 through May 31), Napa SD's WWTP treated wastewater is discharged to the Napa River. During the non-discharge dry season (June 1 through October 31 and sometimes longer), treated wastewater is stored in ponds and used to irrigate golf courses, vineyards, landscaping for corporate parks, ball fields, a cemetery, and other landscaping uses.

The Napa SD Water Recycling Facility has two 10-AF recycled water reservoirs on-site. The adjacent WWTP includes four oxidation ponds that total 344 acres. Napa SD typically stores raw water in these ponds and then treats the water immediately before distribution.

Recycled water users are primarily located along the recycled water distribution pipeline at Highway 29 and Jameson Canyon Road and further north along the Napa Valley Highway. In 2005, recycled water customers received 426 MG per year (1,307 AFY) (Napa SD 2005). Napa SD has identified potential future recycled water users in the MST area, including Napa State Hospital.

Table 3.4-5 presents the WWTP effluent quality data from April 2007 to October 2007provided by Napa SD, and the corresponding USEPA, NBWA and University of California Division of Agriculture and Natural Resources guidelines for the use of recycled water.

Napa Salt Marsh Ponds

The Napa Salt Marsh pond area was historically the marshland between Napa River and Sonoma Creek in the north San Pablo Bay region and is now called the Napa River Unit of the California Department of Fish and Game's (CDFG) Napa- Sonoma Marshes Wildlife Area. The Napa-Sonoma Marsh historically encompassed more than 38,000 acres extending from San Pablo Bay north to the historic limits of the tidal baylands and east to west between the Napa River and Tolay Creek. Of the 38,000 acres, 25,000 acres of the marshlands lie in the Napa River watershed. Currently, approximately 36% of the land remains classified as wetland habitat, while 25% consists of inactive solar salt production ponds, 12% residential areas, and 20% cropland and pasture; the remaining 7% has miscellaneous uses. The salt ponds, cropland, and pasture are diked to prevent tidal and fluvial inundation under normal conditions (JSA, 2003).

TABLE 3.4-4
SVCSD WWTP EFFLUENT WATER QUALITY

Constituent	Units	Water Quality Guidelines					SVCSD[4]			
		UC Davis Recommended Maximum Level for Vineyard Water Quality Needs[1]	USEPA Recommended Constituent Limits in Recycled Water for Irrigation[2]	NBWA Values, Suggested Restrictions on Use[3]			Desired Range[5]	Minimum	Average	Maximum
				None	Slight to Moderate	Severe				
Aluminum	mg/L	5.0	5.0	NA [(8)]			None	< 0.05	0.05925	0.087
Arsenic	mg/L	0.1	0.10	NA			None	< 0.002[6]		
Beryllium	mg/L	0.1	0.10	NA			None	< 0.001[6]		
Bicarbonate[4]	mg/L	NA	NA	<90	90 - 500	>500	75	72	125	210
Boron	mg/L	1	0.75	<0.7	0.7 - 3.0	>3.0	< 0.5	0.35	0.41	0.48
Cadmium	mg/L	0.01	0.01	NA			None	< 0.001[6]		
Chloride	mg/L	262	NA	<140	140 - 350	>350	30	63	76	82
Chromium	mg/L	0.1	0.1	NA			None	< 0.002[6]		
Cobalt	mg/L	0.05	0.05	NA			None	< 0.02[6]		
Copper	mg/L	0.2	0.2	NA			None	0.0050	0.0064	0.0080
Dissolved Solids	mg/L	NA	NA	<450	450 - 2000	>2000	< 500	370	460	520
Fluoride	mg/L	1.0	1.0	NA			None	0.13	0.17	0.22
Iron	mg/L	NA	5.0	<0.1	0.1 - 1.5	>1.5	None	<0.05		<0.10
Lead	mg/L	5.0	5.0	NA			None	< 0.002[6]		
Manganese	mg/L	0.2	0.2	<1.0	1.0 - 5.0	>5.0	None	< 0.02		0.021
Molybdenum	mg/L	0.01	0.01	NA			None	< 0.02[6]		
Nickel	mg/L	0.2	0.2	NA			None	0.0023	0.0031	0.0038
pH		NA	NA	6.5 - 8.4				7.5	8.125	9.2
Selenium	mg/L	0.02	0.02	NA			None	< 0.005[6]		
Sodium	mg/L	NA	NA	<3	3 - 9	>9	< 30	52	66	80
Sodium Adsorption Ratio	units	3		NA			< 6.0	1.86	2.11	2.63
Specific Conductance	mmhos/ cm [7]	NA	NA	<0.7	0.7 - 3.0	>3.0	< 750	0.52	0.67	0.76
Vanadium	mg/L	0.1	0.2	NA			None	< 0.1[6]		
Zinc	mg/L	2.0	2.0	NA			None	0.035	0.049	0.058

1 Source: University of California Division of Agriculture and Natural Resources 2006.
2 Source: Guidelines for Water Reuse, USEPA, 2004
3 North Bay Watershed Association (NBWA) Recycled Water Characterization.
4 Values are a compilation of sampling data for 2000-2003.
5 Desired range as defined by SVCSD.
6 All sampling events were non-detect less than the value specified.
7 mmhos/cm = millimhos per centimeter
8 No guideline exists.

TABLE 3.4-5
NAPA SD WWTP EFFLUENT WATER QUALITY

Constituent	Units	Water Quality Guidelines					Napa SD[4]		
		UC Davis Recommended Maximum Level for Vineyard Water Quality Needs[1]	USEPA Recommended Constituent Limits in Recycled Water for Irrigation[2]	NBWA Values, Suggested Restrictions on Use[3]			Minimum	Average	Maximum
				None	Slight to Moderate	Severe			
Aluminum	mg/L	5.0	5.0	NA[7]			0.120	0.284	0.510
Arsenic	mg/L	0.1	0.10	NA			< 0.0005	0.0085	0.011
Beryllium	mg/L	0.1	0.10	NA			<0.0001		<0.0005
Boron	mg/L	1	0.75	<0.7	0.7 – 3.0	>3.0	0.00029	0.00082	0.00187
Cadmium	mg/L	0.01	0.01	NA			< 0.1[5]		
Chloride	mg/L	262	NA	<140	140 - 350	>350	0.06	0.16	0.25
Chlorine residual[4]	mg/L	NA	NA	<1.0	1.0 – 5.0	>5.0	8	8.5	9.1
Chromium	mg/L	0.1	0.1	NA			<0.0005	0.0008	0.0012
Cobalt	mg/L	0.05	0.05	NA			<0.0005		0.0005
Copper	mg/L	0.2	0.2	NA			0.0020	0.0040	0.0076
Fluoride	mg/L	1.0	1.0	NA			<0.10		0.18
Iron	mg/L	NA	5.0	<0.1	0.1 - 1.5	>1.5	< 0.00005		0.00007
Lead	mg/L	5.0	5.0	NA			< 0.0003		< 0.0005
Lithium	mg/L	2.5	2.5	NA			0.0090	0.0102	0.0120
Manganese	mg/L	0.2	0.2	<1.0	1.0 - 5.0	>5.0	0.0001	0.0456	0.0930
Molybdenum	mg/L	0.01	0.01	NA			0.0010	0.0020	0.0033
Nickel	mg/L	0.2	0.2	NA			0.0036	0.0046	0.0061
Selenium	mg/L	0.02	0.02	NA			<0.001		0.013
Sodium Adsorption Ratio	units	3	NA	NA			0.6	3.5	4.7
Specific Conductance	mmhos/cm[6]	NA	NA	<0.7	0.7 - 3.0	>3.0	0.9	1.0	1.3
Vanadium	mg/L	0.1	0.2	NA			< 0.002		0.002
Zinc	mg/L	2.0	2.0	NA			0.001	0.017	0.024

1 Source: University of California Division of Agriculture and Natural Resources 2006.
2 Source: Guidelines for Water Reuse, USEPA, 2004
3 North Bay Watershed Association (NBWA) Recycled Water Characterization.
4 Values are a compilation of sampling data from April 2007 through October 2007.
5 All sampling events were at non-detect less than the value specified.
6 mmhos/cm = millimhos per centimeter
7 No guideline exists.

A majority of the remaining wetland areas are public lands and are under the management of CDFG as part of the wildlife area. Current operations are designed to manage the site for wildlife and involve managing water use from both San Pablo Bay and Napa River to reduce/manage salinities to the extent possible and ensure appropriate water levels for wildlife. Generally, Napa River water is conveyed to the south and San Pablo Bay water is conveyed to the north. Salinity and elevation are recorded monthly at each pond. Current operating conditions provide a mix of wildlife habitats including tidal mudflats, deep water, salt ponds, levees, and marsh sloughs (JSA, 2003).

3.4.2 Regulatory Framework

Federal – Pertaining to Effluent Discharges

Clean Water Act

Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S., and gave the USEPA the authority to implement pollution control programs such as setting wastewater standards for industrial and municipal dischargers. The CWA also continued requirements to set water quality standards for all known contaminants in surface waters. The CWA made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions (USEPA 2008). This federal law and its accompanying regulations are applicable to WWTP discharges to waterways, however separate State laws and requirements, as described below, govern the delivery and application of recycled water in California.

Section 303(d) of the CWA requires states, territories, and authorized tribes to develop a list of water quality-impaired segments of waterways. The 303(d) list includes water bodies that do not meet water quality standards for the specified beneficial uses of that waterway, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water bodies on their 303(d) lists and implement a process, called Total Maximum Daily Loads (TMDLs), to meet water quality standards (USEPA 2002).

The TMDL process is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the maximum allowable loadings of a pollutant that can be assimilated by a water body while still meeting applicable water quality standards. States are required to include approved TMDLs and associated implementation measures in State water quality management plans. Within California, TMDLs implementation is through regional Basin Plans.

State – Pertaining to Effluent Discharges

Porter-Cologne Water Quality Act

The California Porter-Cologne Water Quality Act (Porter-Cologne Act) was enacted in 1969 and established the State Water Resources Control Board (SWRCB). It is also known as Division 7 of the California Water Code.

The Porter-Cologne Act also contains rules and requirements consistent with the federal CWA for discharges to waterways. It defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. However, unlike the CWA, the Porter-Cologne Act applies to both surface and groundwater. The Porter-Cologne Act requires that each of nine semi-autonomous RWQCBs establish water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per Federal CWA regulations. Therefore, the regional plans provide the regulatory framework for meeting State and Federal requirements for water quality control. Changes in water quality are only allowed if the change is consistent with the most restrictive beneficial use designation identified by the State, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans.

State – Pertaining to Recycled Water Delivery

California Health and Safety Code

On July 1, 2007, the California Department of Public Health (CDPH) was created and took over the duties, powers, purposes, functions, responsibilities, and jurisdiction of the California Department of Health Services, pursuant to Health and Safety Code Section. The Health and Safety Code establishes authority to Sanitary Districts pertaining to water recycling and distribution (section 6512), and building standards pursuant to gray water and untreated wastewater systems.

The California Safe Drinking and Toxic Enforcement Act of 1986 intended to protect the State's drinking water sources from chemicals know to cause cancer and birth defects. Section 116551 establishes regulations to water sources that are augmented with recycled water.

California Water Code

Section 13550 of the California Water Code states that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway landscape areas, and industrial and irrigation uses is a waste and unreasonable use of water if recycled water is available that meets specified conditions of its use. SWRCB supports the use of recycled water and has included increased water recycling in its strategic plan. In 1991, the California Water Recycling Act (California Water Code 13577) set recycling goals of 700,000 AFY of water by year 2000 and 1 million of water AFY by 2010.

The mission of the California Department of Water Resources (DWR) is to "manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments". One of the DWR's goals, included in their strategic plan, is to develop and assess strategies for managing California's water resources, including development of the California Water Plan Update. The 2005 California Water Plan Update recognizes the importance of water recycling to California's water supply system and recommends a variety of steps to take in order for the State to increase recycled water usage. Several recommendations included in the plan were incorporated from the *Recycled Water Task Force Final Report*.[1]

In 1993, the State of California recognized the importance of industrial use of recycled water with the passage of Senate Bill 1196. This piece of legislation provided a mechanism for providing credits to industry on its discharge permit when it uses recycled water, as long as the discharge does not exceed California's water quality standards for the water body. The measure was designed to give industry a greater incentive to use recycled water. For more information on recycled water use credits in the context of the proposed project, see Section 3.4.3, Permitting Framework.

Title 17 Code of Regulations

CDPH is responsible for developing criteria for regulating the use of recycled water in California. The RWQCBs promulgate requirements for individual projects in conformance with the CDPH regulations. Title 17 states "that the water supplier will protect the public water supply from contamination by implementation of cross connection control program". Sections 7601-7605 describe the measures required to prevent contamination of potable water from recycled water.

Title 22 California Code of Regulations

As stated above, CDPH is responsible for developing criteria for regulating the use of recycled water in California. Article 4 in Title 22 of the California Code of Regulations sets water quality standards and treatment reliability criteria for recycled water. Title 22 establishes regulatory requirements for use of recycled water to protect its beneficial uses for land applications and/or industrial uses.

According to Title 22 of the California Code of Regulations (CCR), developed and implemented by CDPH, recycled water can be used for irrigation, wetlands, restricted and non-restricted recreational impoundments, landscape impoundments, industrial or commercial cooling or air conditioning, toilet flushing and industrial and construction applications (22 CCR).

Title 22 establishes quality and treatment standards for the beneficial use of recycled water. The recycled water quality standards (organized with the highest level of treatment first and the lowest level of treatment last) are as follows:

[1] Assembly Bill 331 passed in 2001 required the creation of the 2002 Recycled Water Task Force to identify constraints, impediments, and opportunities for the increased use of recycled water and report to the state legislature by July 1, 2003. The *Recycled Water Task Force Final Report* was released June 2003 (DWR, 2003).

Disinfected tertiary recycled water: A filtered and subsequently disinfected wastewater that meets the following criteria:

- The filtered wastewater has been disinfected by either:
  - A chlorine disinfection process following filtration that provides a contact time (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
  - A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
- The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed [a most probable number (MPN)] of 2.2 per 100 milliliters [mL] utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 mL in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 mL.

Disinfected secondary-2.2 recycled water: Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an MPN of 2.2 per 100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 mL in more than one sample in any 30-day period.

Disinfected secondary-23 recycled water: Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an MPN of 23 per 100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 mL in more than one sample in any 30-day period.

Undisinfected secondary recycled water (also known as oxidized wastewater): Wastewater in which the organic matter has been stabilized, is non-putrescible, and contains oxygen.

Table 3.4-6 summarizes the water quality standards set by Title 22 for agricultural and urban uses of recycled water. The table is organized with the highest level of treatment at the top and the lowest level of treatment at the bottom.

As discussed in Section 2.0, Project Description, all recycled water served by the project will be treated to disinfected tertiary recycled water standards. Treatment to tertiary standards can be readily achieved using a variety of filtration and disinfection methods that are both reliable and relatively common to the wastewater treatment industry. Title 22 also sets use requirements for the separation of areas irrigated with recycled water from domestic groundwater supply wells. The domestic well guidelines are as follows:

TABLE 3.4-6
SUMMARY OF TITLE 22 STANDARDS AND USES OF RECYCLED WATER

Treatment Standard	Use
Disinfected tertiary recycled water	• Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop • Parks and playgrounds • School yards • Residential landscaping • Unrestricted access golf courses • Any other irrigation not prohibited by other sections of the CCR
Disinfected secondary-2.2 recycled water	• Food crops where the edible portion is produced above ground and not contacted by the recycled water
Disinfected secondary-23 recycled water	• Cemeteries • Freeway landscaping • Restricted access golf courses • Ornamental nursery stock and sod farms where access by the general public is not restricted • Pasture for animals producing milk for human consumption • Any non-edible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground, or school yard
Undisinfected secondary recycled water	• Orchards where the recycled water does not come into contact with the edible portion of the crop, • Vineyards where the recycled water does not come into contact with the edible portion of the crop • Non-food-bearing trees • Fodder and fiber crops and pasture for animals not producing milk for human consumption • Seed crops not eaten by humans • Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans • Ornamental nursery stock and sod farms provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or allowing access by the general public

SOURCE: Title 22, California Code of Regulations

- 50 feet for disinfected tertiary recycled water unless additional conditions are met;
- 100 feet for impoundments of disinfected tertiary recycled water;
- 100 feet for irrigation or impoundments of disinfected secondary-2.2 or disinfected secondary-23 recycled water; and
- 150 feet for non-disinfected secondary recycled water (22 CCR).

Additional recycled water use requirements include the following:

- “Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.”
- “Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.”

- "Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff."
- "No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard."
- "All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public…that include the following wording: 'RECYCLED WATER - DO NOT DRINK'."
- "Except as allowed under section 7604 of Title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water."
- "The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access." (22 CCR)

State Recycled Water Policy

The SWRCB approved a Recycled Water Policy in February 2009. California Water Code section 13140 authorizes the SWRCB to adopt state policy for water quality control. The purpose of the Policy is to focus on increasing the use of recycled water from municipal wastewater sources that meets the definition in Water Code Section 13050(n), in a manner that implements state and federal water quality laws. The SWRCB expects to develop additional policies to encourage the use of stormwater, encourage water conservation, encourage the conjunctive use of surface and groundwater, and improve the use of local water supplies. When used in compliance with this Policy, Title 22 and all applicable state and federal water quality laws, the SWRCB finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses.

The Policy declares the SWRCB's mission to "preserve, enhance and restore the quality of California's water resources to the benefit of present and future generations." To achieve that mission, the SWRCB supports and encourage every region in California to develop a salt/nutrient management plan by 2014 that is sustainable on a long-term basis and that provides California with clean, abundant water. These plans shall be consistent with the Department of Water Resources' (DWR) Bulletin 160, as appropriate, and shall be locally developed, locally controlled and recognize the variability of California's water supplies and the diversity of its waterways. The SWRCB strongly encourages local and regional water agencies to move toward clean, abundant, local water for California by emphasizing appropriate water recycling, water conservation, and maintenance of supply infrastructure and the use of stormwater (including dry-weather urban runoff) in these plans (SWRCB, 2009).

The purpose of the Policy is to provide direction to the Regional Water Quality Control Boards (RWQCBs), proponents of recycled water projects, and the public regarding the appropriate criteria to be used by the SWRCB and the RWQCBs in issuing permits for recycled water

projects (SWRCB, 2009). The Policy describes the benefits of recycled water use, mandate for the use of recycled water, roles of the SWRCB, RWQCB, CDPH and DWR and includes plans and requirements that would be a part of streamlined permitting for landscape irrigation projects.

According to the Policy, regulatory requirements for recycled water including emerging contaminants shall be based on the best available peer-reviewed science. SWRCB, in consultation with CDPH, plans to convene a “blue-ribbon” advisory panel to guide future actions relating to constituents of emerging concern (SWRCB, 2009).

Regional

Basin Plan

The California Water Code (Section 13240) requires the preparation and adoption of water quality control plans (Basin Plans), and the Federal CWA (Section 303) supports this requirement. According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected, water quality objectives to protect those uses, and an implementation program needed for achieving the objectives. State law also requires that Basin Plans conform to the policies set forth in the Water Code, beginning with Section 13000, and any State policy for water quality control. The Basin Plans are regulatory references for meeting the state and federal requirements for water quality control (40 Code Federal Regulations 131.20). One significant difference between the State and Federal programs is that California's basin plans also establish standards for groundwater in addition to surface water (SFRWQCB, 2007).

Basin Plans are adopted and amended by nine regional water boards under a structured process involving full public participation and state environmental review. Basin Plans and amendments thereto do not become effective until approved by the SWRCB. Regulatory provisions must be approved by the Office of Administrative Law. Adoption or revision of surface water standards is subject to the approval of the USEPA.

The SWRCB and the regional water boards maintain each Basin Plan in an updated and readily available edition that reflects the current water quality control programs.

RWQCB Resolution 94-086

The San Francisco Bay Basin Plan prohibits the discharge of wastewater under certain conditions, at any point where the wastewater does not receive a minimal initial dilution of at least 10:1 and into any nontidal water or dead-end slough or similar confined water area. The Basin Plan provides an exception to the prohibition under the following conditions:

- where an equivalent level of environmental protection can be achieved, or
- the discharge is approved as part of a reclamation project, or
- where it can be demonstrated that the net environmental benefits will be derived as a result of the discharge.

The RWQCB Resolution 94-086 examines the three exceptions and states that demonstrating the net environmental benefit associated with creating, restoring, and/or enhancing wetlands will apply as an exception to the prohibition of the discharge. The proposed project would include initial use of 2,000 to 3,000 AF of recycled water from the SVCSD WWTP for wetland habitat restoration at the Napa Salt Marsh. SVCSD would be required to obtain an exception to discharge prohibition from the San Francisco Bay RWQCB.

Local

The general plans, policies, and regulations associated with impacts to water quality within the affected jurisdictions are presented in **Appendix 3.4** of this EIR/EIS.

3.4.3 Environmental Consequences/Impacts

Significance Criteria under CEQA

Based on the Appendix G of the California Environmental Quality Act (CEQA) Guidelines, project implementation would have significant impacts and environmental consequences on water quality if it would:

- Violate any water quality standards or waste discharge requirements;
- 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, siltation, on- or offsite; or
- Otherwise substantially degrade water quality

Environmental Consequences/Impact Analysis

Impacts to water quality resulting from construction and operation of the proposed project at both the project level and program level are discussed below. The impacts are considered at a project level for the Phase 1 components included in the Project Alternatives, including both short-term construction and long-term operational phases. The components unique to each alternative that are not included in Phase 1 of the Implementation Plan are analyzed in this section at the programmatic level. Impacts are summarized in **Table 3.4-19**.

With implementation of **Mitigation Measures 3.4.1a**, water quality impacts associated with the project and programmatic level actions proposed as a part of Phase 1 of the Implementation Plan and the alternatives under consideration in this EIR/EIS are anticipated to be less than significant. However, site-specific impacts and mitigation measures will be analyzed for the actions unique to each alternative described at a programmatic level in this EIR/EIS in a future project level document in accordance with NEPA and CEQA.

The NEPA No Action baseline and CEQA No Project baseline establish two conditions against which alternative effects are compared. The NEPA baseline standard compares the alternatives against the conditions anticipated under the Future No Action Alternative or conditions

anticipated in the future without the implementation of an action alternative. The CEQA baseline standard compares the alternatives against the existing conditions in the action area at the time the project Notice of Preparation (NOP) was published.

Impact 3.4.1: Short Term Construction-Related Effects. Disturbance of soils during construction of new project-related infrastructure could generate short term erosion-related water quality impacts. Construction activities could result in the accidental release of fuels or hazardous materials. Project construction activities could require dewatering that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks. (Less than Significant Impact with Mitigation)

All of the proposed project alternatives will, to varying degrees, require earthmoving activities such as excavation, soil stockpiling, and filling that could result in increased erosion and discharge of sediment to neighboring surface water bodies through the disturbance of currently stable soils. Construction activities could result in soil erosion and subsequent discharge of sediment to adjacent surface water or drainages. Sedimentation to the waterways could degrade water quality for beneficial uses by increasing channel sedimentation and suspended sediment levels (turbidity), reducing the flood-carrying capacity, and adversely affecting associated aquatic and riparian habitats. Additionally, sedimentation to local drainage facilities could result in reduced storm flow capacities, resulting in localized ponding or flooding during storm events. Without mitigation, these impacts would be considered potentially significant.

Operation of construction equipment to support the development of project-related infrastructure could potentially result in the accidental release of fuels and other hazardous materials associated with the operation of that equipment to neighboring water bodies in the action area. Hazardous materials associated with construction equipment, such as fuels, oils, antifreeze, coolants, and other substances could adversely affect water quality if inadvertently released to surface waters.

The acreage of land disturbed by individual facility construction would exceed 1 acre, the minimum acreage that would initiate the preparation of a SWPPP in accordance with the NPDES Construction Activity Storm Water Permit requirements. This General Permit mandates the development and implementation of a SWPPP identifying BMPs to reduce erosion of disturbed soils and release of hazardous materials into water courses. As such, Member Agencies or their contractors would prepare a SWPPP requiring implementation of BMPs for erosion and sediment control. These include the use of straw waddles, silt fencing, water detention structures, baker tanks, and other control measures that would limit construction-related storm runoff. Because these measures would reduce the erosion of soils and release of hazardous materials into water courses, facility construction would not violate water quality standards for construction activities. Preparation of the SWPPP and compliance with implementation and reporting measures identified in the SWPPP would ensure compliance with state regulatory policies to minimize the potential for water quality impacts from construction activities (**Mitigation Measure 3.4.1a**). Therefore, impacts to stormwater quality would be reduced to a less than significant level.

Earthmoving activities below grade could potentially encounter low lying groundwater and require dewatering actions to handle and dispose of groundwater that would otherwise interfere with

construction activities. Groundwater levels vary throughout the action area and depths of excavation would vary with each project component. Project construction activities, particularly trenching (for all project facilities), jack and bore tunneling, and directional drilling (for recycled water pipelines), may intercept groundwater, which would require temporary localized dewatering to facilitate construction. Groundwater would be pumped and discharged to the local drainage system. Water from dewatering operations could contain materials used during typical construction activities such as silt, fuel, grease, or other chemicals. The discharge from construction dewatering would have the potential to affect downstream surface water quality. All discharges of groundwater would occur in compliance with limitations established in the Basin Plan, and would be required to implement BMPs established in the SWPPP as required under the NPDES General Activity Storm Water Permit. Implementation of **Mitigation Measure 3.4.1a**, would reduce impacts to surface water from dewatering activities to a less-than-significant level.

This section presents descriptions of the construction actions proposed and specifically the lengths of new pipelines and number of times each alternative would cross a water body. As is described above, **Mitigation Measure 3.4.1a** would reduce the potential impact of construction-related short term stormwater erosion, hazardous material spills, and dewatering effects to a less-than-significant level.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore there would be no change in existing conditions. No impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.4-1, No Action**).

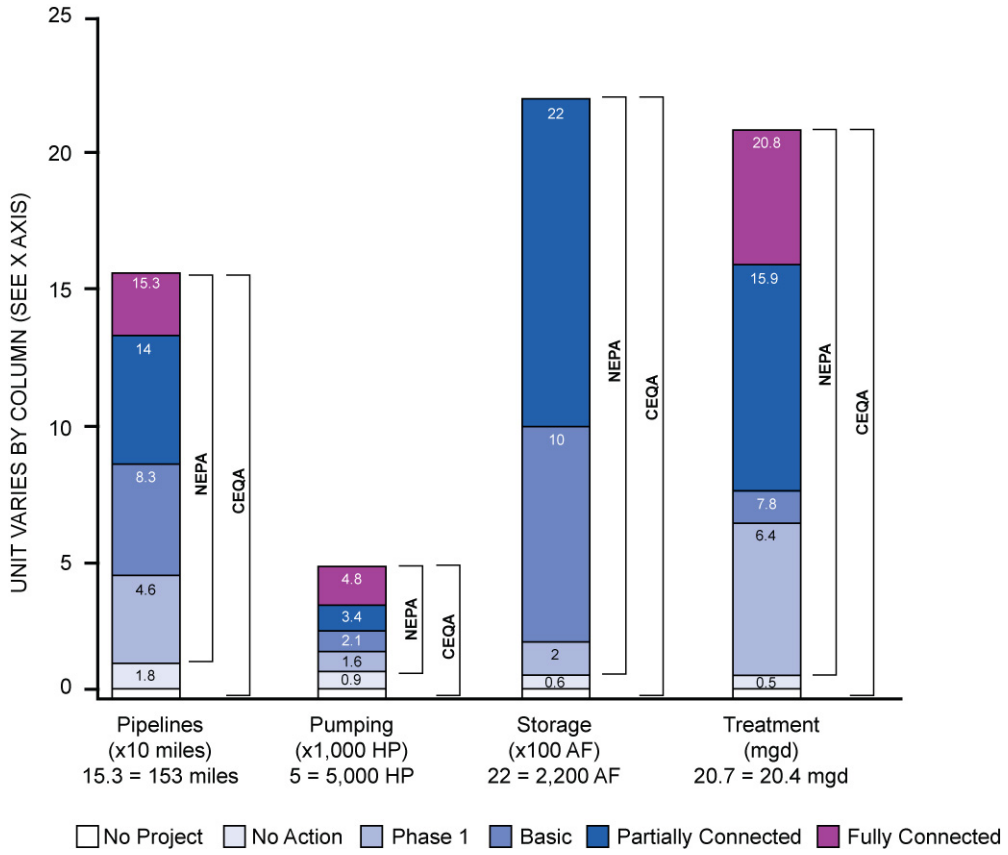
LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/ NMWD

Under the No Action Alternative, Novato SD would construct 4.4 miles of new distribution pipeline to access the North Novato Service Area and would cross seven unnamed water bodies.

CHART 3.4-1
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

For the most part, pipelines would be installed using trenchless technology to avoid impacts to surface water features and water quality. In the event that trenchless technology is not feasible, trenching would be restricted to dry season conditions. As described previously, any trenching activities would be subject to the SWPPP and other stormwater control requirements. Implementation of BMPs to minimize effects to surface water quality, as established in **Mitigation Measure 3.4-1a**, would reduce impacts to less than significant.

SVCSD

Under the No Action Alternative, SVCSD would construct 5.2 miles of new distribution pipeline to access the Sonoma Valley Recycled Water Project. These activities would require 8crossings of both named and unnamed water bodies. The named water bodies include Carriger Creek, Rogers Creek, Schell Creek, Huichica Creek, Champlin Creek, Fowler Creek, and a tributary to Felder Creek,. For the most part, pipelines would be installed using trenchless technology to avoid impacts to surface water features and water quality. In the event that trenchless technology is not feasible, trenching would be restricted to dry season conditions. As described previously, any

trenching activities would be subject to the SWPPP and other stormwater control requirements. Implementation of BMPs to minimize effects to surface water quality, as established in **Mitigation Measure 3.4-1a**, would reduce potential impacts to less than significant.

Under the No Action Alternative, the SVCSD Napa Salt Marsh Restoration Project would include construction of approximately 4.0 miles of pipeline parallel to an existing pipeline that extends between SVCSD WWTP and the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds an additional 4.5 miles of new pipeline would be constructed to convey water to the salt pond mixing chamber in one of three alternative pipeline routes (see **Chapter 2, Project Description**). The Option A salt pond pipeline was discussed and analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2003). Option A would require 17 crossings of water bodies. For the most part, pipelines would be installed using trenchless technology to avoid impacts to surface water features and water quality. In the event that trenchless technology is not feasible, trenching would be restricted to dry season conditions. As described previously, any trenching activities would be subject to the SWPPP and other stormwater control requirements. Implementation of BMPs to minimize effects to surface water quality, as established in **Mitigation Measure 3.4-1a**, would reduce impacts to less than significant.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and no additional storage.

The water quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, LGVSD would upgrade tertiary treatment capacity at the LGVSD WWTP, construct a new booster pump station, and NMWD would construct a recycled water distribution system to serve Hamilton Field. Between the LGVSD WWTP and Hamilton Field, Pipeline Options A, B, and C would involve 10, 8 and 2 stream crossings, respectively. The Coast Guard Housing Loop System, part of the NMWD URWP, would involve five stream crossings during construction. Primary roadways that would be affected in the Hamilton Field area include Main Gate Road, Palm Drive, South Oakwood Drive, Casa Grande Drive, and Hangar Avenue. As

noted above, **Mitigation Measures 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Novato SD/NMWD

Under Phase 1, NMWD would construct 9.8 miles of new distribution pipeline to access the North and Central Novato Service Areas and would cross seven named and unnamed water bodies. The named water bodies include a tributary to Scottsdale Pond, a tributary to Scottsdale Marsh, and a tributary to Novato Creek. As noted above, **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant.

SVCSD

Under Phase 1, SCVSD would construct 5.2 miles of new distribution pipeline to access the Sonoma Valley Recycled Water Project. These activities would require 8 crossings of both named and unnamed water bodies. The named water bodies include Carriger Creek, Rogers Creek, Fowler Creek, Huichica Creek, Schell Creek, Champlin Creek, and Felder Creek,. As noted above, **Mitigation Measures 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level. Impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Under Phase 1, Napa SD would construct 17.5 miles of new distribution pipeline to access the MST Area and would cross 32 named and unnamed water bodies. **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Alternative 1: Basic System (Program level)

Compared to the No Project Alternative (CEQA Baseline), the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The water quality impacts associated with proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under the Basic System, there would be no additional recycled water pipelines constructed by LGVSD or additional stream crossings when compared to Phase 1. The impact discussion for LGVSD under Phase 1 is also applicable for the Basic System.

Novato SD/NMWD

Under the Basic System, Novato SD would construct 2.6 miles of new distribution pipeline to the Sears Point Service Area and would cross five additional named and unnamed water bodies. As

noted above, **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

SVCSD

Under the Basic System, SVCSD would construct additional new distribution pipeline to access the Sonoma Valley Recycled Water Project area and would cross 31 additional named including Sonoma Creek, Nathanson Creek, and Arroyo Seco, as well as other unnamed tributaries. Construction of the Napa Salt Marsh Restoration Pipeline would involve five additional stream crossings. As noted above, **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Napa SD

Under the Basic System, Napa SD would construct 12.5 miles of new distribution pipeline to access the Carneros East area and the Napa Salt Marsh Restoration Area. These activities would require 11 additional crossings at named and unnamed water bodies. As noted above, **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The water quality impacts associated with proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under the Partially Connected System, LGVSD would construct 5.5 miles of new distribution pipeline to access the Peacock Gap Golf Course and 6.5 miles of pipeline to the Novato SD WWTP. These activities would involve two additional crossings at named and unnamed water bodies. **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Novato SD/NMWD

Under the Partially Connected System, Novato SD will construct 14.1 miles of new distribution pipeline to access the North, Central, and West Novato Service Areas, and 9.4 additional miles of pipeline to access the Sears Point Service Area. These activities would require 24 additional crossings at named and unnamed water bodies. **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

SVCSD

Under the Partially Connected System, SVCSD would construct 8.3 miles of new distribution pipeline to access the Southern Sonoma Valley Service Area and would involve an additional 12 crossings at named and unnamed water bodies. Construction of the Napa Salt Marsh Restoration Pipeline would involve five additional stream crossings. As noted above, **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Napa SD

Under the Partially Connected System, Napa SD would construct 8.4 additional miles of new distribution pipeline to access the Carneros East Area, 3.2 additional miles of pipeline to access the MST Area, and 1.3 miles of pipeline to access lands near the Napa SD WWTP. These activities would require an additional 19 crossings at named and unnamed water bodies. Mitigation **Measures 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The water quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under the Fully Connected System, there would be no additional recycled water pipelines constructed by LGVSD or additional stream crossings when compared to Alternative 2. The impact discussion for LGVSD under the Partially Connected System is also applicable for the Fully Connected System.

Novato SD/ NMWD

Under the Fully Connected System, Novato SD would construct 2.8 miles of new distribution pipeline to access the Sears Point Service Area; however the new facilities would not require additional stream crossing. There is no additional impact.

SVCSD

Under the Fully Connected System, SVCSD would construct 10.5 miles of new distribution pipeline to access the Central Sonoma Valley Service Area and the Sears Point area, which would require an additional 23 crossings at named and unnamed water bodies. **Mitigation Measure 3.4.1a** will reduce the significance of construction-related impacts to a less than significant level. Under

the Fully Connected Alternative there are no additional stream crossing impacts associated with construction of the Napa Salt Marsh Restoration Pipeline.

Napa SD

Under the Fully Connected System, there would be no additional recycled water pipelines constructed by Napa SD or additional stream crossings when compared to the Partially Connected System. The impact discussion for Napa SD under the Partially Connected System is also applicable for the Fully Connected System.

Mitigation Measures

Mitigation Measure 3.4.1a: NPDES Construction Activity Stormwater Permit. Member Agencies or their contractor shall comply with the provisions of the NPDES Construction Activity Stormwater permit, including preparation of Notice of Intent to comply with the provisions of this General Permit and preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify implementation measures necessary to mitigate potential water quality degradation as a result of construction-related runoff. These measures will include BMPs and other standard pollution prevention actions, such as erosion and sediment control measures, proper control of non-stormwater discharges, and hazardous spill prevention and response. The SWPPP will also include requirements for BMP inspections, monitoring, and maintenance.

The following items are examples of BMPs that would be implemented during construction to avoid causing water quality degradation:

- Erosion control BMPs, such as use of mulches or hydroseeding to prevent detachment of soil, following guidance presented in the California BMP Handbooks – Construction (CASQA 2003). A detailed site map will be included in the SWPPP outlining specific areas where soil disturbance may occur, and drainage patterns associated with excavation and grading activities. In addition, the SWPPP will provide plans and details for the BMPs to be implemented prior, during, and after construction to prevent erosion of exposed soils and to treat sediments before they are transported offsite.

- Sediment control BMPs such as silt fencing or detention basins that trap soil particles.

- Construction staging areas designed so that stormwater runoff during construction will be collected and treated in a detention basin or other appropriate structure.

- Management of hazardous materials and wastes to prevent spills.

- Groundwater treatment BMPs such that localized trench dewatering does not impact surface water quality.

- Vehicle and equipment fueling BMPs such that these activities occur only in designated staging areas with appropriate spill controls.

- Maintenance checks of equipment and vehicles to prevent spills or leaks of liquids of any kind.

Impact Significance after Mitigation: Less than Significant.

Impact 3.4.2: Incidental Runoff. Project operation would increase the use of recycled water for irrigation within the action area, with the potential to impact surface water quality. (Less than Significant)

Each of the alternatives would increase the use of tertiary treated recycled water within the action area for agricultural uses (vineyard irrigation, dairy/pasture, tree and row crops), urban irrigation (including golf courses, parks, and general landscaping) and environmental enhancement (Napa Salt Ponds). Most of the land that would receive recycled water from the proposed project is currently irrigated with groundwater water, local surface water, or imported surface water supplies.

Over irrigation could potentially increase the runoff of recycled water in local creeks, streams, and rivers that discharge to San Pablo Bay. Title 22 recycled water use requirements prohibit the over-application of recycled water to the extent that it would cause ponding and runoff into adjacent surface water bodies. These policies minimize the potential for the runoff of recycled water applied through irrigation. Additionally, the Project's recycled water would be treated to the Title 22 requirements for disinfected tertiary recycled water. This quality of water is allowed to be used as a water supply source for agricultural irrigation of food crops, landscape irrigation with high public contact, and non-restricted recreational impoundments.

This section describes the potential effects of each alternative by service area, as well as the potential effect under the No Project/No Action Alternative. A summary of the amount of recycled water provided within each Member Agency by alternative is provided in **Table 3.4-7**. While the alternatives have the potential to have a small amount of runoff of recycled water during the summer, the Title 22 requirements would minimize (if not eliminate) the runoff, and the runoff would be of highly-treated water. The water quality impacts to the receiving waters would be less than significant. Please refer to **Impact 3.4.9** for a discussion regarding use of recycled water for habitat enhancement in the Napa Salt Marsh.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

TABLE 3.4-7
RECYCLED WATER AVAILABLE UNDER EACH OF THE ALTERNATIVES

Service Area	Specific Region	No Project	No Action Alternative	Phase 1	Basic System	Partially Connected System	Fully Connected System
		(Acre-Feet Per Year)					
LGVSD	Peacock Gap	0	0	0	0	207	207
	Hamilton Field (southern portion of NMWD URWP)	0	0	202	202	202	202
	Sears Point	0	0	0	0	0	0
Novato SD	NMWD URWP (northern central, and west portions)	0	193	542	542	1,070	1,070
	Sears Point	0	0	0	0	968	1,044
	Southern Sonoma Valley	0	0	0	0	0	1,587
SVCSD	Central Sonoma Valley	0	0	0	0	0	1,511
	Sonoma Valley	0	874	874	2,719	2,719	2,719
	Southern Sonoma Valley	0	0	0	0	1,662.5	0
	Salt Marsh	0	(1)	(2)	(3)	(4)	(5)
Napa SD	Carneros East and Napa Salt Marsh	0	0	0	1,055 (3)	1,440 (4)	1,440 (5)
	MST	0		2,137	2,137	2,826	2,826
	Napa (local)	0	0	0	0	155	155
Total	**Compared to No Project**	**0**	**1,067**	**3,755**	**6,655**	**11,250**	**12,761**
Total	**Compared to No Action**	**--**	**--**	**2,688**	**5,588**	**10,182.5**	**11,694**

(1) Additional 3,257 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type. Because this is a beneficial use that is not related to water supply, this number is tracked separately in each of the alternatives
(2) Additional 2,362 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.
(3) Additional 5,825 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type
(4) Additional 2,933 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.
(5) Additional 3,085 AFY release of recycled water to Napa Salt Ponds 7 and 7A, depending upon year type.

For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available from projects implemented by Member Agencies on an individual basis (see Table 3.4-7).

Under 2020 conditions, it is likely that surface water quality in tributaries to North San Pablo Bay would continue to be reduced over time, due primarily to unregulated non-point source pollutant loads associated with land uses within the North San Pablo Bay watershed. Constituents that are currently on the 303(d) list for San Pablo Bay identified in Table 3.4-1, as well as additional constituents, would continue to be regulated under the TMDL process. Title 22 recycled water use requirements prohibit the over-application of recycled water to the extent that it would cause ponding and runoff into adjacent surface water bodies. These requirements minimize the potential for the runoff of recycled water applied through irrigation.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impacts to surface water would occur.

Novato SD/NMWD, and SCVSD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. User agreements would require compliance with Title 22, which prohibits over-irrigation that would cause ponding or surface runoff. Therefore, potential impacts to surface water quality associated with indirect runoff from irrigation are considered less than significant.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impacts to surface water would occur.

Phase 1 (Project Level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. This would provide 3,755 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and no additional storage. This would provide 2,688 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/ NMWD, Novato SD/ NMWD, SCVSD, Napa SD

Under Phase 1, each Member Agency would deliver the amount of recycled water within their service area identified in **Table 3.4-7**. User agreements would require compliance with Title 22, which prohibits over-irrigation that would cause ponding or surface runoff. Therefore, potential impacts to surface water quality associated with indirect runoff from irrigation are considered less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. This would provide 6,655 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246HP of pumping capacity, treatment

facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage. This would provide 5,588 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD, Napa SD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. User agreements would require compliance with Title 22, which prohibits over-irrigation that would cause ponding or surface runoff. Therefore, potential impacts to surface water quality associated with indirect runoff from irrigation are considered less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. This would provide 11,250 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2,542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage. This would provide 10,183AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD, Napa SD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. User agreements would require compliance with Title 22, which prohibits over-irrigation that would cause ponding or surface runoff. Therefore, potential impacts to surface water quality associated with indirect runoff from irrigation are considered less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline),the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. This would provide 12,761 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135miles of new pipeline, 3,907 HP of pumping

capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage. This would provide 11,694 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. User agreements would require compliance with Title 22, which prohibits over-irrigation that would cause ponding or surface runoff. Therefore, potential impacts to surface water quality associated with indirect runoff from irrigation are considered less than significant.

Napa SD

No additional supplies would be delivered by Napa SD under Alternative 3. Therefore, impacts relating to incidental runoff would be equivalent to those identified under Alternative 2.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4.3: Public Health. The proposed project would increase the use of recycled water on lands within the action area, with the potential to affect public health. (Less than Significant)

The proposed project would increase the use of tertiary treated recycled water within the action area for agricultural, urban and environmental enhancement uses. Recycled water supplies delivered as a part of this project would be treated to meet the requirements of Title 22 for disinfected tertiary recycled water for unrestricted use.

The Member Agencies currently distribute recycled water in their service areas for various uses, as described below. Please refer to Appendix 3.4A for a list of other communities in Northern California that are currently using recycled water.

- *LGVSD*: Existing reclamation area includes 20 acres of wildlife marsh, 40 acres of storage ponds, 10 acres of saltwater marsh, 20 acres of irrigated landscaping in partnership with Marin Municipal Water District, 200 acres of irrigated pasture, and 3.5 miles of public access areas (LGVSD, 2008).

- *Novato SD*: Existing recycled water use area includes 820 acres of irrigated pasture, wildlife pond, and Stone Tree Golf Course. Novato SD reclaims approximately 40 percent of average annual dry weather flow (Novato SD, 2006).

- *SVCSD*: Currently approximately 1,200 AFY of 4,500 to 5,000 AFY of treated wastewater is reused for urban and agricultural irrigation.
- *Napa SD*: Napa SD has produced nearly 700 million gallons per year of Title 22 non-restricted use water. The availability of recycled water has allowed the area to develop recreational facilities including the Chardonnay Golf Course and Vineyards and Eagle Vines Vineyards and Golf Course. Existing recycled water areas include landscape and turf irrigation (383 acres), vineyard irrigation (approximately 445 acres), and reclamation sites (Napa SD, 2009).

Public health concerns related to the use of recycled water for irrigation are related to direct interaction and exposure to irrigated areas at public facilities, such as parks and schools, potential health effects associated with the consumption of agricultural products irrigated with these supplies, and the potential effects on the health of the crops themselves as it relates to farm and vineyard production levels over the long term.

The California Department of Public Health (DPH) has produced Guidelines for Use of Reclaimed Water, which apply to areas receiving water that meets Title 22 Water Recycling Criteria. The guidelines focus on application and management specifications for various recycled water uses, including general use requirements, landscape irrigation requirements, impoundment requirements, and agricultural reuse area guidelines. General requirements include posting signs to inform the public in areas where recycled water is in use, confining recycled water to authorized use areas, using purple pipes to indicate that water distribution and transmission systems contain recycled water, and other requirements designed to ensure that recycled water use does not adversely affect public health through direct interaction. As outlined in Section 3.4.2 above, Title 22 also sets use requirements for the separation of areas irrigated with recycled water from domestic groundwater supply wells.

The potential for public health effects resulting from the consumption of food crops irrigated with recycled water was analyzed in a 1998 study completed by the Monterey County Water Recycling Projects Water Quality and Operations Committee (MCWRP, 1998). The Recycled Water Food Safety Study presented sampling data for microorganisms of public health concern for both the Title 22 disinfected recycled water produced by the Monterey County Water Recycling Projects and other Title 22 disinfected recycled water producers in California. The 1998 study concluded that the recycled water studied did not contain viable microorganisms of public health concern and further outlined the natural barriers to the transfer of living organisms and organic molecules from irrigation water into plant tissues. The cell walls of roots that absorb and transport water to the edible tissues of crops act as a filter for these organisms and molecules.

Non-regulated constituents, or microconstituents and personal care products described above in Section 3.4.1, are a wide variety of chemicals used by society that are assumed to be present in the influent streams of the member agency WWTPs (please also see Appendix 3.4A). Residues of these inputs have been measured at other WWTPs around the country using similar treatment processes and are assumed to be present in the member agencies recycled water streams. As was described above in Section 3.4.1, methods for measuring microconstituents in recycled water have not been established by the USEPA According to the Recycled Water Policy (discussed

above in Section 3.4.2), SWRCB in consultation with CDPH, will convene a “blue-ribbon” advisory panel to guide future actions relating to constituents of emerging concern (SWRCB, 2009). SWRCB will actively manage the panel; each panelist will have extensive experience as a principal investigator in their respective areas of expertise. The panel will review the scientific literature and, within one year from its appointment, will submit a report to SWRCB and CDPH describing the current state of scientific knowledge regarding the risks of emerging constituents to public health and the environment.

Within six months of receipt of the panel’s report, SWRCB, in coordination with CDPH, will hold a public hearing to consider recommendations from staff and will endorse the recommendations, as appropriate, after making any necessary modifications. The panel or a similarly constituted panel will update this report every five years. Each report shall recommend actions that the State should take to improve our understanding of emerging constituents and, as may be appropriate, to protect public health and the environment. Permits for recycled water projects shall be consistent both with any CDPH recommendations to protect public health and with any actions by SWRCB taken pursuant to paragraph 10(b)(2).

Although there are currently no testing methods or monitoring requirements developed for PPCPs, many sanitation districts have started public outreach programs aimed at reducing the amount of pharmaceuticals that are sent to the wastewater system. For example, the California Association of Sanitation Agencies began a campaign in the fall of 2008 to coordinate special areas state-wide where the public could drop-off their old or excess medications. The campaign educated the public about the benefits of utilizing a drop-off location instead of flushing them down the toilet, which had been an accepted practice. The Member agencies will participate and coordinate with these programs as part of their regular public outreach programs for pollution prevention.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore there would be no change in existing conditions. No impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available from projects implemented by Member Agencies on an individual basis (see Table 3.4-7).

LGVSD/NMWD

No project would be implemented under No Action Alternative, therefore no impact would occur.

Novato SD/NMWD, SCVSD, Napa SD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. Recycled water would comply with California Code of Regulations (CCR) Title 22 requirements for tertiary treated recycled water. Therefore, potential impacts related to public health would be less than significant.

Phase 1 (Project Level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. This would provide 3,755 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and no additional storage. This would provide 2,688 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD, Napa SD

Under Phase 1, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. Please refer to Appendix 3.4B for a summary list of potential recycled water users in the LGVSD/NMWD service area. Recycled water would comply with California Code of Regulations (CCR) Title 22 requirements for tertiary treated recycled water. Therefore, potential impacts related to public health would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. This would provide 6,655 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage. This would provide 5,588 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD, Napa SD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. Recycled water would comply with California Code of Regulations (CCR) Title 22 requirements for tertiary treated recycled water. Therefore, potential impacts related to public health would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. This would provide 11,250 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2,542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage. This would provide 10,183AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD, Napa SD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. Recycled water would comply with California Code of Regulations (CCR) Title 22 requirements for tertiary treated recycled water. Therefore, potential impacts related to public health would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. This would provide 12,761 AFY of recycled water for urban, agricultural and environmental enhancement uses. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3,907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage. This would provide 11,694 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LVGSD/NMWD, Novato SD/NMWD, SCVSD

Under the No Action Alternative, each Member Agency would deliver the amount of recycled water within their service area identified in Table 3.4-7. Recycled water would comply with California Code of Regulations (CCR) Title 22 requirements for tertiary treated recycled water. Therefore, potential impacts related to public health would be less than significant.

Napa SD

No additional supplies would be delivered by Napa SD under Alternative 3. Therefore, impacts relating to public health would be equivalent to those identified under Alternative 2.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4.4: Agricultural Uses. The proposed project would offset the use of potable water supplies for agricultural irrigation. Recycled water quality could have the potential to affect crop production. (Less than Significant)

The University of California Division of Agriculture and Natural Resources study described above in Section 3.4.1 examined the quality of Napa SD's recycled water and its appropriateness for vineyard applications. The study concluded that Napa SD recycled water is satisfactory for vineyards with respect to salinity, chloride, sodium, boron, calcium to magnesium ratio, 24 trace elements (mostly metals), nitrogen, phosphorus, and potassium. The study also concluded that long-term salinity accumulation is not expected to occur at a significant level when using Napa SD recycled water given the leaching effect generated by observed average annual rainfall levels in the action area. The findings presented for the suitability of using Napa SD recycled water supplies for vineyard irrigation are also assumed to apply to the other member agencies recycled water supplies given similar average annual rainfall levels, soil conditions, and recycled water quality treated consistent with Title 22 requirements. Recycled water is already commonly used on vineyards and other agricultural uses without demonstrable adverse effects to agricultural production. Therefore, impacts are considered less than significant. A discussion of water quality relative to the NBWA and UC Division of Agriculture guidelines for irrigation with recycled water is provided below for each of the Alternatives under consideration.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore there would be no change in existing conditions. No impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available from projects implemented by Member Agencies on an individual basis (see Table 3.4-7). A discussion of impacts for each Member Agency is provided below.

LGVSD/NMWD

No project would be implemented under No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

Under the No Project Alternative/No Action Alternative, Novato SD would deliver 193 AFY of tertiary treated recycled water to the Novato North Service Area. Novato SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA. This impact would be less than significant.

SVCSD

Under the No Action Alternative, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project and additional tertiary treated recycled water to the Napa Salt Marsh Restoration Project. As shown in Table 3.4-4, the SVCSD WWTP effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA, with the exception of sodium, which is higher than the guideline. However, specific conductance, SAR and TDS are within the recommended guideline range established by the NBWA, and SVCSD effluent, which is currently used within its service area for vineyard irrigation, would not adversely affect vineyards, other agricultural uses, or landscaping areas. Therefore, potential impacts would be less than significant.

Napa SD

No project would be implemented under No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. This would provide 3,755 AFY of recycled water for urban, agricultural and environmental enhancement uses.

Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of

tertiary capacity, and no additional storage. This would provide 2,688 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, LGVSD would deliver 202 AFY of tertiary treated recycled water to the Hamilton Field urban areas in southern Novato. As shown in Table 3.4-2, the LGVSD WWTP effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA. Therefore, impacts would be less than significant.

Novato SD/NMWD

Under Phase 1, Novato SD would deliver 542 AFY of tertiary treated recycled water to the North and Central Novato Service Areas. As shown in Table 3.4-3, Novato SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA. Therefore, impacts would be less than significant.

SVCSD

Under Phase 1, SVCSD would deliver 873 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project, and additional tertiary treated recycled water to the Napa Salt Marsh Restoration Area[2]. As shown in Table 3.4-4, the SVCSD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA, with the exception of sodium. Sodium concentrations presented in Table 3.4-4 for the SVCSD recycled water supply exceed the NBWA recycled water use guidelines.

Average sodium concentrations observed in the 2006 study by the UC Division of Agriculture exceeded 5.0 meq/L or 115 mg/L, which is greater than the average of 66 mg/L identified for SVCSD. The study determined that sodium concentration of 115 mg/L did not to generate an adverse affect on vineyard production over the long term. The 2006 UC Division of Agriculture study noted that at this level negative effects associated with sodium accumulation in the root zone could be prevented by making calcium “available to the roots through the application of gypsum or by acidifying soils high in residual lime” (UC Division of Agriculture and Natural Resources 2006). Therefore, potential impacts are considered less than significant.

[2] As described in Chapter 2, Project Description, the amount of water to be delivered to the Napa Salt Marsh Restoration Area is currently unknown.

Napa SD

Under Phase 1, Napa SD would deliver 2,137 AFY of tertiary treated recycled water to the MST Creeks Area Project. As shown in Table 3.4-5, the Napa SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA, with the exception of chlorine residual, sodium adsorption ratio, and specific conductance. Chlorine residual and specific conductance exceed the NBWA guidelines but have no recommended maximum level set by the USEPA or the UC Division of Agriculture. The observed sodium adsorption levels exceed the recommended levels set by the UC Division of Agriculture, but the 2006 suitability study for Napa SD recycled water determined that average annual rainfall in the action area was sufficient to leach out sodium that might accumulate in the soil profile through recycled water irrigation. Therefore, potential impacts are considered less than significant.

Alternative 1: Basic System (Program level)

The impacts associated with the Basic System would be equivalent to the impacts discussed for Phase 1 above in addition to the following impacts. As a whole, the projects proposed as a part of Alternative 1would further increase the total land area being irrigated with recycled water compared to Phase 1. This impact is considered less than significant over the long-term.

LGVSD/NMWD

Under the Basic System, there would be no additional recycled water served by LGVSD when compared to Phase 1. The impact discussion for LGVSD under Phase 1 is also applicable for the Basic System.

Novato SD/NMWD

Under the Basic System, there would be no additional recycled water served by Novato SD when compared to Phase 1. The impact discussion for Novato SD under Phase 1 is also applicable for the Basic System.

SVCSD

Under the Basic System, SVCSD would serve an additional 1,846 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project when compared to Phase 1. As shown in Table 3.4-4, the SVCSD recycled water supply has sodium, sodium adsorption ratio, and specific conductance levels that exceed the NBWA and UC Division of Agriculture guidelines for irrigation with recycled water. However, as discussed above for Phase 1, the SVCSD effluent sodium levels presented in Table 3.4-4 would not adversely affect vineyards, other agricultural areas, and landscaping areas. Specific conductance has no recommended maximum level set by the USEPA or the UC Division of Agriculture, and the values recorded at the SVCSD WWTP fall within the slight to moderate range of the NBWA guidelines. This impact is considered less than significant relative to both No Action/No Project baselines.

Napa SD

Under the Basic System, Napa SD would serve 1,055 AFY of tertiary treated recycled water to the Carneros East Area and the Napa Salt Marsh Restoration Area[3] when compared to Phase 1. To serve this demand, Napa SD would increase tertiary treatment capacity by 3.5 mgd over the Phase 1 capacity. As shown in Table 3.4-6, the Napa SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA, with the exception of chlorine residual, sodium adsorption ratio, and specific conductance. Chlorine residual and specific conductance, exceed the NBWA guidelines but have no recommended maximum level set by the USEPA or the UC Division of Agriculture. The observed sodium adsorption levels exceed the recommended levels set by the UC Division of Agriculture, but the 2006 suitability study for Napa SD recycled water determined that average annual rainfall in the action area was sufficient to leach out sodium that might accumulate in the soil profile through recycled water irrigation. The observed sodium and sodium adsorption levels would not adversely affect vineyards, other agricultural areas, and landscaping areas. This impact is considered less than significant relative to both No Action/No Project baselines.

Alternative 2: Partially Connected System (Program level)

The impacts associated with the Partially Connected System would be equivalent to the impacts discussed for the Basic System above in addition to the following impacts. As a whole, the projects proposed as a part of the Partially Connected System would further increase the total land area being irrigated with recycled water compared to the Basic System. This impact is considered less than significant over the long-term.

LGVSD/NMWD

Under the Partially Connected System, LGVSD would serve 207 AFY of tertiary treated recycled water to the Peacock Gap Golf Course when compared to the Basic System. As shown in **Table 3.4-2**, the LGVSD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA. To serve demand in its service area, LGVSD would increase its tertiary treatment capacity by 0.8 mgd over the Basic System capacity. It is anticipated that as tertiary treatment capacity is expanded, observed constituent levels in the treatment plant's effluent stream will decrease (SCWA & Reclamation 2008). This impact is considered less than significant.

Novato SD/NMWD

Under the Partially Connected System, Novato SD would serve 1,070 AFY of tertiary treated recycled water to the Novato South Service Area and 968 AFY to the Sears Point Service Area when compared to the Basic System. As shown in Table 3.4-3, the Novato SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA. To serve demand in its service area, Novato SD would increase tertiary treatment capacity by 3.9 mgd over

[3] As described in Chapter 2, Project Description, the amount of water to be delivered to the Napa Salt Marsh Restoration Area is currently unknown.

the Basic System capacity. It is anticipated that as tertiary treatment capacity is expanded, observed constituent levels in the treatment plant's effluent stream will decrease (SCWA & Reclamation 2008). This impact is considered less than significant.

SVCSD

Under the Partially Connected System, SVCSD would serve 1,662.5 AFY of tertiary treated recycled water to the Southern Sonoma Valley Service Area when compared to the Basic System. As shown in Table 3.4-4, the SVCSD recycled water supply has sodium, sodium adsorption and specific conductance levels that exceed the NBWA and UC Division of Agriculture guidelines for irrigation with recycled water. The sodium adsorption ratio levels presented in Table 3.4-4 for SCVWD effluent are lower than the values presented for Napa SD. As was noted in the 2006 Specific UC Division of Agriculture, average annual rainfall in the action area is sufficient to support the leaching of irrigation supplied sodium out of the soil profile, which would minimize the potential for an adverse affect on vineyards. This EIR/EIS assumes rainfall would also minimize the adverse effect on other agricultural and landscaping areas irrigated with recycled water. Specific conductance has no recommended maximum level set by the USEPA or the UC Division of Agriculture, and the values recorded at the SVCSD WWTP fall within the slight to moderate range of the NBWA guidelines. This impact is considered than significant.

Napa SD

Under the Partially Connected System, Napa SD would serve an additional 385 AFY of tertiary treated recycled water to the Carneros East Area, an additional 689 AFY to the MST Area, and 155 AFY to the lands close to the WWTP when compared to the Basic System. As shown in **Table 3.4-6,** the Napa SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and from the NBWA, with the exception of chlorine residual, sodium adsorption ratio, and specific conductance. Chlorine residual and specific conductance, exceed the NBWA guidelines but have no recommended maximum level set by the USEPA or the UC Division of Agriculture. The observed sodium adsorption levels exceed the recommended levels set by the UC Division of Agriculture, but the 2006 suitability study for Napa SD recycled water determined that average annual rainfall in the action area was sufficient to leach out sodium that might accumulate in the soil profile as a part of recycled water irrigation. To serve demand in its service area, Napa SD would increase tertiary treatment capacity by 3.7 mgd over the Alternative 1 levels. It is anticipated that as tertiary treatment capacity is expanded, observed constituent levels in the effluent stream will decrease (SCWA & Reclamation 2008). This impact is considered less than significant.

Alternative 3: Fully Connected System (Program level)

The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for the Partially Connected System above in addition to the following impacts. As a whole, the projects proposed as a part of the Partially Connected System would further increase the total land area irrigated with recycled water compared to the Partially Connected System. This impact is considered less than significant over the long-term.

LGVSD/NMWD

Under the Fully Connected System, there would be no additional recycled water served by LGVSD when compared to the Partially Connected System. The impact discussion for LGVSD under the Partially Connected System is also applicable for the Fully Connected System.

Novato SD

Under the Fully Connected System, Novato SD would serve 1,587 AFY of tertiary recycled water to the Southern Sonoma Valley Service Area compared to the Partially Connected System. As shown in Table 3.4-3, the Novato SD WWTP tertiary treated effluent currently meets the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture, and the NBWA. To serve demand in its service area, Novato SD would increase tertiary treatment capacity by 4.9 mgd over the Partially Connected System. It is anticipated that as tertiary treatment capacity is expanded, observed constituent levels in the treatment plant's effluent stream will decrease (SCWA & Reclamation 2008). This impact is considered less than significant.

SVCSD/NMWD

Under the Fully Connected System, SVCSD would serve 1,511 AFY of tertiary recycled water to the Central Sonoma Valley Service area and would not serve any recycled water to the Southern Sonoma Valley Service Area when compared to the Partially Connected System. Under this alternative, the Southern Sonoma Valley Service Area would be served by Novato SD instead of SVCSD.

The SVCSD recycled water supply has sodium, sodium adsorption, and specific conductance levels that exceed the NBWA and UC Division of Agriculture guidelines for irrigation with recycled water. The sodium adsorption levels presented in Table 3.4-4 for SCVWD effluent are lower than the values presented for Napa SD. As was noted in the 2006 Specific UC Division of Agriculture, average annual rainfall in the action area is sufficient to support the leaching of irrigation supplied sodium out of the soil profile, which would minimize the potential for an adverse affect on vineyards. This EIR/EIS assumes rainfall would also minimize the adverse effect on other agricultural and landscaping areas irrigated with recycled water. Specific conductance has no recommended maximum level set by the USEPA or the UC Division of Agriculture, and the values recorded at the SVCSD WWTP fall within the slight to moderate range of the NBWA guidelines. This impact is considered than significant.

Napa SD

Under the Fully Connected System, there would be no additional recycled water served by Napa SD when compared to the Partially Connected System. The impact discussion for Napa SD under the Partially Connected System is also applicable for the Fully Connected System.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4.5: Secondary Effects to Groundwater Quality. Irrigation with recycled water could contribute to loading of specific constituents to groundwater. (Less than Significant)

Irrigation with reclaimed water could contribute to loading of specific constituents to groundwater supplies in the vicinity of irrigation sites. Typical groundwater quality concerns regarding the use of reclaimed water include metals, microorganisms, TDS, and nitrates. Metals are typically removed from water in soils through a complex process of adsorption, precipitation, ion exchange, and complexation. Microorganisms, including bacteria and viruses, are removed from water through filtration, adsorption, desiccation, predation, disinfection, and exposure to other adverse conditions. Bacteria, including coliform, are removed by filtration through the soil; in general, there is greater filtration of bacteria in fine-grained material than in course-grained material. Studies of wastewater application indicated that coliforms are normally removed after five feet of percolation through the soil (USEPA, 1981).

The drinking water maximum contaminant level for nitrate (as nitrogen) is 10 mg/L. Nitrate is absorbed by plants, and is readily immobilized in the unsaturated zone through absorption. However, once in the ground water, nitrate is relatively stable and mobile. The level of nitrate present in NBWRP reclaimed water would typically be less than the nitrate requirement of crops, and would be expected to be readily absorbed. Therefore, the potential for nitrate loading to affect groundwater quality within the area of irrigation is considered low.

The TDS levels in recycled water supplies are anticipated to average approximately 400 to 600 mg/L per liter (mg/L). This level is generally equivalent to or below groundwater TDS within the proposed irrigation areas. Therefore, irrigation with recycled water is not anticipated to significantly affect TDS levels in local groundwater supplies. The SWRCB Recycled Water Policy encourages every region in California to develop a salt/nutrient management plan by 2014 that is sustainable on a long-term basis and that provides California with clean, abundant water. These plans shall be consistent with the Department of Water Resources' (DWR) Bulletin 160, as appropriate, and shall be locally developed, locally controlled and recognize the variability of California's water supplies and the diversity of its waterways.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4.6: Surface Water Storage. The proposed project would include storage of recycled water at existing WWTP facilities, as well as at individual user properties. Storage of recycled water quality would have the potential to affect localized surface water quality or groundwater quality. (Less than Significant with Mitigation)

Recycled water storage would be provided at individual WWTP locations for distribution, as well as at individual user properties. WWTP sites currently store treated effluent onsite during non-discharge months, as required by NPDES permit limitations. Existing and proposed storage facilities are lined storage ponds or constructed with local clay soils with a very low permeability.

These ponds are designed with adequate freeboard to accommodate storm events, and the potential for impacts to surface or groundwater would be less than significant.

Recycled water use for agricultural irrigation may include storage of recycled water in user storage ponds in the MST Area and Los Carneros area. Under Phase 1, this would include ponds at the Napa Valley Country Club. In addition, agricultural users may elect to use existing storage facilities for storage of recycled water onsite on a willing user basis. Aerial review of storage ponds identified 259 storage ponds occurring within the MST and Los Carneros areas. Of these, 231 storage ponds are located “off-stream”; they have been constructed as storage ponds away from stream channels, do not directly receive stream flow, and are maintained with appropriate freeboard. Under Title 22, discharge of recycled water to surface waters is prohibited, and impoundments must maintain a 100 foot setback from domestic supply wells. Therefore, storage ponds must maintain adequate freeboard to reduce potential for releases.

The State Recycled Water Policy clarifies that incidental runoff from ponds containing recycled water is consistent with the policy if the overflows are the result of a 25-year, 24-hour storm event or greater, and notification of the discharge is provided to the local RWQCB Executive Officer. In addition, compliance with Title 22 would reduce the potential for storage ponds to impact surface water and groundwater quality to less than significant.

Twenty ponds were identified as “on-stream”, i.e., are created by installation of dams within a water course to provide storage, with eventual overflow directly back to the stream channel. An additional 8 ponds were identified as potentially on-stream. For these 28 ponds, discussions with RWQCB would be necessary to allow for recycled water storage in these facilities. It is anticipated that specific operational standards, such as pumping on-stream ponds dry prior to the onset of winter rains, would be required in order to ensure storage in compliance with Title 22.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative; therefore there would be no change in existing conditions. No impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available from projects implemented by Member Agencies on an individual basis (see Table 3.4-7). This would include a limited amount of storage at existing facilities. No additional storage would be implemented under the No Action Alterative. A discussion of impacts for each Member Agency is provided below.

LGVSD/NMWD

No project would be implemented under No Action Alternative within the LGVSD service area; therefore no impact would occur.

Novato SD/NMWD

Under the No Action Alternative, Novato SD would deliver 193 AFY of tertiary treated recycled water to the Novato North Service Area. System storage would be provided through retrofit of the existing 0.5 MG Plum Street storage tank. This above ground tank is self contained, and would be retrofitted to provide diurnal storage. Therefore, this facility would not have the potential to impact groundwater quality. This impact would be less than significant.

SVCSD

Under the No Action Alternative, SVCSD would deliver 873 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project and additional tertiary treated recycled water to the Napa Salt Marsh Restoration Project. SVCSD would construct an additional 65 AFY of storage at its existing WWTP. Construction of the reservoir would convert the site from current agricultural use to open water storage. The reservoir would be compacted at the bottom and lined using synthetic liners such as polyethylene liner. The compaction and lining would comprise the bottom six feet of the reservoirs and would act as a sealant against infiltration of water. The lining would have low permeability allowing for only minor infiltration of stored water to maximize efficiency of the reservoir. Infiltration is expected to occur only at the beginning when the reservoir is brought into operation. The amount of the groundwater actually infiltrating to subsurface levels and thus affecting the groundwater flow patterns or quality would be negligible, particularly when compared to the overall groundwater in the entire Sonoma Valley basin. The impact would be less than significant.

Napa SD

Under the No Action Alternative, no projects would be implemented in the Napa SD. Therefore, potential impacts would be less than significant.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. This would provide 3,755 AFY of recycled water for urban, agricultural and environmental enhancement uses.

Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and no additional storage. This would provide 2,688 AFY of recycled water for urban, agricultural and environmental enhancement uses.

The water quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion

to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, LGVSD would deliver 202 AFY of tertiary treated recycled water to the Hamilton Field urban areas in southern Novato. No additional storage would be constructed. Therefore, impacts would be less than significant.

Novato SD/NMWD

Under Phase 1, Novato SD would deliver 542 AFY of tertiary treated recycled water to the North and Central Novato Service Areas. System storage would be provided through retrofit of the existing 0.5 MG Plum Street storage tank and the existing 0.5 MG Reservoir Hill Tanks. These concrete tanks are self contained, and would be retrofitted to provide for recycled water diurnal storage. Because these concrete structures are isolated from groundwater, these facilities would not have the potential to impact groundwater quality. This impact would be less than significant.

SVCSD

Under Phase 1, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project, and additional tertiary treated recycled water to the Napa Salt Marsh Restoration Area[4]. SVCSD would construct an additional 65 AFY of storage at its existing WWTP. Impacts would be identical to those discussed above for the No Action Alternative.

Napa SD

Under Phase 1, Napa SD would deliver 2,137 AFY of tertiary treated recycled water to the MST Creeks Area Project. Implementation of Phase 1 would include storage of recycled water on individual user properties. At the Napa Valley Country Club, storage would be provided in existing onsite ponds that were constructed in 1991-1992, and were constructed with a bentonite clay liner to minimize any loss of water through infiltration (Zion, personal communication, 2008). Storage would be in compliance with Title 22, which requires a 100 foot setback for impoundments from any domestic supply well. Therefore, no impacts to groundwater conditions are anticipated. The storage ponds are off-stream and self-contained, and currently store rainwater and runoff from the golf course. Under Title 22, discharge of recycled water from these ponds to surface waters is prohibited. Individual users are required to ensure adequate freeboard in off-stream ponds to accommodate winter runoff into the ponds. As required in **Mitigation Measure 3.4.6a,** individual ponds would be reviewed by Member Agencies and Cooperating Agencies for compliance with Title 22 requirements and the SWRCB Draft Recycled Water Policy, as required by each Member Agency's Master Recycling Permit.

In addition to the Napa Valley County Club ponds, Table 3.4-7 summarizes existing ponds located within 500 feet of proposed pipeline routes for the MST Local Project Option 1 and Option 2, as well as ponds within the MST Phase 1 project. These represent individual user

[4] As described in Chapter 2, Project Description, the amount of water to be delivered to the Napa Salt Marsh Restoration Area is estimated between 2,000 and 3,000 AFY.

storage ponds that could be used to store recycled water for agricultural irrigation purposes. As shown in **Table 3.4-8,** the majority of identified ponds are off-stream ponds, and would provide storage in compliance with Title 22 regarding release of recycled water to streams. As previously noted, individual ponds would be reviewed by Member Agencies and Cooperating Agencies for compliance with Title 22 requirements and the SWRCB Draft Recycled Water Policy, as required by each agency's Master Recycling Permit.

TABLE 3.4-8
STORAGE PONDS IN THE MST AREA

Location	Incremental Number of Ponds	Offstream	Onstream
MST Local Project Option 1	16	15	1
MST Local Project Option 2	9	9	0
MST Local Option Subtotal	*25*	*24*	*1*
MST Phase 1	30	29	1
Total MST Area	*55*	*53*	*2*

Alternative 1: Basic System (Program level)

The impacts associated with the Basic System would be equivalent to the impacts discussed for Phase 1 above in addition to the following impacts. As a whole, the projects proposed as a part of Alternative 1 would further increase the amount of WWTP storage by 955 AFY, and may increase the number of user storage ponds. This impact is considered less than significant.

LGVSD/NMWD

Under the Basic System, there would be no additional recycled water served or storage required by LGVSD when compared to Phase 1. The impact discussion for LGVSD under Phase 1 is also applicable for the Basic System.

Novato SD/NMWD

Under the Basic System, there would be no additional recycled water served or storage required by Novato SD when compared to Phase 1. The impact discussion for Novato SD under Phase 1 is also applicable for the Basic System.

SVCSD

Under the Basic System, SVCSD would serve an additional 1,845 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project when compared to Phase 1. Phase 1 would also include construction of an additional 1,020 AFY of storage at the SVCSD WWTP. Potential impacts to groundwater and surface water supplies would be equivalent to those identified for Phase 1.

Napa SD

Under the Basic System, Napa SD would serve 1,055 AFY of tertiary treated recycled water to the Carneros East Area the Napa Salt Marsh Restoration Area[5] when compared to Phase 1. No additional storage at the WWTP would be constructed. However, implementation of Phase 1 may include storage of recycled water on individual user properties on a willing user basis. **Table 3.4-9** summarizes the existing ponds located within 500 feet of proposed pipeline routes for the Carneros Area. As shown in Table 3.4-9, the majority of ponds are off-stream ponds and self contained. Under Title 22, discharge of recycled water from these ponds to surface waters is prohibited. Individual users are required to ensure adequate freeboard in off-stream ponds to comply with the SWRCB Draft Recycled Water Policy. Individual ponds would be reviewed by Member Agencies and Cooperating Agencies for compliance with Title 22 requirements and the SWRCB Draft Recycled Water Policy, as required by each agency's Master Recycling Permit.

TABLE 3.4-9
POTENTIAL STORAGE PONDS IN THE CARNEROS AREA

Location	Total Number of Ponds	Off-stream	On-stream	Undetermined
Carneros Area	204	178	18	8

For the 28 ponds identified as on-stream, discussions with RWQCB would be necessary to allow for recycled water storage in these facilities. It is anticipated that specific operational standards, such as pumping on-stream ponds dry prior to the onset of winter rains, would be required in order to ensure storage in compliance with Title 22.

Alternative 2: Partially Connected System (Program level)

The impacts associated with the Partially Connected System would be equivalent to the impacts discussed for the Basic System above in addition to the following impacts. Under the Partially Connected System an additional 1,200 AF of WWTP storage would be required, and the number of user storage ponds may be increase compared to the Basic System. This impact is considered less than significant.

LGVSD/NMWD

Under the Partially Connected System, LGVSD would serve 207 AFY of tertiary treated recycled water to the Peacock Gap Golf Course when compared to the Basic System. No additional storage would be required. Therefore, impacts would be less than significant.

Novato SD/NMWD

Under the Partially Connected System, Novato SD would serve 1070 AFY of tertiary treated recycled water to the Novato South Service Area and 968 AFY to the Sears Point Service Area

[5] As described in Chapter 2, Project Description, the amount of water to be delivered to the Napa Salt Marsh Restoration Area is estimated at 2,000 to 3,000 AFY under Phase 1.

when compared to the Basic System. No additional storage would be required. Therefore, impacts would be less than significant.

SVCSD

Under the Partially Connected System, SVCSD would serve 1,662.5 AFY of tertiary treated recycled water to the Southern Sonoma Valley Service Area when compared to the Basic System. This would require an additional 1,200 AF of storage at the SVCSD WWTP when compared to the Basic System. Design of storage ponds at the WWTP would be consistent with those proposed under Phase 1, and would include liner installation and provision of adequate freeboard. Therefore, potential impacts to surface water and groundwater resources would be less than significant.

Napa SD

Under the Partially Connected System, Napa SD would serve an additional 385 AFY of tertiary treated recycled water to the Carneros East Area and Salt Ponds, an additional 689 AFY to the MST Area, and 155 AFY to the lands close to the WWTP when compared to the Basic System. Additional storage of recycled water at user storage ponds may occur on a willing user basis. Impacts would be similar to those identified for the Basic System.

Alternative 3: Fully Connected System (Program level)

The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for the Partially Connected System above in addition to the following impacts. As a whole, the projects proposed as a part of the Partially Connected System would have the same amount of WWTP storage compared to the Partially Connected System. Additional storage of recycled water at user storage ponds may occur on a willing user basis. Impacts would be similar to those identified for the Partially Connected System. This impact is considered less than significant over the long-term.

LGVSD/NMWD

Under the Fully Connected System, there would be no additional recycled water served by LGVSD when compared to the Partially Connected System. The impact discussion for LGVSD under the Partially Connected System is also applicable for the Fully Connected System.

Novato SD/NMWD

Under the Fully Connected System, Novato SD would serve 1,587 AFY of tertiary recycled water to the Southern Sonoma Valley Service Area compared to the Partially Connected System. No additional storage facilities would be required, although additional storage of recycled water at user storage ponds may occur on a willing user basis. Therefore, impacts would be equivalent to those identified under the Partially Connected System.

SVCSD

Under the Fully Connected System, SVCSD would serve 1,511 AFY of tertiary recycled water to the Central Sonoma Valley Service area and would not serve any recycled water to the Southern Sonoma Valley Service Area when compared to the Partially Connected System. No additional storage facilities would be required, although additional storage of recycled water at user storage ponds in the Central Sonoma Valley Service may occur on a willing user basis.

Napa SD

Under the Fully Connected System, there would be no additional recycled water served by Napa SD when compared to the Partially Connected System. The impact discussion for Napa SD under the Partially Connected System is also applicable for the Fully Connected System.

Mitigation Measures

Mitigation Measure 3.4.6a: Under the Master Recycling Permit for each Member Agency and Cooperating Agency, user agreements shall include provisions for compliance with Title 22 and the State Recycled Water Policy regarding storage and use of recycled water onsite at individual properties.

Mitigation Measure 3.4.6b: Prior to storage of recycled water in any "on-stream" storage facility that directly receives and releases stream flow, each Member Agency or Cooperating Agency shall enter into discussions with RWQCB regarding operational requirements to ensure operation of proposed facilities in compliance with Title 22 and the State Recycled Water Policy. It is anticipated that specific operational standards, such as pumping on-stream ponds dry prior to the onset of winter rains or other measures, would be required in order to ensure storage in compliance with Title 22.

Impact 3.4.7: Pipeline Rupture. Pipeline ruptures could generate accidental releases of recycled water. (Less than Significant Impact)

Pipeline ruptures as a result of an earthquake or other unforeseen events could potentially generate a discharge of recycled water to surface water bodies within the action area.

The design and construction of new pipelines will incorporate features and operational procedures to minimize the risk of water quality impacts in the event of emergency pipeline rupture, including:

- Inspections of all pipelines for adherence to construction standards;
- Leak detection system; and
- Placement of block valves to allow sections of pipelines to be shut off in the event a leak is detected.

In addition, the recycled water conveyed through pipelines developed as a part of the project alternatives would be treated to meet Title 22 disinfected tertiary requirements. Water quality

impacts to surface water bodies in the action area associated with a leak or spill from a recycled water pipeline would be considered less than significant.

No Project Alternative

No project would be implemented under the No Project Alternative, therefore no impact would occur.

No Action Alternative

Under the No Action Alternative, construction of new independent wastewater recycling projects within each service area would develop new recycled water conveyance pipelines that would incorporate the same safety measures that would be included in new pipelines developed by the project alternatives, described above in Impact 3.4.3. The effects generated by an emergency pipeline rupture under the No Project Alternative/No Action Alternative are anticipated to be less than significant.

Phase 1, Alternative 1, Alternative 2, and Alternative 3

All the action alternatives would incorporate the design features and operational procedures described above to minimize the risk of water quality impacts in the event of emergency pipeline ruptures. The amount of new pipeline construction associated with Phase 1, and the incremental amount associated with each alternative are presented in the impact discussion for **Impact 3.4.3: Short Term Construction Related Effects**. As described above, the design features and operational procedures would reduce the potential impact to water quality from pipeline ruptures to a less than significant level.

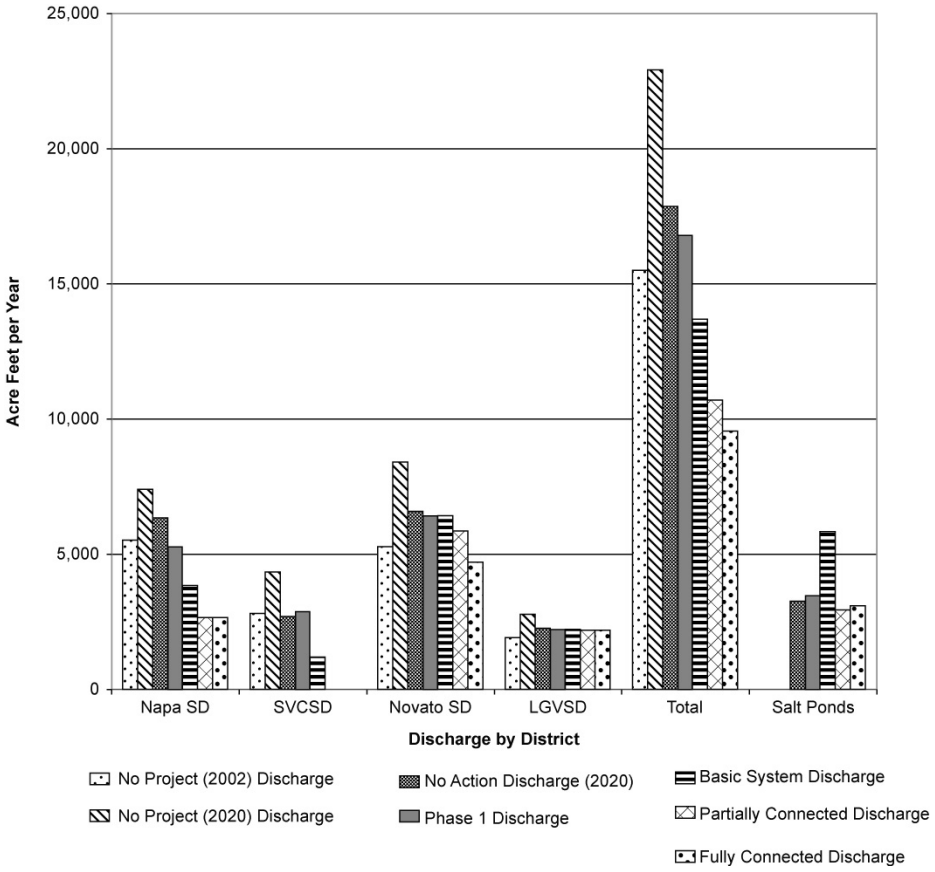
Mitigation Measures

No additional mitigation measures are required.

Impact 3.4.8: Reduced Discharge to Surface Water. The proposed project would result in reduced discharge from the WWTPs. (Beneficial Impact)

Each of the Action Alternatives would increase the use of recycled water within the action area for agricultural uses (vineyard irrigation, dairy/pasture, tree and row crops) and urban irrigation (including golf courses, parks, and general landscaping (medians and office parks)). The increased use of recycled water under each of the Action Alternatives would result in a reduction in discharge from each Member Agency's WWTP to sloughs, rivers, and eventually San Pablo Bay. Reduced discharge from the WWTPs when compared to the CEQA and NEPA baselines would have a beneficial impact on water quality. A summary of discharge by Member Agency for each alternative is provided in **Chart 3.4-2**.

CHART 3.4-2
DISCHARGE REDUCTION BY ALTERNATIVE FOR EACH MEMBER AGENCY



SOURCE: CDM, 2009, ESA, 2009.

No Project Alternative

No project would be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. For comparison to the Action Alternatives, it is estimated that approximately 1,067 AFY of recycled water would be available from projects implemented by Member Agencies on an individual basis.

It is estimated that WWTP inflow will increase over time, with a corresponding increase in discharge of treated effluent by the year 2020 (**Table 3.4-10**). Provision of 1,067 AFY of recycled water for use as irrigation and release of 3,460 AFY to the Napa Salt Ponds as envisioned under the No Action Alternative would reduce WWTP discharges, as shown in Table 3.4-10. Provision of this amount of recycled water would result in a discharge reduction of 4,860 AFY to receiving waters tributary to North San Pablo Bay at 2020, with approximately 3,460 AFY redirected to Napa Salt Ponds, depending upon year type. A discussion by Member Agency is provided below.

TABLE 3.4-10
COMPARISON OF NO PROJECT (2002, 2020) AND NO ACTION ALTERNATIVE – PROJECTED MONTHLY DISCHARGE (2020) (AFY)

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
2020 Discharge Increase	1,887	1,529	3,139	862	7,499	0
No Action (2020) Discharge	6,338	2,882	6,574	2,257	18,051	3,460
No Action (2020) Reduction	**(1,064)**	**(1,452)**	**(1,832)**	**(511)**	**(4,860)**	**+3,460**

SOURCE: CDM, 2009

LGVSD/NMWD

The No Action Alternative would not include any new recycled water facilities by LGVSD; however, future conditions would include development within the LGVSD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge to Miller Creek, and eventually San Pablo Bay, under future 2020 discharge conditions would increase by an estimated 862 acre-feet per year (AFY). Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 511 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Novato SD/NMWD

Under the No Action Alternative, Novato SD would deliver 193 AFY of tertiary treated recycled water to the Novato North Service Area. Future conditions would include development within the Novato SD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 3,139 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,832 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

SVCSD

Under the No Action Alternative, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project. Future conditions would include development within the SVCSD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 1,529 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,452 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Napa SD

The No Action Alternative, would not include any new recycled water deliveries by Napa. Future conditions would include development within the Napa service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 1,887 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,062 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Phase 1 (Project level)

Compared to existing conditions (CEQA Baseline), Phase 1 projects would include 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage to provide 3,755 AFY of recycled water. This would result in a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in estimated discharge assumed 2020 inflow and discharge conditions for the WWTP, which include increased inflow over time. Implementation of Phase 1 projects would have an estimated 2020 discharge reduction of 6,121 AFY for all the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 2,688 AFY of recycled water, 28.9 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and 0 AF of additional storage. When implemented, Phase 1 would result in an estimated total discharge reduction of 1,073 AFY for all the WWTPs combined, compared to the No Action Alternative. (see **Table 3.4-11**).

Table 3.4-12 presents the anticipated Phase 1 change in discharge for each WWTP on a monthly basis, compared to both the CEQA Baseline and No Action Alternative (NEPA Baseline).

LGVSD/NMWD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 202 AFY of recycled water, with a corresponding decrease in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 548 AFY.

TABLE 3.4-11
PHASE 1 DISCHARGE COMPARED TO
CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Phase 1 Discharge	5,265	2,882	6,423	2,220	16,790	3,460
Phase 1 Discharge vs 2002 Discharge	**-250**	**+77**	**+1,156**	**+314**	**+1,298**	**+3,460**
Phase 1 Discharge vs 2020 Discharge	**-2,137**	**-1,452**	**-1,983**	**-548**	**-6,121**	**+3,460**
No Action Discharge (2020)	6,338	2,882	6,574	2,257	18,051	3,257
Phase 1 Discharge	5,265	2,882	6,423	2,220	16,790	3,460
Phase 1 Discharge NEPA Increment	**-1,073**	**+0**	**-151**	**-38**	**-1,261**	**+203**

SOURCE: CDM, 2009

TABLE 3.4-12
CHANGE IN MONTHLY WWTP DISCHARGE UNDER PHASE 1 (AFY)

	LGVSD		Novato SD		SVCSD		Napa SD	
	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)
January	51	0	157	0	121	0	70	0
February	46	0	142	0	110	0	63	0
March	50	-2	154	-3	53	0	-33	-103
April	36	-14	115	-25	-139	0	-538	-589
May	34	-18	111	-30	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	0	0	78	-48	0	0	0	0
October	0	0	99	-38	0	0	0	0
November	47	-3	146	-5	-189	0	102	-381
December	50	-1	155	-2	122	0	70	0
Total	314	-38	1,157	-151	77	0	-267	-1,073

SOURCE: CDM, 2009.

Compared to the No Action Alternative (NEPA baseline), Phase I would result in the same reduction in discharge; however, when compared to the No Action Alternative, estimated net discharge reduction would be 38 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines.

Novato SD/NMWD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 542 AFY of recycled water. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 1,983 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would reduce discharge by an estimated 151 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines. This reduction in discharge would have an incremental, but beneficial, impact to receiving water quality.

SVCSD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 874 AFY of recycled water. Additionally, SVCSD would provide flows to the Napa Salt Ponds, of up to 3,460 AFY (depending upon year type). Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 1,452 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would not reduce SVCSD discharge, as these projects would likely be implemented by SVCSD under the No Action Alternative.

This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines.

Napa SD

Compared to existing conditions (CEQA baseline), Phase 1 would provide 2,137 AFY of recycled water, with a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 would reduce 2020 discharge by an estimated 2,137 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would reduce Napa SD discharge by an estimated 1,073 AFY.

Therefore, Phase 1 would reduce current discharges to Napa River. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. **Table 3.4-13** provides a summary of discharge change by WWTP. The Basic System would result in a total discharge reduction of an estimated 1,806 AFY compared to the CEQA Baseline. Compared to 2020 discharge conditions, the Basic System would result in a total discharge reduction of 9,305 AFY from all of the WWTPs combined.

TABLE 3.4-13
BASIC SYSTEM DISCHARGE (2020) COMPARED TO CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002 Data)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Basic System Discharge	3,847	1,196	6,423	2,220	13,686	5,825
Basic System Discharge vs. 2002 Discharge	**-1,668**	**-1,609**	**+1,156**	**+314**	**-1,806**	**+5,825**
Basic System Discharge vs 2020 Discharge	**-3,555**	**-3,138**	**-1,983**	**-546**	**-9,305**	+5,825
No Action Discharge (2020)	6,338	2,693	6,574	2,257	17,863	3,257
Basic System Discharge	3,847	1,196	6,423	2,220	13,686	5,825
Basic System Discharge NEPA Increment	**-2,491**	**-1,497**	**-151**	**-38**	**-4,177**	**+2,568**

SOURCE: CDM, 2009

Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage. The Basic System would result in a total discharge reduction of 4,177 AFY from all of the WWTPs combined, compared to the No Action Alternative (NEPA Baseline).

Table 3.4-14 presents the anticipated monthly change in discharge for each WWTP under the Basic System, compared to both existing conditions and the No Project/No Action Alternative. As a whole, the projects proposed as a part of the Basic System would further increase the use of recycled water in the action area, and further reduce the volume of treated effluent discharged by the WWTPs compared to the Phase 1 Implementation Plan.

LGVSD/NMWD

Under the Basic System, there would be no additional recycled water served by LGVSD when compared to Phase 1; therefore, there would be no change to the amount of treated wastewater discharged by LGVSD. The impact discussion for LGVSD under Phase 1 is also applicable for the Basic System.

TABLE 3.4-14
CHANGE IN MONTHLY WWTP DISCHARGE UNDER THE BASIC SYSTEM (AFY)

	LGVSD		Novato SD		SVCSD		Napa SD	
	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)
January	51	0	157	0	-612	-733	70	0
February	46	0	142	0	-375	-485	63	0
March	50	-2	154	-3	-396	-449	-1,010	-1,080
April	36	-14	115	-25	-139	0	-538	-589
May	34	-18	111	-30	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	0	0	78	-48	0	0	0	0
October	0	0	99	-38	0	0	0	0
November	47	-3	146	-5	-189	0	-339	-822
December	50	-1	155	-2	103	-19	70	0
Total	314	-38	1,157	-151	-1,609	**-1,686**	-1,686	-2,491

SOURCE: CDM, 2009

Novato SD/NMWD

Under the Basic System, there would be no additional recycled water served by Novato SD when compared to Phase 1; therefore, there would be no change to the amount of treated wastewater discharged by Novato SD. The impact discussion for Novato SD under Phase 1 is also applicable for the Basic System.

SVCSD

Under the Basic System, SVCSD would serve an additional 1,845 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project service area when compared to Phase 1. Additional supplies would also be sent to the Napa Salt Ponds as available. This would provide a greater reduction in treated effluent discharge to San Pablo Bay. When compared to current (2002) conditions, this represents an estimated net reduction in discharge of 1,609 AFY. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 3,138 AFY. Therefore, Phase 1 would reduce current discharges to Schell Slough, Hudeman Slough and San Pablo Bay. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay.

Compared to the No Action (NEPA Baseline) discharge would be reduced by an estimated 1,497 AFY. Therefore, this Phase 1 change in discharge from the SVCSD WWTP would have an incremental, but beneficial, impact to receiving water quality under both CEQA and NEPA baselines.

Napa SD

Under the Basic System, Napa SD would serve 1,055 AFY of tertiary treated recycled water to the Carneros East Area and the Napa Salt Marsh Restoration Area, when compared to Phase 1. When compared to current (2002) conditions, this represents an estimated net reduction in discharge of 1,668 AFY. Phase 1 Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP. When the offset of the addition of 1,055 AFY for irrigation is incorporated into projected 2020 flow conditions, discharge would be reduced by an estimated 3,555 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay.

Compared to the No Action (NEPA) baseline, the Basic System would reduce discharge by an estimated 2,491 AFY. Therefore, this change in discharge from the Napa SD WWTP would have an incremental, but beneficial, impact to receiving water quality under both CEQA and NEPA baselines.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Provision of this amount of recycled water would result in an estimated total discharge reduction of 4,821 AFY for all of the WWTPs (see **Table 3.4-15**).

TABLE 3.4-15
PARTIALLY CONNECTED SYSTEM DISCHARGE (2020) COMPARED TO CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002 Data)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Partially Connected Discharge	2,657	0	5,851	2,181	10,689	2,933
Partially Connected Discharge vs 2002 Discharge	**-2,875**	**-2,805**	**+584**	**+275**	**-4,821**	**+2,933**
Basic System Discharge vs 2020 Discharge	**-4,745**	**-4,334**	**-2,555**	**-587**	**-12,222**	**+2,993**
No Action Discharge (2020)	6,338	2,693	6,574	2,257	17,863	3,257
Partially Connected Discharge	2,657	0	5,581	2,181	10,689	2,933
Partially Connected Discharge NEPA Increment	**-3,681**	**-2,693**	**-723**	**-76**	**-7,174**	**-324**

SOURCE: CDM, 2009

Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage. Provision of this amount of recycled water would result in an estimated total discharge reduction of 7,174 AFY for all of the WWTPs (see Table 3.4-15).

Table 3.4-16 presents the anticipated monthly change in discharge for each WWTP under the Partially Connected System, compared to both existing conditions and the No Action Alternative. As a whole, the projects proposed as a part of the Partially Connected System would further increase the use of recycled water in the action area and further reduce the volume of treated effluent discharged by the WWTPs compared to the Basic System.

TABLE 3.4-16
CHANGE IN MONTHLY WWTP DISCHARGE UNDER THE PARTIALLY CONNECTED SYSTEM (AFY)

	LGVSD		Novato SD		SVCSD		Napa SD	
	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)
January	51	0	157	-1	-612	-733	-200	-270
February	46	0	142	-1	-375	-485	-837	-900
March	48	-3	148	-8	-396	-449	-1,030	-1,100
April	21	-29	26	-113	-139	0	-538	-589
May	16	-36	-93	-234	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	0	0	-88	-215	0	0	0	0
October	0	0	3	-135	0	0	0	0
November	44	-5	138	-12	-603	-413	-339	-822
December	49	-2	152	-5	-680	-802	70	0
Total	275	-76	585	-723	-2,805	**-2,882**	**-2,875**	-3,681

SOURCE: CDM, 2009

LGVSD/NMWD

The Partially Connected System would provide an additional 207 AFY of recycled water when compared to the Basic System, with a corresponding reduction in discharge. Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, implementation of the Partially Connected System would reduce estimated 2020 discharge by 587 AFY

Compared to the No Action Alternative (NEPA) baseline of 2020 discharge conditions, the Partially Connected System would slightly reduce discharge by 76 AFY. This would have a beneficial effect

with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines.

Novato SD/NMWD

Under the Partially Connected System, Novato SD would serve 1,070 AFY of tertiary treated recycled water to the Novato South Service Area and 968 AFY to the Sears Point Service Area when compared to the Basic System, with a corresponding reduction discharge. Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, the Partially Connected System would reduce discharge by an estimated 2,555 AFY. Compared to the No Action (NEPA) baseline, Partially Connected System would reduce discharge by an estimated 723 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines. This reduction in discharge would have an incremental, but beneficial, impact to receiving water quality.

SVCSD

Under the Partially Connected System, SVCSD would serve 1,662 AFY of tertiary treated recycled water to the Southern Sonoma Valley Service Area when compared to the Basic System, with a corresponding reduction in discharge. Additional supplies would also be sent to the Napa Salt Ponds as available. This would provide a greater reduction in treated effluent discharge to San Pablo Bay. Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When in incorporated into projected 2020 flow conditions, the Partially Connected System would result in an estimated discharge reduction of 4,334 AFY. Compared to the No Action (NEPA Baseline) discharge would be reduced 2,693 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay under both CEQA and NEPA baselines. Therefore, this reduction in discharge would have an incremental, but beneficial, impact to receiving water quality.

Napa SD

Under the Partially Connected System, Napa SD would serve 1,440 AFY of tertiary treated recycled water to the Carneros East Area and Napa Salt Marsh Restoration Area, 2,826 AFY to the MST Area, and 155 AFY to areas east of the Napa SD WWTP. Compared to the CEQA baseline, the Partially Connected System would provide 4,421 AFY of recycled water for irrigation compared to the Basic System, with a corresponding reduction in discharge. Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP. When incorporated into projected 2020 flow conditions, the Partially Connected System would result in an estimated discharge reduction of 4,745 AFY. Compared to the No Action (NEPA) baseline, the Basic System would reduce discharge by 3,681 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines. Therefore, this discharge reduction would have an incremental, but beneficial, impact to receiving water quality.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Provision of this amount of recycled water would result in an estimated total discharge reduction of 5,949 AFY for all of the WWTPs (See **Table 3.4-17**).

Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage. Provision of this amount of recycled water would result in an estimated total discharge reduction of 8,320 AFY for all of the WWTPs (see Table 3.4-17).

TABLE 3.4-17
FULLY CONNECTED SYSTEM DISCHARGE (2020) COMPARED TO CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002 Data)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Fully Connected Discharge	2,657	0	4,706	2,181	9,543	3,085
Fully Connected Discharge CEQA Increment	**-2,858**	**-2,805**	**-561**	**+275**	**-5,949**	**+3,085**
Fully Connected Discharge vs 2020 Discharge	**-4,745**	**-4,334**	**-3,700**	**-587**	**-13,368**	**+3,085**
No Action Discharge (2020)	6,338	2,693	6,574	2,257	17,863	3,257
Fully Connected Discharge	2,657	0	4,706	2,181	9,543	3,085
Fully Connected Discharge NEPA Increment	**-3,681**	**-2,693**	**-1,868**	**-76**	**-8,320**	**-172**

SOURCE: CDM, 2009

Table 3.4-18 presents the anticipated monthly change in discharge for each WWTP under the Fully Connected System, compared to both existing conditions and the No Action Alternative. As a whole, the projects proposed as a part of the Fully Connected System would further increase the use of recycled water in the action area and further reduce the volume of treated effluent discharged by the WWTPs compared to the Partially Connected System.

LGVSD/NMWD

Under the Fully Connected System, there would be no additional recycled water served by LGVSD when compared to the Partially Connected System; therefore, there would be no change to the amount of treated wastewater discharged by LGVSD. The impact discussion for LGVSD under the Partially Connected System is also applicable for the Fully Connected System.

TABLE 3.4-18
CHANGE IN MONTHLY WWTP DISCHARGE UNDER THE FULLY CONNECTED SYSTEM (AFY)

	LGVSD		Novato SD		SVCSD		Napa SD	
	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)
January	51	0	156	-1	-612	-733	-200	-270
February	46	0	142	-1	-375	-485	-837	-900
March	48	-3	15	-142	-396	-449	-1,030	-1,100
April	21	-29	-495	-634	-139	0	-538	-589
May	16	-36	-499	-640	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	0	0	-158	-284	0	0	0	0
October	0	0	-12	-149	0	0	0	0
November	44	-5	138	-12	-603	-413	-339	-822
December	49	-2	152	-5	-680	-802	70	0
Total	275	-76	-561	-1,869	-2,805	**-2,882**	**-2,875**	-3,681

SOURCE: CDM, 2009

Novato SD/NMWD

Under the Fully Connected System, Novato SD would serve 1,587 AFY of tertiary recycled water to the Southern Sonoma Valley Service Area compared to the Partially Connected System, with a corresponding reduction in discharge. Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, discharge would be reduced by an estimated 3,700 AFY. Compared to the No Action (NEPA) baseline, the Fully Connected System would reduce discharge by 1,868 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both CEQA and NEPA baselines. Therefore, this Partially Connected System reduction in discharge would have an incremental, but beneficial, impact to receiving water quality.

SVCSD

Under the Fully Connected System, SVCSD would serve 1,511 AFY of tertiary recycled water to the Central Sonoma Valley Service area and would not serve any recycled water to the Southern Sonoma Valley Service Area when compared to the Partially Connected System. Under this alternative, the Southern Sonoma Valley Service Area would be served by Novato SD instead of SVCSD. However, SVCSD will continue to send excess tertiary treated recycled water to the Napa Salt Marsh for habitat restoration. Analysis of recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, discharge would be reduced by an estimated 4,334 AFY. Compared to the No Action (NEPA Baseline) discharge

would be reduced to an estimated 2,693 AFY. This would have a beneficial effect with regard to mass loading of constituents of concern, including those identified on the 303(d) list for San Pablo Bay, under both the CEQA and NEPA baseline. Therefore, this change in discharge would have an incremental, but beneficial, impact to receiving water quality.

Napa SD

Under the Fully Connected System, there would be no additional recycled water served by Napa SD when compared to the Partially Connected System; therefore, there would be no change to the amount of treated wastewater discharged by Napa SD. The impact discussion for Napa SD under the Partially Connected System is also applicable for the Fully Connected System.

Impact 3.4.9: Reuse for Habitat Restoration. Disinfected tertiary-treated wastewater from the SVCSD WWTP would be delivered to the Napa Salt Marsh ponds as a dilution source for bittern ponds, thereby improving water quality. (Beneficial Impact)

Treated wastewater from SVCSD WWTP is currently discharged to Schell Slough during the wet season and is stored during the dry season for irrigation. The upgraded SVCSD WWTP would produce disinfected tertiary treated water, which would be delivered to Ponds 7 and 7A. The recycled water would be mixed with water from Ponds 7 and 7A. After the pond restoration is complete, the recycled water would be used for agricultural irrigation during the summer.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore there would be no change in existing conditions. No impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. Facilities for Napa salt marsh pond restoration would be implemented only by SVCSD and Napa SD. A discussion of impacts for each Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, Napa SD

No facilities would be implemented for habitat restoration at the Napa salt marsh ponds under No Action Alternative within the LGVSD, Novato SD, and Napa SD service areas. Therefore no impact would occur.

SVCSD

The Napa River Salt Marsh Restoration Project EIR/EIS describes the Water Delivery Option that includes use of recycled water generated at the SVCSD WWTP for habitat restoration in the Napa

salt marsh area. Ponds 7 and 7A form 8% of the marsh area and are located north of Napa Slough. The ponds north of Napa Slough have limited aquatic diversity due to survival of only high-salt tolerant organisms in the highly saline conditions due to the historical salt production processes. Dilution of salinity would improve the aquatic habitat diversity and provide feeding and resting habitat for migratory shorebirds and water fowl. Reduction of the existing high salinity in the ponds through use of disinfected tertiary treated wastewater would therefore have a long term beneficial impact (JSA, 2003).

Use of recycled water for habitat restoration would reduce or eliminate discharge to San Pablo Bay from SVCSD. This water would be valuable as a means of further diluting bittern (i.e., increasing the allowable bittern discharge rate). Use of recycled water for reducing salinity would also ensure availability of sufficient discharge capacity to accommodate the available volume of water (JSA, 2003). This would be a beneficial impact.

In general, the soluble concentrations of trace metal and organic compounds are higher in the salt ponds than in San Pablo Bay. Therefore, opening the ponds to tidal action would gradually reduce the elevated pond than concentrations down to ambient background conditions. Nutrients such as nitrogen and phosphorus could stimulate algal and vascular aquatic vegetation growth due to the shallow depth of the ponds. However, it is anticipated that chemical constituents would be diluted substantially due to the large volume of water and dilution capacity in the ponds. Mercury accumulation in the restored wetlands could pose a concern due to the potential formation of methyl mercury in the chemically-reducing conditions of shallow wetland sediments. The potential long-term impacts of bioaccumulation of mercury are likely to increase over existing levels; therefore the impact could be significant. Use of recycled water to restore the natural salinity patterns in the salt ponds would occur under the wastewater reuse policy in the San Francisco Bay RWQCB Resolution 94-086. SVCSD would be required to prepare a management plan and obtain an exception to waste discharge prohibition from the San Francisco Bay RWQCB. In addition, implementation of **Mitigation Measure 3.4. 9a** would minimize any adverse water quality impact to less-than-significant levels.

Phase 1 (Project level)

LGVSD/ NMWD, Novato SD/ NMWD, Napa SD

Restoration of the Napa salt marsh ponds implemented under Phase 1 would be similar to that under the No Action Alternative for all the Member Agencies, therefore the impacts would be similar. There would be no impacts and no additional impacts are expected.

SVCSD

Restoration of the Napa salt marsh ponds implemented under Phase 1 would be similar to that under the No Action Alternative for SVCSD. Similar to that discussed under Phase 1, the impact would be less than significant with **Mitigation Measure 3.4.9a**, the impact would be similar. No additional impacts are expected.

Alternative 1: Basic System (Program level)

Restoration of the Napa salt marsh ponds implemented under the Basic System would be similar to those under the No Action Alternative for some of the Member Agencies; therefore the impacts would be similar. No additional impacts are expected.

LGVSD/ NMWD, Novato SD/ NMWD

No facilities would be implemented for habitat restoration at the Napa salt marsh ponds under the Basic System within the LGVSD, Novato SD, and Napa SD service areas. Therefore no impact would occur.

SVCSD and Napa SD

Restoration of the Napa salt marsh ponds implemented under the Basic System would be similar to that under the No Action Alternative and Phase 1 for SVCSD. Please refer to the discussion under SVCSD above. The impact would be less than significant with **Mitigation Measure 3.4.9a**.

Alternative 2: Partially Connected System (Program level)

Restoration of the Napa salt marsh ponds implemented under the Partially Connected System would be similar to those under the Basic System for some of the Member Agencies; therefore the impacts would be similar. No additional impacts are expected.

LGVSD/ NMWD, Novato SD/ NMWD

No facilities would be implemented for habitat restoration at the Napa salt marsh ponds under the Partially Connected System. Therefore no impact would occur.

SVCSD and Napa SD

Restoration of the Napa salt marsh ponds implemented under the Partially Connected System would be similar to that under the Basic System. Similar to that discussed above, the impact would be less than significant with **Mitigation Measure 3.4.9a**. No additional impacts are expected.

Alternative 3: Fully Connected System (Program level)

Restoration of the Napa salt marsh ponds implemented under the Fully Connected System would be similar to those under the Partially Connected System for some of the Member Agencies; therefore the impacts would be similar. No additional impacts are expected.

LGVSD/ NMWD, Novato SD/ NMWD

No facilities would be implemented for habitat restoration at the Napa salt marsh ponds under the Fully Connected System. Therefore no impact would occur.

SVCSD and Napa SD

Restoration of the Napa salt marsh ponds implemented under the Fully Connected System would be similar to that under the Partially Connected System. Similar to that discussed above, the impact would be less than significant with **Mitigation Measure 3.4.9a**. No additional impacts are expected.

Mitigation Measures

Mitigation Measure 3.4. 9a: SVCSD and Napa SD (as appropriate) shall implement the following measures:

- Prepare a Management Plan required by the San Francisco Bay RWQCB to obtain a discharge prohibition. The management plan will comply with the RWQCB Resolution 94-086. The management plan will include the following features for Ponds 7 and 7A:

  a) Facility Plan, includes project purpose and objectives, site selection factors, site sampling and analyses, planning and design elements.

  b) Operations and Maintenance plan, includes vegetation planning and harvesting, channel and bank maintenance, pump and gate maintenance, vector controls, and contingency/emergency plans.

  c) Monitoring Program, includes monitoring of pollutants, habitat diversity, wildlife use, and vector populations;

3.4.4 Impact Summary by Service Area

Table 3.4-19 provides a summary of potential project impacts related to water quality.

TABLE 3.4-19
POTENTIAL IMPACTS AND SIGNIFICANCE – WATER QUALITY

Proposed Project	Impact by Member Agency Service Areas			
	LGVSD	Novato SD	SVCSD	Napa SD
Impact 3.4.1: Short Term Construction Related Effects.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic Connected System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.4.2: Incidental Runoff.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic Connected System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.4.3: Public Health.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic Connected System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS

TABLE 3.4-19 (Continued)
POTENTIAL IMPACTS AND SIGNIFICANCE – WATER QUALITY

Proposed Project	Impact by Member Agency Service Areas			
	LGVSD/NMWD	Novato SD	SVCSD	Napa SD
Impact 3.4.4: Agricultural Use.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic Connected System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.4.5: Secondary Effects to Groundwater Quality.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic Connected System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.4.6: Surface Water Storage.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LSM
Alternative 1: Basic Connected System	LTS	LTS	LTS	LSM
Alternative 2: Partially Connected System	LTS	LTS	LTS	LSM
Alternative 3: Fully Connected System	LTS	LTS	LTS	LSM
Impact 3.4.7: Pipeline Rupture.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic Connected System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.4.8: Reduced Discharge to Surface Water.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	SI	SI	SI	SI
Phase 1	BI	BI	BI	BI
Alternative 1: Basic Connected System	BI	BI	BI	BI
Alternative 2: Partially Connected System	BI	BI	BI	BI
Alternative 3: Fully Connected System	BI	BI	BI	BI
Impact 3.4.9: Reuse for Habitat Restoration.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	LSM	NI
Phase 1	NI	NI	LSM	NI
Alternative 1: Basic Connected System	NI	NI	LSM	LSM
Alternative 2: Partially Connected System	NI	NI	LSM	LSM
Alternative 3: Fully Connected System	NI	NI	LSM	LSM

BI = Beneficial impact
NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

3.4.5 References

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3.5 Biological Resources

This section describes the biological resources occurring in the North Bay Water Recycling Program Project study area, and assesses the potential for the project alternatives to affect sensitive biological resources. Study areas were established for each of the proposed facilities or facility types, and wetlands and other biological resources were identified within these areas to assess the direct (footprint) and indirect effects (such as construction noise, light, or erosion) of the project on biological resources. Total impact area increases with each progressive alternative, since each alternative adds additional facilities. Phase 1 facilities were assessed at a project level. Alternatives 1, 2 and 3 were assessed at a program level. Study areas include:

- **Pipelines:** This study area includes 153 miles of total potential pipeline alignments. For impact analysis of alignments within existing roadways, a 40-foot wide construction corridor was assumed, measured on each side of the roadway from centerline and including the roadway, road shoulder, and road-right-of-way. In cross-country alignments, the impact analysis evaluated a buffer area of approximately 50 feet on each side of the centerline.

- **Pump stations:** For these facilities, the study area included the footprint of the facility plus a 150-foot-wide buffer around the site.

- **New/enhanced storage facilities:** For these facilities, the study area included the anticipated footprint of the facility plus a 150 foot wide buffer around the site.

The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.5.1 Affected Environment/Setting

This evaluation of biological resources is based on field surveys, aerial photograph interpretation, and database review of vegetation communities, wildlife habitat, and jurisdictional “waters of the United States” that occur or potentially occur in the action area, including habitats, plant communities, and special-status plants and wildlife. Field surveys were conducted in 2008 and 2009 to augment existing information on biological resources and to verify the results of previously produced biological reports.

Vegetation communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. The vegetation community descriptions and terminology used in this analysis are based on *A Manual of California Flora* (Sawyer and Keeler-Wolf, 1995), the California Department of Fish and Game’s (CDFG) *List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database* (CDFG, 2003), and Holland’s *Preliminary Description of Terrestrial Natural Communities of California* (Holland, 1986).

Recycled water service areas are described below, followed by vegetation community descriptions and species accounts. Species accounts are prefaced by a table indicating where species occur by service area and project alternative.

Recycled Water Service Areas

LGVSD

The LGVSD recycled water service area is located between Novato and central San Rafael, in the Las Gallinas Valley. This region is generally characterized by oak woodlands on the slopes and coastal salt marshes at the San Pablo Bay fringe, with a few pockets of annual grassland, freshwater marsh, riparian scrub, and freshwater ponds along the pipeline alignment. This area is home to the well-known China Camp State Park.

Treated wastewater that could be redirected for recycled water use under the proposed Project is currently discharged by LGVSD to the tidal portion of Miller Creek, approximately one mile upstream of San Pablo Bay, during the permitted discharge period of November 1 through May 31. Miller Creek is a tidally-influenced perennial creek having very low flows during the summer months (and winter months during a drought). During low tide, when the creek is experiencing low flows, effluent dominates the creek (RWQCB, 2003).

Novato SD

The core service area is located in the City of Novato on the western fringe of North San Pablo Bay, with most development occurring west of Highway 101. Marin County is distinct from Sonoma and Napa Valley action areas, with the region experiencing a partly Mediterranean climate that is influenced by coastal weather patterns such as fog and on-shore flow, resulting in a number of Marin-county endemic plants. Vegetation is characterized by redwood, mixed conifer, riparian and oak woodlands, and forests on the western slopes, to annual grassland and chaparral at the transition to freshwater wetlands and coastal salt marshes along the bay margin.

Treated wastewater that could be redirected for recycled water use under the proposed Project is currently discharged from two Novato SD treatment facilities via one combined effluent outfall to the intertidal mud flats of San Pablo Bay, adjacent to the former Hamilton Air Force Base in Marin County, from September 1 through May 31. The discharge diffuser is located in the intertidal zone and is submerged at the +1 foot Mean Lower Low Water (MLLW) tidal elevation and above. At lower tidal elevations, the outfall is exposed and the San Pablo Bay water line can range from 1,000 to 3,500 feet from the end of the diffuser (RWQCB, 1999).

SVCSD

The recycled water service area is concentrated in rural Sonoma Valley and the City of Sonoma, within the Outer North Coast Ranges sub-region of the California Floristic Province (Hickman, 1993).[1] The Outer North Coast Ranges experience a Mediterranean climate, and compared to coastal California this region has colder winters and hotter summers. The Outer North Coast Ranges include the Mayacamas Mountains that define the east boundary of Sonoma Valley. The Sonoma

[1] Geographic subdivisions are used to describe and predict features of the natural landscape. The system of geographic units is four-tiered: provinces, regions, sub-regions, and districts. Three floristic provinces cover the State of California: California Floristic Province, Great Basin, and Desert. The California Floristic Province is the largest and is made up of six regions.

Mountain Range defines the west boundary of Sonoma Valley. This region is generally characterized by mosaics of upland oak and mixed evergreen forests, native and non-native grasslands, chaparral, upland scrub communities, marsh and wetland communities, and riparian scrubs, woodlands and forests. The core action area supports vineyards, ornamental landscaping, non-native annual grassland, valley oak and coast live oak woodlands, and riparian vegetation along numerous intermittent and perennial streams. Some streams support emergent wetland vegetation.

The SVCSD would also deliver water to the Napa Salt Marsh Restoration Area via a pipeline extending southeast from Sonoma Valley to the Napa Marsh. Leaving Sonoma, the pipeline traverses ruderal and grazed upland grassland, farmland, vineyards, and seasonal and permanent wetlands. As the pipeline approaches its terminus at now-defunct commercial salt ponds at the Napa Salt Marsh Restoration Area, the pipeline traverses seeps and tidal marsh.

Treated wastewater that could be redirected for recycled water use under the proposed Project is currently discharged by SVCSD into Schell Slough during the wet weather period of November 1 through April 30. Schell Slough flows to San Pablo Bay by way of Steamboat Slough, Third Napa Slough, Second Napa Slough, and the lower reaches of Sonoma Creek. Schell Slough is a tidal estuary which receives freshwater flow from Schell Creek during the wet weather months. During the dry weather months, Schell Slough is a dead end slough, and is flushed only by limited tidal action (RWQCB, 2002).

Napa SD

The service area is located in the city of Napa in the lower reaches of Napa Valley, which is separated from Sonoma Valley by the Mayacama Range to the west and from the vast Central Valley by the Vaca Mountains to the east. The Napa Valley represents the northernmost extension of San Francisco Bay wetlands, and is a transitional bioregion comprising the eastern boundary for Coast Redwood and the intermixing area between coast live oak and interior live oak. This region is generally characterized by a relatively small urban core west of the Napa River, oak woodlands, abundant streams and riparian corridors, non-native annual grassland, chaparral scrub, freshwater marshes, wetlands, and the Napa River system. Brackish water and coastal salt marshes occur in the southernmost portions of Napa County. Small vineyards and farmland dominate the developed landscape.

Treated wastewater that could be redirected for recycled water use under the proposed Project is currently discharged from the Napa SD Soscol wastewater treatment plant to the Napa River at Soscol Ferry Road, during the permitted discharge period of November 1 through April 30 (RWQCB, 2000).

Vegetation Communities

Annual Grassland

Annual grasslands consist of sparse to dense coverage of non-native grasses often associated with numerous other annual and perennial herbs. These grasslands typically occur on deeper soils in the gaps between oak and riparian forests, and also form the understory of several other plant

communities. Exotic grassland species generally respond well to moderate disturbance, such as grazing, which may have played a role in their widespread establishment. Along roadsides and beneath the many valley oak and coast live oak trees, annual grasslands provide a nearly continuous ground coverage. These areas have generally low habitat structure and diversity as a result of historic management and disturbances. Most of the upland habitat within the north bay region has been converted to agriculture, including oat hay, pastureland, and more recently, vineyards. These areas support a mixture of native and nonnative vegetation in the form of annual grasses, herbs, and wildflowers, along with oat hay and grapevines. Ruderal species, which are typically aggressively-growing, nonnative plants, appear where repeated disturbance such as vehicular traffic alters the natural ecosystem.

California annual grassland includes mostly non-native annual grasses and few non-native herbaceous forbs. The dominant grass species in this community include wild oat (*Avena barbata*), annual ryegrass (*Lolium multiflorum*), ripgut brome (*Bromus hordaceus*), and foxtail barley (*Hordeum murinum* var. *leporinum*). Herbaceous forbs include California burclover (*Medicago polymorpha*), ox-tongue daisy (*Picris echioides*), cutleaf geranium (*Geranium dissectum*), star-thistles (*Centaurea* spp.), wild radish (*Raphanus sativa*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), filaree (*Erodium cicutarium*) and uncommonly, California poppy (*Eschscholzia californica*), California buttercup (*Ranunculus californica*), and dove lupine (*Lupinus bicolor*).

By themselves, nonnative annual grasslands support a generally low diversity of wildlife, but nearby oak woodland and riparian communities greatly enhance the wildlife habitat benefits of these areas. Many wildlife species use both native and non-native grasslands for refugia and nesting and foraging materials, and wooded habitats adjacent to grasslands in the action area provide shelter and breeding and nesting habitat. Amphibians in this community include western toad (*Anaxyrus boreas*), Pacific tree frog (*Pseudacris regilla*), and California slender salamander (*Batrachoseps attenuatus*). Common reptiles in Sonoma grassland habitats include western fence lizard (*Sceloporus occidentals*), western skink (*Eumeces skiltonianus*), gopher snake (*Pituophis melanoleucus*), and western rattlesnake (*Crotalus viridus*), which are often found in association with woody debris or rocks. Blacktail jackrabbit (*Lepus californicus*), Audubon's cottontail (*Sylvilagus audubonii*), and Botta's pocket gopher (*Thomomys bottae*) are common. Small rodents provide forage for area raptors (birds of prey) including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), red-shouldered hawk (*Buteo lineatus*), and northern harrier (*Circus cyaneus*). Birds that nest and forage locally in grasslands include western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), and song sparrow (*Melospiza melodia*). Principal game species in this habitat type include blacktail deer (*Odocoileus hemionus*), California quail (*Callipepla californica*), and mourning dove *(Zenaida macroura*).

Aside from landscaped urban areas and disturbed ruderal areas, California annual grassland is a most common vegetation community in Novato, Sonoma, and Napa. This community occurs along roadsides and off-road pipeline routes throughout the action area, varying from disturbed ruderal vegetation to relatively intact grassland communities. California annual grassland is found

in the surrounding hillsides along with oak woodlands and is often found in areas that have been grazed or otherwise converted to agriculture.

Oak Woodland

Oak woodlands typically occur on higher slopes and ridgetops where soils are well-drained. Throughout the project vicinity, this habitat community is present in areas that have not been cleared for cattle grazing or residential development. Oaks provide food, cover, and nesting sites for many wildlife species. On account of historic grazing and management activities, oak woodlands support a savannah-like woodland structure, with clusters of a few scattered mature oaks separated from each other by weedy annual grasslands. Relatively degraded annual grasslands are common both between and beneath wooded portions of the action area. Valley oak (*Quercus agrifolia*) and coast live oak (*Quercus agrifolia*) are the dominant canopy trees along rural action area roads. Other trees that are regionally common include California buckeye (*Aesculus californica*) and California black walnut (*Juglans californica*).

Coast live oak forests support an abundance of birds, reptiles and amphibian species. Coast live oak and valley oak woodlands in the action area support many of the same species as described above in the annual grasslands habitat, but also many that occur in the riparian woodland habitat described below. Coast live oak woodlands are a prominent habitat type in the LGVSD area, and are present in SVCSD and Napa SD recycled water service areas upslope from the valley floor. While oak woodlands are prevalent in Novato, pipelines in the recycled water service area are largely installed in urban roadways and open grasslands.

Riparian

The subclassification of riparian woodland and scrub communities is principally determined by the dominant species that occur near project components. Riparian habitat varies throughout the action area; vegetation along drainage corridors forms sparse to dense woodlands and scrub, and in some disturbed areas riparian habitat is displaced by nonnative annual grassland. Dominant species vary and include valley oak (*Quercus lobata*, coast live oak (*Q. agrifolia*), and Oregon ash (*Fraxinus latifolia*) often accompanied by arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), California bay (*Umbellularia californica*), walnut (*Juglans californica*), big-leaf maple (*Acer macrophyllum*), and black cottonwood (*Populus balsamifera*). Below the tree canopy, a relatively dense understory of shrubs and sapling trees comprised of California and Himalayan blackberry (*Rubus ursinus* and *R. discolor*), mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), and various rushes (*Juncus* spp.). Riparian scrub in the action area is characterized by dense thickets of arroyo and red willows. This community supports very little herbaceous understory due to low light conditions at the soil surface, which suppresses seed germination. Riparian scrub may succeed to any of several riparian woodland or forest types in the absence of flooding disturbance.

Riparian woodland (including mixed riparian and willow riparian scrub) habitat provides food, water, migration and dispersal corridors, breeding sites, and thermal cover for many resident and migratory wildlife species. Wooded stream edges serve as nesting sites and escape habitat for

many species. Foliage, bark, and ground substrates provide a variety of foraging areas. Birds that forage for insects in riparian areas include Bewick's wren (*Thryomanes bewickii*), black phoebe (*Sayornis nigricans*), and black-headed grosbeak (*Pheuticus melanocephalus*). Bark-insect foraging birds also occur in this habitat and include acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttalli*), and white-breasted nuthatch (*Sitta canadensis*). Other bird species expected in the riparian corridor include dark-eyed junco (*Junco hyemalis*), bushtit (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), chestnut-backed chickadee (*Poecile rufescens*), and brown creeper (*Certhia americana*). Riparian woodland areas also support piscivorous birds such as the belted kingfisher (*Ceryle alcyon*).

Riparian woodlands provide habitat for reptiles and amphibians including the western toad, California newt (*Taricha torosa*), Pacific tree frog, and Pacific slender salamander. Mammals such as the western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), western gray squirrel (*Sciurus griseus*), Virginia opossum (*Didelphis marsupialis*), and raccoon (*Procyon lotor*) utilize these habits for nesting and foraging. Small rodents attract raptors such as red-shouldered hawk (*Buteo lineatus*) and red-tailed hawk. Blacktail deer and striped skunk (*Mephitis mephitis*) are also expected.

Riparian woodland and scrub communities are prevalent and generally intact along numerous project-area streams and drainages in the SVCSD and Napa SD areas. The LGVSD Peacock Gap action area crosses only one ephemeral drainage which appears to have been redirected into an underground culvert as it passes among urban homes bordering San Pedro Road; the pipeline extending from the wastewater treatment plant north to Hamilton field borders and crosses Miller Creek, which offers low- to moderate-quality riparian scrub habitat. In the three Novato SD action area drainages, riparian vegetation is highly disturbed to the extent that riparian communities are largely absent and displaced by California annual grassland or Himalayan blackberry scrub, though some riparian willow scrub persists in a drainage ditch along the railroad.

Wetlands

Freshwater marshes

Freshwater marshes occur at many recycled water service area locations: at areas with slow moving and shallow water or perennially saturated soils, such as in low-flow stream channels or where gravel bars support a sparse cover of annual and perennial emergent vegetation species, often in association with willow scrub habitat; in flood control channels and irrigation ditches; alongside roadways and bike trails; and in detention ponds throughout the action area. Freshwater marsh or freshwater emergent wetland habitats are generally dominated by perennial emergent monocots and other hydrophytic vegetation; common species include cattail (*Typha latifolia* and *T. agrifolia*), bulrush (*Scirpus* sp.), spikerush (*Eleocharis* spp.), lance-leaved water plantain (*Alisma lanceolatum*), and Baltic rush (*Juncus balticus*). Freshwater marshes are among the most productive wildlife habitats. They provide food, water, and shelter for many species of amphibians, reptiles, birds, and mammals. Freshwater marsh and freshwater seep habitats are often contiguous with riparian habitat and support many of the same wildlife species previously described.

Freshwater marshes are found throughout the SVCSD, Novato SD and Napa SD recycled water service areas at stream crossings, in irrigation canals, along roadside ditches, and at other topographical low areas. Freshwater wetlands are found along a few roadside segments within the LGVSD Peacock Gap area, at the LGVSD wastewater treatment ponds, and along Miller Creek and unnamed tributaries near the treatment ponds. Phase 1 pipelines in southern Novato border freshwater wetlands, as do Phase 1 pipelines along Rowland Boulevard and Olive Avenue in north Novato. Freshwater marsh occurs in the Novato SD recycled water service area near the Basic System pipeline as it crosses the Black Point/Day Island area; near the Partially Connected System pipeline in the Bel Marin Keys/Hamilton Field area; and near the Fully Connected System pipeline as it crosses Sears Point. In the SVCSD recycled water service area, freshwater marsh occurs near Phase 1 pipeline crossings at Schell Creek, Fowler Creek and Rodgers Creek, beside Napa Road between Arnold Dr. and Broadway, and extensively along the off-road pipeline extending to the Napa Salt Marsh Restoration Area, as well as along the Phase 2 off-road pipeline west of Viansa winery. Freshwater marsh occurs in the Napa SD recycled water service area along the Phase 1 pipeline at Third Avenue; where the Basic System pipeline crosses Carneros Creek and approaches the Napa River; and where the Partially Connected System pipeline approaches the Napa River.

Seasonal Wetlands

Seasonal wetlands occur in topographical low-points where water is allowed to saturate or inundate for long periods of time and hydrophytic vegetation is able to establish seasonally. Seasonal wetlands are typically annual in nature and are colonized by opportunistic vegetation. Evidence of these features may not be visible after late spring or early summer and features may not persist from year to year, depending on climatic conditions. Pickleweed (*Salicornia* spp.) and brass buttons (*Cotula coronopifolia*) are common in saline seasonal wetlands; pickleweed and alkali bulrush (*Scirpus maritimus*) are common in brackish seasonal wetlands; and rushes and sedges are common in freshwater seasonal wetlands. Seasonal wetlands support a variety of invertebrates and amphibians that in turn provide food for other wildlife species.

Rivers, Creeks and Ponds

The action area encompasses portions of the Petaluma River watershed, the Sonoma Creek watershed, and the Napa River watershed, involving major and minor creeks, sloughs and rivers. Total potential crossings number 194 and include Petaluma River, Sonoma Creek, Napa River, Nathanson Creek, Calabazas Creek, Carriger Creek, Fowler Creek, Rodgers Creek, Novato Creek, Miller Creek, Huichica Creek, and Felder Creek, most of which are designated critical habitat for steelhead (*Oncorhynchus mykiss*), a listed species. Varying amounts of overhanging riparian vegetation regulate stream temperatures and provide a steady source of invertebrate forage for fish and other wildlife. With a diversity of pool, riffle, and run habitats, some stream reaches also support California freshwater shrimp (*Syncaris pacifica*), Pacific lamprey (*Lampetra tridentata*), Sacramento splittail (*Pogonichthys macrolepidotus*), California brackish-water snail (*Tryonia imitator*) and other listed or special-status aquatic species.

Resident fish typical of streams in the region include Pacific lamprey, prickly sculpin (*Cottus asper*), Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus*

grandis), and California roach (*Hesperoleucus symmetricus*). The identified roach-sucker-pikeminnow fish association is typical of lower California stream reaches that are characterized by relatively warm, low-gradient conditions. This presents the expectation that steelhead rearing habitat may be comparatively infrequent in lower creek reaches, but habitat improves in quality in fast-moving upstream areas and relatively cooler tributaries.

Vineyard and agricultural ponds throughout Sonoma and Napa valleys in the general project vicinity number in the tens to hundreds. In the LGVSD recycled water service area, the Partially Connected System pipeline borders two ponds along San Pedro Road. In the Novato SD recycled water service area, ponds occur near Phase 1 pipelines along Redwood Dr., Lea Road, and Olive Road; near the Basic System pipelines at the Black Point/Day Island area; near the Partially Connected System pipelines along the off-road alignment north of Hamilton Road, south of the off-road alignment near Ignacio Blvd., and along Lakeville Highway; and near the Fully Connected System pipeline along Highway 121 at Sears Point. In the SVCSD recycled water service area, numerous ponds occur along the Phase 1 off-road alignment extending to the Napa Salt Marsh; adjacent to the Partially Connected System in-road alignment along Highway 121 south of Sonoma; and along the Fully Connected System alignments along Arnold Drive and near Norrbom Rd. In the Napa SD recycled water service area, ponds occur near Phase 1 alignments along Hagen and Imola Roads; near the Basic System alignments along Cuttings Wharf, Duhib, Las Amigas, Stanley and Stanley Crossover Roads and Highway 121; and near the Partially Connected System alignments along Henry, Dealy, Old Sonoma, Buhman and Congress Valley Roads in western Napa and along Atlas Peak Rd. in north Napa. Additionally, wastewater treatment plant ponds in the action area offer varying levels of aquatic habitat.

Common wildlife species typically found in this habitat include pacific chorus frog, western toad, garter snake, and bird species adapted to riparian environments such as snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), and black phoebe (*Sayornis nigricans*).

Salt and Brackish Marsh

Salt and brackish water marshes are found along the margins of San Pablo Bay. Salt-tolerant vegetation thrives in these marshes; salinity can vary annually in relation to rainfall patterns and stream flow, and successful vegetation must also tolerate water level fluctuations. Common vegetative species include pickleweed, alkali bulrush, California cord grass (*Spartina foliosa*), California tule (*Scirpus californicus*), fleshy jaumea (*Jaumea carnosa*), Baltic rush, saltmarsh dodder (*Cuscuta salina*), frankenia (*Frankenia salina*), fat hen (*Atriplex triangularis*), arrow grass (*Triglochin maritima*), curly dock (*Rumex crispus*), brass buttons, gumplant (*Grindelia stricta* var. *angustifolia*), yarrow (*Achillea borealis*), asters (*Aster* spp.), and sedges (*Carex* spp.). Nonnative invasives include pepperweed (*Lepidium latifolium*), smooth cord grass (*Spartina alternifolia*), and fennel (*Foeniculum vulgare*).

Tidal marshes support a variety of special-status species, including salt marsh harvest mouse (*Reithrodontomy raviventris*), California clapper rail (*Rallus longirostrus obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), salt marsh shrews (*Sorex* spp.), and bird’s beak (*Cordylanthus* spp.).

While levees and flood-control features prevent tidal influence in many areas, expanses of high-quality tidal marshes persist in the North Bay. Salt and brackish marshes occur extensively along San Pedro Road in the LGVSD recycled water service area; they occur near Hamilton Field, Bel Marin Keys, Sears Point and the Petaluma River mouth in the Novato SD recycled water service area; and they occur at the terminus of the Napa Salt Marsh pipeline served by the SVCSD recyled water service area.

Salt Ponds

Salt ponds are found throughout the San Francisco Bay Area, and in the action area are found at the Napa Salt Marsh Restoration Area, specifically salt pond 7A. Vegetation along the northern reach of the salt pond alignment consists of basically no vegetation in the levee access roadway, to ruderal species growing in roughly a two-foot-wide margin on each side of the roadway, further giving way to saltgrass and pickleweed on the slopes. Other common vegetation occurring on the roadside or the levee banks, increasing in abundance as the route heads south, includes annual grasses, coyote brush (*Baccharis pilularis*), milk thistle (*Silybum* sp.), fennel, curly dock, mustard, radish, yarrow, peppergrass, and iceplant (*Carpobrotus edulis*). A windrow of eucalptus occurs midway between the parking lot and the mixing chamber to the east of the access levee. The northwestern levee of salt pond 7A and marsh islands east of the access levee are known to provide nesting habitat for western snowy plover (*Charadrius alexandrinus nivosus)*, a listed species.

Open Water Estuary

The San Pablo Bay watershed drains into the northern reaches of San Francisco Bay and is a major drainage basin for Marin, Sonoma, Napa, Solano, and Contra Costa Counties. San Pablo Bay supports abundant saltwater aquatic life and provides shelter for large numbers of waterbirds, especially during heavy winter storms when open coastal waters become rough. All anadromous fish species entering the Napa River and Sacramento River drainages pass through San Pablo Bay. In addition, San Pablo Bay provides nursery and rearing habitat for several fish species.

Most of the fish occurring in the San Francisco Bay estuary do so on a seasonal basis, taking advantage of favorable conditions to complete their life cycles. The fluctuating and intermediate salinity typical of estuarine habitats is the factor that limits the penetration of both marine and freshwater species into the mixed waters in the interior of the estuary. Accordingly, the specific area of San Pablo Bay in which a species is found is determined largely by the species' salinity tolerances. San Pablo Bay contains a productive and diverse fish community. The considerable inflow of the Sacramento-San Joaquin River system into San Pablo Bay provides a rich source of nutrients to support organic production. In addition, nutrient and organic input from the Napa River, Sonoma Creek, and the Petaluma River further enhances the region's ecological productivity. The freshwater input of all these river systems creates the large spatial and temporal variations in salinity and temperature that characterize San Pablo Bay (Jones & Stokes, 2003).

CDFG conducts annual fish surveys in San Pablo Bay. Northern anchovy (*Engraulis mordax*), longfin smelt (*Spirinichus thaleichthys*), English sole (*Parophrys vetulus*), white croaker (*Genyonemus lineatus*), and bay goby (*Lepidogobius lepidus*), were the species most frequently

caught in the CDFG surveys from 1980-1995 (Jones & Stokes, 2003). More recently, however, abundances of some native species San Francisco Bay estuary, including longfin smelt, have been declining drastically in what has come known to be known as the Pelagic Organism Decline (Sommer et al., 2007).

The benthic invertebrate community of the project vicinity is expected to be composed of various annelids, mysid shrimp, copepods, amphipods, shrimp, crabs and other macroinvertebrates. All of these organisms provide important food sources for estuary fish and birds species.

Urban

The majority of pipeline alignments will be installed within existing roadways and urban corridors to avoid or minimize potential environmental impacts. Urban neighborhoods dominate the Novato SD recycled water service area landscape west of Highway 101. While not as densely populated as Novato, the urban cores of Sonoma and Napa are served by Phase 1 and the Basic System pipelines. In the LGVSD recycled water service area, the first half of San Pedro Road is heavily built on the north side, with a dense single row of houses separating the roadway from oak woodlands to the south.

Special-status Species

Species known to occur on or in the project vicinity are considered “special-status” because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection from federal or state endangered species legislation. Other species have been designated as “sensitive” on the basis of the following: adopted policies and expertise of state resource agencies; organizations with acknowledged expertise; or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives.

A focused database and literature search identified 41 special-status plants and 50 special-status wildlife species with known occurrences in the recycled water service areas. **Table 3.5-1** lists these species, their potential habitat, and the potential for occurrence within 40 feet of the alignment. For alignments coincident with existing roadways, a distance of 40 feet is measured on each side of the road from the edge of pavement; the total widths for off-road alignments are not precisely defined but a buffer area of approximately 50 feet on each side of the centerline was evaluated. No focused or protocol-level wildlife surveys were conducted in support of the proposed project. However, suitable habitat for several species occurs within the action area. These species are discussed in Species Accounts.

Special-status Plants

A species list from the U.S. Fish and Wildlife Service (USFWS) was obtained for the action area, and the California Natural Diversity Data Base (CNDDB)(CDFG, 2008) and California Native Plant Society (CNPS) electronic database (CNPS, 2008) were searched to compile a list of potentially-occurring special-status plant species. Previously prepared environmental reports were

TABLE 3.5-1
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Action area	Project Phase	LGVSD	Novato SD	SVCSD	Napa SD
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING								
ANIMALS								
Invertebrates								
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--	Central valley grasslands, Central Coast mountains, South Coast mountains in rain-fed pools.	**Absent.** Known only from one location in Napa County at the airport, outside the action area. Next nearest occurrence is in Solano County.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	E/--	Historically known to occur in San Mateo County north to the mouth of the Russian River in Sonoma County.	**Low.** Inhabits coastal praries, coastal scrub, and grassland habitats where *Viola* sp. occurs as a larval host plant. Extant 1991 population in South Petaluma/ Sears Point area is 0.25 mile from Alt. 2 pipeline. Habitat not expected in ROW.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3		x		
California freshwater shrimp *Syncaris pacifica*	FE/CE	Found in low-elevation, low gradient perennial freshwater streams in Sonoma, Marin and Napa Counties where banks are structurally diverse with undercut banks, exposed roots, or overhanging woody debris or vegetation.	**Presumed present.** Known to occur in project vicinity with habitat in Sonoma Creek, Huichica Creek and larger tributaries. Habitat potentially present in Schell Creek and Fowler Creek.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2				x
				Alt 3			x	
Fish								
Tidewater goby *Eucyclogobius newberryi*	FE/CSC	Shallow waters of bays and estuaries.	**Absent.** Historical records from Novato Creek, but the species is now believed to be extirpated from San Francisco Bay drainages, including San Pablo Bay.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Delta smelt *Hypomesus transpacificus*	FT/ST	Found in large, main channels and open areas of the Bay. Occur from tidal freshwater reaches of the Delta west to eastern San Pablo Bay.	**Present.** Found in San Pablo Bay during high outflows but not thought to establish permanent populations. Have been recorded in Napa River during dry years, but are not believed to persist there (Leidy, 2007).	**Phase 1**				
				Alt 1				
				Alt 2				x
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)								
Fish (cont.)								
Coho salmon, Central California Coast ESU *Oncorhynchus kisutch*	FE/CE	Central and northern Calif. coastal rivers and drainages.	**Absent.** Believed to be extirpated from San Francisco bay drainages.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Steelhead, Central California Coast DPS *Oncorhynchus mykiss*	FT/CSC	Drainages of San Francisco and San Pablo bays, central Calif. Coastal rivers.	**Present.** Steelhead spawn in upper watershed portions of Sonoma Creek and larger tributaries including Schell Creek, Fowler Creek, Carriger Creek, and Rodgers Creek. Juvenile rearing habitat present in various lower stream reaches.	**Phase 1**		x	x	x
				Alt 1		x	x	x
				Alt 2		x	x	x
				Alt 3			x	
Steelhead, Central Valley DPS *Oncorhynchus mykiss*	FT/CSC	Spawns in the Sacramento and San Joaquin Rivers and their tributaries.	**Present.** Steelhead migrate through San Pablo Bay to upstream spawning grounds in the Sacramento and San Joaquin River basins.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Chinook salmon, Sacramento River winter-run *Oncorhynchus tshawytscha*	FE/CE	Mostly confined to the Sacramento River where it spawns in the upper reaches of the mainstem.	**Present.** Migrates through San Pablo Bay to upstream spawning grounds in the Sacramento River.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Chinook salmon, Central Valley spring-run *Oncorhynchus tshawytscha*	FT/CT	Mostly confined to the Sacramento River where it spawns in the upper reaches of the mainstem.	**Present.** Migrates through San Pablo Bay to upstream spawning grounds in the Sacramento River.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)								
Fish (cont.)								
Green sturgeon, southern DPS *Acipenser medirostris*	FT/CSC	Adults spawn in freshwater and then return to estuarine or marine environments. Preferred spawning habitat occurs in the lower reaches of large rivers with swift currents and large cobble.	**Present.** Known to occur in San Pablo Bay. Sacramento River is the only known spawning site for the southern DPS.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Amphibians								
California tiger salamander *Ambystoma californiense*	FT/CSC	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds, vernal pools, and slow-moving or receding streams.	**Absent.** The action area is beyond this species' known range.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
California red-legged frog *Rana draytonii*	FT/CSC	Breed in stock ponds, pools, and slow-moving streams.	**Presumed present.** Potential habitat occurs in lower Fowler Creek and Rodgers Creek in Sonoma; unlikely in Napa; present at Sears Point in area ponds and drainages; present at roadside drainages along Lakeville Highway.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3		x		
Birds								
Swainson's hawk *Buteo swainsoni*	--/ST	Breeds in grasslands with scattered trees, riparian areas, savannahs.	**High.** Single Napa Valley nest in 2005 in oak tree within 200 feet of alignment, approx. 850 feet from Highway 29; a second pair may have nested nearby.	**Phase 1**				
				Alt 1				
				Alt 2				x
				Alt 3				
Western snowy plover *Charadrius alexandrinus nivosus*	FT/CSC	Nests inland on salt pond levees and other open areas with sandy substrate and sparse vegetation.	**Present.** Nests on levees at Salt Pond 7A and Fly Bay in the action area.	**Phase 1**			x	
				Alt 1				
				Alt 2				
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)								
Birds (cont.)								
Willow flycatcher *Empidonax traillii*	FSC/SE	Inhabits willow thickets bordering wet meadows, ponds and backwaters, from 2000-8000 feet elevation.	**Low.** Potential habitat available in Sonoma Valley; breeding not identified in action area.	**Phase 1**			x	
				Alt 1			x	
				Alt 2			x	
				Alt 3				
California black rail *Laterallus jamaicensis coturniculus*	--/ST	Occurs in salt and brackish marshes, also freshwater marshes at low elevations.	**High.** Known to occur in tidal marshes of San Pablo Bay and larger tributary drainages in the Novato, Sonoma, Las Gallinas Valley, and Napa service areas.	**Phase 1**		x	x	
				Alt 1		x		
				Alt 2	x	x		
				Alt 3		x		
California clapper rail *Rallus longirostris obsoletus*	FE/SE	Occurs in salt marshes and tidal sloughs. Requires tidal mudlfats for foraging habitat. Prefers cordgrass for cover and nesting, but can be occasionally found in bulrush and cattails.	**Present.** Present in Novato Creek near Highway 101. Known to occur in tidal marshes of San Pablo Bay and larger tributary drainages in the Novato, Sonoma, Las Gallinas Valley, and Napa service areas.	**Phase 1**		x	x	
				Alt 1		x		
				Alt 2	x	x	x	
				Alt 3		x		
Mammals								
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/SE	Tidally-influenced salt marshes with dense pickleweed and upland transitional vegetation.	**High.** Known or expected in emergent pickleweed salt marshes in the Napa, Sonoma, Las Gallinas Valley, and Novato service areas. Small habitat impacts possible at Napa Salt Marsh Restoration Area.	**Phase 1**			x	
				Alt 1		x		x
				Alt 2	x	x		x
				Alt 3		x		
Plants								
Sonoma sunshine *Blennosperma bakeri*	FE/SE	Mesic grasslands, vernal pools, intermittent swales.	**Present.** 1990s extant population mapped on both sides of Bonneau Rd. in Sonoma (CDFG, 2008), an area not surveyed for rare plants for the SVRWP EIR.	**Phase 1**				
				Alt 1				
				Alt 2			x	
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)								
Plants (cont.)								
Tiburon mariposa lily *Calochortus tiburonensis*	FT/ST	Open, rocky slopes in serpentine soils of valley and foothill grassland.	**Unlikely.** Known to occur in a single location in Marin County, at the Ring Mountain Preserve at the north end ot the Tiburon Peninsula, nearly 6 miles from the action area.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Tiburon Indian paintbrush *Castilleja affinis* ssp. *neglecta*	FE/ST	Valley and foothill grassland in serpentine soils.	**Unlikely.** Nearest known populations are about 5 miles southeast from the Napa SD action area.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Sonoma spineflower *Chorizanthe valida*	FE/SE	Sandy soils of coastal praries.	**Unlikely.** Possibly extirpated population in Petaluma. In Marin County, known only from Drakes Bay, nearly 20 miles from the action area.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Soft bird's beak *Cordylanthus mollis* spp. *mollis*	FE/--	Found in coastal salt marsh on north shores of San Francisco Bay.	**Low.** Possible Fly Bay population not expected to be impacted by the project. Historical population near Huichica Creek is believed extirpated.	**Phase 1**			x	
				Alt 1				
				Alt 2				
				Alt 3				
Golden larkspur *Delphinium luteum*	FE/--	North-facing rocky slopes of chaparral, coastal scrub, and coastal praries.	**Unlikely.** Within the project vicinity, the nearest occurrence is in Petaluma, greater than 6 miles from the nearest project element.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				
Marin western flax *Hesperolinon congestum*	FT/ST	Found on dry slopes in serpentine soils in coastal scrub and grasslands.	**Unlikely.** Extant population at Mt. Burdell beyond action area; LGVSD occurrence is 2 miles from proposed pipeline.	**Phase 1**				
				Alt 1				
				Alt 2	x	x		
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)								
Plants (cont.)								
Santa Cruz tarplant *Holocarpha macradenia*	FT/SE	Occurs in heavy soils on grassy coastal flats. Known to occur in Marin, Alameda and Santa Cruz counties.	**Unlikely.** Nearest known occurrence is a possibly extirpated population in the vicinity of Ross Valley, roughly 3 miles from the proposed project.	**Phase 1**				
				Alt 1				
				Alt 2	x			
				Alt 3				
Contra Costa goldfields *Lasthenia conjugens*	FE/--	Found in low-elevation sunny flats and drying borders of vernal pools in dry, inner Coast Range valleys.	**Low.** 2005 extant occurrence 0.12 mile north of Napa SD proposed pipelines. Two possibly extirpated populations north of the extant population.	**Phase 1**				
				Alt 1				x
				Alt 2				x
				Alt 3				
White-rayed pentachaeta *Pentachaeta bellidiflora*	FE/SE	Dry, rocky slopes and grassy areas in serpentine soils of valley and foothill grassland.	**Unlikely.** The nearest occurrence is over 3 miles southwest of the LGVSD Alt 2 pipeline.	**Phase 1**				
				Alt 1				
				Alt 2	x			
				Alt 3				
Tiburon jewelflower *Streptanthus niger*	FE/SE	Shallow, rocky serpentine slopes of valley and foothill grassland.	**Unlikely.** Known only from Marin County on the Tiburon peninsula, the nearest occurrence is greater than 7.5 miles south of the LGVSD Alt 2 pipeline.	**Phase 1**				
				Alt 1				
				Alt 2	x			
				Alt 3				
Two-fork clover *Trifolium amoenum*	FE/--	Valley and foothill grassland, coastal bluff scrub.	**Low.** Possibly extirpated population at Fly Bay; not expected to be impacted by project.	**Phase 1**			x	
				Alt 1				x
				Alt 2				
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Action area	Project Phase	LGVSD	Novato SD	SVCSD	Napa SD
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN								
ANIMALS								
Invertebrates								
Opler's longhorn moth *Adela oplerella*	SC/--	Marin County, inner Coast Ranges south to Santa Clara County.	**Low.** Identified population at Sears Point roughly 1 mile east of project ROW.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3		x		
Marin blind harvestman *Calicina diminua*	--/--	Known only from serpentine area of Mt. Burdell in Marin County.	**Unlikely.** This species is present at Mt. Burdell open space and mapped along San Marin Dr., which is now a built-up residential neighborhood along the proposed alignment.	**Phase 1**		x		
				Alt 1				
				Alt 2		x		
				Alt 3				
Monarch butterfly (wintering sites) *Danaus plexippus*		Throughout California. Overwinters in coastal Monterey pine, Monterey cypress, and eucalyptus groves in California.	**Seasonally present.** Found in China Camp State Park from late winter to early spring. Roosting tree at Sears Point is greater than 0.25 mile from pipeline. No impacts are expected.	**Phase 1**				
				Alt 1				
				Alt 2	x			
				Alt 3		x		
Ricksecker's water scavenger beetle *Hydrochara ricksecker*i	FSC/--	Found in freshwater ponds, shallow water of streams marshes and lakes of San Francisco Bay area.	**Unknown.** Potential habitat may occur in slow moving tributaries to Sonoma Creek, Napa River and agricultural reservoirs.	**Phase 1**			x	x
				Alt 1			x	x
				Alt 2			x	x
				Alt 3			x	
Ubick's gnaphosid spider *Talanites ubicki*	--/--	Known only from serpentine areas of Mt. Burdell in Marin County.	**Unlikely.** This species is present at Mt. Burdell open space and mapped along San Marin Dr., which is now a built-up residential neighborhood along the proposed alignment.	**Phase 1**		x		
				Alt 1				
				Alt 2		x		
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Invertebrates (cont.)								
California brackishwater snail *Tryonia imitator = mimic tryonia*	--/--	Coastal lagoons, estuaries and salt marshes from Sonoma County to San Diego County. Found only in permanently submerged areas.	**Presumed present i**n tidal marshlands associated with Petaluma River, Napa River and Novato Creek.	**Phase 1**			x	
				Alt 1		x		x
				Alt 2		x		
				Alt 3				
Fish								
Central Valley Chinook salmon, fall/late fall run *Oncorhynchus tshawytscha*	FC/CSC	Spawns in the Sacramento and San Joaquin Rivers and their tributaries.	**Present.** Infrequently observed in Sonoma and Carriger Creeks, Napa River, Novato and Miller Creeks. Migrate through San Pablo Bay to upstream spawning grounds in the Sacramento and San Joaquin River basins.	**Phase 1**		x	x	x
				Alt 1		x	x	x
				Alt 2		x	x	x
				Alt 3			x	
Pacific lamprey *Lampetra tridentate*	FSC/CSC	Adults inhabit estuaries and nearby ocean areas with spawning in upstream freshwater gravel beds.	**Presumed present.** Adult lampreys seasonally breed in Sonoma Creek; juveniles are present year-round. Possibly in Petaluma, Napa and Novato Creeks.	**Phase 1**			x	
				Alt 1		x	x	x
				Alt 2		x	x	x
				Alt 3			x	
Longfin smelt *Spirinchus thaleichthys*	--/CSC	California populations of the species occur in estuaries and near-coastal waters from Monterey Bay to the Smith River	**Present.** This species is known to occur in San Pablo Bay, tidal reaches of the Napa river and associated marshes, and historically in the lower Petaluma River.	**Phase 1**				
				Alt 1		x		x
				Alt 2		x		x
				Alt 3				
Sacramento splittail *Pogonichthys macrolepidotus*	FSC/CSC	Endemic to Central Valley. Within the San Francisco Bay Estuary, splittail are found in the open-water floodplains and vegetated tidal channels, sloughs and backwaters of larger watersheds, and smaller tidal tributaries to these streams	**Present.** This species is known to occur in the Napa and Petaluma river estuaries.	**Phase 1**				
				Alt 1		x		x
				Alt 2		x		x
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Action area	Project Phase	LGVSD	Novato SD	SVCSD	Napa SD
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Amphibians								
Foothill yellow-legged frog *Rana boylii*	FSC/CSC	A year-round resident of cobble-lined streams; breeds in spring months after high water subsides.	**Unlikely.** Identified in montane streams, though not identified in action area.	**Phase 1**				x
				Alt 1				
				Alt 2				x
				Alt 3			x	
Reptiles								
Western pond turtle *Actinemys marmorata*	FSC/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands.	**Presumed present.** Known to occur in Napa, Sonoma and Marin County major creeks, tributary drainages, and agricultural ponds.	**Phase 1**		x	x	x
				Alt 1		x	x	
				Alt 2	x	x	x	x
				Alt 3		x	x	
Birds								
Sharp-shinned hawk *Accipiter striatus*	--/CSC	Nests in riparian growths of deciduous trees and live oaks.	**Moderate.** Nesting sites are available throughout wooded riparian margins within parts of the Sonoma, Napa, Novato and Las Gallinas Valley service areas. No documented nesting sites near alignment.	**Phase 1**		x	x	x
				Alt 1		x	x	x
				Alt 2	x	x	x	x
				Alt 3		x	x	
Cooper's hawk *Accipiter cooperii*	--/CSC	Nests in riparian growths of deciduous trees and live oak woodlands.	**Moderate.** Nesting sites are available throughout wooded riparian margins within parts of the Sonoma, Napa, Novato and Las Gallinas Valley service areas. No documented nesting sites near alignment.	**Phase 1**		x	x	x
				Alt 1		x	x	x
				Alt 2	x	x	x	x
				Alt 3		x	x	
Tricolored blackbird *Agelaius tricolor*	FSC/CSC	Scattered breeding locations in Sonoma county. Found among red-winged blackbird colonies. Nests in tall freshwater emergent marsh or weedy vegetation, brambles. Requires large foraging areas.	**Moderate.** 1997 record of nesting population at Sears Point, within 900 feet of proposed pipeline. Habitat not expected in ROW.	**Phase 1**		x	x	
				Alt 1		x	x	x
				Alt 2		x		x
				Alt 3		x		

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Birds (cont.)								
Bell's sage sparrow *Amphispiza belli belli*	FSC/CSC	Nests and forages in chaparral in the inner Coast Range.	**Low to moderate.** Scrub habitat on the fringes of Sonoma Creek, Novato Creek, and the east side of the Napa River and other drainages provide potential nesting habitat.	**Phase 1**			x	x
				Alt 1				
				Alt 2	x	x		x
				Alt 3			x	
Golden eagle *Aquila chrysaetos*	--/--/-- fully protected	Large trees in open areas and cliff-walled canyons provide nesting habitat. Forages in rolling foothills, mountain areas, flats and deserts.	**Moderate.** A single 2003 nesting site in a large eucalyptus tree within 200 feet of Alt 1 pipeline.	**Phase 1**				
				Alt 1				x
				Alt 2				
				Alt 3				
Great blue heron (rookery) *Ardea herodias*	--/--	West coast of California; Salton Sea and Colorado River area.	**Moderate.** 1982 record of long-term rookery on private land within 0.3 miles of Alt 2 pipeline in LGVSD.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3				
Burrowing owl *Athene cunicularia*	FSC/CSC	Nests and forages in low-growing grasslands that support burrowing mammals.	**High.** Recent occurrences at Sears Point within 0.4 miles of proposed Alt 2 pipeline; and southeastern Napa within 1.0 mile of Alt 2 pipeline and 0.2 miles of Hwy. 12; 1984 occurrence in Phase 1 pipeline route in south Novato; 1990s occurrences just south of Napa Salt Marsh proposed pipeline.	**Phase 1**		x	x	
				Alt 1		x		x
				Alt 2		x		x
				Alt 3		x		
Northern harrier *Circus cyaneus*	--/CSC	Nests in coastal freshwater and saltwater marshes, nest and forages in grasslands.	**Moderate.** Nesting sites are potentially present at proposed storage reservoirs, booster stations, and in or near cross-country pipelines routes. 2004 nesting location within 0.6 mile of Napa Salt Marsh pipeline.	**Phase 1**			x	
				Alt 1				x
				Alt 2		x		x
				Alt 3		x		

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Birds (cont.)								
California yellow warbler *Dendroica petechia brewsteri*	--/CSC	Nests in riparian areas dominated by willows, cottonwoods, sycamores, alders, or mature chaparral; may use urban areas near waterways.	**Low to moderate.** Potential breeding sites at stream crossing sites and marshy riparian habitat in Napa. Sonoma, and Novato service areas.	**Phase 1**		x	x	
				Alt 1		x	x	x
				Alt 2		x	x	x
				Alt 3		x	x	
White-tailed kite (nesting) *Elanus leucurus*	CDFG fully protected	Nests near wet meadows and open grasslands dense oak, willow or other large tree stands.	**Moderate.** Nesting sites are available in large oak and eucalyptus trees located throughout the action area.	**Phase 1**		x	x	x
				Alt 1		x	x	x
				Alt 2	x	x	x	x
				Alt 3		x	x	
California horned lark *Eremophila alpestris*	--/CSC	Occurs from Sonoma County south to the Mexican border.	**Moderate.** Habitat is present in grasslands in the Novato, Sonoma, and Napa service areas.	**Phase 1**			x	
				Alt 1				x
				Alt 2		x	x	x
				Alt 3		x		
Salt marsh common yellowthroat *Geothlypis trichas sinuosa*	FSC/CSC	Freshwater, salt and brackish marshes of San Francisco Bay only. Uses willows, tules, and tall grasses for nesting and cover.	**High.** Occurs in salt marshes throughout the action area.	**Phase 1**		x		x
				Alt 1		x		x
				Alt 2	x	x	x	x
				Alt 3		x		
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC	Scrub, open woodlands, and grasslands.	**Moderate.** Shrike nesting sites may occur at proposed storage reservoir and booster station sites, and in or near cross-country pipelines routes.	**Phase 1**			x	x
				Alt 1			x	
				Alt 2		x		
				Alt 3			x	
San Pablo song sparrow *Melospiza melodia samuelis*	FSC/CSC	Tidal marshes. Forages over mudflats. Nests in gumweed, fennel and other tall vegetation.	**Present.** San Pablo song sparrow is present in tidal marshes in the Novato, Las Gallinas Valley, Napa and Sonoma service areas.	**Phase 1**		x	x	
				Alt 1		x		x
				Alt 2	x	x	x	
				Alt 3		x		

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Birds (cont.)								
California thrasher *Toxostoma redivivum*	--/CSC	Cismontane foothills and lowlands; moderate to dense chaparral and uncommonly in open valley foothill riparian habitat.	**Low to moderate.** Though unlikely, this species could breed in brushy edges that border riparian habitat near site drainages.	**Phase 1**		x		x
				Alt 1				x
				Alt 2			x	
				Alt 3		x		
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.	**Present.** Roosting habitat available in large diameter oaks and under bridges. Known roosts are present within the pipeline route at Sonoma Creek Bridge; within 0.4 mile at Riverside Dr. Bridge; within 0.8 mile at Saintsbury Winery.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				
Pacific western "Townsend's" big-eared bat *Corynorhinus townsendii townsendii*	FSC/CSC	Forages in a variety of habitats; prefers mesic sites. Roosts in caves, mines, tunnels and buildings.	**Low to moderate.** Roosting habitat available in large diameter oaks and under bridges. Possible nursery roost within 2.5 miles from Phase 1 and Alt 2 pipelines in Novato.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC	Needs rock crevices, grassland, coastal scrub; may use urban areas.	**Low to moderate.** Roosting habitat available in large diameter oaks and under bridges.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				
Long-eared myotis *Myotis evotis*	FSC/--	Roosts in buildings, crevices, under bark, snags, and in forests. Caves are the primary night roost.	**Low to moderate.** Roosting habitat available in large diameter oaks and under bridges.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Mammals (cont.)								
Fringed myotis *Myotis thysansodes*	FSC/--	Roosts in caves, old buildings and under bark.	**Low to moderate.** Roosting habitat available in large diameter oaks and under bridges.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				
Long-legged myotis *Myotis volans*	FSC/--	Roosts in rock crevices, buildings, tree bark, snags, mines and caves. Trees are perhaps the most important daytime roosts for this species.	**Low to moderate.** Roosting habitat available in large diameter oaks and under bridges.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				
Yuma myotis *Myotis yumanensis*	FSC/CSC	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring.	**Low to moderate.** Roosting habitat available in large diameter oaks and under bridges.	**Phase 1**			x	
				Alt 1			x	x
				Alt 2		x		x
				Alt 3				
Suisun ornate shrew *Sorex ornatus sinuosus*	FSC/CSC	Upper edges of tidal marshes within northern shores of San Pablo and Suisun Bays.	**Moderate.** Within the action area, known to occur in Sears Point within 0.54 mile from Alt 2 and 3 pipelines.	**Phase 1**			x	
				Alt 1		x		x
				Alt 2	x	x		x
				Alt 3		x		
American badger *Taxidea taxus*	--/--/CSC	Prefers dry, open areas with friable soils.	**Low.** Grassland habitat present at Sears Point and north of railroad tracks between Sonoma and Napa; historical occurrences in Napa.	**Phase 1**			x	
				Alt 1				x
				Alt 2			x	x
				Alt 3			x	
Plants								
Franciscan onion *Allium peninsulare* var. *franciscanum*	--/--/List 1B	Cismontane woodland, valley and foothill grassland.	**Present.** Known population occurs in the Sonoma Alt 3 pipeline route on either side of Norrbum Road.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3			x	

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Action area	Project Phase	LGVSD	Novato SD	SVCSD	Napa SD
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Plants (cont.)								
Napa false indigo *Amorpha californica var. napensis*	FSC/--/ List 1B	Openings in broadleafed forest, chaparral, cismontane woodland.	**Present.** Known population occurs in the Sonoma Alt 3 pipeline route on either side of Norrbum Road.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3			x	
Bent-flowered fiddleneck *Amsinckia lunaris*	--/--/List 1B	Cismontane woodland, valley and foothill grassland.	**Unlikely.** Known to occur in Marin and Contra Costa Counties; 2 records from Marin. Nearest known population is over 3 miles from Novato Alt 2 pipeline.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3				
Sonoma canescent manzanita *Arctostaphylos canescens* ssp. *sonomensis*	--/--/List 1B	Chaparral, lower montane coniferous forest.	**Unlikely.** Known to occur in 1 record, a 1968 occurrence 1.5 miles from Alt 3 pipeline in north Sonoma.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3			x	
Mt. Tamalpais manzanita *Arctostaphylos hookeri* spp. *montana*	--/--/List 1B	Chaparral, valley and foothill grassland.	**Low to Moderate.** Based on CNDDB records. Entire Novato area is mapped as an undated record for this species; also LGVSD area. Habitat is present.	**Phase 1**				
				Alt 1		x		
				Alt 2	x	x		
				Alt 3				
Alkali milk-vetch *Astragalus tener* var. *tener*	FSC/--/ List 1B		**Unlikely.** Populations within 4.0 miles of the action area have been extirpated. Occurrences in Solano County and Petaluma vicinity are greater than 4 miles from the action area.	**Phase 1**				
				Alt 1				x
				Alt 2				x
				Alt 3				
San Joaquin spearscale *Atriplex joaquiniana*	FSC/--/ List 1B	Valley and foothill grassland, alkali meadow, chenopod scrub.	**Unlikely.** Two populations occur across the Napa River 0.8 mile from the Phase 1 pipeline.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Plants (cont.)								
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	--/--/List 1B	Valley and foothill grassland, cismontane woodland.	**Low.** Known populations are greater than 4.0 miles from Phase 1, Alt 1 and Alt 2 pipelines southeast of Napa service area.	**Phase 1**				x
				Alt 1				x
				Alt 2				x
				Alt 3				
Narrow-anthered California brodiaea *Brodiaea californica* var. *leptandra*	FSLC/--/ List 1B	Openings in broadleafed forest, chaparral, lower montane coniferous forest.	**Low.** An undated record occurs within 0.8 miles from Phase 1 pipeline in east Sonoma; a 1984 population occurs within 1.5 miles of Alt 3 pipeline in north Sonoma; several populations occur within 1.5 miles of Phase 1 and Alt 2 pipelines in northeast Napa, on preserves owned by the Sonoma Land Trust.	**Phase 1**			x	x
				Alt 1				
				Alt 2				x
				Alt 3			x	
Holly-leaved ceanothus *Ceanothus purpureus*	--/--/List 1B	Chaparral, rocky volcanic slopes.	**Unlikely.** Known to occur in Napa and Solano Counties. Occurs on hilly slopes about 0.8 miles upslope from the Napa service area Phase 1 and Alt 2 proposed pipelines.	**Phase 1**				x
				Alt 1				
				Alt 2				x
				Alt 3				
Sonoma ceanothus *Ceanothus sonomensis*	--/--/List 1B	Chaparral; sandy, serpentine or volcanic soils.	**Unlikely.** Known to occur in Sonoma and Napa Counties. Occurs on slopes outside of action area. An historical population occurs within 0.3 miles of Alt 3 pipeline in north Sonoma; other populations occur greater than 2 miles from Sonoma Alt 3 pipelines.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3			x	
Pappose tarplant *Centromadia parryi* spp. *parryi*	--/--/List 1B	Coastal prarie, meadows and seeps, coastal salt marsh, valley and foothill grassland.	**Unlikely.** A 1933 occurrence is mapped in the Novato Alt 2 pipeline alignment extending south from Sonoma to Sears Point.	**Phase 1**				
				Alt 1				
				Alt 2			x	
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Plants (cont.)								
Point Reyes bird's beak *Cordylanthus maritimus* spp. *palustris*	FSC/--/ List 1B	Coastal salt marsh.	**High.** Known to occur in Marin and Sonoma counties. Within the action area there is a 1990s extant population in LGVSD within 0.1 mile of the Alt 2 pipeline.	**Phase 1**				
				Alt 1				
				Alt 2	x			
				Alt 3				
Dwarf downingia *Downingia pusilla*	--/--/ List 2	Mesic grasslands, vernal pools. Known to occur in Napa, Sonoma and Solano counties.	**Low.** Historical records in Phase 1 Sonoma area; SVRWP EIR rare plant surveys were negative. Population in Sonoma Valley Regional Park 0.7 miles outside the Sonoma Alt 3 action area; undated CNDDB record within 0.3 mile of Napa Alt 2 pipeline; 1960s occurrence in the Alt 2 pipeline alignment from south Sonoma heading to Sears Point.	**Phase 1**			x	
				Alt 1				
				Alt 2			x	x
				Alt 3			x	
Greene's narrow-leaved daisy *Erigeron greenei*	--/--/List 1B	Found in serpentine soils on dry slopes among chaparral.	**Unlikely.** Known to occur in several occurrences in Sonoma and Napa counties outside the action area; nearest occurrence is historical, greater than 1 mile from Alt 2 pipeline in north Napa.	**Phase 1**				
				Alt 1				
				Alt 2				x
				Alt 3				
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	--/--/List 1B	Found in sandy or gravelly serpentine soils of chaparral, coastal prarie, cismontane woodland, valley and foothill grasslands.	**Unlikely.** A historical occurrence is within 1 mile southeast of the LGVSD Alt 2 pipeline. An undated record occurs is within 2 miles southwest of the south Novato Phase 1 and Alt 2 pipelines.	**Phase 1**		x		
				Alt 1				
				Alt 2	x	x		
				Alt 3				
Fragrant fritillary *Fritillaria liliacea*	FSC/--/ List 1B	Found in loamy clay soils of open grassland; rocky soils; coastal scrub. Often associated with vernal pools and mima mounds.	**Unlikely.** This species is present at Mt. Burdell open space. Action area along San Marin Dr. is a built-up residential neighborhood.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Plants (cont.)								
Brewer's western flax *Hesperolinon Breweri*	--/--/List 1B	Found in grassy or brushy slopes with serpentine soils along the inner Coast Ranges. Associated with chaparral; prefers shade.	**Unlikely.** Nearest record is an 1891 occurrence 5 miles east of Napa Phase 1 pipelines.	**Phase 1**				x
				Alt 1				
				Alt 2				
				Alt 3				
Napa western flax *Hesperolinon* sp. nov. *serpentinum*	--/--/List 1B	Chaparral, usually in serpentine soils.	**Low.** Nearest occurrence is 0.8 miles northeast of north Napa Phase 1 pipelines.	**Phase 1**				x
				Alt 1				
				Alt 2				
				Alt 3				
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	FSC/--/-List 1B	Found in the freshwater marshes of Suisun and San Pablo Bays.	**High.** Known to occur in Napa county. Extant population where Napa Salt Marsh pipeline crosses Huichica Creek; several known extant populations in vicinity of Napa Salt Marsh pipeline and Napa SD Phase 1, Alt 1, and Alt 2 pipelines.	**Phase 1**			x	x
				Alt 1				x
				Alt 2				x
				Alt 3				
Legenere *Legenere limosa*	--/--/ List 1B	Vernal pools.	**Low to Moderate.** Extant population within 0.4 miles of Napa Alt 2 pipeline. Habitat not expected in ROW.	**Phase 1**				
				Alt 1				
				Alt 2				x
				Alt 3				
Jepson's leptosiphon = Jepson's linanthus *Leptosiphon jepsonii=Linanthus jepsonii*	FSLC/--/ List 1B	Openings in chaparral, cismontane woodland (usually volcanic or periphery of serpentinite).	**Unlikely.** Nearest record is 6 miles west of Sonoma Alt 3 pipelines.	**Phase 1**				
				Alt 1				
				Alt 2				
				Alt 3			x	
Mason's lilaeopsis *Lilaeopsis masonii*	FSC/--/ List 1B	Freshwater marshes, brackish flats, and coastal salt marshes. From North San Pablo Bay south to Baja California.	**Moderate.** Known occurrences along Napa River; habitat present where Alt 1 and 2 pipelines cross Napa River.	**Phase 1**				
				Alt 1				x
				Alt 2				x
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Action area	Project Phase	LGVSD	Novato SD	SVCSD	Napa SD
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Plants (cont.)								
Baker's navarretia *Navaretia leucocephala* spp. *bakeri*	--/--/List 1B	Cismontance woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest.	**Unlikely.** This species is present at Mt. Burdell open space. Action area along San Marin Dr. is a built-up residential neighborhood.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3				
California beaked-rush *Rhynchospora californica*	--/--/List 1B	Lower montane coniferous forest, in meadows, seeps, bogs, marshes, and swamps.	**Unlikely.** Nearest occurrence is on Mt. George in a spring-fed area 1 mile northeast of north Napa Phase 1 and Alt 2 pipelines.	**Phase 1**				x
				Alt 1				
				Alt 2				x
				Alt 3				
Point Reyes checkerbloom *Sidalcea calycosa* ssp. *rhizomata*	--/--/List 1B	Marshes and swamps, usually in coastal slopes and coastal praries.	**Unlikely.** Nearest occurrences are: Marin County greater than 6 miles west from LGVSD Alt 2 pipelines; 1.8 miles east of north Napa Phase 1 and Alt 2 pipelines.	**Phase 1**				
				Alt 1				x
				Alt 2	x			x
				Alt 3				
Mt. Tamalpais bristly jewel-flower *Streptanthus glandulosas* spp. *pulchellas*	--/--/List 1B	Chaparral, valley and foothill grasslands, endemic to Marin County.	**Unlikely.** Closest known occurrence is from 1945 on private land 1.2 miles southwest of Novato Alt 2 pipeline, 2-3 miles west of Hamilton Air Base.	**Phase 1**				
				Alt 1				
				Alt 2		x		
				Alt 3				
Suisun marsh aster *Symphyotrichum lentum*	--/--/List 1B	Brackish and freshwater marshes and swamps.	**Moderate.** Habitat is present in marshes throughout the eastern action area. Known populations occur within 1.5 miles of Napa Phase 1, Alt 1 and Alt 2 pipelines.	**Phase 1**			x	x
				Alt 1				x
				Alt 2				x
				Alt 3				
Saline clover *Trifolium depauperatum* var. *hydrophilum*	--/--/List 1B	Valley and foothill grassland, marshes and swamps, vernal pools.	**Low.** An extant population occurs within 0.3 mile of SVCSD Alt 2 pipelines in southern Sonoma. An extirpated population occurred within 0.7 mile of the southern Napa Alt 2 pipeline.	**Phase 1**				
				Alt 1				
				Alt 2			x	x
				Alt 3				

TABLE 3.5-1 (Continued)
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

Common Name ***Scientific Name***	**Listing Status USFWS/CD FG/ CNPS**	**General Habitat Requirements**	**Potential for Species Occurrence Within the Action area**	**Project Phase**	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)								
Plants (cont.)								
Oval-leaved viburnum *Viburnum ellipticum*	--/--/ List 2	Openings in chaparral, cismontane woodland, lower montane coniferous forest.	**Low.** Historical records in immediate vicinity of Sonoma Phase 1 And Alt 3 pipelines; rare plant surveys for Phase 1 were negative. Populations presently occurs greater than 2.5 miles east of Napa Phase 1 pipelines.	**Phase 1**			x	
				Alt 1				
				Alt 2				
				Alt 3			x	

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
CSC = California Species of Special Concern
* = Special Animals

Shaded areas= no pipelines proposed for the service area
x = species present or potentially present
blank = No CNDDB occurrences reported in action area.

SOURCE: CNPS, 2008; CDFG, 2008; USFWS, 2008.

also consulted (Jones and Stokes 2003; ESA, 2005; ESA, 2006). Based on search results, a total of 41 special-status plant species have potential to occur in the action area. Of these 41 species, twenty-four are unlikely to occur in the action area; eight have low potential to occur in the action area; five have moderate potential to occur in the action area; two have high potential to occur in the action area; and the following three are present based on known distribution: federal and state endangered Sonoma sunshine, California List 1B franciscan onion (*Allium peninsulare* var. *franciscanum*), and California List 1B Napa false indigo (*Amorpha californica* var. *napensis*). The exact distribution of these species in the project ROW is unknown, and they may not occur on the road shoulder or in the road right-of-way. It is also unknown whether pipelines in these areas would be installed in the roadway or whether project disturbance would extend to the road shoulder or the road right-of-way. Subsequent project-level analyses and focused plant surveys would be required for Alternatives 1, 2 and 3 except for SVCSD recycled water service area Basic System pipelines as described below.

The Sonoma Valley Recycled Water Project (SVRWP) EIR was a project-level analysis of pipeline alignments coincident with Phase 1 and Basic System pipeline alignments evaluated in this EIR, excepting the pipeline extending to the Napa Salt Marsh Restoration Area. Rare plant surveys were conducted along the SVRWP alignments for Napa false indigo (*Amorpha californica* var. *napensis*), Sonoma sunshine (*Blennosperma bakeri*), narrow-anthered California brodiaea (*Brodiaea californica* var. *leptandra*), dwarf downingia (*Downingia pusilla*), largeleaf filaree (*Erodium macrophyllum*), legenere (*Legenere limosa*), Jepson's leptosiphon (*Leptosiphon jepsonii=Linanthus jepsonii*), Mt. Diablo cottonweed (*Micropus amphibolus*), and oval-leaved viburnum (*Viburnum ellipticum)*. None of the target species were observed in the SVRWP action area during appropriately-timed botanical surveys. The disturbed nature of undeveloped portions of the project site in combination with the presence of non-native annual grasses that favor disturbed areas likely prohibits the establishment of target special-status plant species.

Focused plant surveys have not been performed for project alignments in the LGVSD, Novato SD, or Napa SD recycled water service areas.

Special-status Wildlife

An initial list of special-status wildlife species known to occur in the general project region and potentially occurring within the action area was compiled on the basis of the following: an analysis of previous studies conducted in the project region concerning special-status wildlife (Jones and Stokes, 2003; ESA, 2005; ESA, 2006); data from the CNDDB (CDFG, 2008) and USFWS (USFWS, 2009); review of pertinent scientific literature about the sensitive species of concern; review of the most recent Notice of Review for federally-listed and candidate animals; review of the CDFG's most recent list of special animals and plants (which also includes federally-listed and candidate plants); review of the CNPS database ; and ESA biologists' familiarity with local wildlife resources.

Reconnaissance surveys were conducted in 2008 on January 9 and 10; February 25; April 16, 22, 25, and 29; May 5, 16, and 22; and June 11; and in 2009 on January 13th to assess available habitat in the action area. ESA considered factors such as available habitat, habitat quality, and

species distribution in evaluating the likelihood of special-status species occurrence in the action area.

Potential habitat was identified for 50 special-status species, of which several are present or presumed present in or near the action area: seven threatened or endangered species (California freshwater shrimp, steelhead, California red-legged frog, western snowy plover, California black rail, California clapper rail, and salt marsh harvest mouse) and 6 non-listed special-status species (Ricksecker's water scavenger beetle, California brackish water snail; Pacific lamprey; Sacramento splittail; western pond turtle, and pallid bat). On the basis of this biological resources analysis, it was determined that habitat for threatened, endangered, and otherwise special-status wildlife species near the proposed project alignment is generally restricted to within stream corridors, ponds, freshwater marshes, grasslands, salt pond levees, salt marshes, and areas in the immediate vicinity of such features that are crossed by the proposed pipeline or adjacent to proposed alignments within existing roadways. Public road rights-of-way are not particularly sensitive relative to special-status species.

Focused protocol-level surveys were not conducted for special-status wildlife species. As a result, this report describes those areas that have been identified to support sensitive wildlife species (CDFG, 2008), and those capable of supporting such species based on the field assessment. The general ecology for special-status species identified as having the greatest potential to occur in or near the proposed project are described below.

Special-status Fish

An initial list of special-status fish species known to occur in the general project region and potentially occurring within the action area was compiled on the basis of the following: an analysis of previous studies conducted in the project region concerning special-status fish species presence (ESA, 2005; ESA, 2006; Jones and Stokes, 2003); data from the CNDDB (2008) and USFWS (2009); review of pertinent scientific literature about the sensitive species of concern (e.g., Moyle, 2002: Leidy, 2007); review of the most recent Federal Register notices for federally-listed and candidate species; and ESA biologist's familiarity with local fisheries resources. Focused fish surveys were not performed for the purposes of this Draft EIR.

Based on the results of the review, a total of nine special-status fish species have potential to occur in the action area, including San Pablo Bay. Of these nine species, two are unlikely to occur in the action area due to their presumed extirpation from San Francisco Bay drainages (coho salmon, tidewater goby); four are known to occur in San Pablo Bay and may occur in the lower tidal reaches of action area drainages, but are not expected to occur within the upper freshwater portions of action area streams and rivers (delta smelt, green sturgeon, longfin smelt, Sacramento splittail); and three have a high potential to occur both in San Pablo Bay and in action area drainages (steelhead, Chinook salmon, Pacific lamprey).

Special-status Vegetation Communities

Northern Coastal Salt Marsh

Northern coastal salt marsh is usually found along sheltered inland margins of estuaries, lagoons and bays that are subject to regular tidal influence. Vegetation changes with the salinity gradient but always consists of salt-tolerant plants, usually perennials that form a moderate to dense land cover. Vegetation characteristic of northern coastal salt marsh includes pickleweed, saltgrass (*Distichlis spicata*), alkali heath (*Frankenia grandifolia*), marsh gumplant (*Grindelia stricta*), and California cordgrass. Adjacent communities include valley grassland and freshwater marsh. Northern coastal salt marsh occurs where Alternatives 1 and 2 pipelines approach and cross the Petaluma River; where the Fully Connected System pipeline crosses Sears Point; along off-road portions of the Partially Connected System pipeline near the Novato WWTP and west of Hamilton Field; and along the north side of San Pedro Road at Peacock Gap in the LGVSD. Northern coastal salt marsh could be impacted by the project at the stated off-road locations, and where it occurs in the road right-of-way.

Coastal Brackish Marsh

Coastal brackish marsh communities are similar to coastal salt marsh communities but receive freshwater from area creeks and drainages. Salinity levels fluctuate with rainfall and drainage patterns, and with tidal variations. Brackish marshes usually intergrade with coastal salt marshes along coastal or bay fringes and with freshwater marshes at upstream drainages. Vegetation is usually dense and dominated by tall, perennial monocots that can reach six feet in height. Typical vegetation includes sedges (*Carex* spp.), rushes (*Juncus* spp.), bulrush (*Scirpus* spp.), and cattails (*Typha* spp.). Coastal brackish marsh occurs at several locations along the Phase 1 pipeline extending from Sonoma to the Napa Salt Marsh Restoration Area, and where the Basic System and Alternative 2 pipelines approach and cross the Napa River. This vegetation community could be impacted at the Petaluma River crossing and along the Phase 1 pipeline.

Northern Vernal Pool

Northern vernal pools occur in Mediterranean-climate regions with heavy winter rains and long, dry summers. Vernal pools form in intermediate depressions underlain by an impermeable soil layer. Water is retained during the winter rainy season for a length of time sufficient to prevent terrestrial plants from growing; specialized vernal pool vegetations tend to grow in a pattern of concentric rings as the pools dry. Vernal pool plants include brass buttons (*Cotula coronopifolia*), downingia (*Downingia* spp.), and spikerush (*Eleocharis macrostachya*). Goldfields (*Lasthenia* spp.) and owl's-clover (*Castilleja* spp.) are also associated with vernal pools. Vernal pool communities are most common in open grassland, and a community is present in the southern SVCSD action area southeast of the junction of Highway 116 and Bonness Road. This land parcel adjacent to Highway 116 on the east appears to be uncultivated open grassland, and vernal pools could be present in the road right-of-way.

Species Accounts

Listed Species – Plants

Sonoma Sunshine (*Blennosperma bakeri*)

Sonoma sunshine is a federal and state-listed endangered species. Sonoma sunshine is a California endemic, restricted to vernal pools, shallow depressions, and intermittent swales within mesic valley and foothill grasslands on the Santa Rosa Plain and the adjacent Sonoma Valley in Sonoma County. Its blooming period is March through May. This species is threatened by urbanization, irrigation with wastewater effluent, and conversion of habitat to agricultural lands, as well as possibly threatened by non-native plants, foot traffic and road maintenance. Sonoma sunshine is present in the recycled water service area along Bonneau Road. Focused surveys are needed to determine presence or absence in the project ROW.

Soft Bird's Beak (*Cordylanthus mollis* spp. *mollis*)

Soft bird's beak is a federal endangered species, and is listed by the California Native Plant Society (CNPS) as rare and endangered (CNPS List 1B). Soft bird's beak is found in coastal salt marshes at elevations of 0-3 meters with a blooming period of July through November. Soft bird's-beak is endemic to the San Pablo Bay and Suisun Bay area. This listed subspecies was historically found in high tidal marshes along the Petaluma and Napa Rivers through the Carquinez Strait to Suisun Bay and the San Joaquin-Sacramento River Delta spanning Marin, Sonoma, Napa, Solano, Contra Costa, and Sacramento Counties. Soft bird's beak is presently known to occur in fewer than 15 populations limited to the edges of San Pablo Bay, Suisun Marsh, and the Petaluma River. The species is threatened by non-native plants, erosion, trampling, and marsh drainage. Soft bird's beak is present at Fly Bay near the Napa Salt Marsh Restoration Area; focused surveys are needed to determine presence or absence in the project ROW. A population near the proposed Huichica Creek crossing is believed to be extirpated.

Contra Costa Goldfields (*Lasthenia conjugens*)

Contra Costa goldfields is a federal endangered species and a CNPS List 1B species. Contra Costa goldfields grows in vernal pools within open grassy areas in woodlands and valley grasslands. Its blooming period is March through June. This species has been extirpated from Santa Barbara and Santa Clara counties by agricultural land conversion, urbanization and creek channelization. Nearly all of the remaining populations are imminently threatened by urban development or agricultural land conversion. Currently, 22 populations are believed to be extant in Mendocino, Napa, Marin, Contra Costa, Alameda, Solano and Monterey counties. An extant population occurs 0.12 mile north of alignments in the Napa SD recycled water service area, but this species is not known to occur in the project ROW.

Two-fork Clover (*Trifolium amoenum*)

Two-fork clover is a federal endangered species and a CNPS List 1B species. Historically, two-fork clover ranged from Mendocino County south to Sonoma, Marin, Alameda and Santa Clara counties, and east to Napa and Solano counties. The species was found in a variety of habitats including low, wet swales, grasslands and grassy hillsides. It typically grows in moist, heavy soils

below 100 meters (328 feet) altitude with a blooming period of April through June. Historical habitat has been lost to urbanization and agriculture. A population historically occurred at Fly Bay, but may be extirpated.

Listed Species – Fish

Winter-run, Fall-run, and Spring-run Chinook Salmon (Oncorhynchus tshawytscha)

The population of Chinook salmon in San Francisco Bay is comprised of four races: fall-run, late fall-run, spring-run, and winter-run. These races are distinguished by the seasonal differences in adult upstream migration, spawning, and juvenile downstream migration. Chinook salmon are anadromous fish, spending three to five years at sea before returning to freshwater to spawn. Chinook salmon generally require cool, clean, and well-oxygenated water in streams and rivers that contain adequately sized spawning gravels, instream cover, and riparian shading. Migration barriers in the form of dams, grade control structures, culverts, or water diversion structures significantly limit Chinook salmon access to historical habitat throughout their range. These fish pass through San Francisco Bay waters, including San Pablo Bay, to reach their upstream spawning grounds. In addition, juvenile salmon migrate through the Bay en route to the Pacific Ocean.

The Central Valley (Sacramento) winter-run Chinook salmon, listed as both State and federally endangered, migrate through San Francisco Bay from December through July with a peak in March. Spawning is confined to the mainstem Sacramento River and occurs from mid-April through August. Juveniles emerge between July and October, and are resident in their natal stream for 5 to 10 months followed by an indeterminate residency period in estuarine habitats.

The State and federal-listed threatened Central Valley spring-run Chinook salmon migrate to the Sacramento River from March to September with a peak spawning period between late August and October. Juvenile salmon emerge between November and March, and are resident in streams for a period of 3 to 15 months before migrating to downstream habitats.

The Central Valley fall-run and late fall-run Chinook salmon are federal candidates for listing, and California Species of Special Concern. These salmon enter freshwater from June through December and spawn from October through December, with a peak in November.

Central California Coast and Central Valley Steelhead (Oncorhynchus mykiss)

Central Valley and Central Coast steelhead, like Chinook salmon, are anadromous. Adult steelhead spawn in freshwater and the juveniles migrate to the Pacific Ocean where they reside for a period of years before returning to the river system to spawn. Adult steelhead migrate upstream during the fall and winter (September through approximately February) with Central Valley steelhead migration into the upper Sacramento River typically occurring during the fall and adults migrating into lower tributaries typically during the late fall and winter. Steelhead spawn in areas characterized by clean spawning gravels, cold-water temperatures, and moderately high velocity. Spawning typically occurs during the winter and spring (December – April) with the majority of spawning activity occurring during January and March. Unlike Chinook salmon

that die after spawning, adult steelhead may migrate downstream after spawning and return to spawn in subsequent years. Juvenile steelhead rear within the stream system for one or more years before migrating to the ocean. Downstream migration of juvenile steelhead typically occurs during the late winter and early spring (January – May). The seasonal timing of downstream migration of Central Valley and Central Coast steelhead may vary in response to a variety of environmental and physiological factors including changes in water temperature, changes in stream flow, and increased turbidity resulting from stormwater runoff. The juvenile steelhead rear within the coastal marine waters for approximately 2 to 3 years before returning to their natal stream as spawning adults.

Delta smelt (Hypomesus transpacificus)

The delta smelt, a federal and State listed threatened species, is a small, slender-bodied fish which is able to tolerate a wide salinity range and is native to the Sacramento-San Joaquin estuary. The fish live in schools and primarily feed on planktonic crustaceans, small insect larvae and mysid shrimp. This species, which has a one-year life span, live primarily along the freshwater edge of the saltwater-freshwater interface of the Sacramento-San Joaquin Delta. Prior to spawning, Delta smelt migrate upstream from the brackish-water habitat to river channels and tidally influenced backwater sloughs to spawn. Migration and spawning occur between December and June. They are found seasonally throughout Suisun Bay and in small numbers in larger sloughs and channels of the western Delta (e.g., Lindsey Slough) when spawning. During high outflow periods, they may be washed into San Pablo Bay, but they do not establish permanent populations there (Moyle, 2002). However, Delta smelt have been recorded in the Napa River and marshes during dry and critically dry years, suggesting that populations there may be resident, although there is evidence that populations in the Napa River may not persist (Leidy, 2007).

In May 2006, an emergency petition seeking to re-list delta smelt as endangered was submitted to the USFWS.

Green sturgeon (Acipenser medirostris)

The southern DPS of green sturgeon is a federal threatened species. This anadromous fish is the most widely distributed member of the sturgeon family and the most marine-oriented of the sturgeon species. Green sturgeons range in the nearshore waters from Mexico to the Bering Sea and are common occupants of bays and estuaries along the western coast of the United States. Adults in the San Joaquin Delta are reported to feed on benthic invertebrates including shrimp, amphipods and occasionally small fish while juveniles have been reported to feed on opossum shrimp and amphipods. Adult green sturgeons migrate into freshwater beginning in late February with spawning occurring in March through July, with peak activity in April and June. After spawning, juveniles remain in fresh and estuarine waters for 1-4 years and then begin to migrate out to the sea. The upper Sacramento River has been identified as the only known spawning habitat for green sturgeon in the southern DPS.

Listed Species - Animals

Myrtle's Silverspot Butterfly (*Speyeria zerene myrtlene*)

Myrtle's silverspot butterfly, a federally-endangered species, is known from foggy coastal praries and mixed grassland/scrub areas in Sonoma, Marin and San Mateo counties at elevations ranging from sea level to 1,000 feet. Critical factors in the distribution of Myrtle's silverspot include the presence of the presumed larval host plant, *Viola adunca* (western violet), and availability of nectar sources for adults. Temperatures are moderated by fog, which keeps summers relatively cool and winters relatively warm compared to inland habitats. In the recycled water service areas, Myrtle's silverspot butterfly is known to occur in hills northwest of Sears Point. Habitat is not expected in the project ROW.

California Freshwater Shrimp (Syncaris pacifica)

The California freshwater shrimp is a federal- and state-listed endangered species. This species is endemic to 17 coastal streams in Marin, Sonoma, and Napa counties north of San Francisco Bay. Streams that support California freshwater shrimp present a broad range of stream and water temperature conditions that are characteristic of coastal streams. They have been found in low elevation (less than 380 feet) and low gradient (generally less than one percent) perennial coastal streams.

California freshwater shrimp are generally found in stream reaches where banks are structurally diverse with undercut banks, exposed roots, overhanging woody debris, or overhanging vegetation. Optimal habitat conditions for the shrimp occur under stream conditions with 12 to 35 inches in depth with exposed live roots (e.g., alder and willow trees) along undercut banks (greater than 6 inches) with overhanging stream vegetation and vines. Such areas provide cover from swift currents as well as some protection from high sediment concentrations associated with high stream flows. Adults reach sexual maturity by the end of their second summer of growth. Thereafter, they breed once a year in the fall. Females produce about 50 to 120 eggs, which remain attached to their mother throughout the winter.

Though endemic to Marin, Sonoma and Napa county streams, within the recycled water service area stream crossings, only Sonoma Creek is known to support California freshwater shrimp. They are presumed present.

California Red-legged Frog (*Rana draytonii*)

The California red-legged frog is a federally-listed threatened species and a California species of special concern. 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.

California red-legged frog is present in roadside drainages along Lakeville Highway in south Petaluma. This species also occurs in upslope ponds near Sears Point Raceway and agricultural ponds in south Sonoma.

Swainson's Hawk (*Buteo swansonii*)

Swainson's hawk is a state-listed threatened species. These medium-sized opportunistic predators feed on rodents, rabbits, bats, large arthropods, amphibians, reptiles, birds, and, rarely, fish. This species arrives in California in late February and departs for wintering grounds in early September. Eggs are typically laid in April and early May. Swainson's hawks reside in a wide variety of open habitats, including prairies, grasslands, and intensively farmed areas. Nests are usually constructed in riparian corridors adjacent to agricultural fields or pastures. Swainson's hawks were historically distributed throughout the lowlands of California, absent only from the Sierra Nevada, north Coast Ranges and Klamath Mountains, and portions of the southern California deserts. The highest density currently is in the Central Valley, between Sacramento and Modesto, and in the northern San Joaquin Valley.

Swainson's hawk is present in the Napa SD recycled water service area. A single nest, recorded in 2005, is located in a riparian oak tree approximately 200 feet from the alignment. A second pair may have nested nearby (CDFG, 2008).

Western Snowy Plover (*Charadrius alexandrinus nivosus*)

The western snowy plover is a federally-listed threatened species and a state Species of Concern. The western snowy plover is a small, 6-inch migratory shorebird found on sandy marine and estuarine shores and at some inland nesting locations. Small numbers are year-round inhabitants at salt ponds on the San Francisco Bay. The threatened Pacific Coast population is defined as those nesting adjacent to the tidal waters of the Pacific Ocean, known to breed from Washington to Baja California. This species gleans insects and amphipods from the dry sand of upper beaches, but occasionally forages in kelp or in wet sand for young sand crabs. They also feed on brine flies at salt ponds. Western snowy plovers rely on camouflage for cover, crouching motionless when danger is suspected.

For nesting they require friable soil, usually sand or gravel, above the high tide line, preferring to nest on coastal beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries. They are uncommon nesters at dry salt ponds and salt pond levees, but such nesting has become more common in response to human disturbances. Nests are shallow depressions sometimes lined with pebbles, gravel, or fragments of glass. They are frequently located near or under driftwood, rocks, or defoliated bushes. The breeding season is March 1 through September 30, clutches average 3 eggs, and parents share incubation duties. Western snowy plovers are polyandrous and the female often abandons the brood, leaving the male to raise the precocial chicks while she mates again for a second clutch. Chicks usually fledge within 31 days.

Western snowy plovers are predated at all life stages by gulls, ravens, coyotes, and skunks. The encroachment of non-native European beachgrass (*Ammophila arenaria*) has also reduced available nesting habitat. The greatest threats are human disturbance, with the breeding season coinciding with the warmest summer months and peak human recreation at sandy beaches.

Western snowy plover nest on salt pond levees at Fly Bay and Salt Pond 7A in the Napa Salt Marsh Restoration Area.

California Black Rail (*Laterallus jamaicensis*)

The California black rail is a state-listed threatened species. The sparrow-sized California black rail is a year-round resident of saline, brackish and freshwater emergent wetlands in the San Francisco Bay Area, the Sacramento-San Joaquin Delta, and a few other locations, including small, isolated populations in southeastern California and western Arizona (CWHR, 2005). This species is found in tidal wetlands dominated by pickleweed, in brackish marshes dominated by pickleweed and bulrush, and in freshwater marshes with bulrush, cattails, and saltgrass (*Distichlis spicata*) as dominant vegetation. Heard but rarely seen, black rail live and breed in the high wetland zone, an area with minimal water-level fluctuation. They pick isopods, athropods and insects from the mud or from vegetation. Breeding season is from March through June, and the majority of breeding in northern California is thought to occur in San Pablo Bay. They make deep, loose cup nests at ground level or slightly elevated in pickleweed or other dense vegetation, with an average clutch size of six eggs in California.

Black rails are predated by raptors, large wading birds, and domestic cats. In areas where transitional vegetation between the high wetland zone and the upland zone is absent, predation can be intense (Evens et. al., 1991). Habitat loss is the greatest threat to this species, and the loss of higher wetlands and transitional wetlands throughout San Francisco Bay is thought to be responsible for eliminating breeding populations in the southern parts of the Bay (CWHR, 2005).

California black rail is present in tidal marshes at Novato SD, SVCSD, and LGVSD recycled water service areas.

California Clapper Rail (*Rallus longirostris obsoletus*)

The California clapper rail is a federal- and state-listed endangered species, federally listed on October 13, 1970 (35 FR 16047). California clapper rails can be found year-round in coastal wetlands and brackish areas around San Francisco and Monterey Bays. These medium-sized birds require emergent wetlands and mud flats for survival, preferring salt marshes dominated by Pacific cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia pacifica*). They can also be found in brackish or freshwater marshes where dense bulrush or cattails grow. Clapper rails will forage in higher marsh vegetation along the mudflat interface and in tidal creeks, feeding on crabs, mussels, clams, snails, insects, spiders, worms, and even mice and dead fish. Clapper rails nest in lower tidal zones where cordgrass grows abundantly and tidal sloughs are nearby, building a nesting platform concealed by a canopy of woven cordgrass, pickleweed, or marsh gumplant (*Grindelia stricta*), or of cattail (*Typha spp.*) or bulrush (*Scirpus spp.*) in fresh and brackish

waters. In the Bay Area, the breeding season varies but is typically described from February 1 through August 31, with an average clutch size of 7.6 with 38% hatching success.

Adult California clapper rails are preyed upon by raptors and mammals, while rats predate on eggs and young. In northern California, populations may fluctuate according to rainfall patterns. Agricultural and urban development, accompanied by the filling and diking of wetlands, has led to the destruction of emergent wetland habitat and particularly cordgrass marshes.

California clapper rail is present in tidal marshes at Novato SD, SVCSD, and LGVSD recycled water service areas.

Salt Marsh Harvest Mouse (*Reithrodontomys raviventris halicoetes*)

The salt marsh harvest mouse is a federal- and state-listed endangered species. The salt marsh harvest mouse is found only in a few northern California locations. There are two subspecies, the northern salt marsh harvest mouse (*R. r. halicoetes*) found in the salt marshes of San Pablo and Suisun Bays, and the southern salt marsh harvest mouse (*R. r. raviventris*) found in salt marshes of San Francisco Bay and a few locations in Corte Madera and Richmond. The Collinsville-Antioch area is the eastern limit of distribution, and movement among marshes is infrequent if it occurs at all. This species is critically dependent on dense cover, preferring pickleweed, and is seldom found in cordgrass or alkali bulrush (*Scirpus maritimus*). The value of pickleweed increases with depth, density and the degree of intermixing with fat hen (*Chenopodium spp*.) and alkali heath (*Frankenia grandifolia*). Transitional upper tide zones with peripheral halophytes are used to escape high tides, and even adjoining grasslands are used during the highest winter tides.

The salt marsh harvest mouse eats grass, leaves, seeds, and stems of plants, including pickleweed and saltgrass. Fresh water is required, but both subspecies can drink brackish or salty water for short periods. They are primarily nocturnal, but some afternoon activity does occur. Breeding takes place between March and November, and there are 1 to 2 litters per year with an average litter size of four. This species does not burrow. The northern subspecies makes a minimal nest of grass and sedge, often built over an old bird’s nest.

Salt marsh harvest mice are predated by owls, hawks, gulls, weasels, and other mammals. Their greatest threat is habitat reduction and degradation. Historically, tidal marshes and open mudflats surrounding San Pablo Bay neared 80,000 acres. There has been an 82% reduction in North Bay wetlands since the 1800s, with most of it diked, drained and claimed for agricultural use. The resulting changes in salinity and vegetation support only small, disconnected salt marsh harvest mouse populations. Small, fragmented habitats that are completely submerged during high tides and lack transitional upper tidal zones likely result in breeding failures and increased predation.

Salt marsh harvest mouse is present in salt marshes at SVCSD, Novato SD and LGVSD recycled water service areas but is not expected in the project ROW.

Non-listed Special-status Species - Plants

Species accounts are provided for non-listed special-status plants that are present or have at least a moderate potential to occur in the recycled water service areas.

Franciscan Onion (Allium peninsular var. franciscanum)

A California List 1B plant, the Napa False Indigo grows on dry, open or wooded slopes at elevations below 3,000 feet. In the North Bay, the inner coast ranges provide foothills woodlands and valley grasslands that support this species. A known population occurs in the Alternative 3 action area in southern Sonoma.

Mt. Tamalpais Manzanita (Arctostaphylos canescens ssp. sonomensis)

A California List 1B plant, the Mount Tamalpais manzanita occurs on serpentine flats and slopes. It grows as a low spreading, bushy perennial, often rooting where its branches touch the ground. The species produces small, whitish flowers from February to April, and is known from fewer than 20 occurrences near Mt. Tamalpais in Marin County. Mt. Tamalpais manzanita has a low potential to occur along off-road pipelines in the Novato SD recycled water service area, but is not expected in the project ROW along roadways.

Pt. Reyes Bird’s Beak (Cordylanthus maritimus ssp. palustris)

A California List 1B plant, Pt. Reyes bird’s beak is known from coastal salt marshes in Marin and Sonoma counties. While not expected in the project ROW, this species occurs in salt marshes adjacent to the LGVSD recycled water service area alignment.

Delta Tule Pea (Lathyrus jepsonii var. jepsonii)

This List 1B species occurs in freshwater sloughs and rivers in eastern San Pablo Bay and the Sacramento Delta. The tule pea has lavender to reddish-purple flowers and is difficult to distinguish from its upland variety; taxonomic designations are based on habitat. Levee construction has resulted in loss of habitat. Delta tule pea has a high potential to occur in the SVCSD recycled water service area at the Huichica Creek crossing, and several populations are known in the vicinity of proposed Napa SD recycled water service area pipelines.

Legenere (Legenere limosa)

A California List 1B plant, legenere is a small annual that grows in valley grasslands within the dried beds of vernal pools. Its blooming period is May through June. A known population occurs in Napa, but this species is not expected in the action area.

Mason’s Lilaeopsis (Lilaeopsis masonii)

Mason's lilaeopsis is a small, perennial fresh or brackishwater plant known from river banks along the Sacramento, San Joaquin and Napa rivers and along sloughs in the Delta. This rare member of the celery family (*Apiaceae*) is a List 1B species. The species bears three or four small white flowers in an umbel at the top of a quarter to half inch tall flower stalk; leaves are hollow linear and reed-like, round in cross section with walls at intervals dividing the interior of the

leaves into chambers. Mason's lilaeopsis is threatened by loss of habitat due to levee building and repair in the Delta. Habitat is present where Napa SD recycled water service area pipelines would cross the Napa River, but this species is not known to occur along the alignment.

Suisun Marsh Aster (Symphyotrichum lentum)

This List 1B species occurs along rivers levees and sloughs in Suisun and Napa marshes and around Delta islands. The plant is a tall perennial with large ray flowers; the blooming period is between August and November. Suisun marsh aster is generally threatened by habitat loss, but habitat is present in brackish marshes in the southeastern Napa SD recycled water service area. This species occurs along the lower Napa River but is not known to occur along the alignment.

Non-listed Special-status Species – Fish

*Pacific Lamprey (*Lampetra tridentata*)*

Pacific lamprey, a California species of special concern, is an anadromous fish with a widespread distribution in Bay Area streams.

Pacific lampreys enter streams from July to October with spawning occurring in the following spring months, between April and July. Spawning takes place in low gradient sections of streams with gravel and sandy bottoms. Upon spawning, adults die. Following a three-week incubation period, larval lampreys emerge and reside in the stream mud or sand substrate for a period of three to five years before metamorphosing into juveniles. Juveniles migrate downstream in late fall through spring and reside in estuaries before swimming to the ocean. After two to three years in the ocean, Pacific lampreys return to freshwater to spawn.

Pacific lamprey are present in Sonoma Creek, the Napa River and the Petaluma River, and they are presumed present in all tributaries that support steelhead trout.

Longfin smelt (Spirinchus thaleichthys)

Longfin smelt is a small schooling fish that inhabits the freshwater section of the lower Delta and has been observed from south San Francisco Bay to the Delta, with the bulk of the San Francisco Bay population occupying the region between the Carquinez Straight and the Delta. In the fall, adults from San Francisco and San Pablo Bays migrate to fresher water in the Delta to spawn. The spawning habits of longfin smelt are similar to the Delta Smelt and both species are known to school together. Longfin Smelt are harvested commercially and sold in local markets.

The longfin smelt is a California species of special concern. However, the U.S. Fish and Wildlife Service (USFWS) was petitioned to list longfin smelt as an endangered species on August 8, 2007. On May 6, 2008, the USFWS found that the listing may be warranted and initiated a status review to determine if listing this species is in fact warranted. Likewise, on August 14, 2007, CDFG received a petition to list longfin smelt as an endangered species under the California Endangered Species Act (CESA). As such, longfin smelt may become both a federal and State listed protected species by the time the proposed project is implemented.

Longfin smelt is known to occur in San Pablo Bay, in the lower tidal marshes and reaches of the Napa River, and historically occurred in the lower reaches of the Petaluma River.

Sacramento splittail (Pogonichthys macrolepidotus)

Sacramento splittail, a state species of special concern, are primarily freshwater fish, but are tolerant of moderate salinity of up to 10-18 parts per thousand (ppt). In the 1950s, they were commonly caught by striped bass anglers in Suisun Bay, and prior to 1985, they were also common San Pablo Bay. During the past 20 years, however, they have been found mostly in slow-moving sections of rivers and in sloughs and have been most abundant in the Suisun Bay and Marsh region. Nevertheless, there is evidence of successful splittail reproduction in the Napa and Petaluma rivers (Leidy, 2007). Adults migrate upstream from brackish areas to spawn in freshwater. Spawning begins by late January and early February and continues through July, with most spawning taking place from February through April. Splittail spawn on submerged vegetation in temporarily flooded upland and riparian habitat. Typically, terrestrial shrubs and herbs are preferred over emergent wetland vegetation such as cattails and tules. Spawning occurs in the lower reaches of rivers, bypasses used for flood management, dead-end sloughs and in the larger sloughs such as Montezuma Slough. Larvae remain in the shallow, weedy areas inshore near the spawning sites and move into the deeper offshore habitat as they mature.

Sacramento splittail are known to occur in the Napa and Petaluma River estuaries.

Non-listed Special-status Species – Animals

Species accounts are provided for non-listed special-status invertebrates, reptiles, and mammals that are present or have at least a moderate potential to occur in the recycled water service area and for non-listed special-status birds that are known to nest in the general project vicinity.

Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*)

Ricksecker's water scavenger beetle has no official status with the State of California but is considered rare. This beetle inhabits permanent or semi-permanent water sources which are required for it to survive and reproduce. Specific details of the life history of this species are unknown. This species has been found from January through July in areas capable of ponding water, including freshwater seeps, springs, farm ponds, and slow-moving streams. Related species in the genus are aquatic scavengers as adults, while larvae feed as predators on soft bodied aquatic invertebrates (Arnold, prior ESA communication). Larvae are usually found in relatively calm, shallow water of ponds, streams, marshes or lakes.

The beetle's range is thought to extend generally around the Bay Area, with collections having been made in Sonoma County.

California brackish water snail (*Tryonia imitator*)

The California brackishwater snail has no official status with the State of California but is considered rare. Native to the United States, the brackishwater snail occupies coastal lagoons,

estuaries and salt marshes from Sonoma to San Diego counties. It is found only in permanently submerged areas, but tolerates a wide range of salinities.

This snail is known to occur in the Petaluma River, and could potentially be present in the Napa River.

Western Pond Turtle (*Actinemys marmorata*)

The western pond turtle is a California species of special concern. This species occurs from the Pacific Northwest through the Central Valley, southern Coast Ranges, and northern Baja California. The Central Valley and Bay Area are areas of intergradation between the northwestern (*E. m. marmorata*) and southwestern pond turtle (*E. m. pallida*) subspecies. Pond turtles inhabit ponds, marshes, streams, and ditches that typically have a rocky or muddy substrate and support emergent vegetation. Threats to the turtle include a large number of natural and introduced predators that prey on eggs, hatchlings, and juveniles while the greatest threat to the western pond turtle is human interference, primarily by habitat destruction.

Turtles are typically alert and secretive, and retreat to the cover of water when disturbed, diving beneath the surface and hiding in vegetation or beneath submerged rocks and debris. Western pond turtles are omnivorous scavengers. This species hibernates during the winter, emerging in March to feed and reproduce. Reproduction generally takes place between May and August followed by the deposition of five to eleven eggs which are buried in nests in sunny areas near the water.

Western pond turtle is known from freshwater drainages and ponds throughout Marin, Sonoma and Napa counties. This species has also been observed in brackishwater habitats.

Tri-colored 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 (Zeiner et al., 1988–1990).

Tricolored blackbirds are locally common throughout the Central Valley and coastal areas south of Sonoma County. Breeding colonies in the North Bay include the Napa Salt Marsh Restoration Area, wetlands east of Napa airport, Sears Point, and Pope Valley. Historic breeding colonies were observed along Copeland Creek near Sonoma State University and along the Sonoma/Marin county line east of Valley Ford.

Golden Eagle (Aquila chrysaetos)

The golden eagle is a CDFG fully-protected species. It is a very large bird with a wingspan of approximately seven feet. It is typically dark brown but may shows slight signs of white on the wings and on the tail. Juvenile eagles usually show white patches on the wings and tail but the tail

patch may be absent. Golden eagles are found throughout California with a range extending from sea level to approximately 11,500 feet.

Golden eagles feed mostly on rodents and rabbits but will take other mammals, birds, reptiles and some carrion. Golden eagles require open woodland or grassland for foraging and tall trees or steep cliffs for breeding. It can also be found in open, rolling country grasslands or savannahs, farms, chaparral, and at the desert edge.

Golden eagles nest on cliffs or tall trees. Large platform nests are constructed from sticks, twigs, and greenery. Breeding season occurs in late January through August but typically between March through July. Golden eagle are single brooded and typically lay 1 or 2 eggs, but rarely 3. Incubation usually performed by female alone, but sometimes by male and female for approximately 43-45 days. Young are semi-altricial and downy and the nestling period is approximately 30 days. The female feeds the young food brought to the nest by the male until young are approximately 40 days old and then both parents feed for the remainder of the fledging period, typically 65-75 days. Fledglings practice pouncing while remaining in the nest and can fly for short periods at 63-70 days but typically remain at or close to the nest for another 21 days.

Nests have been observed in Napa County (CDFG, 2008), with only one noted in the project vicinity. Recorded in 2003, this nest was built in a large eucalyptus tree approximately 200 feet from a proposed Basic System pipeline in the Los Carneros area of southern Napa County.

Great Blue Heron (Ardea herodias)

The great blue heron has no official status with the State of California but rookeries- nesting colonies and habitat, usually a large tree- are protected. The great blue heron is a large bird measuring 46 inches in body length and possessing a wingspan of 72 inches. This species is a year-round resident over much of the United States, including coastal California.

This species inhabits freshwater and brackish marshes, swamps, lakes, and rivers. Herons are opportunistic feeders, usually feeding on fish but also taking aquatic invertebrates, human food scraps, small amphibians, nestlings and small mammals.

Great blue heron nests in colonies, usually in very tall deciduous or semi-deciduous trees but occasionally in shrubs, on rock ledges, and coastal cliffs, and even as a solitary nester. The nest is large and flat, made of interwoven sticks and lined with twigs and leaves. Nests are often repaired with green needles. A monogamous bird, the great blue heron has 1 brood and lays just one egg. Both sexes incubate the egg and care for the chick, which is born semialtricial and in need of more extensive parental care than precocial chicks.

Rookeries are known from Marin and Sonoma counties. A long-term rookery occurs on private land within 0.3 mile of a proposed Alternative 2 pipeline in the LGVSD (CDFG, 2008).

Burrowing Owl (Athene cunicularia)

The burrowing owl is a California species of special concern. Burrowing owls are year-round California residents of open, dry grassland and desert habitats. They are frequently found in low, open grasslands where large rodent burrows are available for nesting. Breeding takes place from March through August, with a peak in April and May. The young emerge from the burrow at about two weeks of age, and can fly at four weeks. Nesting requires existing burrows (these owls have been reported to make their own burrows, but if these reports are accurate the behavior is rare). Ground squirrel colonies provide a potential source of burrows for this owl. The burrows are often lined with grass, debris, and feathers.

Hunting occurs both day and night. Prey species are primarily insects, but also include small mammals, reptiles, birds, and carrion. Burrowing owls may hunt by hovering, diving from above, or pursuing their prey on the ground. However, they often hunt from a perch, and also use perches to thermoregulate. Although burrowing owls in northern California are thought to migrate, owls within central and southern California are predominantly non-migratory.

Burrowing owl is known from scattered locations throughout Marin, Sonoma and Napa counties. Two possibly-extirpated populations occur near proposed pipelines in the LGVSD and Novato service areas.

Northern Harrier (Circus cyaneus)

The northern harrier is a California species of special concern. This species is present throughout the central valley and surrounding areas and is a resident in the Bay Area in open grasslands and near wetland areas. Female harriers are a large raptor, typically dark brown throughout and a obvious white patch at the base of its tail. Male harriers are slightly smaller than females and mostly gray or mottled grays and an obvious white patch at the base of its tail.

Harriers breed from April to September with peak breeding activity occurring during June through July. Harriers are ground nesters and nests are a mound of sticks and leaves on moist ground, hidden by shrubby vegetation, tall grasses, and forbs in wetlands, and in wetland/upland borders in tidal marshes, freshwater marshes, and annual grasslands habitats. The nestling period is approximately 53 days and harriers typically brood 2-3 young. All fledglings are brown with the white tail patch until males begin to mature and display sexual dimorphism. Breeding pairs and juveniles may roost annually in late fall and winter. Forage areas consist of open ground and grasslands, where harriers hunt for prey items including small mammals, birds, reptiles and amphibians.

Northern harrier is known to breed 0.6 mile south of the Napa Salt Marsh pipeline. Breeding habitat is available throughout Marin, Sonoma and Napa counties and its conspicuous presence indicates that most breeding locations are unrecorded.

Salt Marsh Common Yellowthroat (Geothlypis trichas sinuosa)

This species is a California species of special concern. The saltmarsh common yellowthroat breeds and winters in wet meadows, riparian corridors, fresh and saline water emergent habitats, and occasionally grasslands. Forage items primarily include terrestrial invertebrates, but seeds are

taken as well. Salt marsh common yellowthroat is known from scattered locations throughout the North Bay, including Tolay Creek and the mouth of the Petaluma river within the action area.

San Pablo Song Sparrow (Melospiza melodia samuelis)

This species is a California species of special concern. A year round resident to riparian corridors, fresh and saline emergent wetland, and wet meadow habitats. This species is largely granivorous but takes insects as well. San Pablo song sparrow is known from scattered locations throughout the North Bay, including Sears Point, Peacock Gap, and the Napa Salt Marsh Restoration Area. This species historically occurred at numerous locations throughout the Novato and SVCSD service areas.

Breeding Birds

Fish and Game Code Sections 3503 and 3503.5, and the Migratory Bird Treaty Act protect raptors and passerines and their eggs and nests from incidental "take." These protections apply to special-status birds identified in Table 1 and other birds that may occur in the project alignment.

Bat Species

Eight sensitive bat species have a low to moderate potential to occur in the general project vicinity, though pallid bat (*Antrozous pallidus*), a California species of concern, may be the only species that roosts locally. Other species that have not been identified from the area, but for which the Proposed Project is within their described range include pacific western big-eared bat (*Corynorhinus townsendii townsendii*), greater western mastiff bat (*Eumops perotis californicus*), long-eared myotis (*Myotis evotis*), fringed myotis (*M. thysanodes*), long-legged myotis (*M. volans*), Yuma myotis (*M. yumanensis*), and Townsend's big-eared bat (*Plecotis townsendii*). The status of these species is presented in Table 3.5-1.

Though specific habitats vary among species, the above bats generally inhabit woodlands and forests and roost in buildings, mines, caves, crevices, cliff faces, tunnels, bridges, or beneath tree bark. Bats are nocturnal feeders on insects in flight. Prey includes moths, flies, beetles, and other insects. Most bats require a nearby water source.

Large trees within extensive riparian woodlands and older bridges may provide roosting habitat for common and special-status bats including Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*), long-legged myotis bat (*Myotis volans*), and Yuma myotis bat (*Myotis yumanensis*), among others. Pallid bats have been identified at two locations near the project alignment: in 1999 at the Watmaugh Creek bridge over Sonoma Creek and in 2000 roughly 1/4-mile west of the intersection of Arnold Drive and Felder Road (CNDDB, 2005). Bat roosts may occur in older bridges or in large oak trees that occur sporadically along major roads in the project vicinity.

Suisun Ornate Shrew (Sorex ornatus sinuosus)

Ornate shrews occur in California from the Bay Area south to the northern tip of Baja. One of nine subspecies, the Suisun ornate shrew is known only from islands and tidal marshlands of San

Pablo and Suisun Bays, California, where it occurs mostly in brackish-water marshes near sea level. It is the most widely distributed subspecies, reported from dry, chaparral-covered slopes and able to tolerate an absence of drinking water. Their presence is associated with vegetative structure rather than species composition, and they prefer low, dense vegetation. Such habitat provides adequate cover, nesting places, and invertebrates for food. The reproductive period extends from February through October. Breeding occurs in spring by shrews born the previous year; they rarely live more than 16 months.

Within the project Suisun ornate shrew is known from saltwater or brackish marshes of southern Sonoma and Napa counties, generally in the same habitat as salt marsh harvest mouse and rails. The nearest known population occurs at Sears Point, but would not be affected by the proposed project.

American Badger (Taxidea taxus)

In California, American badgers occupy a diversity of habitats. Grasslands, savannas, and mountain meadows near the timberline are preferred, though they can be found in deserts as well. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground.

In California, 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. This species could occur in very low densities in project-area grassland habitats.

Critical Habitat for Listed Fish and Wildlife Species

Delta Smelt

Critical habitat for delta smelt has been designated within the Sacramento-San Joaquin River Delta system eastward from the Carquinez Straits and thus does not include the project vicinity.

Central California Coast and Central Valley Steelhead

Critical habitat for central California coast and central valley steelhead was designated by the National Marine Fisheries Service (NMFS) in September 2005 and became effective on January 2, 2006. Within the action area, the critical habitat designation for central valley steelhead only includes the waters of San Pablo Bay. For the central California coast steelhead DPS, the critical habitat designation includes streams throughout the Novato SD, SVCSD, and Napa SD areas.

LGVSD. No designated critical habitat streams are within the LGVSD area.

Novato SD. Designated critical habitat for central California coast steelhead includes the Petaluma River in the Petaluma River Hydrologic Subbasin (NMFS, 2005). No other drainages on or near the project site are included in the federal critical habitat designation.

SVCSD. Designated critical habitat for central California coast steelhead includes the following project-area streams in the Sonoma Creek Hydrologic Subbasin: Sonoma Creek, Nathanson Creek, Calabazas Creek, Carriger Creek, Fowler Creek, Rodgers Creek, Schell Creek, (NMFS,

2005). The SVCSD action area includes the Napa Salt Marsh pipeline which crosses Huichica Creek, a designated critical habitat stream within the Napa River Hydrologic Subbasin. No other drainages on or near the project site are included in the federal critical habitat designation.

Napa SD. Designated critical habitat for central California coast steelhead includes the following project-area streams in the Napa River Hydrologic Subbasin: Napa River, Miliken Creek, Sarco Creek, Murphy Creek, Spencer Creek, Suscol Creek, and Carneros Creek (NMFS, 2005). No other drainages on or near the project site are included in the federal critical habitat designation.

Sacramento River Winter-run and Central Valley Spring-run Chinook Salmon

Critical habitat for Sacramento River winter-run chinook salmon and central valley spring-run chinook salmon was designated in 1993 and 2005, respectively, and includes the waters of San Pablo Bay.

Green Sturgeon

Critical habitat for the southern DPS of green sturgeon was proposed for designation on September 8, 2008 and, if finalized as proposed, would include the waters of San Pablo Bay.

California Red-legged Frog

Critical habitat for California red-legged frog does not include the project vicinity (Federal Register, 2006).

Western snowy plover

Critical habitat for western snowy plover does not include the project vicinity (Federal Register, 2005).

Contra Costa Goldfields

Critical habitat for Contra Costa goldfields does not include the action area (Federal Register, 2003). The nearest critical habitat designation is 0.5 mile south of Napa SD Phase 1 pipelines and would not be affected by the project.

3.5.2 Regulatory Framework

Federal and State laws regulate wetlands, surface water features, and vulnerable plant and animal species and their habitats. The jurisdiction, resource management approaches, and enforcement activities of federal and State regulatory agencies vary depending on the specific vulnerable resource. Wetlands and endangered or threatened plants and animals receive the highest protection. Other non-listed plant and animal species may still be vulnerable enough to be recognized as special-status species.

Federal

Special-status Species

USFWS administers the Federal Endangered Species Act (FESA), the Migratory Bird Treaty Act (MBTA), and the Bald Eagle Protection Act (BEPA), among other programs. The USFWS also creates the list of threatened or endangered (T&E) species protected under the FESA.

Federal Endangered Species Act (FESA)

The FESA prohibits the "take" of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery. The FESA also requires issuance of an incidental take permit prior to taking any public or private action that could harm, harass, injure, kill, capture, collect, or otherwise hurt any individual of a T&E species. Permit issuance requires preparation and implementation of a habitat conservation plan providing specific measures to offset impacts to these species.

Critical Habitat

The USFWS designates critical habitat for federal T&E species listed under the FESA. Critical habitat areas are occupied by the species and are located within a specific geographic region determined to be critical for survival. A discussion of critical habitat occurring in Marin, Sonoma, and Napa counties is included above following Special-status Species.

Federal Essential Fish Habitat

Although the concept of EFH is similar to that of critical habitat under the FESA, measures recommended to protect EFH by NMFS are advisory, not proscriptive. The Sustainable Fisheries Act of 1996 (Public Law 104-297), amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for Essential Fish Habitat (EFH) descriptions in federal Fisheries Management Plans (FMPs) and to require federal agencies to consult with NMFS on activities that may adversely affect EFH. The Magnuson-Stevens Act requires all fishery management councils to amend their FMPs to describe and identify EFH for each managed fishery. The Act also requires consultation for all federal agency actions that may adversely affect EFH (i.e., direct versus indirect effects); it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside of EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of the activity's location. Under section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. However, state agencies and private parties are not required to consult with NMFS unless state or private actions require a federal permit or receive federal funding.

NMFS strongly encourages efforts to streamline EFH consultation and other federal consultation processes. EFH consultation can be consolidated, where appropriate, with interagency

consultation, coordination and environmental review procedures required by other statutes such as the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, Clean Water Act, FESA, and Federal Power Act. EFH consultation requirements can be satisfied using existing review procedures if they provide NMFS timely notification of actions that may adversely affect EFH and the notification meets requirements for EFH Assessments (i.e., a description of the proposed action, an analysis of the effects, and the Federal agency's views regarding the effects of the action on EFH and proposed mitigation, if applicable).

Migratory Bird Protection Act (MBTA)

The MBTA prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs and nests. Executive Order 13186 of the MBTA instructs federal agencies to coordinate with USFWS in developing a Memorandum of Understanding to conserve migratory bird populations when taking actions that would likely have a negative impact.

Bald and Golden Eagle Protection Act

Under the BEPA, it is illegal to import, export, molest, disturb, sell, purchase or barter any bald eagle or golden eagle or part thereof.

Wetlands

Clean Water Act (CWA)

The CWA regulates discharges to waters of the U.S. and is the principal federal law protecting the nation's surface waters, including seas, lakes, rivers, streams, wetlands, natural ponds, mud flats, sand flats, sloughs, and wet meadows. Section 401 requires projects that could affect state water quality, and that have a federal component, to obtain state certification. Section 402 of the CWA regulates construction-related stormwater discharges through the National Pollutant Discharge Elimination System (NPDES) program. Administered by the USEPA, in California the State Water Resources Control Board (SWRCB) is authorized to oversee the NPDES program. The USACE administers Section 404 of the CWA and coordinates with the U.S. Environmental Protection Agency (USEPA) to regulate the discharge of dredged and fill materials into waters of the U.S. via a permitting process.

State

Special-status Species

The CDFG administers several laws and programs designed to protect biological resources, and designates state threatened, endangered, and other special-status species occurring in California.

California Endangered Species Act (CESA)

The CESA regulates the listing and "take" of state-listed T&E species. CDFG may allow take of a listed species through special permit issuance, except for fully protected species.

Fully Protected Species

CDFG code sections 3511, 4700, 5050 and 5515 designate fully protected species and protection measures. Fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except when collecting these species is necessary for scientific research and relocation of bird species is necessary for livestock protection.

Protection of Nesting Birds

Nesting birds are protected under CDFG code sections 3503 and 3503.5, which make it (1) unlawful to take, possess, or destroy the nests or eggs of any such bird of prey (i.e., species in the order Falconiformes and Strigiformes) except as otherwise provided by the code; and (2) protect the active nests of all other birds (except English sparrow (Passer domesticus) and European starling (Sturnus vulgaris)). Disturbance that causes nest abandonment and/or reproductive failure is considered a take. No take permits are issued under these statutes.

Species of Special Concern (CSC)

The CDFG designates species of special concern, which are species with limited distribution, diminishing habitat, and declining populations, or species that otherwise possess unusual scientific, recreational, or educational value. The Species of Special Concern list is intended to be a land-use management tool.

Native Plant Protection Act (NPPA)

CDFG code sections 1900-1913 comprise the NPPA and seek to preserve, protect, and enhance rare or endangered California plants. The agency is responsible for establishing criteria to determine what native plants are rare or endangered, and for governing the take, possession, propogation or sale of such plants. The California Native Plant Society (CNPS) also identifies rare or endangered plants and lists them as 1A, 1B, 2, 3, and 4 species. Plants appearing on CNPS List 1A, 1B, or 2 meet CEQA significance criteria and CDFG sections 1901, 2062 and 2067 criteria as rare or endangered species.

Wetlands

CDFG §1602

Activities that would interfere with the natural flow of, or substantially alter the channel, bed or bank of, a lake, river, or stream are regulated under CDFG Section 1602.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act transfers oversight authority of the Clean Water Act NPDES program from the federal USEPA to the state California State Water Resources Control Board (SWRCB). The state of California oversees this federal program within and throughout the state via Regional Water Quality Control Boards (RWQCB).

Local

The local regulations are provided in Appendix 3.5.

3.5.3 Environmental Consequences/ Impacts

Significance Criteria under CEQA

Based on the Appendix G of the *CEQA Guidelines*, project implementation would have significant impacts and environmental consequences on biological resources if it would:

- Substantially diminish habitat for fish, wildlife, or plants species;
- Result in a fish or wildlife population to drop below self-sustaining levels;
- Threaten elimination of a plant or animal community;
- Substantially affect an endangered, rare, or threatened species of animal or plant or the habitat of the species;
- Decrease the number of or diminish the range of an endangered, rare, or threatened species;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species; impede use of native wildlife nursery sites;
- Substantially degrade the quality of the environment, including but not limited to:
    - the substantial adverse effect on or loss of federally protected wetlands,
    - the substantial degradation or loss of habitat, sensitive natural communities, or other resources identified in local or regional plans, policies, regulations or by lists compiled by CDFG or USFWS; or
- Conflict with any local policies or ordinances protecting biological resources or with provisions of an adopted habitat conservation plan; natural community conservation plan; or other local, regional, or state habitat conservation plan.

CEQA Section 15380 further provides that a plant or animal species may be treated as “rare or endangered” even if it is not on one of the official lists if, for example, the species is likely to become endangered in the foreseeable future.

Environmental Consequences/Impact Analysis

Impacts to sensitive biological resources resulting from construction and operation of the proposed project are evaluated herein at the project level for Phase 1 and at the program level for Alternatives 1 through 3. Evaluations are based on previous biological resource studies, database records, agency communications, and field reconnaissance surveys. The impacts are considered for all project components, including both short-term construction phases and long-term operation. Impacts are summarized in **Table 3.5-6**.

Impact 3.5.1: Impacts on Wetlands, Streams and Riparian Habitats. Construction of the Proposed Project could result in impacts to jurisdictional wetlands and other waters of the United States, as well as impacts to riparian habitat. (Less than Significant with Mitigation)

Potential impacts could involve temporary and permanent discharge of fill material into jurisdictional wetlands and other waters of the U.S. to accommodate construction activities. Wetlands or drainages could be affected by pipeline trenching activities, bore and jack installation under streams, and other construction activities, and temporary filling of seasonal wetlands in work areas.

Potential impacts to riparian habitat include temporary and permanent disturbance of stream channels during construction activities, including removal or disturbance to riparian vegetation, and alteration of bed and banks of drainages due to trenching.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.5-1, No Action** and **Figure 2-9, No Action Alternative**).

Under future baseline (2020) conditions, the wetlands, streams, and riparian habitats within the region would likely continue to be protected under existing or new regulations. A discussion of individual Member Agencies is provided below.

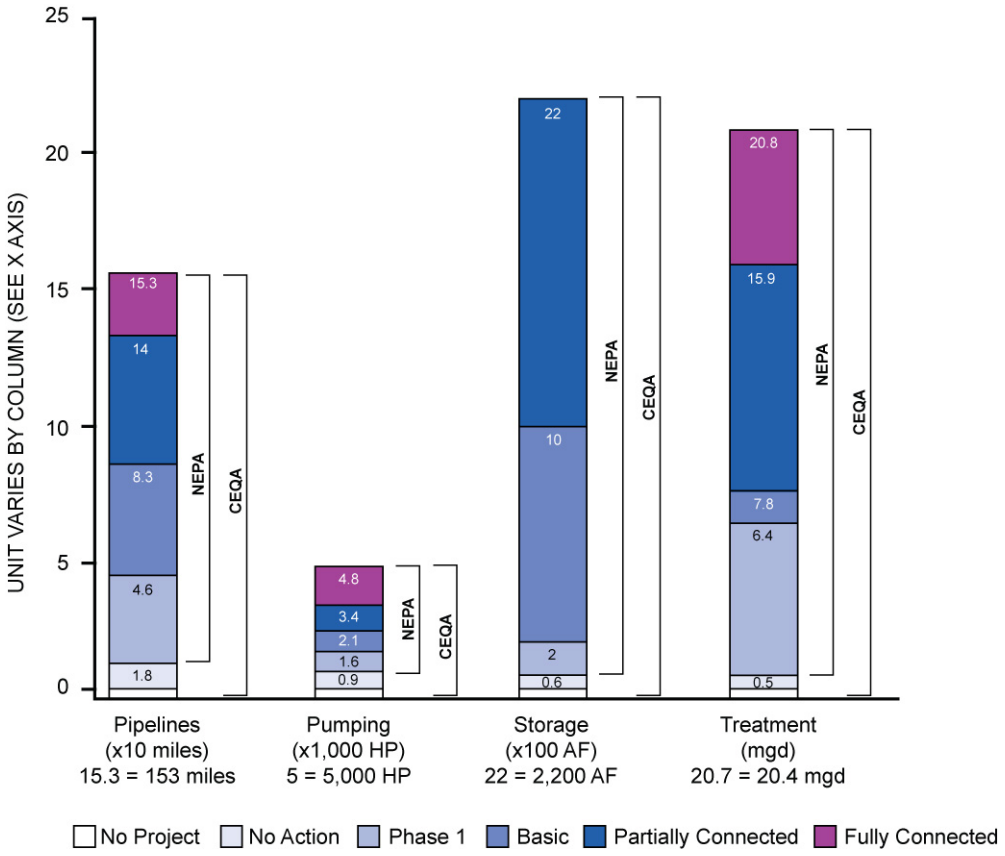
LGVSD/NMWD

No project facilities would be constructed in this recycled water service area under the No Action Alternative, therefore no impacts would occur to wetlands, streams or riparian habitats.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Pipelines would be installed within existing roadways, but if installed in the road shoulder or in the road ROW then pipelines constructed under the No Action Alternative could impact wetlands and other jurisdictional waters adjacent to roadways, especially along rural portions of Atherton and Olive Avenues.

CHART 3.5-1
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities would result in temporary impacts to wetland/water features and drainages/associated riparian vegetation near project components, but identified that those impacts could be avoided with the implementation of standard construction best management practices or other protective measures.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). Approximately 4.0 miles of pipeline would be installed parallel to an existing pipe that extends between SVCSD WWTP and the SVCSD storage ponds, located near the intersection of Northwestern Pacific Railroad and Ramal Road. A pump station would be installed at the pond site. From the ponds, an additional 4.5 miles of new pipeline would be

constructed along the NWPRA railroad tracks to convey water to the salt pond mixing chamber (Option A). Two Alternative Routes (Option B and Option C) consist of a pipeline that would traverse north from the existing reservoirs to Ramal Road, extend east along Ramal Road and then south along Buchli Station Road toward the salt ponds. Option C deviates south from Ramal Road to feed an existing winery reservoir before joining Buchli Station Road.

Approximately five wetland areas occur near or within the construction corridor for the alignment extending from Sonoma to the Napa Salt Marsh and could be impacted by implementation of the No Action Alternative. The Napa Salt Marsh Restoration Plan EIR also identified direct impacts on coastal salt marsh from construction of a proposed outfall structure, but a site assessment based on recent pipeline specifications indicates that only approximately 0.06 acre of degraded levee habitat would be impacted. **Table 3.5-2** below summarizes potential impacts to wetlands and other waters of the U.S., assuming a 25-foot-wide buffer from edge of pavement on each side of the road, and **Table 3.5-3** below identifies action area streams and tributaries that would be crossed by No Action pipelines.

TABLE 3.5-2
NO ACTION ALTERNATIVE WETLAND IMPACTS

Agency with Jurisdiction	Acreage
Army Corps of Engineers	1.88
CDFG	.68

TABLE 3.5-3
NO ACTION ALTERNATIVE STREAM IMPACTS

Service Area	Stream/Tributary	Crossings
Novato SD	Novato Creek	1
SVCSD Alignment 1A	Unnamed streams	6
	Felder Creek	X
	Carriger Creek	X
	Fowler Creek	X
	Rodgers Creek	X
	Champlin Creek	X
SVCSD Napa Salt Marsh*	Schell Creek	1
	Huichica Creek	1
	Unnamed tributaries	15

* This table assumes Napa Salt Marsh Option A, which has the largest number of stream crossings.

SOURCE: ESA, 2009.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impacts would occur to wetlands, streams or riparian habitats.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to wetlands and riparian habitat from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

For Phase 1, the project would directly impact a total of 68 drainages in all four service areas. Of these 68 drainages, 44 are unnamed tributaries, most of which are likely to be ephemeral drainages that are dry most of the year. Major creeks and perennial drainages would be crossed by trenchless methods including jack and bore and pipeline suspension, where feasible[2]. **Table 3.5-4** below summarizes potential Phase 1 impacts to wetlands and other waters of the U.S., assuming a 25-foot-wide buffer from edge of pavement.

TABLE 3.5-4
PHASE 1 WETLAND IMPACTS

Agency with Jurisdiction	Acreage
Army Corps of Engineers	2.1
CDFG	1.6

Impacts related to Phase 1 would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.1**, which provides measures to avoid and minimize impacts to jurisdictional wetlands and other waters of the U.S., and provides compensation for impacts through wetland restoration and enhancement. A detailed analysis of impacts on wetlands, riparian habitats and stream crossings by member agency appears below.

LGVSD/NMWD

Phase 1 pipelines would cross up to 14 drainages in the LGVSD service area, depending on which Option is chosen for the pipeline route. Option A would involve 10 stream crossings; Option B would involve 8 stream crossings; and Option C would involve 2 stream crossings. Three unnamed tributaries would be crossed in the service area regardless of, and unaffected by, which Option is chosen. Of these three crossings, one near the wastewater treatment plant is shared in common by Options A through C. Options B and C share in common the crossings of five additional unnamed tributaries. Option C then crosses an additional four unnamed tributaries and Option B then crosses an additional two unnamed tributaries. Option A crosses one additional

[2] Major creeks and perennial stream crossings that support threatened and endangered species would be crossed by trenchless methods.

tributary- Miller Creek. **Table 3.5-5** below identifies action area streams and tributaries that would be crossed by Phase 1 pipelines.

TABLE 3.5-5
PHASE 1 STREAM IMPACTS IN THE LGVSD AREA

Stream/Tributary	Crossings
Miller Creek	1
Unnamed tributaries	13

Novato SD/NMWD

Phase 1 pipelines would cross two streams and five unnamed tributaries and channels in the Novato SD area. The NSDWFP EIR identified seasonal wetlands along the eastern edge of the Novato WWTP and significant wetlands along the NWPRR drainage canal. Novato Creek at the NWPRR ROW would likely be crossed via a suspended pipeline to avoid impacts to the creek bed. **Table 3.5-6** below identifies action area streams and tributaries that would be crossed by Phase 1 pipelines.

TABLE 3.5-6
PHASE 1 STREAM IMPACTS IN THE NOVATO SD AREA

Stream/Tributary	Crossings
Novato Creek	1
Arroyo Avichi	1
Unnamed tributaries	5

SVCSD

Phase 1 pipelines would cross 25 streams and and/or unnamed tributaries and channels (some more than once) in the SVCSD area, assuming Napa Salt Marsh Pipeline Option C, which represents the most conservative number. Realistically, only one Option would be chosen and at least 15 of the potential stream crossings would be eliminated from possibility. Option A would cross 17 drainages, including Huichica Creek and 16 unnamed tributaries. Option B would cross 14 drainages, including Huichica Creek and 14 unnamed tributaries. Option C is a slight deviation from Option B and would not result in any additional stream crossings.

Five seasonal wetlands occur partially within the construction corridor at the Watmaugh Road/ 5th Street segment.The SCVRWP EIR identified a wetland swale on the eastern side of the property north of the SVCSD WWTP that would be impacted by construction of the proposed operational facility, capacity-storage reservoir and associated pump station. Impacts related to the Napa Salt Marsh Restoration Project will be equivalent to those under the No Action Alternative. **Table 3.5-7** below identifies action area streams and tributaries that would be crossed by Phase 1 pipelines.

TABLE 3.5-7
PHASE 1 STREAM IMPACTS IN THE SVCSD AREA

Stream/Tributary	Crossings
Felder Creek	2
Fowler Creek	1
Huichica Creek	2
Rodgers Creek	2
Champlin Creek	1
Carriger Creek	1
Schell Creek	1
Unnamed tributaries	15

SOURCE: ESA, 2009.

Napa SD

Phase 1 pipelines cross 3 streams and 29 unnamed tributaries and drainages in the Napa SD area. The wetland features identified during site reconnaissance would be impacted by the project if they extend into the pipeline ROW. **Table 5.3.8** below identifies action area streams and tributaries that would be crossed by Phase 1 pipelines.

TABLE 3.5.8
PHASE 1 STREAM IMPACTS IN THE NAPA SD AREA

Stream/Tributary	Crossings
Tulucay Creek	1
Kreuse Creek	1
Murphy Creek	1
Unnamed tributaries	29

SOURCE: ESA, 2009.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to wetlands and riparian habitat from proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

For the Basic System, the project would directly impact fifty-two additional streams or drainages. Impacts related to the Basic System would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.1**, which provides measures to avoid and minimize impacts to jurisdictional wetlands and other waters of the U.S., and provides compensation for impacts through wetland restoration and enhancement. A brief discussion of impacts by member agency is discussed below.

LGVSD/NMWD

No additional pipelines are proposed under the Basic System beyond those identified in Phase 1.

Novato SD/NMWD

In addition to the No Action and Phase 1 stream crossings previously identified, the Basic System pipelines would involve five additional crossings including Novato Creek and four unnamed tributaries. Wetland features could be present along off-road pipeline alignments or in the construction ROW.

SVCSD

In addition to the No Action and Phase 1 stream crossings previously identified, the Basic System pipelines involve thirty-one additional stream crossings at Dowdall, Carriger, Nathanson and Sonoma Creeks[3] and at other unnamed tributaries. Wetland features could be present along off-road pipeline alignments or in the construction right-of-way.

Napa SD

In addition to the Phase 1 stream crossings previously identified, the Basic System pipelines involve 11 additional stream crossings at Carneros Creek, the Napa River and unnamed tributaries. Wetland features could be present along off-road pipeline alignments or in the construction right-of-way.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to wetlands and riparian habitat from proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

[3] Program-level analyses for Alternatives 1, 2, and 3 relied on high-resolution stream data supplied by the National Hydrology Dataset published by the Department of Water Resources. The information was not verified by field surveys and stream crossings may occur at more locations than portrayed in the dataset or may not exist where portrayed.

For the Partially Connected System, the project would directly impact a total of 80 additional streams or drainages, which represents an additional 28 more compared to the Basic Alternative. Impacts related to Alternative would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.1**, which provides compensation for impacts through wetland restoration and enhancement. A brief discussion of impacts by Member Agency is discussed below.

LGVSD/NMWD

In addition to Phase 1 pipelines previously identified, the Partially Connected System pipeline in the LGVSD would involve two additional crossings at unnamed tributaries, and could result in potential impacts on approximately a 0.5 mile length of wetlands adjacent to the roadway, if present in the project right-of-way.

Novato SD/NMWD

In addition to No Action, Phase 1, and Basic System stream crossings previously identified, the Partially Connected System pipelines involve forty-two additional stream crossings including the Petaluma River, Novato Creek, Arroyo Jan Jose, and numerous unnamed tributaries.

SVCSD

In addition to No Action, Phase 1 and the Basic System stream crossings previously identified, the Partially Connected System pipelines involve seventeen additional stream crossings at unnamed tributaries.

Napa SD

In addition to Phase 1 and the Basic System stream crossings previously identified, the Partially Connected System pipelines involve nineteen additional stream crossings at the Napa River, Sarco Creek, Milliken Creek, Suscol Creek, and numerous unnamed tributaries.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to wetlands and riparian habitat from the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially System, in proportion to the facilities constructed under this alternative.

For the Fully Connected System, the project would directly impact twenty-three additional streams or drainages. **Table 3.5-9** below summarizes the incremental stream crossings that would occur as project alternatives are introduced. A combined total of 113 stream crossings in the four recycled water service areas would occur under the Fully Connected System. Impacts related to

TABLE 3.5-9
STREAM CROSSINGS BY ALTERNATIVE

Pipeline	No Project Alternative	No Action Alternative	Phase 1	Basic System	Partially Connected System	Fully Connected System
LGVSD						
Peacock Gap	0	0	0	0	2	0
NMWD URWP (South)			2			
Option A	--	--	10	--	--	--
Option B	--	--	8	--	--	--
Option C	--	--	2	--	--	--
LGVSD Total	**0**	**0**	**4[1]**	**0**	**2**	**0**
Novato SD						
NMWD URWP (North)	0	7	7	5	24	0
Sears Point	0	0	0	0	18	0
Novato SD Total	**0**	**7**	**7**	**5**	**42**	**0**
SVCSD						
Southern Sonoma Valley	0	0	0	0	11	0
Central Sonoma	0	0	0	0	0	22
Sonoma Valley Recycled Water Project	0	8	8	31	1	0
Sears Point	0	0	0	0	0	1
Napa Salt Marsh	0	17	17[2]	5	5	0
Option A	--	--	17	--	--	--
Option B	--	--	14	--	--	--
Option C	--	--	14	--	--	--
SVCSD Total	**0**	**25**	**25**	**36**	**17**	**23**
Napa SD						
Napa MST	0	0	32	0	4	0
Carneros East	0	0	0	11	15	0
Napa SD Total	**0**	**0**	**32**	**11**	**19**	**0**
Increase by Alt	***0***	***32***	***68***	***52***	***80***	***23***
Alternative Total	***--***	***--***	***68***	***120***	***200***	***223***

[1] Assumes Novato Option C
[2] Assumes Napa Option A
-- = no pipelines are proposed for this project phase/alternative in this Recycled Water Service Area

SOURCE: ESA, 2009

the Fully Connected System would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.1**, which provides compensation for impacts through wetland restoration and enhancement. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No Fully Connected System pipelines are proposed for the LGVSD area; impacts would be limited to those incurred under the Partially Connected System.

Novato SD/NMWD

No Fully Connected System pipelines are proposed for the Novato SD area; impacts would be limited to those incurred under the Partially Connected System.

SVCSD

In addition to No Action, Phase 1, Basic System, and the Partially Connected System stream crossings previously identified, the Fully Connected System pipelines involve twenty-three additional stream crossings, including Wilson Creek, Sonoma Creek, Agua Caliente Creek, Nathanson Creek, Arroyo Seco and unnamed tributaries.

Napa SD

No Fully Connected System pipelines are proposed for the Napa SD area; impacts would be limited to those incurred under the Partially Connected System.

Mitigation Measures

Mitigation Measure 3.5.1: Implement the following measures to avoid, minimize and compensate for impacts to jurisdictional wetlands and other waters of the U.S. and impacts to riparian habitat.

Construction activities resulting in the introduction of fill or other disturbance to jurisdictional wetlands and other waters of the U.S. will require permit approval from the U.S. Army Corps of Engineers and water quality certification from the Regional Water Quality Control Board, pursuant to Section 401 of the Clean Water Act. The Proposed Project will most likely be authorized under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the Clean Water Act. The CDFG has jurisdiction in the action area over riparian habitat, including stream bed and banks, pursuant to Sections 1600-1616 of the Fish and Game Code. Pipeline construction resulting in alteration to channel bed or banks, extending to the outer dripline of trees forming the riparian corridor, is subject to CDFG jurisdiction. The project proponent will be required to obtain a Streambed Alteration Agreement (SAA) from the CDFG. Terms of these permits and SAA will likely include, but will not necessarily be limited to, the mitigation measures listed below.

1) Specific locations of pipeline segments, storage reservoirs, and pump stations shall be configured, wherever feasible, to avoid and minimize direct and indirect impacts to wetlands and stream drainage channels. Consideration taken in finalizing configuration placement shall include:

- Reducing number and area of stream channel and wetland crossings where feasible. Crossings shall be oriented as close to perpendicular (90 degree angle) to the drainage or wetland as feasible.

- Placement of project components as distant as feasible from channels and wetlands.

- For pipeline construction activities in the vicinity of wetland and stream drainage areas, the construction work area boundaries shall have a minimum 20-foot setback from jurisdictional features[4]. Pipeline construction activities in proximity to jurisdictional features include: 1) entrance and exit pits for directional drilling and bore and jack operations; and 2) portions of pipeline segments listed as "parallel" to wetland/water features.

2) Sites identified as potential staging areas will be examined by a qualified biologist prior to construction. If potentially jurisdictional features are found that could be impacted by staging activities, the site will not be used.

3) Construction methods for channel crossing shall be designed to avoid and minimize direct and indirect impacts to channels to the greatest extent feasible. Use of trenchless methods including suspension of pipeline from existing bridges, directional drilling, and bore and jack tunneling will be used when feasible. Trenchless methods are required for all perennial drainage crossings (i.e., Sonoma Creek). Construction occurring in the vicinity of riparian areas shall be delimited with a minimum 20-foot setback to avoid intrusion of construction activities into sensitive habitat.

   The following additional measures shall apply to channel crossings in which the trenching construction method is used:

   - Limiting of construction activities in drainage channel crossings to low-flow periods: approximately April 15 to October 15.

   - At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.

   - At off-road drainage crossings, the construction corridor width will be minimized to the greatest extent feasible at the crossing and at least 20 additional feet to either side of the drainage at the crossing.

   - If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.

[4] Setbacks of channels with associated riparian vegetation will be from the outer dripline edge of the riparian corridor canopies and/or the upper bank edge, or per City or County code, whichever is greater.

4) Implement BMPs required in **Mitigation Measure 3.4.1** to reduce risk of sediment transport into all construction areas in proximity of drainages.

5) For channels or wetlands for which soil removal is necessary (off-road crossings or wetlands to be trenched or otherwise directly disturbed), the top layer of the drainage or wetland bottom shall be stockpiled and preserved during construction. After the pipeline has been installed, the stockpiled material shall be placed back into the drainage or wetland feature to return the beds to approximately their original composition.

6) To offset temporary and permanent impacts to wetlands and other waters of the U.S., and impacts to riparian habitat, compensatory mitigation will be provided as required by regulatory permits and SAAs.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.2: Construction Impacts on Special-status Fish and California Freshwater Shrimp. Construction of Proposed Project facilities could affect special-status invertebrate or fish species including central California coast steelhead, Chinook salmon, California freshwater shrimp, Pacific lamprey, and Sacramento splittail, or designated critical habitat for steelhead. (Less than Significant with Mitigation)

Trenchless crossing methods (e.g., suspending pipes from bridges or directional drilling) would be employed at major project-area streams that support, or are presumed to support, threatened or endangered species (i.e., Sonoma Creek, Nathanson Creek, Calabazas Creek, Carriger Creek, Fowler Creek, Rodgers Creek, Schell Creek, Novato Creek, Miller Creek, Petaluma River, Napa River). During the course of construction activities both near and at stream crossings, the potential exists for accidental spills of drilling muds such as bentonite, gasoline, oil, or other toxic substances. During directional drilling activities, drill head lubricants sometimes escape through soil fractures to the surface, termed a “frac-out,” and spill into upland or aquatic environments. The release of such materials into streams can be deleterious to fish and otherwise damaging to aquatic environs depending upon the sensitivity of receiving waters, timing of the spill, magnitude of the release and the scale of cleanup activities. In the event of a materials spill, impacts could be experienced during site cleanup activities. Such impacts could include direct mortality by escaped materials or cleanup equipment, and temporary degradation of habitat.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an

individual basis, without the benefit of regional coordination or federal funding. Future baseline conditions (2020) for erosion and sedimentation are assumed to be equivalent to current conditions.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.5-1, No Action, and Figure 2-9, No Action Alternative**).

Under future baseline (2020) conditions, the special-status species in the region would likely be continued to be protected under existing or new regulations. Construction of the proposed facilities could affect special-status fish and freshwater shrimp, however implementation of **Mitigation Measure 3.5.2**, which includes measures to reduce any impacts to the special-status species, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

Under the No Action Alternative, impacts to special-status fish and California freshwater shrimp identified in the SVRWP EIR would still occur but would be less-than-significant with the implementation of mitigation measures. No additional project elements proposed in the other service areas would directly or indirectly impact special-status fish or California freshwater shrimp. A brief discussion of impacts by member agency is discussed below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur to special-status fish. California freshwater shrimp are not known within this service area.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Pipelines would be installed within existing roadways and would cross only one unnamed and unsubstantial tributary not known or expected to support special-status fish. California freshwater shrimp are not known from this service area.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities could result in impacts on special-status fish and California freshwater shrimp.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of approximately 8.5 miles of pipeline that would cross Huichica Creek and several unnamed tributaries. No impacts on special-status fish or California freshwater shrimp were identified in that EIR. California freshwater shrimp are not known from this lower reach of

Huichica Creek, but special-status fish could potentially be present at Huichica Creek and impacted by implementation of the No Action Alternative.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The construction impact to special-status fish and freshwater shrimp from Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities under this alternative.

Under Phase 1, the project would directly impact 102 streams. However, only ten of these are perennial and provide the necessary habitat to support special-status fish and/or California freshwater shrimp: Carriger Creek, Nathanson Creek, Rodgers Creek, Schell Creek, Sonoma Creek, Huichica Creek, Tulucay Creek, Murphy Creek, Novato Creek and Miller Creek. Major creeks and perennial drainages that support or are presumed to support threatened or endangered species would be crossed by trenchless methods including jack and bore and pipeline suspension. Impacts related to Phase 1 would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.2**, which provides protection for aquatic habitats. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Phase 1 pipelines would cross up to 15 drainages in the LGVSD service area, but only Miller Creek is known to support special-status fish. Miller Creek would be crossed by Option C. Significant impacts would be reduced to a less-than-significant level through implementation of **Mitigation Measure 3.5.2.**

Novato SD/NMWD

Phase 1 pipelines would involve stream crossings at Novato Creek and Arroyo Avichi. Steelhead are known to occur in upper Novato Creek (Leidy, 2005); though surveys were not performed at this downstream crossing, presumably they seasonally pass to and from the Bay. Arroyo Avichi has not been adequately surveyed for steelhead; an overall assessment of the Novato Watershed concluded that, while not adequately surveyed, the watershed has historically supported and continues to support anadromous steelhead populations (Leidy, 2005).

Chinook salmon, believed to be central valley fall run, have been observed over multiple years in the vicinity of Highway 101; it is unknown whether they spawn in Novato Creek (NMFS, 2000a). Juvenile chinook are known to occur in Miller Creek in small numbers, and both adults and juveniles have been noted in portions of Miller Creek upstream from the action area as recently as 2003 (NMFS, 2008).

Pacific lamprey had a widespread historical distribution, occurring in coastal streams from California to Baja, and including San Francisco Bay, Carquinez Strait, and San Pablo Bay. In the north San Pablo Bay, Pacific lamprey are known to occur in the Sonoma Creek and Napa River watersheds. Recent surveys have not found Pacific lamprey in the Novato Creek watershed, but their widespread historical distribution and low detectability suggest they could be present (Leidy, 2007). This species could be potentially impacted by the project.

Sacramento splittail are present in the Petaluma River and an historic presence is documented from the area parallel to Highway 101 between the cities of Petaluma and Novato (Leidy, 2007).California freshwater shrimp are not documented from the Novato Watershed and would not be present in Novato stream crossings. No impacts to this species would occur. Construction of the proposed facilities could affect special-status fish and freshwater shrimp, however implementation of **Mitigation Measure 3.5.2**, which includes measures to reduce any impacts to the special-status species, would reduce the impact to less-than-significant-level.

SVCSD

In addition to No Action pipelines, Phase 1 pipelines would involve a total of nine stream crossings at Carriger Creek, Felder Creek, Fowler Creek, Rodgers Creek, Sonoma Creek, Arroyo Seco, Schell Creek, Nathanson Creek, Huichica Creek and more crossings at unnamed tributaries. High quality fisheries habitat in the action area is associated with stream crossings at Carriger, Felder, Fowler, Sonoma, and Rodgers Creeks; Schell Creek offers low quality habitat. Arroyo Seco is not identified as habitat for any special-status fish or California freshwater shrimp.

The Sonoma Creek watershed was extensively surveyed in the 1960s with later surveys performed along assorted streams at various points, confirming steelhead presence in Sonoma Creek, Fowler Creek, Rodgers Creek, Carriger Creek, and Nathanson Creek (Leidy, 2005). Fish surveys were not performed in support of the proposed project; however, based on prior surveys adult steelhead and smolts are seasonally present in both ephemeral and perennial action area streams. It is presumed that adult and/or juvenile steelhead could be present within each of these streams during appropriate times of the year and they could be impacted by the project. This is principally during winter and spring migrations between December and May for adult steelhead. Juvenile steelhead may be present year-round in larger streams (e.g., Sonoma Creek) or seasonally during flows in ephemeral streams. Designated critical habitat occurs in the following project-area streams: Sonoma Creek, Nathanson Creek, Carriger Creek, Fowler Creek, Rodgers Creek, and Schell Creek (NMFS, 2005), and these streams have historically supported or presently support steelhead (Leidy, 2005).

The historic use of Sonoma Creek by Chinook salmon was likely by small and/or sporadic runs; when present, principal spawning areas are expected to be in the upper watershed but the lower portion of this stream is apparently used for spawning in drier years. It remains unknown whether chinook use any of the tributary streams (NMFS, 1998a). Chinook salmon has the potential to be impacted by the project.

Pacific lampreys are documented in Sonoma Creek as far upstream as the Lawndale Avenue Bridge in Kenwood (ESA, 2006) and could be impacted by the project. Post-spawning adult lamprey have been observed in Sonoma Creek habitat immediately upstream from the Madrone Road bridge in the town of Glen Ellen (ESA, 2006). There are no physical barriers in Sonoma Creek that prevent adult lamprey migration to upper watershed spawning grounds.

Sacramento splittail are regularly known to occur in tidal reaches of the Napa River and its marsh complex (Leidy, 2007); it is unknown whether they are present in Huichica Creek at the pipeline crossing and project impacts to this species are not known.

California freshwater shrimp has been identified in Sonoma Creek near Maxwell Park and further upstream (CDFG, 2008) and likely occurs in downstream reaches as well. This species could be impacted by the proposed project. A 1999 habitat assessment for this species identified 38-linear feet of suitable shrimp habitat within 75 feet of the Watmaugh Road Bridge (Stabler, 1999). Potential habitat presumably occurs at the two other Sonoma Creek crossing sites. Habitat is considered marginal at Schell Creek adjacent to the SVCSD wastewater treatment facility, and along Fowler Creek at three locations (Leveroni Road, Watmaugh Road, and the Hwy 116 to SVCSD wastewater treatment facility route) because flows cease at some point during the year and often go subsurface. California freshwater shrimp is also present in Huichica Creek upstream from the action area, but the reach crossed by Phase 1 pipelines near the Napa Salt Marsh Restoration Area is too saline to support this species. Construction of the proposed facilities could affect special-status fish and freshwater shrimp, however implementation of **Mitigation Measure 3.5.2**, which includes measures to reduce any impacts to the special-status species, would reduce the impact to less-than-significant-level.

Napa SD

Phase 1 pipelines would involve stream crossings at Murphy, Tulucay and Kreuse Creeks. Fish sampling data was not available for Kreuse Creek, but steelhead are documented from Murphy and Tulucay Creeks (NMFS, 2008).

It is unknown whether Chinook use any of the tributary streams to the Napa River (NMFS, 1998a), and whether they are present in Murphy, Tulucay and Kreuse Creeks. The historic use of the Napa River by Chinook salmon was likely by small and/or sporadic runs. Chinook, believed to be Central valley fall run, have been observed in the Napa River as recently as 1997 and occasional spawning has been noted, possibly by strays. This species has the potential to be impacted by the project.

It is unknown whether Pacific lamprey are present in Murphy, Tulucay and Kreuse Creeks. They are known to occur in the Napa River and Huichica Creek (Leidy, 2007), and at least one unnamed tributary within the Napa Watershed. Their widespread historical distribution and low detectability suggest they could be present (Leidy, 2007).

Sacramento splittail are known to occur in the mouth of Tulucay Creek and from both the mainstem and the tidal reaches of the Napa River. Phase 1 pipelines cross Tulucay Creek over two miles upstream from its confluence with the Napa River; splittail spawn in freshwater upstream reaches, but their upstream distribution in Tulucay Creek is unknown. Tulucay Creek is designated critical habitat for steelhead, so upstream reaches could provide spawning habitat for splittail as well.

Within the Napa Watershed, California freshwater shrimp are known only from upper reaches of Huichica Creek and the Napa River and would not be impacted by the project. Construction of the proposed facilities could affect special-status fish and freshwater shrimp, however implementation of **Mitigation Measure 3.5.2**, which includes measures to reduce any impacts to the special-status species, would reduce the impact to less-than-significant-level.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The construction impacts to special-status fish and freshwater shrimp from the project facilities under the Basic System would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under the Basic System, the potential for project impacts on special-status fish and California fairy shrimp is presumed to increase with the number of stream crossings.[5] The Basic System pipelines would directly impact nine additional streams or drainages: Dowdall, Carriger, Sonoma, and Carneros Creeks; the Napa River; and four unnamed tributaries. Major creeks and perennial drainages would be crossed by trenchless methods including jack and bore and pipeline suspension. Impacts related to the Basic System would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.2**, which provides protection for aquatic habitats. A discussion of impacts by Member Agency is provided below.

[5] Unnamed tributaries are probably ephemeral. However, fish surveys in the area (Leidy, 1998; Leidy, 2007) indicate the presence of special-status fish in surveyed unnamed tributaries. Neither field surveys nor fish surveys were preformed in support of Alternatives 1 through 3 program-level analyses. Therefore, unnamed tributaries are included as potentially perennial crossings that could provide habitat for special-status aquatic species.

LGVSD/NMWD

No additional pipelines are proposed under the Basic System beyond those identified in Phase 1.

Novato SD/NMWD

In addition to the No Action and Phase 1 stream crossings previously identified, the Basic System pipelines would involve another crossing of Novato Creek, and crossings at unnamed tributaries. Novato Creek is known to support special-status fish. Unnamed tributaries are often ephemeral and wouldn't support special-status fish, but if perennial, the tributary could potentially support steelhead, Chinook, Pacific lamprey, or Sacramento splittail. California freshwater shrimp are not known from this service area.

SVCSD

In addition to the No Action and Phase 1 stream crossings previously identified, the Basic System pipelines involve additional stream crossings at Dowdall, Carriger and Sonoma Creeks. Carriger and Sonoma Creeks are designed critical habitat for steelhead, and Chinook salmon, Pacific lamprey, and California freshwater shrimp are known to occur in Sonoma Creek as previously identified.

Napa SD

In addition to Phase 1 pipelines, the Basic System pipelines involve stream crossings at Carneros Creek, the Napa River and unnamed tributaries. The Napa River supports steelhead and is designated critical habitat for this species; chinook salmon, Pacific lamprey, and Sacramento splittail are present as previously identified. California freshwater shrimp are not known to occur in the lower Napa Watershed.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The construction impacts to special-status fish and freshwater shrimp under the Partially Connected System would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under the Partially Connected System, the potential for project impacts on special-status fish is presumed to increase with the number of stream crossings; additional impacts on California freshwater shrimp are not expected. The Partially Connected System pipelines would directly impact 24 additional streams or drainages including the Petaluma River, Novato Creek, Sarco Creek, Milliken Creek, Suscol Creek and unnamed tributaries. Major creeks and perennial drainages that support or are presumed to support threatened or endangered species would be crossed by trenchless methods, including jack and bore and pipeline suspension. Impacts related

to the Partially Connected System would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.2**, which provides protection for aquatic habitats. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

In addition to Phase 1 pipelines previously identified, the Partially Connected System pipeline in the LGVSD would involve six additional crossings at unnamed tributaries, Unnamed tributaries are often ephemeral and are not likely to support special-status fish. California freshwater shrimp are not known to occur in this service area.

Novato SD/NMWD

In addition to No Action, Phase 1, and Basic System stream crossings previously identified, the Partially Connected System pipelines involve forty additional stream crossings including the Petaluma River, Novato Creek, Arroyo Jan Jose, and numerous unnamed tributaries. The Petaluma River is designated critical habitat for steelhead. Steelhead are also known to occur in upper Novato Creek and could be more widely distributed in the Novato Watershed, as previously stated.

SVCSD

In addition to No Action, Phase 1 and the Basic System stream crossings previously identified, the Partially Connected System pipelines involve twelve additional stream crossings at unnamed tributaries. Unnamed tributaries are often ephemeral and wouldn't support special-status fish or California freshwater shrimp. If perennial, the tributary could potentially support these species.

Napa SD

In addition to Phase 1 and the Basic System stream crossings previously identified, the Partially Connected System pipelines involve twenty-four additional stream crossings at the Napa River, Sarco Creek, Milliken Creek, Suscol Creek, and numerous unnamed tributaries. The Napa River and Sarco, Milliken, and Suscol Creek are designated critical habitat for steelhead, with fairly recent observations in all (Leidy, 1999). Chinook salmon, Pacific lamprey, and Sacramento splittail are present in the watershed and could potentially be present at stream crossings. California freshwater shrimp is not known to occur in the lower Napa Watershed as previously stated.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The construction impacts to special-status fish and freshwater shrimp to proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under the Fully Connected System, the potential for impacts on special-status fish and California freshwater shrimp is presumed to increase with the number of stream crossings. The Fully Connected System pipelines would directly impact twenty-three additional streams or drainages: Wilson Creek, Sonoma Creek, Agua Caliente Creek, Nathanson Creek, Arroyo Seco, Tolay Creek and unnamed tributaries. Major creeks and perennial drainages would be crossed by trenchless methods including jack and bore and pipeline suspension. Impacts related to the Fully Connected System would be significant prior to mitigation, but would be reduced to less-than-significant through implementation of **Mitigation Measure 3.5.2,** which provides protection for aquatic habitats. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No Fully Connected System pipelines are proposed for the LGVSD area; impacts would be limited to those incurred under the Partially Connected System.

Novato SD/NMWD

No Fully Connected System pipelines are proposed for the Novato SD area; impacts would be limited to those incurred under the Partially Connected System.

SVCSD

In addition to No Action, Phase 1, Basic System, and the Partially Connected System stream crossings previously identified, the Fully Connected System pipelines involve twenty-three additional stream crossings, including Wilson Creek, Sonoma Creek, Agua Caliente Creek, Nathanson Creek, Arroyo Seco and unnamed tributaries. Sonoma Creek and Nathanson Creek support steelhead populations and are designated critical habitat. Chinook salmon, Pacific lamprey, and California freshwater shrimp are known to occur in Sonoma Creek.

Napa SD

No Fully Connected System pipelines are proposed for the Napa SD area; impacts would be limited to those incurred under the Partially Connected System.

Mitigation Measures

> **Mitigation Measure 3.5.2:** Specific measures shall be implemented to protect aquatic habitats potentially inhabited by special-status fish and California freshwater shrimp.
>
> Sensitive fisheries and other aquatic resources shall be protected by minimizing in-stream and near-stream habitat impacts during project design, informally consulting with resource agencies (NMFS, USFWS, CDFG, and USACOE), and implementing protective measures. For Sonoma Creek, Petaluma River, Napa River, and other perennial drainages, special-status fish are presumed present. California freshwater shrimp are presumed present in Sonoma Creek. Because of the sensitivity of seasonal and ephemeral drainages, the following measures will be required to avoid and minimize impacts to aquatic habitat:

1) Project designs shall be reconfigured, whenever feasible, to avoid direct impacts to sensitive wetland areas and minimize disturbances to wetland and riparian corridors. Ground disturbance and construction footprints in these areas shall be minimized to the greatest degree feasible.

2) If trenching or directional boring stream crossing methods are used, the construction schedule of such activities shall be implemented according to conditions of the SAAs.

3) In-stream construction shall be avoided at all locations that are known, or presumed, to support threatened or endangered species, if at the time of construction such locations contain flowing or standing water.

4) In the event that equipment shall operate in any watercourse with flowing or standing water, the project proponent will ensure that they have the appropriate permit authorizations.

5) Prior to construction, a qualified biologist shall install fencing to establish a minimum 20-foot setback from sensitive habitat.

6) For work sites located adjacent to sensitive aquatic sites, a biological resource education program shall be provided by a qualified biologist, as per conditions of the SAAs.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.3: Long term impacts on Special-status Fish. Operation of the proposed project has the potential to affect special-status fish species due to reduced discharges from the WWTPs. (Less than Significant)

Each of the proposed project alternatives will increase the use of recycled water within the action area for agricultural uses (vineyard irrigation, dairy/pasture, tree and row crops) and urban irrigation (including golf courses, parks, and general landscaping (medians and office parks). The increased use of recycled water under each of the project alternatives will result in a reduction in discharge from each Authority member's WWTP to tributaries of San Pablo Bay. Reduced discharge from the WWTPs when compared to the two baselines would have a less than significant impact on special-status fish species.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. Under future baseline (2020) conditions, the special-status species in the region would likely be continued to be protected under existing or new regulations.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.5-1, No Action**). This would provide 1,067 AFY of recycled water, and would reduce the amount of discharge to tributaries of San Pablo Bay. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

The No Action Alternative would not include any new recycled water facilities by LGVSD; however, future conditions would include development within the LGVSD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge to Miller Creek, and eventually San Pablo Bay, under future 2020 discharge conditions would increase by 862 acre-feet per year (AFY). Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 511 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Novato SD/NMWD

Under the No Action Alternative, Novato SD would deliver 193 AFY of tertiary treated recycled water to the Novato North Service Area. Future conditions would include development within the Novato SD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 3,139 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,832 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

SVCSD

Under the No Action Alternative, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project. Future conditions would include development within the SVCSD service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 1,529 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,452 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Napa SD

The No Action Alternative, would not include any new recycled water deliveries by Napa. Future conditions would include development within the service area consistent with approved General Plans, with corresponding increases in treated effluent discharge. Discharge under future 2020 discharge conditions would increase by an estimated 1,887 AFY. Under the No Action Alternative, which considers implementation of a subset of recycled water projects, 2020 discharge conditions would increase by an estimated 1,062 AFY. This represents the future baseline discharge conditions, and no impacts would occur as a result from the NBWRP.

Phase 1

Compared to existing conditions (CEQA Baseline), Phase 1 projects would include 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage to provide 3,755 AFY of recycled water. This would result in a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in estimated discharge assumed 2020 inflow and discharge conditions for the WWTP, which include increased inflow over time. Implementation of Phase 1 projects would have an estimated 2020 discharge reduction of 6,121 AFY for all the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 2,688 AFY of recycled water, 28.9 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 3.8 mgd of tertiary capacity, and 0 AF of additional storage. When implemented, Phase 1 would result in an estimated total discharge reduction of 1,073 AFY for all the WWTPs combined, compared to the No Action Alternative (see Table 3.4-11**,** Water Quality).

Table 3.4-12 in **Section 3.4, Water Quality** presents the anticipated monthly change in discharge for each WWTP under Phase 1, compared to both existing conditions and the No Action Alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, LGVSD would deliver 202 AFY of tertiary treated recycled water to the Hamilton Field urban areas in southern Novato. Compared to the CEQA baseline, Phase 1 would provide 202 AFY of recycled water, with a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 would reduce 2020 discharge by an estimated 548 AFY. When compared to the No Action Alternative (NEPA Baseline), the estimated net reduction in discharge would be 38 AFY.

This incremental reduction of treated effluent would be distributed over discharge months during the wet season, and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in Miller Creek. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and

the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay. Thus, the reduction of LGVSD's WWTP discharge would be a less-than-significant impact.

Novato SD/NMWD

Compared to the CEQA baseline, Phase 1 would provide 542 AFY of recycled water, with a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge an estimate 1,983 AFY. When compared to the No Action Alternative (NEPA baseline), the net reduction in discharge would be an estimated 151 AFY.

This incremental reduction of treated effluent would be distributed over discharge months during the wet season, and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay. Thus, the reduction of Novato SD's WWTP discharge would be a less-than-significant impact.

SVCSD

Compared to the CEQA baseline, Phase 1 would provide 874 AFY of recycled water, with a corresponding decrease in discharge. Additionally, SVCSD would provide flows to the Napa Salt Ponds, of up to 3,460 AFY (depending upon year type). Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 1,452 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would not reduce SVCSD discharge, as these projects would likely be implemented by SVCSD under the No Action Alternative.

Under Phase 1, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project, and additional tertiary treated recycled water to the Napa Salt Marsh Restoration Area. Phase 1 of the proposed project would reduce SVCSD's discharge from storage facilities in the fall.[6] This incremental change in discharge of treated effluent would only occur during the wet season and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in Schell Slough, downstream sloughs, and lower Sonoma Creek. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status

[6] SVCSD would retain its National Pollutant Discharge Elimination System (NPDES) Permit to discharge between November and April.

fish species in the Bay. Thus, the changes in SVCSD's WWTP discharge would be a less-than-significant impact.

Napa SD

Compared to the CEQA baseline, Phase 1 would provide 2,137 AFY of recycled water, with a corresponding decrease in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 2,137 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would reduce Napa SD discharge by an estimated 1,073 AFY.

This incremental reduction in treated effluent discharge would be spread over the winter discharge months, is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in the Napa River. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay. Thus, changes in Napa SD's WWTP discharge would be a less-than-significant impact.

Alternative 1: Basic System (Program Level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Table 3.2-5 provides a summary of discharge change by WWTP. The Basic System would result in a total discharge reduction of 1,806 AFY compared to the CEQA Baseline. Compared to 2020 discharge conditions, the Basic System would result in a total estimated discharge reduction of 9,305 AFY from all of the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage. The Basic System would result in an estimated total discharge reduction of 4,177 AFY from all of the WWTPs combined, compared to the No Action Alternative (NEPA Baseline).

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Impacts to special-status fish from operation of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the reduction in treated effluent discharge during winter months, under this alternative. Please refer to the impacts discussed under Phase 1.

Alternative 2: Partially Connected System (Program Level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Provision of this amount of recycled water would result in an

estimated total discharge reduction of 4,803 AFY from existing conditions for all of the WWTPs (**see Table 3.2-6**). Compared to 2020 discharge conditions, the Partially Connected System would result in an estimated total 2020 discharge reduction of 12,222 AFY from all of the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), Partially Connected System would provide 122 miles of new pipeline, 2,542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage. The Partially Connected System would result in an estimated total 2020 discharge reduction of 7,174 AFY from all of the WWTPs combined, compared to the No Action Alternative (NEPA Baseline).

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Impacts to special-status fish from operation of the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the reduction in treated effluent discharge during winter months, under this alternative. For the SVCSD, potential discharge to Schell Slough and Hudeman Slough, would reduced to zero, due to the provision of recycled water for irrigation and to the Napa Salt Ponds. [7] This incremental change in discharge of treated effluent would only occur during the wet season and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in Schell Slough, downstream sloughs, and lower Sonoma Creek. Discharge is currently restricted to zero during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay. This seasonal change discharge may result in some seasonal changes to species' composition in the tidally influenced areas over time, but that the overall effect would be a shift toward more natural/historic conditions. Thus, the changes in SVCSD's WWTP discharge would be a less-than-significant impact.

Alternative 3: Fully Connected System (Program Level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Provision of this amount of recycled water would result in a total discharge reduction of 5,949 AFY from existing conditions for all of the WWTPs (see Table 3.2-7). Compared to 2020 discharge conditions, the Fully Connected System would result in a total estimated 2020 discharge reduction of 13,368 AFY from all of the WWTPs combined.

Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage. Provision of this amount of recycled water

[7] SVCSD would retain its National Pollutant Discharge Elimination System (NPDES) Permit to discharge between November and April.

would result in a total estimated discharge reduction of 8,320 AFY from all of the WWTPs combined (see Table 3.2-7).

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Impacts to special-status fish from operation of the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the reduction in treated effluent discharge during winter months, under this alternative. Please refer to the impacts discussed under Phase 1. For the SVCSD, potential discharge to Schell Slough and Hudeman Slough, would reduced to zero, due to the provision of recycled water for irrigation and to the Napa Salt Ponds. [8] This incremental change in discharge of treated effluent would only occur during the wet season and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in Schell Slough, downstream sloughs, and lower Sonoma Creek. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay. This seasonal change in discharge may result in some seasonal changes to species' composition in the tidally influenced areas over time, but that the overall effect would be a shift toward more natural/historic conditions. Thus, the changes in SVCSD's WWTP discharge would be a less-than-significant impact.

Mitigation Measures

No mitigation measures are required.

Impact 3.5.4: Impacts on Special-status Invertebrates. Construction of Proposed Project facilities could impact special-status invertebrates including Myrtle's silverspot butterfly, Opler's longhorn moth, Monarch butterfly wintering sites, Ricksecker's water scavenger beetle and California brackishwater snail. (Less than Significant with Mitigation)

Project activities such as earthmoving, grading, and trenching have the potential to result in direct mortality of these species.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

[8] SVCSD would retain its National Pollutant Discharge Elimination System (NPDES) Permit to discharge between November and April.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action). Under future baseline (2020) conditions, it is anticipated that invertebrates in region would likely be continued to be protected under existing or new regulations.

Under the No Action Alternative, no additional project elements proposed in the four recycled water service areas would directly or indirectly impact special-status invertebrates. Impacts on Ricksecker's water scavenger beetle could occur in the SVCSD and Novato SD areas, and impacts on California brackishwater snail could occur in the Napa SD area. No impacts would be incurred to Myrtle's silverspot butterfly, Opler's longhorn moth or wintering monarch butterflies. Impacts would be less-than-significant with the implementation of mitigation measures. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact on special-status invertebrates would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Pipelines would be installed within existing roadways but would cross one drainage where, if present, impacts on Ricksecker's water scavenger beetle could occur. No impacts would occur to Myrtle's silverspot butterfly, Opler's longhorn moth, or California brackishwater snail due to an absence of habitat in the action area. Monarch butterfly wintering sites are not known to occur in the Novato Sanitary District Wastewater Facility Plan Project EIR action area.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities would result in temporary impacts to wetland/water features and drainages/associated riparian vegetation near project components, and impacts on Ricksecker's water scavenger beetle could occur, if present. No impacts would occur to California brackishwater snail due to an absence of appropriate habitat in the action area. Myrtle's silverspot butterfly, Opler's longhorn moth, and monarch butterfly wintering sites are not known to occur in the service area and no impacts are expected.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). Approximately 4.3 miles of pipeline would be installed, and impacts on California brackishwater snail, if present, could occur. No impacts would occur to Ricksecker's water scavenger beetle due to an absence of appropriate habitat in the action area. Myrtle's silverspot butterfly, Opler's longhorn moth, and monarch wintering sites are not known to occur in the Napa Salt Marsh Restoration Area and no impacts would occur to these species.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impacts would occur to special-status invertebrates.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to special-status species from operation of the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under Phase 1, the potential for project impacts on Ricksecker's water scavenger beetle and California brackishwater snail are unknown but are presumed to increase with the number of stream crossings. One hundred and two stream crossings would occur under this alternative. Little is known about the ecology of these species and not all drainages would provide appropriate habitat. The project could impact Ricksecker's water scavenger beetle at drainage crossings in the SVCSD, Novato SD and Napa SD areas. Impacts on California brackishwater snail could occur in the SVCSD and Novato SD areas. Myrtle's silverspot butterfly, Opler's longhorn moth and monarch butterfly wintering sites are not known to occur in the Phase 1 action area. Impacts related to Phase 1 would be significant prior to mitigation, but implementation of **Mitigation Measure 3.5.3** would reduce Phase 1 impacts on special-status invertebrates to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD

Ricksecker's water scavenger beetle, California brackishwater snail, Myrtle's silverspot butterfly, Opler's longhorn moth and monarch butterfly wintering sites are not known to occur in this service area. Area drainages are not expected to provide habitat for California brackishwater snail or Ricksecker's water scavenger beetle.

Novato SD

Phase 1 pipelines involve seven stream crossings as stated previously under Impact 3.5.1, Phase 1. Crossings could result in impacts on Ricksecker's water scavenger beetle but they are not known to occur in the action area. California brackishwater snail could be present in Miller Creek, but the project crossing occurs upstream in a segment that may not have enough tidal influence to provide appropriate habitat and they are not known to occur in the action area. Little is known about the ecology of Ricksecker's water scavenger beetle and California brackishwater snail and project impacts are unknown. Myrtle's silverspot butterfly, Opler's longhorn moth and monarch butterfly wintering sites are not known to occur in the action area, and no impacts would occur to these species.

SVCSD

Phase 1 pipelines involve forty-eight stream crossings as stated previously under Impact 3.5.1, Phase 1. Ricksecker's water scavenger beetle is not known to occur in the action area, but they could be present at low-flow stream crossings. Little is known about the ecology of the beetle and project impacts on this species are not known.

California brackishwater snail is known to tolerate a wide range of salinities and occur only in permanently submerged brackish areas. This species is not known to occur in the project vicinity, but they could be present in Huichica Creek at the pipeline crossing or present in an unnamed tributary traversing the pipeline at the Napa Salt Marsh Restoration Area. Project impacts on this species are not known.

Myrtle's silverspot butterfly, Opler's longhorn moth and monarch butterfly wintering sites are not known to occur in the action area, and no impacts would occur to these species.

Napa SD

Phase 1 pipelines involve thirty-two stream crossings as stated previously under Impact 3.5.1, Phase 1. Ricksecker's water scavenger beetle is not known to occur in the action area, but could be present at stream crossings. No impacts would occur to California brackishwater snail due to an absence of appropriate habitat in the action area. Myrtle's silverspot butterfly, Opler's longhorn moth and monarch butterfly wintering sites are not known to occur in the action area, and no impacts would occur to these species.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to special-status species from operation of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion

to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Basic System, the potential for project impacts on Ricksecker's water scavenger beetle and California brackishwater snail are unknown but are presumed to increase with the number of stream crossings. Eighty stream crossings would occur under this alternative. Little is known about the ecology of these species and not all drainages would provide appropriate habitat. The project could impact Ricksecker's water scavenger beetle at drainage crossings in the SVCSD, Novato SD and Napa SD areas and the California brackishwater snail at drainage crossings in SVCSD and Novato SD recycled water service areas. Myrtle's silverspot butterfly, Opler's longhorn moth and monarch butterfly wintering sites are not known to occur in the Basic System action area. Impacts related to the Basic System would be significant prior to mitigation, but implementation of **Mitigation Measure 3.5.3** would reduce impacts on special-status invertebrates to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No additional pipelines are proposed under the Basic System beyond those identified in Phase 1. Impacts would be limited to those identified for the Phase 1 projects.

Novato SD/NMWD

The Basic System pipelines involve five additional and twelve cumulative stream crossings as stated previously under Impact 3.5.1, the Basic System. Impacts under the Basic System would be similar to those identified for the No Action Alternative and Phase 1 projects.

SVCSD

The Basic System pipelines involve twelve additional and sixty cumulative stream crossings as stated previously under Impact 3.5.1, the Basic System. Impacts under the Basic System would be similar to those identified for the Phase 1 project.

Napa SD

The Basic System pipelines involve sixteen additional and forty-eight cumulative stream crossings as stated previously under Impact 3.5.1, the Basic System. Impacts under the Basic System would be similar to those identified for the Phase 1 project. California brackishwater snail is not known to occur in the Napa River, but its presence in the Petaluma River suggests the Napa River could provide habitat.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to special-status species from operation of the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Partially Connected System, the potential for project impacts on Ricksecker's water scavenger beetle and California brackishwater snail are unknown but are presumed to increase with the number of stream crossings. Two hundred and seventeen cumulative stream crossings would occur under this alternative. The project could impact Ricksecker's water scavenger beetle at drainage crossings in the SVCSD, Novato SD and Napa SD recycled water service areas and California brackishwater snail at the Petaluma River crossing in the Novato SD recycled water service area. Monarch butterfly wintering sites are known to occur in the LGVSD recycled water service area, but are not expected in the project ROW. Myrtle's silverspot butterfly and Opler's longhorn moth are known to occur in the Novato SD recycled water service area but their habitat is not expected in the project ROW. Implementation of Mitigation Measure 3.5.3 would reduce the Partially Connected System impacts on special-status invertebrates to a less-than-significant level. A brief discussion of impacts by member agency is provided below.

LGVSD/NMWD

The Partially Connected System pipeline involves six stream crossings as stated previously under Impact 3.5.1, the Partially Connected System. No impacts on special-status invertebrates are expected in this recycled water service area. Coastal salt marsh borders San Pedro Road to the north and south in some Las Gallinas areas, but California brackishwater snail is not expected in the project ROW. Monarch butterfly wintering sites are known to occur in the action area within 600 feet of the alignment but would not be impacted by the project.

Novato SD/NMWD

The Partially Connected System pipelines involve forty additional and fifty-two cumulative stream crossings as stated previously under Impact 3.5.1, the Partially Connected System. Impacts would be similar to those identified for the prior projects. California brackishwater snail is known to occur in the Petaluma River and could be impacted by the project. Myrtle's silverspot butterfly is known to occur in the action area about 0.25 mile from the alignment. However, this species occurs on nearby slopes co-located with its host plant *Viola* and habitat is not expected in the project ROW. Opler's longhorn moth is known to occur in the project vicinity, but occurs in the hills nearly 1.5 miles east of the alignment co-located with its host plant California buttercups and is not expected in the project right-of-way. Marin blind harvestman and Ubick's gnaphosid spider are known to occur in serpentine rock outcrops at Mt. Burdell and are mapped along a 0.75 mile segment of San Marin Drive (CDFG, 2008). This segment is beyond the action area and these species would not be impacted by the project.

SVCSD

The Partially Connected System pipelines involve twelve additional and seventy-two cumulative stream crossings as stated previously under Impact 3.5.1, the Partially Connected System.

Impacts would be similar to those identified for the prior projects. No impacts would occur to California brackishwater snail due to an absence of habitat in the project alignment.

Napa SD

The Partially Connected System pipelines involve twenty-four additional and seventy-two cumulative stream crossings as stated previously under Impact 3.5.1, the Partially Connected System. Impacts would be similar to those identified for the prior projects. California brackishwater snail is not known to occur in the Napa River, but its presence in the Petaluma River suggests the Napa River could provide habitat.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to special-status species from operation of proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Fully Connected System, the potential for project impacts on Ricksecker's water scavenger beetle and California brackishwater snail are unknown but are presumed to increase with the number of stream crossings. Two hundred and forty cumulative stream crossings would occur under this alternative. The project could impact Ricksecker's water scavenger beetle at drainage crossings in the SVCSD recycled water service areas and California brackishwater snail at the Petaluma River crossing in the Novato SD recycled water service area. Monarch butterfly wintering sites are known to occur in the LGVSD recycled water service area, but are not expected in the project ROW. Myrtle's silverspot butterfly and Opler's longhorn moth are known to occur in the Novato SD recycled water service area but their habitat is not expected in the ROW. Implementation of Mitigation Measure 3.5.3 would reduce the Fully Connected System impacts on special-status invertebrates to a less-than-significant level. A brief discussion of impacts by member agency is provided below.

LGVSD/NMWD

No Fully Connected System pipelines are proposed for the LGVSD area. No impacts on special-status invertebrates are expected in this recycled water service area under any alternatives.

Novato SD/NMWD

No Fully Connected System pipelines are proposed for the Novato SD area; impacts would be limited to those incurred under the Partially Connected System.

SVCSD

The Fully Connected System pipelines involve twenty-three additional and ninety-five cumulative stream crossings as stated previously under Impact 3.5.1, the Fully Connected System. Myrtle's silverspot butterfly and Opler's longhorn moth occur upslope approximately 1 mile west of the proposed alignment, co-located with their respective host plants, and are not expected in the project right-of-way. Impacts would be similar to those identified for the prior projects.

Napa SD

No Fully Connected System pipelines are proposed for the Napa SD area; impacts would be limited to those incurred under the Partially Connected System.

Mitigation Measures

> **Mitigation Measure 3.5.3** would reduce potential impacts on special-status invertebrates to a less-than-significant level.
>
> Implementation of **Mitigation Measure 3.5.5** for the protection of California red-legged frogs and **Mitigation Measure 3.5.1** for protection and restoration of wetlands would protect special-status invertebrates that could potentially be impacted by the project. No specific mitigation is required.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.5: Impacts on Western Pond Turtle. Construction of the proposed project has the potential to impact western pond turtles in upland and aquatic habitat. (Less than Significant with Mitigation)

No Project Alternative

No project facilities would be constructed under the No Action Alternative, therefore no impacts would occur to western pond turtle. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action). Under future baseline (2020) conditions, biological conditions within the region are anticipated to remain unchanged from existing conditions.

Under the No Action Alternative, no additional project elements proposed in the four recycled water service areas would directly or indirectly impact western pond turtle. Impacts identified in the SVRWP and Novato SD EIRs would still occur and would be less-than-significant with the implementation of mitigation measures. A brief discussion of impacts by member agency is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact on western pond turtle would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Pipelines would be installed within existing roadways, but if installed in the road shoulder or in the road ROW where wetlands and lacustrine habitat could be present adjacent to roadways, especially along rural portions of Atherton and Olive Avenues, then western pond turtle could be impacted, if present.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities would result in temporary impacts to wetland/water features and drainages/associated riparian vegetation near project components, and implementation of the No Action Alternative could result in impacts to western pond turtle, if present.

The No Action Alternative would also include construction of approximately 8.5 miles of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). Approximately five wetland areas occur near or within the construction corridor for the alignment and western pond turtle, if present, could be impacted by implementation of the No Action Alternative.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact on western pond turtle would occur.

Phase 1 (Project Level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to western pond turtle from the project facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

LGVSD, Novato SD, SVCSD, and Napa SD

Under Phase 1, the Basic System, the Partially Connected System and the Fully Connected System, the project has the potential to impact western pond turtle in all four project service areas. Implementation of **Mitigation Measure 3.5.4** would reduce these impacts to a less-than-significant level.

Western pond turtles have the potential to occur in freshwater drainages throughout the action area including the 113 identified perennial and ephemeral drainages, and nearby irrigation ponds. Because the proposed project expects to bridge or bore beneath drainages, there are few anticipated project impacts on aquatic habitat. Potential impacts on aquatic habitat would probably only occur in the event of an accidental materials release during construction. In such an instance, if pond turtles were present, potential impacts could arise from exposure to spill materials and increased human presence during cleanup.

Turtles and their upland breeding sites could additionally be encountered in upland habitats. This presents the potential to inadvertently harm migrating or breeding turtles, or their nests. The potential loss or disturbance of western pond turtles and their habitat is potentially significant but mitigable.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to western pond turtle from the project facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to western pond turtle from the project facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to west pond turtle from the project facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

Mitigation Measures

Mitigation Measure 3.5.5: The appropriate Member Agency shall implement protection measures to avoid and minimize impacts to western pond turtles.

- When working within 200 feet of stream crossings, all construction personnel shall receive awareness training relating to the protection of western pond turtles, in accordance with the SAAs. Also, to minimize the likelihood of encountering turtles in upland areas near stream crossings, construction footprints shall be minimized to the greatest extent feasible. Based on reconnaissance-level surveys, if staging and construction activities occur principally within or immediately adjacent to project alignment roads the project will be outside of principal pond turtle habitat.

- Within 48 hours prior to the start of construction activities, a qualified biologist shall perform pond turtle surveys within suitable habitat within projected work areas. If a pond turtle nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall.

The measures proposed for protection of aquatic species and red-legged frogs (**Mitigation Measures 3.5.2** and **3.5.6**) will additionally protect western pond turtles during construction.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.6: Impacts on California Red-legged Frog. Construction of the Proposed Project has the potential to affect California red-legged frogs, if present. (Less than Significant with Mitigation)

Trenchless crossing methods (e.g., suspending pipes from bridges or directional drilling) would be employed at streams known or presumed to support California red-legged frog, if flowing or

standing water is present at the time of construction. Construction methods in the vicinity of these crossing sites for installation of pipelines would be minimally invasive, utilizing open trench methods either within or adjacent to roadways.

Used as a standard for red-legged frog mitigation, the USFWS (1999) Programmatic Biological Opinion for impacts on red-legged frogs during Corps-permitted activities identifies typical impacts that could occur as a result of construction in streams that support red-legged frog. Assuming that the identified creeks will be traversed by trenchless techniques (e.g., directional drilling), impacts on California red-legged frogs would generally be avoided but may include:

1. Injury or mortality from being crushed by earth moving equipment, debris, and worker foot traffic;

2. Work activities, including noise and vibration causing frogs to leave suitable habitat;

3. Mortality as a result of the accidental spill of hazardous materials or careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats, or;

4. Injury or mortality as a result of handling, containment, or transport of individuals from active work locations.

No Project Alternative

No project facilities would be constructed in this recycled water service area under the No Action Alternative, therefore no impacts would occur to California red-legged frog. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action). Under future baseline (2020) conditions, the California red-legged frog within the region would likely be continued to be protected under existing or new regulations anticipated to remain unchanged.

Under the No Action Alternative, no additional project elements proposed in the four recycled water service areas would directly or indirectly impact California red-legged frog. Impacts on California red-legged frog identified in the SVRWP EIR would still occur and would be less-than-significant with the implementation of mitigation measures. A brief discussion of impacts by member agency is described below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). California red-legged frog is not reported from the North Novato Service Area and no impacts are expected.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities would result in temporary impacts to wetland/water features and drainages/associated riparian vegetation near project components, and impacts would occur to red-legged frog, if present.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). Red-legged frog is not known from the valley floor and no impacts to this species are expected.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Phase 1

Compared to the CEQA Baseline Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to California red-legged frogs from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under Phase 1, the project could impact California red-legged frog in the SVCSD action area. Implementation of **Mitigation Measure 3.5.5** will reduce potential impacts on California red-legged frog to a less-than-significant level. A detailed discussion of impacts by member agency is provided below.

LGVSD/NMWD, Novato SD/NMWD and Napa SD

California red-legged frog is not known to occur in the Phase 1 action area of Novato SD or Napa SD. This species has not been found on the eastern side of Sonoma Valley and no impacts are expected to occur.

SVCSD

The only known populations of California red-legged frog in the action area are from the immediate vicinity of the Sonoma County Transfer Station located on the west side of Highway 116 a distance of 0.8 miles from the nearest pipeline alignment, and from a ponded portion of adjacent Champlin Creek. Champlin Creek is an ephemeral drainage that drains to Rodgers Creek just south of Watmaugh Road, and then into Fowler Creek. During high flow periods there is habitat continuity among these three drainages that may provide red-legged frog dispersal. This species could additionally occur in Sonoma Creek; however, when found in stream habitats red-legged frogs occur more characteristically in lower order tributary drainages such as Champlin Creek and not in large downstream reaches.

Based on the distribution of red-legged frog in the action area and potential habitat, this species may be expected near the Fowler Creek crossing sites, Rodgers Creek crossing sites, and less likely (due to habitat discontinuity) at the Schell Creek crossing site located west of the SVCSD wastewater treatment facility. Red-legged frogs are also considered unlikely in Nathanson Creek and Arroyo Seco due to discontinuity with known red-legged frog populations.

In the absence of specific protocol-level surveys to establish species presence or absence at these locations, red-legged frogs are presumed present within available aquatic habitat and adjoining upland environs.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to California red-legged frog from operation of proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

Under the Basic System, no impacts on California red-legged frog are expected. No Basic System pipelines are proposed in the LGVSD area. California red-legged frog is not known to occur along the additional SVCSD, Novato SD and Napa SD recycled water service area pipelines that

would be constructed under the Basic System. Therefore, no additional impacts would occur beyond those identified for Phase 1 and no mitigation is necessary.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to California red-legged frog from operation of proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative

Under the Partially Connected System, California red-legged frog is known to occur near pipelines in the Novato SD recycled water service area and could be present in the project ROW. Red-legged frog is not known to occur along the Partially Connected System pipelines in the LGVSD, SVCSD and Napa SD recycled water service areas. Implementation of **Mitigation Measure 3.5.6** will reduce potential impacts on California red-legged frog to a less-than-significant level. A brief discussion of impacts by member agency is described below.

LGVSD/NMWD, SVCSD/NMWD, and Napa SD

California red-legged frog is not known to occur along the proposed LGVSD recycled water service area pipeline, nor along the additional SVCSD and Napa SD pipelines that would be constructed under the Partially Connected System. Therefore, no additional impacts would occur beyond those identified under the Basic System and no mitigation is necessary.

Novato SD/NMWD

California red-legged frog is known to occur in the Sears Point area in a stockpond upstream from Tolay Creek, in the hills owned by Sears Point Raceway. In south Petaluma, two other occurrences are from roadside drainages and impoundments along Lakeville Highway. California red-legged frog could be present in the project ROW and in the absence of specific protocol-level surveys to establish species presence or absence at these locations, red-legged frogs are presumed present in roadside drainages.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to California red-legged frog from operation of proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

Under the Fully Connected System, no additional impacts on California red-legged frog are expected beyond those identified under the Partially Connected System and no additional mitigation is required. A discussion of impacts by Member Agency is provided below.

LGVSD and Napa SD

No Fully Connected System pipelines are proposed in the LGVSD area. California red-legged frog is not known to occur along the additional Napa SD pipelines that would be constructed under the Fully Connected System. Therefore, no additional impacts would occur beyond those identified under the Partially Connected System and no mitigation is necessary.

Novato SD/NMWD

California red-legged from is known to occur within 400 feet of the Fully Connected System alignment in a stockpond upstream from Tolay Creek, adjacent to the Sears Point Raceway, but is not expected in the project right-of-way. No additional impacts are anticipated beyond those identified under the Partially Connected System, therefore no additional mitigation is necessary.

SVCSD

California red-legged frog is known to occur in drainages crossed by the Fully Connected System pipelines connecting south Sonoma to Sears Point. The pipeline in this reach crosses Tolay Creek and several other unnamed tributaries, and additional impacts are anticipated beyond those identified in the Partially Connected System.

Mitigation Measures

Mitigation Measure 3.5.6: The appropriate Member Agency shall implement the following protection measures to avoid and minimize impacts on California red-legged frog.

1) The implementation of measures identified for the protection of special-status fish and California freshwater shrimp would also protect California red-legged frogs within aquatic habitat. All protection measures identified in **Mitigation Measure 3.5.2** shall be applied to the protection of red-legged frogs at sites that provide potential aquatic habitat for this species. These include informal USFWS consultation, avoiding aquatic habitat, establishing a suitable buffer from the aquatic habitat (e.g., 50 feet), and implementing a worker education program.

2) All work activities within or adjacent to aquatic habitat that is potentially occupied by red-legged frogs will be completed between May 1 and November 1.

3) A qualified biological resource monitor will conduct a training session for construction personnel working in upland habitat near potentially occupied drainages, as per conditions of the SAAs.

4) All trash that could attract predators will be regularly contained and removed from the work site.

In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.7: Impacts on Threatened and Endangered Marsh Birds. Construction of the proposed project has the potential to affect western snowy plover, California black rail and California clapper rail and their habitat in and near the project alignments. (Less than Significant with Mitigation)

If nesting rails are present, the construction of the project could result in adverse effects, including loss of individuals, loss of breeding habitat, temporary flight, and/or the abandonment of territories or nests. Construction activities associated with the project would involve removing wetland habitat to accommodate the outfall structure at the Napa Salt Marsh Restoration Area, operating heavy equipment, generating loud noises, and temporary human presence in and adjacent to tidal marsh.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, threatened and endangered species within the region would likely be continued to be protected under existing or new regulations.

Under the No Action Alternative, no additional project elements proposed in the four recycled water service areas would directly or indirectly impact California black rail, California clapper rail, or western snowy plover. Impacts would still occur on California black rail, California clapper rail, and western snowy plover present at the Napa Salt Marsh Restoration area and would

be less-than-significant with the implementation of mitigation measures. A brief discussion of impacts by member agency is described below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact on California black rail and California clapper rail would occur. Western snowy plover is not known to occur in this action area.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). California black rail, California clapper rail, and western snowy plover are not known from this specific action area and no impacts to these species are expected.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities would result in temporary impacts to freshwater wetland features that do not support California black rail, California clapper rail, or western snowy plover.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). Approximately 4.0 miles of pipeline would be installed parallel to an existing pipe that extends between SVCSD WWTP and the SVCSD storage ponds, located near the intersection of Northwestern Pacific Railroad and Ramal Road. A pump station would be installed at the pond site. From the ponds, an additional 4.5 miles of new pipeline would be constructed along the NWPRA railroad tracks to convey water to the salt pond mixing chamber (Option A). Two Alternative Routes (Option B and Option C) consist of a pipeline that would traverse north from the existing reservoirs to Ramal Road, extend east along Ramal Road and then south along Buchli Station Road toward the salt ponds. Option C deviates south from Ramal Road to feed an existing winery reservoir before joining Buchli Station Road.

Approximately five wetland areas occur near or within the construction corridor for the alignment extending from Sonoma to the Napa Salt Marsh and could be impacted by implementation of the No Action Alternative. The Napa Salt Marsh Restoration Plan EIR also identified direct impacts on coastal salt marsh from construction of a proposed outfall structure, but a site assessment based on recent pipeline specifications indicates that only approximately 0.06 acre of degraded levee habitat would be impacted.

Western snowy plover nests on salt pond levees at the Napa Salt Marsh Restoration Area, and California clapper rail and California black rail occur in tidal marshes immediately adjacent to the pipeline alignment. Pipeline installation would occur primarily within a salt pond levee not

presently known to host nesting western snowy plover, but the pipe would extend for some distance into the marsh and an outfall structure would be constructed, resulting in both direct habitat impacts to these species and indirect disturbances. Western snowy plovers nest on the northwestern levee of Salt Pond 7A and on levees at the northwest end of Fly Bay at distances varying from 0.9 miles to within 170 feet of the alignment. California clapper rail and black rail are present in the tidal marsh that occurs at the base of the levee access road within feet of the project, and could be impacted by the proposed project.

Option A follows an old railroad alignment that borders sensitive coastal salt marsh to the south for most of its length. In contract, Options B and C traverse vineyards to the north and do not border sensitive salt marsh habitat. Option A would likely result in greater impacts to salt marsh species than Options B and C. All Options converge at Buchli Station Road to head south and enter the Napa Salt Marsh Restoration Area where California clapper rail, California black rail, and western snowy plover are known to occur. Pipeline installation would occur within a levee access road and, with construction proposed outside the breeding season, no direct impacts to the species are expected.

Napa SD

No project facilities would be constructed under the No Action Alternative, and no impacts on California black rail, California clapper rail or western snowy plover would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to threatened and endangered species from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under Phase 1, impacts on western snowy plover, California clapper rail, and California black rail could occur at the Napa Salt Marsh Restoration Area within the SVCSD recycled water service area. Impacts could also occur in the Novato SD service area at the Novato Creek stream crossings. Pipeline alignments in the LGVSD service area do not traverse appropriate habitat for these species, and they are not known from the Napa SD Phase 1 action area. A discussion of impacts by member agency is described below.

LGVSD/NMWD

Phase 1 pipelines, including Options A through C, traverse agricultural fields and ruderal areas that do not provide habitat for California clapper rail, California black rail, or western snowy plover. No impacts to these species are expected.

Novato SD/NMWD

Habitat is absent for western snowy plover in the Novato SD Phase 1 action area. California clapper rail are known to occur in Novato Creek downstream from Highway 101, east of the railroad crossing and in the proximity of the Novato Creek stream crossings. California black rail have similar habitat requirements and can be expected where clapper rail are present. Impacts to California clapper rail and California black rail are anticipated at the Novato Creek Phase 1 stream crossing.

SVCSD

Under Phase 1, impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Habitat is absent for western snowy plover and California clapper rail in the Napa SD Phase 1 action area. Black rail are occasionally found in upland freshwater marshes but are not known to occur along Napa SD Phase 1 pipelines. No impacts to these species are anticipated.

Alternative 1: Basic System (Program- level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to threatened and endangered species from the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

Under the Basic System, California clapper rail and California black rail could be impacted in the Novato SD area. Implementation of **Mitigation Measure 3.5.6** would reduce impacts on threatened and endangered marsh birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, SVCSD, and Napa SD

Basic System pipelines are not proposed for the LGVSD service area. Coastal salt marsh habitat is absent in the SVCSD and Napa SD Basic System action areas. Black rail are occasionally found in upland freshwater marshes but are not known to occur along proposed pipeline routes. Western snowy plover nesting habitat is not known to occur along the Basic System pipeline routes.

Novato SD/NMWD

California clapper rail and California black rail are known to occur in the action area where the pipeline approaches the Petaluma River, and could be impacted by the project.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to threatened and endangered species from the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Partially Connected System, California clapper rail and California black rail could be impacted in the LGVSD and Novato SD areas. Black rail could be impacted in the SVCSD and Napa SD areas. Implementation of **Mitigation Measure 3.5.6** would reduce the Partially Connected System impacts on threatened and endangered marsh birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Only the Partially Connected System pipeline is proposed in this recycled water service area. California clapper rail and California black rail are known to occur in marshes immediately adjacent to the LGVSD alignment. These species are not expected in the project right-of-way but could experience indirect project impacts due to noise disturbance and construction traffic.

Novato SD/NMWD

In addition to impacts incurred under the Basic System, California clapper rail and California black rail are known to occur in the action area where the Partially Connected System pipeline approaches and crosses the Petaluma River. These species could be impacted by the project.

SVSD and Napa SD

Habitat is absent for western snowy plover and California clapper rail in the SVCSD and Napa SD Partially Connected System action area. Black rail are not known or expected from the action area. No impacts on these species are anticipated.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to threatened and endangered species from the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

Under the Fully Connected System, California black rail could be impacted in the Novato SD area. Implementation of **Mitigation Measure 3.5.6** would reduce impacts on threatened and endangered marsh birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, SVCSD/NMWD, and Napa SD

No Fully Connected System pipelines are proposed for the LGVSD and Napa SD area. No impacts would be incurred in the Napa SD recycled water service area under any alternatives, and impacts in the LGVSD recycled water service area are limited to those incurred under the Partially Connected System. Habitat is absent for western snowy plover and California clapper rail in the SVCSD Fully Connected System action area. Black rail are not known or expected from the action area. No impacts to these species are anticipated.

Novato SD/NMWD

In addition to impacts incurred under the Partially Connected System, California black rail are known to occur in Tolay Creek marsh, which is bisected by Highway 121 north of Highway 37. The pipeline would be installed in the existing roadway of Highway 121 through Sears Point. However, this was a 1977 record and the species may not longer be present. Habitat is not expected in the project ROW, but the project could result in indirect disturbance impacts to the species if present.

Mitigation Measures

Mitigation Measure 3.5.7: Impacts to Threatened and Endangered Marsh Birds. To minimize the likelihood of project effects on threatened and endangered marsh birds, the following reasonable and prudent measures would be implemented by the appropriate Member Agency:

- Protocol-level surveys will be conducted in locations with suitable habitat to determine species presence or absence.
- Agency consultation will be initiated.
- Construction activities will occur during the non-breeding season, September 15 through January 31. The combined breeding season for all three species extends from February 1 through September 14.
- Construction personnel will receive environmental awareness training specific to the identification of clapper rails, black rails, western snowy plover and their habitat.
- Any clapper rail and western snowy plover activity will be immediately reported to the USFWS; black rail activity will be reported to the CDFG.

- Construction activities will be constrained to the smallest area possible to minimize marsh disturbance.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.8: Impacts on Burrowing Owl. Construction of the proposed project could result in direct and indirect impacts to burrowing owls, if present in portions of the project alignment. (Less than Significant with Mitigation)

If present, project construction, site clearing and grubbing, noise disturbances and/or increased human presence could have direct or indirect impacts on burrowing owl. Disturbances could result in nest abandonment by adults, and could potentially cause reproductive failure and loss of young.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis(see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, burrowing owl in the region would likely be continued to be protected under existing or new regulations.

Under the No Action alternative, no additional project elements proposed in the four recycled water service areas would directly or indirectly impact burrowing owl. Impacts on burrowing owl identified in the SVRWP EIR would still occur and would be less-than-significant with the implementation of mitigation measures. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Burrowing owls are present at Gnoss Field approximately 1.0 miles to the north, but are not known from or expected in the action area.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities could result in impacts to burrowing owl. Potential nesting habitat was identified in grasslands between Highway 116 and the SVCSD wastewater treatment plant.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). Burrowing owl populations are documented 0.67 mile south of this alignment connecting the SVCSD area to the Napa Salt Marsh Restoration Area.

Within the core of the SVCSD, open grasslands were identified in two locations: between Highway 116 and the SVCSD wastewater treatment facility and between Hyde Road and the wastewater treatment facility. The likelihood of encountering burrowing owls in these agricultural areas is considered low due to historic and/or ongoing cultivation.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to burrowing owl from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Burrowing owl could potentially be present in the SVCSD and Novato SD Phase 1 action areas. Implementation of **Mitigation Measure 3.5.8** would reduce potential impacts on burrowing owl to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Napa SD

Implementation of Phase 1 would entail construction of a pipeline from the Recycled Water Treatment Facility at LGVSD WWTP to the Hamilton Field area and Reservoir Hill Tank by one of Options A, B or C. Options A and B traverse agricultural fields that are regularly cultivated and would not support burrowing owl. Option C traverses the levee of Miller Creek, heavily overgrown with fennel but bordered by grazing areas to the west and a rarely-driven dirt road to the north. Burrowing owl was known from this area in the early 1980s (CDFG, 2008) but has not been recently observed. The berm between Miller Creek and the dirt road offers a narrow strip of potential habitat, and ruderal grazing areas to the west offer fair quality habitat, but no owls or small mammal burrow complexes were observed during field surveys.

Novato SD/NMWD

Burrowing owl is known from Gnoss Field, 0.67 mile north of the nearest pipeline alignment, but is not known from the action area. No impacts to this species are expected.

SVCSD

Under Phase 1, impacts in the SVCSD would be equivalent to those under the No Action Alternative.

Napa SD

Burrowing owl is known from one location in south Napa, but is not known from the action area. No impacts to this species are anticipated.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to burrowing owl from the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

Under the Basic System, burrowing owl could be impacted in the Novato SD and Napa SD recycled water service areas. Implementation of **Mitigation Measure 3.5.7** would reduce potential impacts on burrowing owl to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD and SVCSD

No Basic System pipelines are proposed for the LGVSD area. The Basic System pipelines in the core SVCSD area near suitable habitat for burrowing owl are short offshoots of Phase 1 pipelines and are adequately covered in the Phase 1 discussion above.

Novato SD//NMWD

In addition to impacts incurred under Phase 1, the Basic System pipelines in Novato SD traverse off-road open areas that could provide habitat for burrowing owl. Areas appear to be farmed for hay, and regular mowing and tilling would discourage burrowing owls from using this area, but areas that are grazed have the potential for impacts.

Napa SD

Burrowing owl is not known to occur along the Basic System pipelines in this recycled water service area, but undescribed populations could be present in off-road or farm road alignments.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to burrowing owl from the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

Under the Partially Connected System, burrowing owl could be impacted in the SVCSD and Novato SD recycled water service areas. Implementation of **Mitigation Measure 3.5.7** would reduce potential impacts on burrowing owl to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Only the Partially Connected System pipeline is proposed in this recycled water service area. Burrowing owl is not known to occur along the proposed pipeline and additional impacts are not expected.

Novato SD/NMWD

In addition to impacts incurred under the Basic System, the Sears Point area supports two populations of burrowing owl within 0.7 miles of the proposed alignment but they are not likely to be impacted due to their distance from proposed activities. A possibly extirpated population occurs within the alignment just south of the Lakeville Highway/ Highway 37 junction; if still present, this population would be impacted by the project.

Grasslands north of Hamilton Field could support unknown populations of burrowing owl and be impacted by off-road alignments.

SVCSD

In addition to impacts incurred under the Basic System, an off-road alignment extending east from Highway 116 south of Bonness Road and an off-road arm alignment extending west from Highway 116 approximately 1 mile south of Meadowlark Lane would pass through open areas of sloping grasslands that could support undescribed populations of burrowing owl.

Napa SD

Burrowing owl is not known to occur along proposed in-road alignments and impacts on this species are not expected.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to burrowing owl from the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

Under Fully Connected System, burrowing owl is not known to occur along additional pipelines from the four recycled water service areas but habitat is present in the SVCSD and Novato SD areas. If present, implementation of **Mitigation Measure 3.5.7** would reduce potential impacts on burrowing owl to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD and Napa SD

No Fully Connected System pipelines are proposed for the LGVSD and Napa SD areas. No impacts on burrowing owl are expected in the LGVSD recycled water service area under any alternatives, and impacts in the Napa SD recycled water service area would be limited to those incurred under the Basic System.

Novato SD/NMWD

In addition to impacts incurred under the Partially Connected System, an off-road alignment would occur briefly between Tolay Creek Rd. and Reclamation Rd. south of Sears Point, passing through open areas that could support undescribed populations of burrowing owl. If present, this species could be impacted by the project.

SVCSD

In addition to impacts incurred under the Partially Connected System, off-road alignments near Lomita Ave., Norblum Rd., Davenport Rd., and Fowler Creek Rd. pass through dry, hilly areas

that could support undescribed populations of burrowing owl. If present, this species could be impacted by the project.

Mitigation Measures

Mitigation Measure 3.5.8: The following measures to avoid, minimize, or mitigate impacts on burrowing owls would be incorporated into the project by the appropriate Member Agency:

- In areas identified to provide potential burrowing owl habitat, preconstruction surveys for burrowing owls would be conducted by a qualified biologist 14-30 days prior to the start of construction. Surveys would cover grassland areas within 500-foot buffer and check for adult and juvenile burrowing owls and their habitat.

- Construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the non-breeding season (September 1 through January 31), the exclusion zone would extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250 feet around occupied burrows. Passive relocation of owls is not proposed.

- A qualified biologist (the on-site monitor or otherwise) will monitor owl activity on the site to ensure the species is not adversely affected by the project.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.9: Impacts on Nesting Birds. Construction of the proposed project has the potential to affect nesting birds including Swainson's hawk, willow flycatcher, sharp-shinned hawk, Cooper's hawk, tri-colored blackbird, Bell's sage sparrow, golden eagle, northern harrier, California yellow-warbler, white-tailed kite, California horned lark, salt marsh common yellowthroat, loggerhead shrike, San Pablo song sparrow, California thrasher, rookeries, and additional bird species protected by California Fish and Game Code Section 3503 and the federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989). (Less than Significant with Mitigation)

Potential nesting habitat for numerous common and special-status birds occurs in and adjacent to the Proposed Project facilities and throughout the action area. Potential nesting sites include large trees, riparian corridors, streamside vegetation, shrubs, and open grasslands. Project activities, such as earthmoving, grading, and trenching during the nesting season (generally February 1 to August 31) have the potential to result in direct mortality of these species. In addition, human disturbances and construction noise have the potential to cause indirect impacts due to nest abandonment and death of young, or loss of reproductive potential at active nests located near project activities. If ground-disturbing activities (i.e., ground clearing, trenching, or grading, including removal or trimming of trees or shrubs), are scheduled to occur outside the nesting season (September 1 through January 28), no mitigation is required. However, if activities would

occur from February 1 to August 31, then implementing **Mitigation Measure 3.5.8** would reduce potential impacts to a less-than-significant level.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, nesting birds within the region would likely be continued to be protected under existing or new regulations.

A brief discussion of impacts by member agency is provided below. Implementation of **Mitigation Measure 3.5.9** would reduce Phase 1 impacts on nesting birds to a less-than-significant level.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact on nesting birds would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Roadside vegetation offers suitable habitat for many birds, and impacts to nesting birds are anticipated.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities could impact nesting birds. No specific nests are known from the action area.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline)

(JSA, 2003). A northern harrier nest occurs on Coon Island 0.6 miles southeast of the Napa Salt Marsh pipeline; at this distance, no direct or indirect impacts are anticipated. Tri-colored blackbird, salt marsh common yellowthroat, and San Pablo song sparrow are known to occur in marshes adjacent to the Napa Salt Marsh pipeline alignment and could be impacted by Option A, B,and C pipeline installation.

Option A follows an old railroad alignment that borders undeveloped areas for most of its length. In contract, Options B and C traverse vineyards to the north, a monoculture that offers little habitat value and would not support as many breeding birds. Option A would likely result in greater impacts to breeding birds than Options B and C.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact on nesting birds would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to nesting birds from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under Phase 1, one specific nest is known to occur in the recycled water service areas. Impacts on nesting birds are presumed to increase as additional pipelines are introduced under each alternative. Implementation of **Mitigation Measure 3.5.9** would reduce Phase 1 impacts on nesting birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Specific nests and rookeries are not known to occur in the action area, but nesting birds may be present and could be impacted by pipeline installation.

Novato SD/NMWD and Napa SD

Specific nests and rookeries are not known to occur in the action area, but nesting birds may be present and could be impacted by pipeline installation.

SVCSD

Under Phase 1, impacts in the SVCSD would be equivalent to those under the No Action Alternative.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to nesting birds from the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

In addition to specific nests identified in Phase 1, one specific nest is known to occur in the recycled water service areas under the Basic System. Impacts on nesting birds are presumed to increase as additional pipelines are introduced under each alternative. Implementation of **Mitigation Measure 3.5.9** would reduce Phase 1 impacts on nesting birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD and SVCSD

No Basic System pipelines are proposed for the LGVSD area. Specific nests and rookeries are not known to occur along proposed SVCSD recycled water service area pipelines, but nesting birds may be present and could be impacted by the project.

Novato SD/NMWD

San Pablo song sparrow is known to occur in tidal marshes in the recycled water service area and could be impacted where the pipeline crosses the Petaluma River.

Napa SD

Tricolored blackbird and salt marsh common yellowthroat are known to occur in various locations along the Napa River and could be impacted where the pipeline crosses the river. Nesting golden eagles were described in a large eucalyptus tree in 2003, approximately 200 feet from the Stanley Crossroad alignment (CDFG, 2008) and the project could result in indirect impacts.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to nesting birds from the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

In addition to specific nests identified in the Basic System, two specific nests or rookeries are known to occur in the recycled water service areas under the Partially Connected System. Impacts on nesting birds are presumed to increase as additional pipelines are introduced under each alternative. Implementation of **Mitigation Measure 3.5.9** would reduce Phase 1 impacts on nesting birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Only the Partially Connected System pipeline is proposed in this recycled water service area. San Pablo song sparrow and tricolored blackbird are known to occur in marshes in China Camp State Park and along San Pedro Road, and could be present in the ROW. A great blue heron rookery was described on private land within 0.3 miles of the alignment and although not directly impacted by pipeline installation, the rookery could be adversely affected by construction noise.

Novato SD/NMWD

In addition to specific impacts incurred under Phase 1, tricolored blackbird and salt marsh common yellowthroat are known to occur in marshes in the action area and could be impacted where the pipeline crosses Petaluma River.

SVCSD

In addition to specific impacts incurred under Phase 1, salt marsh common yellowthroat is known to occur in marshes neighboring the action area. Habitat is not expected in the project ROW and direct impacts on the species are not anticipated.

Napa SD

In addition to specific impacts incurred under Phase 1, tricolored blackbird and salt marsh common yellowthroat are known to occur in marshes in the action area and could be impacted where the pipeline crosses the Napa River. The state-threatened Swainson's hawk nests in an oak tree approximately 200 feet from the alignment near Soscol Ferry Road and could be impacted by the project.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to nesting birds from the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

Under Fully Connected System, no additional nests are identified beyond those previously described. Impacts on nesting birds are presumed to increase as additional pipelines are introduced under each alternative. Implementation of **Mitigation Measure 3.5.9** would reduce Phase 1 impacts on nesting birds to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, SVCSD, and Napa SD

The Fully Connected System pipelines are not proposed for the LGVSD and Napa SD areas. Impacts in these recycled water service areas would be limited to those incurred under the Partially Connected System. Specific nests and rookeries are not known to occur in the SVCSD recycled water service area, but nesting birds may be present and could be impacted by the project.

Novato SD/NMWD

In addition to specific impacts incurred under the Partially Connected System, salt marsh common yellowthroat and San Pablo song sparrow are known to occur in marshes south of Sears Point. Pipeline installation would occur along a dirt farmroad outside of appropriate habitat and these species would not be directly impacted by the project.

Mitigation Measures

Mitigation Measure 3.5.9: To avoid disturbing common and special-status nesting birds, the following protection measures shall be implemented:

- Whenever feasible, vegetation shall be removed during the non-breeding season (generally defined as September 1 to January 31).
- For ground disturbing activities occurring during the breeding season (generally defined as February 1 to August 31), a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities.
- If active bird nests are found during preconstruction surveys, a 500-foot no-disturbance buffer will be created around active raptor nests during the breeding season or until it is determined that all young have fledged. A 250-foot buffer zone will be created around the nests of other special-status birds. These buffer zones are consistent with CDFG avoidance guidelines; however, they may be modified in coordination with CDFG based on existing conditions at work locations.
- If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs that have been determined to be unoccupied by special-status birds or that are located at least 500 feet from active nests may be removed.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.10: Impacts on Salt Marsh Harvest Mouse and Suisun Ornate Shrew. Construction of the proposed project has the potential to affect salt marsh harvest mouse and suisun ornate shrew and their habitat in and near the project alignments. (Less than Significant with Mitigation)

Impacts may include the temporary removal of vegetation, direct mortality from equipment, entrapment in pipe sections or trenches, and harassment due to noise or vibration.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis(see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, the salt marsh harvest mouse and suisun ornate shrew in the region would likely be continued to be protected under existing or new regulations. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Salt marsh harvest mouse and Suisun ornate shrew are not present in this action area.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. Salt marsh harvest mouse and Suisun ornate shrew are not present in this action area.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline)

(JSA, 2003). Impacts on salt marsh harvest mouse and suisun ornate shrew identified in that EIR would still occur.

None of Options A, B or C traverse appropriate habitat for salt marsh harvest mouse and suisun ornate shrew until they converge to enter the Napa Salt Marsh Restoration Area.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to harvest mouse and shrew from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under Phase 1, salt marsh harvest mouse and Suisun ornate shrew could be impacted in the SVCSD recycled water service area. Implementation of **Mitigation Measure 3.5.9** would reduce potential Phase 1 impacts on salt marsh harvest mouse and Suisun ornate shrew to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Pipeline alignments in the LGVSD service area do not traverse appropriate habitat for salt marsh harvest mouse and Suisun ornate shrew. No impacts to these species are expected.

Novato SD/NMWD and Napa SD

Pipelines bordering coastal salt marshes in Novato pipelines would be installed in existing roadways; this vegetation community is not expected in the project ROW and no impacts are anticipated. No habitat is present in the Napa SD area.

SVCSD

Under Phase 1, impacts in the SVCSD would be equivalent to those under the No Action Alternative.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline),

Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to harvest mouse and shrew from the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

Under the Basic System, salt marsh harvest mouse and Suisun ornate shrew could be impacted in the Novato SD recycled water service area. Implementation of Mitigation Measure 3.5.9 would reduce potential the Basic System impacts on salt marsh harvest mouse and Suisun ornate shrew to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, SVCSD, and Napa SD

Additional Basic System pipelines are not proposed for LGVSD. Coastal salt marsh habitat is absent from the SVCSD and Napa SD the Basic System recycled water service areas and no additional impacts would occur.

Novato SD/NMWD

Coastal salt marsh habitat is present where the Basic System pipeline crosses the Petaluma River. Salt marsh harvest mouse are known to occur in the Petaluma River near the action area and could be impacted by the project. Suisun ornate shrew are not known to occur in the action area and are not distributed west of the Petaluma River (CDFG, 2008).

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to harvest mouse and shrew from the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

Under the Partially Connected System, salt marsh harvest mouse and Suisun ornate shrew could be impacted in the Novato SD recycled water service area. Implementation of **Mitigation Measure 3.5.9** would reduce potential the Basic System impacts on salt marsh harvest mouse and Suisun ornate shrew to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, SVCSD, and Napa SD

LGVSD pipelines would be installed in the existing roadway. Coastal salt marsh habitat is absent from the SVCSD and Napa SD areas. No impacts are expected.

Novato SD/NMWD

In addition to impacts incurred under the Basic System, coastal salt marsh habitat is present as the pipeline crosses the Petaluma River and the project could impact salt marsh harvest mouse and Suisun ornate shrew at this location. Salt marsh harvest mouse is known to occur in the Petaluma River, and both salt marsh harvest mouse and Suisun ornate shrew are known to occur in the Sears Point area.

Implementation of **Mitigation Measure 3.5.9** would reduce the Partially Connected System impacts on salt marsh harvest mouse and Suisun ornate shrew to a less-than-significant level.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to harvest mouse and shrew from the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. No Fully Connected System impacts on Salt marsh harvest mouse and Suisun ornate shrew are anticipated and no additional mitigation is required. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, SVCSD, and Napa SD

No Fully Connected System pipelines are proposed for LGVSD or Napa SD and no impacts on salt marsh harvest mouse and Suisun ornate shrew are expected in these service areas under any alternatives. Coastal salt marsh habitat is absent in the SVCSD Fully Connected System recycled water service area.

Novato SD/NMWD

Salt marsh harvest mouse and Suisun ornate shrew are known to occur in coastal salt marsh habitat near Sears Point, but the pipeline would be installed in existing dirt farm roads outside of coastal salt marsh habitat and no impacts are expected.

Mitigation Measures

> **Mitigation Measure 3.5.10:** The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on salt marsh mammals during construction.
>
> Where avoidance of sensitive habitat is not feasible (e.g., by bridging or bore and jack), consultation with CDFG and/or USFWS would be initiated. If species are present or presumed to be present after informal consultation with USFWS and/or CDFG, then a formal consultation and Biological Assessment in support of a Biological Opinion would be required. Such a consultation would proceed as part of the Corps 404 permitting program.

To avoid potential impacts on salt marsh harvest mouse and Suisun ornate shrew, a qualified biologist shall conduct specific preconstruction surveys prior to project initiation, following USFWS survey guidelines. The project proponent shall install exclusionary fences to prevent species movement into the action area, and a biologist with the appropriate permits to relocate these species shall live-trap mice and shrews within the enclosure and move these animals outside the fence. The biological monitor shall inspect these fences to ensure their integrity, and shall conduct an education workshop for contractors employees outlining species' biology, legislative protection, and construction restrictions to reduce potential impacts.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.11: Impacts on Special-Status Bats. Construction of the proposed project has the potential to affect roosting or breeding special-status bats in and near the project alignments. (Less than Significant with Mitigation)

Bridges and large trees throughout the action area provide potential habitat for roosting and breeding bats. Potential direct impacts to special-status bats include removal of roost sites during site clearing and grubbing activities. Indirect impacts include increased noise and human presence during construction, with the possibility of temporary nest or roost abandonment.

No Project Alternative

No project would be implemented under No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, special-status bats within the region would likely be continued to be protected under existing or new regulations. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact on special-status bats would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). No impacts on special-status bats are anticipated.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities could result in impacts to special-status bats.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). No special-status bats are known from the action area.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact on special-status bats would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to special-status bats from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No special-status bats are known from the LGVSD service area. However, large eucalyptus trees are abundant in this rural environment, and could provide potential habitat for bats.

Novato SD/NMWD, Napa SD

Bridge crossings could provide suitable nesting and roosting habitat, and Sonoma Creek, Novato Creek, Napa River and other perennial drainages provide a required nearby water source. No roosting habitat is known to occur in these action areas.

SVCSD

Special-status-bat roosts are present in the SVCSD recycled water service area. Bat surveys have not been conducted; however, roosting pallid bats have been identified under Sonoma Creek

Bridge within the alignment (CNDDB, 2008) and could be impacted by the project. A roosting population has also been identified within 0.4 mile of the alignment at Riverside Drive Bridge, but may not be affected by the project and the project has the potential to impact special-status bats in all recycled water service areas. Implementation of **Mitigation Measure 3.5.10** would reduce potential impacts on special-status bats to a less-than-significant level. A brief discussion by member agency is provided below.

Alternative 1 (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to special-status bats from the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD, Novato SD, SVCSD, and Napa SD

Please refer to the discussion above.

Alternative 2 (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to special-status bats from the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

Please refer to the discussion above.

Alternative 3 (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to special-status bats from the proposed facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD, Novato SD, SVCSD, and Napa SD

Please refer to the discussion above.

Mitigation Measures

> **Mitigation Measure 3.5.11:** The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on special-status bats in and near project facilities during construction.
>
> Concurrent with breeding bird surveys (**Mitigation Measure 3.5.8**), a qualified biologist will conduct preconstruction surveys for special-status bats at each bridge crossing location and in rural (i.e., non-road) areas where any large trees (e.g., > 24 inch diameter at breast height) will be removed. If an active roost is observed, a suitably-sized buffer (e.g., 100 to 150 feet) will be placed around the roost if it appears that trenching or other project activities may cause abandonment. Demolition activities must cease until juvenile bats are self-sufficient and will not be directly or indirectly impacted by activities.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.12: Impacts on American Badger. Construction of the proposed project has the potential to affect American badger and its habitat in and near the project alignments. (Less than Significant with Mitigation)

Project activities, including grading, stockpiling, and other site disturbances along pipeline alignments would disturb annual grasslands and potentially eliminate badger dens. This species may be present on the site at any time of the year, and the removal of active dens could result in the direct mortality of individual badgers that are denning in action area grasslands, if present when activities occur.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, the American badger within the region would likely be continued to be protected under existing or new regulations. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact to American badger would occur.

Novato SD/NMWD

Under the No Action Alternative, recycled water facilities would be constructed in the Novato North Service Area (see 2.7.1 Project Description, Phase 1 Implementation Plan, Novato Sanitary District, Novato North Service Area). Pipeline alignments would be installed within existing roadways and impacts to American badger are not expected.

SVCSD

Under the No Action Alternative, Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP) would be implemented. As discussed in the SVRWP EIR (ESA, 2006), which included Alignment 1A in a larger pipeline analysis, construction of these facilities could result in impacts to American badger in grassland habitats.

The No Action Alternative would also include construction of water delivery project components analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (the Sonoma Pipeline) (JSA, 2003). This low-elevation coastal scrub habitat would not provide suitable habitat for American badger, however impacts on American badger could occur in upland grassland pipeline routes.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact to American badger would occur.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to American badger from construction of the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Under Phase 1, American badger could be impacted in the SVCSD recycled water service area. Implementation of **Mitigation Measure 3.5.12** would reduce potential Phase 1 impacts on American badger to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Proposed alignments in the LGVSD service area traverse coastal baylands and cultivated farmland in areas east of Highway 101. These areas are isolated from oak woodlands to the west. This isolation, combined with the intensely cultivated nature of the open space, would not result in appropriate habitat for badger. No impacts to this species are anticipated in the service area or under any alignment Option.

Novato SD/NMWD

Phase 1 pipelines south of Hamilton Field traverse an expanse of open area and annual grasslands. However, no American badger occurrences are known to occur in the action area, and though American badger was historically present in Marin County and habitat is available along portions of this off-road pipeline alignment, this area is isolated by Highway 101 from undeveloped hills to the west. Impacts on American badger are not anticipated.

SVCSD

Off-road pipelines in the SVCSD area traverse ruderal grazing areas and non-native grasslands and could impact American badger. American badger is known to occur in the action area (C. Alvarado, pers. comm., 2009) and fair-quality habitat is available along portions of off-road pipeline alignments. Off-road pipelines in Sonoma occur between Watmaugh and Imperial Roads, east of 8th Street, between Arnold and Watmaugh, between first and fourth street, and between Specht and Imperial east of Highway 12.The remaining off-road pipelines were surveyed either on foot or from the road, and while most land parcels have been converted to vineyards or croplands, some remaining parcels are ruderal grazing lands and annual grassland that provide moderate habitat for American badger. Under Phase 1, impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Phase 1 pipelines are in road rights-of-way and are not expected to impact American badger.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline),

Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to American Badger from construction of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

Under the Basic System, American badger could be impacted in the SVCSD, Novato SD and Napa SD recycled water service areas. Implementation of **Mitigation Measure 3.5.12** would reduce potential Phase 1 impacts on American badger to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under the Basic System, project construction would involve increasing tertiary treatment capacity at the LGVSD WWTP by 0.3 mgd through onsite improvements. No additional Basic System pipelines are proposed for the LGVSD.

Novato SD/NMWD

American badger is not known along proposed the Basic System pipeline routes, but in addition to impacts incurred under Phase 1 there is a low potential to impact American badger along an alignment that traverses off-road towards Black Point to deliver water to the Stonetree Golf Club. While open areas appear to be farmed for hay and regular mowing and tilling would prevent badgers from using this area, grazing areas could support American badger.

SVCSD

American badger is not specifically known to occur along proposed Basic System pipeline routes, but in addition to impacts incurred under Phase 1 there is a low potential to impact American badger along an off-road alignment that extends east from Arnold Drive south of Cypress. While this area appears to have been largely converted to vineyards, grazing and open grassland areas could support badger.

Napa SD

American badger is not known to occur along proposed the Basic System alignments but there is a low potential to impact American badger along an alignment that follows an existing dirt farm road across grazing and open grassland areas that could support badger.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to American badger from construction of proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

Under the Partially Connected System, American badger could be impacted in the SVCSD and Napa SD recycled water service areas. Implementation of **Mitigation Measure 3.5.12** would reduce potential Phase 1 impacts on American badger to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Only the Partially Connected System pipeline is proposed for this recycled water service area. The pipeline traverses dry, sloping grasslands off-road for a short distance from San Pedro Rd. to Biscayne Dr. and while Marin County is within this species' described range, this area is isolated from undeveloped hills to the west by Highway 101. Therefore, impacts are American badger are not expected.

Novato SD/NMWD

American badger is not known to occur along proposed pipelines, but in addition to impacts incurred under the Basic System, badger could be present in grazing areas along a 1 mile alignment through Sears Point. The potential for impacts is reduced by Highway 37, which interrupts the habitat continuity by reducing access to undeveloped hills to the north.

Impacts on American badger are not anticipated along several lengthy, off-road the Partially Connected System pipelines that traverse the Bel Marin Keys area then head south to Hamilton Field and farther south to agricultural areas, passing through grassland and grazing areas. Occurrences are not known along the proposed alignments, and though American badger was historically present in Marin County and habitat is available along portions of this off-road pipeline alignment, this area is isolated by Highway 101 from undeveloped hills to the west.

SVCSD

American badger is not known to occur along proposed alignments, but in addition to impacts incurred under the Basic System, American badger may be present in dry grasslands along off-road alignments extending east from Highway 116 south of Bonness Road and west from Highway 116 approximately 1 mile south of Meadowlark Lane.

Napa SD

American badger is not known to occur in the action area, but in addition to impacts incurred under the Basic System, badger may be present in dry, open areas along an off-road alignment south of Soscol Ferry Rd. This alignment would traverse east from the Napa River across Highway 121 and into the hills, generally paralleling Suscol Creek.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to American badger from construction of project facilities under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

Under the Fully Connected System, American badger could be impacted in the SVCSD and Novato SD recycled water service areas. Implementation of **Mitigation Measure 3.5.12** would reduce potential Phase 1 impacts on American badger to a less-than-significant level. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

No Fully Connected System pipelines are proposed in the LGVSD area.

Novato SD/NMWD

American badger is not known to occur in the action area, but in addition to impacts incurred under the Partially Connected System, badger could be present along an off-road alignment between Tolay Creek Rd. and Reclamation Rd. at Sears Point.

SVCSD

American badger is known to occur in the action area (C. Alvarado, pers.comm., 2009). In addition to impacts incurred under the Partially Connected System, badger may be present in dry, hilly areas along off-road alignments near Lomita Ave., Norblum Rd., Davenport Rd., and Fowler Creek Rd.

Napa SD

No Fully Connected System pipelines are proposed for the Napa SD area and impacts would be limited to those incurred under the Partially Connected System.

Mitigation Measures

Mitigation Measure 3.5.12: To avoid and minimize impacts on badgers, the appropriate Member Agency shall implement preconstruction surveys prior to ground clearing and grading in annual grasslands habitat or areas that are known or suspected to support badger.

- Within 30-days prior to ground-clearing, a qualified biologist shall survey areas that provide potential badger habitat that occur within 100-feet of project activities. If no evidence of badgers presence is detected, no further mitigation is required. If active badger dens are identified within the action area, badgers will be passively relocated. If identified, vacated dens shall be temporarily covered using plywood sheets or

similar materials to prevent badgers from returning to the action area during construction.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.13: Impacts on Rare Plants. Project construction could result in impacts to listed and other special-status plants. (Less than Significant with Mitigation)

The following listed and special-status plants have been identified as having at least a low potential to occur in the action area and are discussed in this impact section: Sonoma sunshine, soft bird's beak, Contra Costa goldfields, two-fork clover, franciscan onion, Napa false indigo, Mt. Tamalpais manzanita, narrow-anthered California brodiaea, Point Reyes bird's beak, dwarf downingia, Napa western flax, delta tule pea, legenere, Mason's lilaeopsis, Suisun marsh aster, saline clover, and oval-leaved viburnum.

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, rare plants in the region would likely be continued to be protected under existing or new regulations. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact on listed and other special-status plant species known to occur in the project vicinity would occur.

Novato SD/NMWD

If the project is not implemented in the Novato SD, no pipelines would be constructed that could impact listed and other special-status plant populations. Pipelines identified in the Novato

Sanitary District Wastewater Facility Plan Project EIR would still be constructed, but those findings concluded that no habitat existed in that action area for rare plants.

SVCSD

Rare plant surveys conducted for the SVRWP along Alignment 1A concluded that no impacts on listed or other special-status plants would occur.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of approximately 4.3 miles of pipeline, departing southeast from central Sonoma and traversing off-road between Ramal Road and Buchli Station Road, then turning south along Buchli Station Road to the salt pond access road levee and terminating at the mixing ponds. Two unverified populations of soft bird's beak are reported by the CNPS along this pipeline route (CDFG, 2008). The first occurs near Bentley's Wharf where the pipeline would intersect soft bird's beak habitat at Huichica Creek, south of the railroad tracks and west of Salt Pond 7A. This population is believed to be extirpated. The second population is an undated record immediately to the east of the proposed pipeline terminus at the mixing ponds, near Fly Bay, for which more detailed information was not available. This mapped soft bird's beak population occurs in the action area in the Napa-Sonoma Marshes Wildlife Area Huichica Creek Unit, though its specific distribution and the potential for project impacts are not known because the site was not accessible for surveys. This population could be impacted by the project, and more specific surveys are required to determine the extent of the anticipated impact.

A possibly extirpated population of two-fork clover occurs in the vicinity of the railroad track and salt pond access road junction. First observed in 1952, a follow-up survey along the railroad tracks in April 1987 found no plants. Habitat to the northeast of the railroad tracks is upland grassland and to the northwest is managed vineyards; south of the railroad tracks the habitat is managed marsh. The specific distribution and the potential for project impacts are unknown because the site was not accessible for surveys. This population could be impacted by the project.

An extant population of delta tule pea occurs about 160 feet southeast of where the off-road pipeline would intersect with Huichica Creek and could be impacted by the project. Several other extant populations occur in the vicinity of the Napa Salt Marsh Restoration area but are not in the project alignment.

Napa SD

No project facilities woulod be constructed under the No Action Alternative, therefore no impact on listed and other special-status plant species known to occur in the project vicinity would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects

would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to rare plants under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under Phase 1, pipeline alignments could impact soft bird's beak, two-fork clover and delta tule pea in the SVCSD recycled water service area; Mt. Tamalpais manzanita in the Novato SD recycled water service area; and Suisun marsh aster in the Napa SD recycled water service area. Pending the findings of focused botanical surveys, as-yet unidentified populations of rare plants could be impacted by the project. Implementation of **Mitigation Measure 3.5.13** would reduce potential Phase 1 impacts to a less-than-significant level.

LGVSD/NMWD

Phase 1 pipeline alignments, including Options A through C, would be installed in existing dirt roadways or within levee berms adjacent to chaparral/coastal scrub and agricultural fields. Mt. Tamalpais manzanita grows in chaparral, and valley and foothill grasslands and is known to occur in the LGVSD service area. This species could be impacted if present in the project right-of-way.

Novato SD/NMWD

If the Phase 1 project is implemented in the Novato SD, impacts on Mt. Tamalpais manzanita could occur. Mt. Tamalpais manzanita grows in chaparral, and valley and foothill grasslands, a habitat type found adjacent to the main stem of the Phase 1 pipelines through Novato (CDFG, 2008) though they are not expected in the project ROW. Focused botanical surveys are pending in this service area; thus, a small though unknown number of Mt. Tamalpais manzanita could be impacted during construction. Impacts on Tiburon buckwheat are unlikely based on known occurrences.

SVCSD

Under Phase 1, impacts related to the SVRWP and the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative if Alternative A is the preferred Napa Salt Marsh pipeline alignment. The construction of Options B or C is expected to result in fewer potential impacts to rare plants since they traverse the disturbed soils of monocultural vineyards where rare plants would not be expected.

Napa SD

If the Phase 1 project is implemented in the Napa SD, Suisun marsh aster could be impacted. Suisun marsh aster was observed in 1992 in a ditch and railroad berm parallel with the west boundary of the Napa Golf Course at Kennedy Park. The southern pipeline portion cuts through moist areas in the off-road portion between Imola and Hwy. 121 that could potentially be habitat for Suisun marsh aster.

No other rare plants are known to occur in the action area. Napa western flax and delta tule pea occur in the project vicinity, but appropriate habitat does not occur along pipeline routes. Holly-leaved ceanothus, Brewer's western flax, and narrow-anthered California brodiaea are unlikely in the action area based on known distribution.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to rare plants under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Basic System, pipeline alignments could impact Mt. Tamalpais manzanita in the Novato SD recycled water service area and Suisun marsh aster in the Napa SD recycled water service area. No the Basic System pipelines are proposed in the LGVSD recycled water service area. Focused botanical surveys have not been conducted in the Novato SD and Napa SD recycled water service areas, but were conducted for the Basic System pipelines in the SVRWP EIR and no rare plants were found in the action area. Pending the findings of focused surveys, as-yet unidentified rare plant populations could be impacted by the proposed project. Implementation of Mitigation Measure 3.5.13 would reduce potential impacts to a less-than-significant level.

LGVSD/NMWD

Under the Basic System, project construction would involve increasing tertiary treatment capacity at the LGVSD WWTP by 0.3 mgd through onsite improvements.

Novato SD/NMWD

In addition to Phase 1 impacts previously described, implementation of the Basic System could impact Mt. Tamalpais manzanita. Generally known to occur in Novato though not specifically known to occur in the action area, construction of a pipeline connecting the Ignacio Treatment Plant to the Stone Creek Golf Course could result in project impacts on a small but unknown number of Mt. Tamalpais manzanita.

SVCSD

Implementation of the Basic System would result in no additional impacts beyond No Action and Phase 1 impacts previously described. The Basic System pipelines are identical to pipelines analyzed in the SVRWP EIR, for which rare plant surveys were conducted and none were found in the action area.

Napa SD

In addition to Phase 1 impacts previously described, implementation of the Basic System could impact Mason's lilaeopsis. Mason's lilaeopsis occurs in various places along Napa River and habitat is present where the pipeline crosses the river, but it is not specifically known to occur in the project alignment. Suisun marsh aster habitat is present in brackish marshes throughout the eastern action area; known populations occur within 1.5 miles of the project but are not known specifically from the alignment. Delta tule pea is present in various locations along the Napa River and habitat is available where the pipeline crosses the river, but is not known specifically from the alignment. No other rare plant populations are known in the pipeline right-of-way. Pending the results of focused botanical surveys, Mason's lilaeopsis, Suisun marsh aster, delta tule pea, Contra Costa goldfields and two-fork clover could occur in the action area. Impacts on alkali milk-vetch, big-scale balsamroot, and Point Reyes checkerbloom are unlikely based on known occurrences.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to rare plants under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Partially Connected System, pipeline alignments could impact Point Reyes bird's beak in the LGVSD recycled water service area; Sonoma sunshine in the SVCSD recycled water service area; and delta tule pea, Mason's lilaeopsis, and Suisun marsh aster in the Napa SD recycled water service area. Focused botanical surveys have not been conducted for the Partially Connected System pipelines in any service areas and specific surveys are required to determine the extent of the anticipated impact. Implementation of Mitigation Measure 3.5.13 would reduce potential impacts to a less-than-significant level.

LGVSD/NMWD

The Peacock Gap Golf Course area would be served by a single Partially Connected System pipeline extending from the LGVSD WWTP to the golf course. An extant population of Point Reyes bird's beak occurs within 0.1 mile of San Pedro Road but is not expected in the project right-of-way. No other rare plant populations are known in or adjacent to the pipeline alignment.

Novato SD/NMWD

Implementation of the Partially Connected System is not likely to result in impacts beyond those previously described for Phase 1 and the Basic System. Extant populations of Marin western flax occur at Mt. Burdell in the general vicinity of the Partially Connected System pipelines, but the

action area along San Marin Drive is a built-up residential neighborhood on both sides of the road and would not result in additional impacts on rare plants.

SVCSD

In addition to Phase 1 and the Basic System impacts previously described, implementation of the Partially Connected System could impact Sonoma sunshine. A known population of Sonoma sunshine is mapped on either side of Bonneau Road (CDFG, 2008), an area that was not surveyed for rare plants in the SVRWP EIR. Review of satellite imagery suggests habitat occurs on the north side of the road and Sonoma sunshine is not expected in the action area. No other rare plant populations are known in the pipeline alignment. Pending the results of focused surveys, impacts on unknown populations of dwarf downingia and saline clover could occur; impacts on pappose tarplant are unlikely based on known distribution. Under the Partially Connected System, impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

In addition to Phase 1 and the Basic System impacts previously described, implementation of the Partially Connected System could impact delta tule pea, Mason's lilaeopsis and Suisun marsh aster. The Partially Connected System pipeline traverses through a population of delta tule pea on the east side of the Napa River (CDFG, 2008) and could result in project impacts. Habitat for Mason's lilaeopsis is present where the Partially Connected System pipeline crosses the Napa River, and Suisun marsh aster habitat is present in brackish marshes throughout the eastern action area.

No other rare plant populations are known in the pipeline alignment. An extant population of Contra Costa goldfields occurs 0.12 mile north of the proposed alignment and an extant population of legenere occurs within 0.4 mile of the pipeline, but these species would not be impacted by the project. Pending the results of focused botanical surveys, as-yet unidentified populations of delta tule pea, legenere, Suisun marsh aster, Contra Costa goldfields, narrow-anthered California brodiaea, and dwarf downingia could be impacted. Alkali milk-vetch, big-scale balsamroot, holly-leaved ceonothus, Greene's narrow-leaved daisy, California beaked-rush, and Point Reyes checkerbloom are unlikely in the action area based on known occurrences and distribution.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to rare plants under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Fully Connected System, Franciscan onion and Napa false indigo occur in the pipeline route in the SVCSD recycled water service area and would likely be impacted by the project. Focused botanical surveys have not been conducted for the Fully Connected System pipelines in any service areas; pending the results of focused plant surveys, as-yet unidentified rare plant populations could be impacted by the proposed project. Implementation of **Mitigation Measure 3.5.13** would reduce potential impacts to a less-than-significant level.

LGVSD/NMWD

No Fully Connected System pipelines are proposed for this area.

Novato SD/NMWD

Implementation of the Fully Connected System is not likely to result in impacts beyond those previously described for Phase 1, the Basic System, and the Partially Connected System.

SVCSD

In addition to No Action, Phase 1, the Basic System, and the Partially Connected System impacts previously described, implementation of the Fully Connected System could impact populations of Franciscan onion and Napa false indigo that occur in the alignment. No other rare plants are known to occur in the pipeline alignment, but historical populations of oval-leaved viburnum occurred in the immediate vicinity of pipelines, narrow-anthered California brodiaea occurs 1.5 miles east of pipelines in northern Sonoma, and dwarf downingia occurs 0.7 miles outside the project alignment in the Sonoma Valley Regional Park. No impacts on these species are expected. Pending the findings of rare plants surveys, as-yet unidentified populations of Franciscan onion, Napa false indigo, narrow-anthered California brodiaea, dwarf downingia, and oval-leaved viburnum could occur in the action area. Impacts on Sonoma canescent manzanita, Sonoma ceanothus, and Jepson's leptosiphon are unlikely based on distribution and known occurrences.

Napa SD

No Fully Connected System project is proposed in the Napa SD area.

Mitigation Measures

Mitigation Measure for Impact 3.5.13. Impacts on Rare Plants. Before the initiation of any vegetation removal or ground-disturbing activities in areas that provide suitable habitat for special-status plants, the following measures shall be implemented by the appropriate Member Agency:

- A qualified botanist will conduct appropriately-timed surveys for special-status plant species, including those identified in Table 3.5.1, in all suitable habitat that would be potentially disturbed by the project.
- Surveys shall be conducted following CDFG- or other approved protocol.
- If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter to the appropriate agencies and no further mitigation will be required.

If special-status plants are found during focused surveys, the following measures shall be implemented:

- Information regarding the special-status plant population shall be reported to the CNDDB.

- If the populations can be avoided during project implementation, they shall be clearly marked in the field by a qualified botanist and avoided during construction activities. Before ground clearing or ground disturbance, all on-site construction personnel shall be instructed as to the species' presence and the importance of avoiding impacts to this species and its habitat.

- If special-status plant populations cannot be avoided, consultations with CDFG and/or USFWS would be required. A plan to compensate for the loss of special-status plant species could be required, detailing appropriate replacement ratios, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures that would be implemented if the initial mitigation fails; the plan would be developed in consultation with the appropriate agencies prior to the start of local construction activities.

- If mitigation is required, the project proponent shall maintain and monitor the mitigation area for 5 years following the completion of construction and restoration activities. Monitoring reports shall be submitted to the resource agencies at the completion of restoration and for 5 years following restoration implementation. Monitoring reports shall include photo-documentation, planting specifications, a site layout map, descriptions of materials used, and justification for any deviations from the mitigation plan.

Impact Significance after Mitigation: Less than Significant.

Impact 3.5.14: Impacts on Heritage and Other Significant Trees. The proposed project could affect heritage and other significant tress. (Less than Significant with Mitigation)

No Project Alternative

The proposed project would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity,

and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.5-1, No Action).

Under future baseline (2020) conditions, significant and other heritage trees in the region would likely be continued to be protected under existing or new regulations. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

No project facilities would be constructed under the No Action Alternative, therefore no impact on heritage and other significant trees would occur.

Novato SD/NMWD

If the project is not implemented in the Novato SD, no pipelines would be constructed and no impacts would occur to heritage and other significant trees. Pipelines identified in the Novato Sanitary District Wastewater Facility Plan Project EIR would still be constructed, but tree and vegetation removal were not identified in that EIR.

SVCSD

Under the No Action Alternative, pipeline Alignment 1A would still be constructed, and heritage or other significant trees identified in that EIR could be impacted by that project.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of approximately 4.3 miles of pipeline parallel to an existing pipeline that extends between SVCSD WWTP and the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds an additional 4.5 miles of new pipeline would be constructed to convey water to the salt pond mixing chamber in one of three alternative pipeline routes (see **Chapter 2, Project Description**). The Option A salt pond pipeline was discussed and analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2003). Impacts on heritage and other significant trees identified in that EIR would still occur.

The Napa Salt Marsh pipeline could impact heritage trees at the Huichica Creek riparian stream crossing under both Options A and B.

Napa SD

No project facilities would be constructed under the No Action Alternative, therefore no impact on heritage and other significant trees would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The impacts to heritage and other significant trees from the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

No trees have been identified for removal as a result of the proposed project. However, a moderate number of relatively large valley oak, coast live oak, California bay, blue oak, madrone, eucalyptus, sycamore, cypress, acacia and other species occur near roads and in off-road areas proposed for pipeline construction and in the vicinity of project components. It is likely that some trees will need to be trimmed or removed, some of which may be considered significant to the Counties of Marin, Sonoma and Napa. Implementation of **Mitigation Measure 3.5.14** will reduce potential impacts to a less-than-significant level.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to heritage and other significant trees from proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Please refer to discussion above under Phase 1.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to heritage and other significant trees from proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Please refer to discussion above under Phase 1.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The impacts to heritage and other significant trees under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Please refer to discussion above under Phase 1.

Mitigation Measures

Mitigation Measure 3.5.14: The following measures shall be implemented by the appropriate Member Agency to avoid or reduce impacts to heritage or other significant trees:

1. Prior to the commencement of construction activities, trees necessary to remove or at risk of being damaged will be identified.

2. A certified arborist will inventory these trees, with the results of the inventory providing species, size (diameter at breast height, or *dbh*), and number of protected trees. Also, in consultation with the appropriate County, the arborist will determine if any are heritage or landmark trees.

3. If any protected trees are identified that will be potentially removed or damaged by construction of the proposed project, design changes will be implemented where feasible to avoid the impact.

4. Any protected trees that are removed will be replaced per applicable City and County tree protection ordinances. Foliage protectors (cages and tree shelters) will be installed to protect the planted trees from wildlife browse. The planted trees will be monitored as required by the ordinance, or regularly during a minimum two-year establishment period and maintenance during the plant establishment period will include irrigation. After the establishment period, the native tree plantings are typically capable of survival and growth without supplemental irrigation.

Impact Significance after Mitigation: Less than Significant.

3.5.4 Impact Summary by Service Area

Table 3.5-10 provides a summary of potential project impacts related to biological resources.

TABLE 3.5-10
POTENTIAL IMPACTS AND SIGNIFICANCE – BIOLOGICAL RESOURCES

Proposed Project	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.5.1: Wetlands, Streams and Riparian Habitats.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	LSM
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.5.2: Special-status Fish and California Freshwater Shrimp.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	NI	LSM
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.5.3: Long-term Impacts to Special-status Fish.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Alternative 1: Basic System	LTS	LTS	LTS	LTS
Alternative 2: Partially Connected System	LTS	LTS	LTS	LTS
Alternative 3: Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.5.4: Special-status Invertebrates.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	NI	LSM	LSM	LSM
Alternative 1: Basic System	NI	LSM	LSM	LSM
Alternative 2: Partially Connected System	NI	LSM	LSM	LSM
Alternative 3: Fully Connected System	NI	LSM	LSM	LSM
Impact 3.5.5: Western Pond Turtle.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.5.6: California Red-legged Frog.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	NI	NI
Phase 1	NI	LSM	NI	NI
Alternative 1: Basic System	NI	LSM	NI	NI
Alternative 2: Partially Connected System	NI	LSM	LSM	NI
Alternative 3: Fully Connected System	NI	LSM	LSM	NI

TABLE 3.5-10 (Continued)
POTENTIAL IMPACTS AND SIGNIFICANCE – BIOLOGICAL RESOURCES

Proposed Project	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.5.7: Threatened and Endangered Marsh Birds.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	NI	LSM	LSM	NI
Alternative 1: Basic System	NI	LSM	LSM	NI
Alternative 2: Partially Connected System	LSM	LSM	LSM	NI
Alternative 3: Fully Connected System	LSM	LSM	LSM	NI
Impact 3.5.8 Burrowing Owl.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	LSM	NI
Phase 1	LTS	LSM	LSM	NI
Alternative 1: Basic System	LTS	LSM	LSM	LTS
Alternative 2: Partially Connected System	LTS	LSM	LSM	LTS
Alternative 3: Fully Connected System	LTS	LSM	LSM	LTS
Impact 3.5.9 Nesting Birds.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.5.10: Salt Marsh Harvest Mouse and Suisun Ornate Shrew.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	NI	LSM	LSM	NI
Alternative 1: Basic System	NI	LSM	LSM	NI
Alternative 2: Partially Connected System	NI	LSM	LSM	NI
Alternative 3: Fully Connected System	NI	LSM	LSM	NI
Impact 3.5.11: Special-Status Bats.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	NI	NI
Phase 1	LTS	LSM	NI	NI
Alternative 1: Basic System	LTS	LSM	NI	NI
Alternative 2: Partially Connected System	LTS	LSM	NI	NI
Alternative 3: Fully Connected System	LTS	LSM	NI	NI
Impact 3.5.12: American Badger.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	NI	NI
Phase 1	NI	LSM	NI	NI
Alternative 1: Basic System	NI	LSM	LTS	LTS
Alternative 2: Partially Connected System	NI	LSM	LTS	LSM
Fully Connected System	NI	LSM	LSM	LSM

TABLE 3.5-10 (Continued)
POTENTIAL IMPACTS AND SIGNIFICANCE – BIOLOGICAL RESOURCES

Proposed Project	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.5.13: Rare Plants.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	NI	NI
Phase 1	LTS	LSM	LSM	LTS
Alternative 1: Basic System	LTS	LSM	LSM	LSM
Alternative 2: Partially Connected System	LTS	LSM	LSM	LSM
Alternative 3: Fully Connected System	SM	LSM	LSM	LSM
Impact 3.5.14: Heritage and Other Significant Trees.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	NI	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3:Fully Connected System	LSM	LSM	LSM	LSM

NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation
SU = Significant Unavoidable impact
N/A = Not Applicable

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3.6 Land Use and Agricultural Resources

This section describes the existing land uses and agricultural resources in the action area, and the federal, state, and local regulations that apply to the North Bay Water Recycling Program (NBWRP). This section evaluates the potential land use and agricultural resource impacts that could result from implementation of the NBWRP. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.6.1 Affected Environment/Setting

General Setting

Marin, Sonoma, and Napa Counties are located north of the San Francisco Bay Area, California. This area has a diverse and unique physical setting, including mountain ridges, hills, and valleys, which are replete with forests, oak woodlands, stream corridors, and tidal and fresh water marshes.

Land uses in the action area include urban residential and commercial developments, light industrial development, low density rural communities, agriculture and viticulture, grazing land, and open space. Currently, nearly half of the land in this region consists of open space, parks, and rural, agricultural and grazing lands. The most intensive farming occurs in Napa and Sonoma Counties. Only a small percentage of land has been developed, primarily along the transportation corridor (Highway 101) and within associated cities. Other land uses include golf course/cemetery/parks/ landscaping, government-developed land, unimproved/vacant land, miscellaneous/unknown, and completed and planned wetlands restoration.

Individual land use designations from existing land use data were grouped into the major categories mentioned above. “Urban landscaping” is covered under the golf course/cemetery/ parks/landscaping designation. “Miscellaneous/unknown land” includes areas not surveyed or not allowed to be surveyed, utility-owned land, mining rights, private roads, and well and tank sites. “Government developed land” includes federal, state, and local buildings, military installations, hospitals, government utility property, state colleges and schools, and municipal shops and yards. “Unimproved/vacant lands” consist of vacant land, vacant municipal land, native vegetation, barren lands, and wasteland.

Agricultural Setting

Agricultural land uses constitute much of the action area. Categories of agricultural land uses include irrigated farmland, dry farm property, dairy/pasture, vineyard, and orchard. “Irrigated farm property” includes rice and field, truck, nursery, and berry crops. “Dairy/pasture” consists of dairies, dairies with residences, and semi-agricultural areas. The “orchard” category groups deciduous fruits and nuts, and citrus and subtropical trees. The primary agricultural land uses in

the southern Sonoma, Napa, and Petaluma Valleys are vineyards and hay fields. Vineyards exist mainly in the hillside ranges and upland areas adjacent to the diked baylands. Oat hay exists mainly on the diked baylands, and some farmers double-crop the lands with beans. In the past, farmers have grown other crops such as barley and legumes, but changes in market conditions have decreased profitability for these crops given their high production costs (BCDC, 1999). Secondary land uses include dairy farming, row crops, orchards, the farming of other livestock, and grassland, which includes irrigated pastureland.

Important Farmland in the Action Area

As described in **Appendix 3.6**, important farmlands are divided into five categories based on their suitability for agriculture, Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance and Grazing Land. **Figures 3.6-1** through **3.6-4** show important farmland classifications for land in the action area including land under Williamson Act Contract. Further information on each project facility, including the type and number of acres of agricultural land affected, are more fully described in subsection 3.6.3, Environmental Consequences, below.

Farmland Conversion

Table 3.6-1 provides a summary of recent changes to agricultural land within the action area, in Napa County, Sonoma County and Marin County respectively. All three counties experienced a net loss of agricultural land between 2004 and 2006. In all three Counties, the most significant net losses were in Unique Farmland.

TABLE 3.6-1
RECENT FARMLAND CONVERSIONS IN NAPA, SONOMA AND MARIN COUNTIES

Land Use Category	Total Acres Inventoried		2004–2006 Acreage Changes		
	2004	2006	Acres Lost	Acres Gained	Net Loss
Prime Farmland	66,257	64,264	2,582	589	-1,993
Farmland of Statewide Importance	28,859	27,872	1,357	370	-987
Unique Farmland	51,367	48,840	3,727	1,200	-2,527
Farmland of Local Importance	161,415	162,761	2,410	3,756	1,346
Grazing Land	690,167	688,835	2,352	1,020	-1,332
Agricultural Land Subtotal	998,065	992,572	**12,428**	**6,935**	**-5,493**

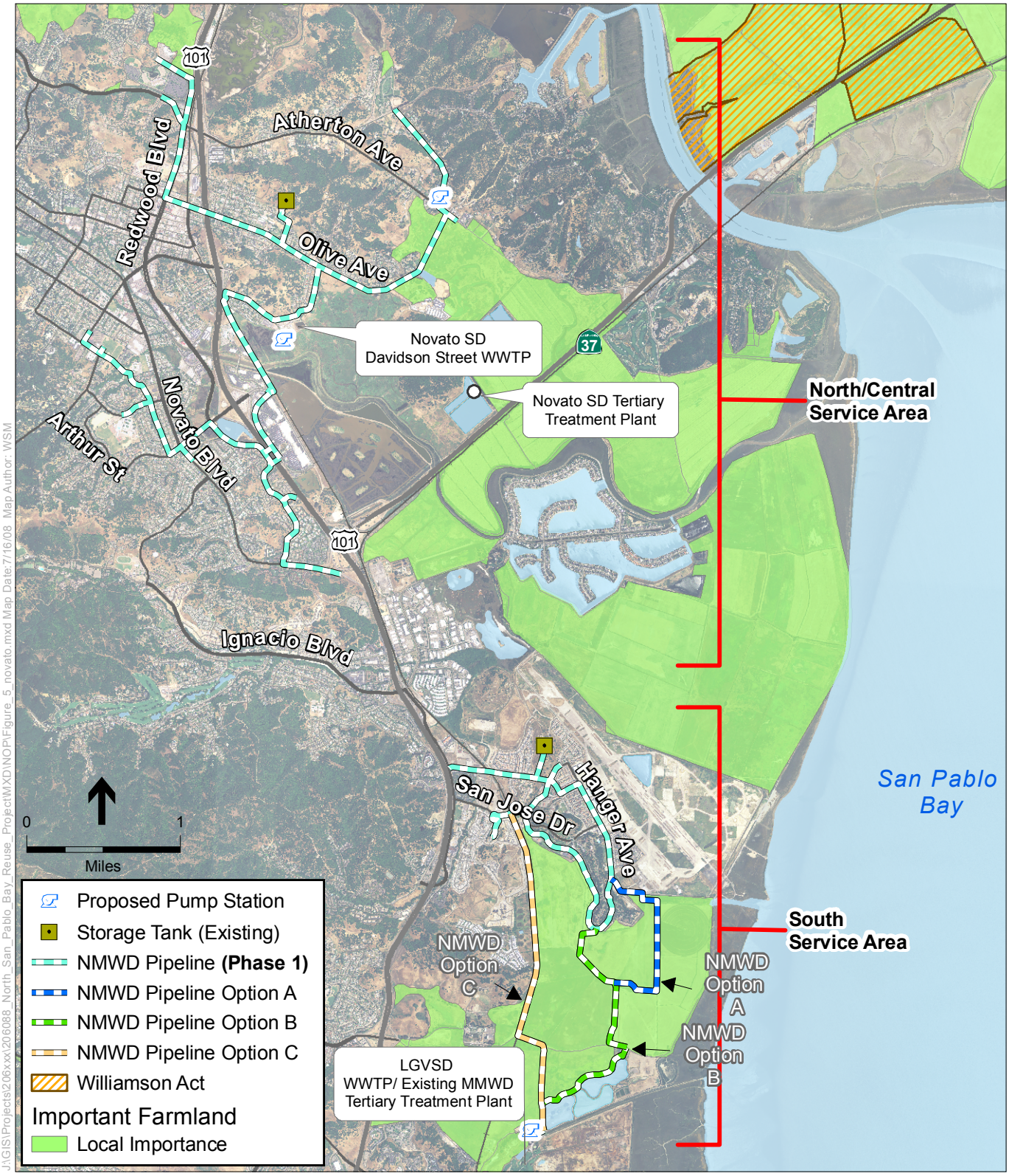
SOURCE: California CDC, 2009a, 2009b, 2009c (Table A-4).

Local Setting

LGVSD

City of San Rafael

The second portion of the South Service Area for service to Peacock Gap, would be located in the City of San Rafael within Marin County. Incorporated in 1874 and later as a charter city in 1913,



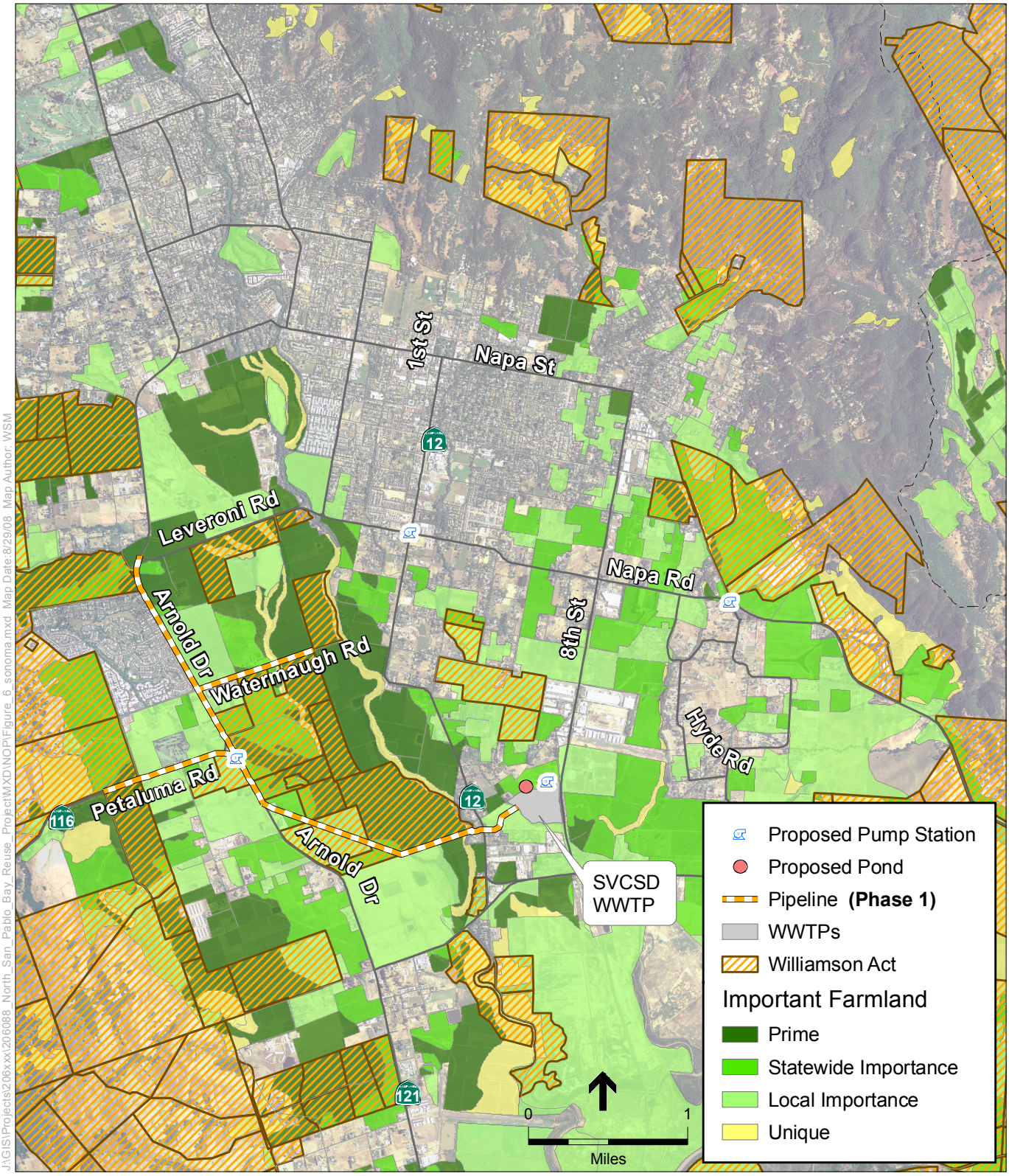
SOURCE: USDA, 2005; CDM, 2008; DOC, 2006; and ESA, 2008

Note: Existing Tank Facilities Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.6-1

Novato Service Area:
Important Farmland and Williamson Contracted Land



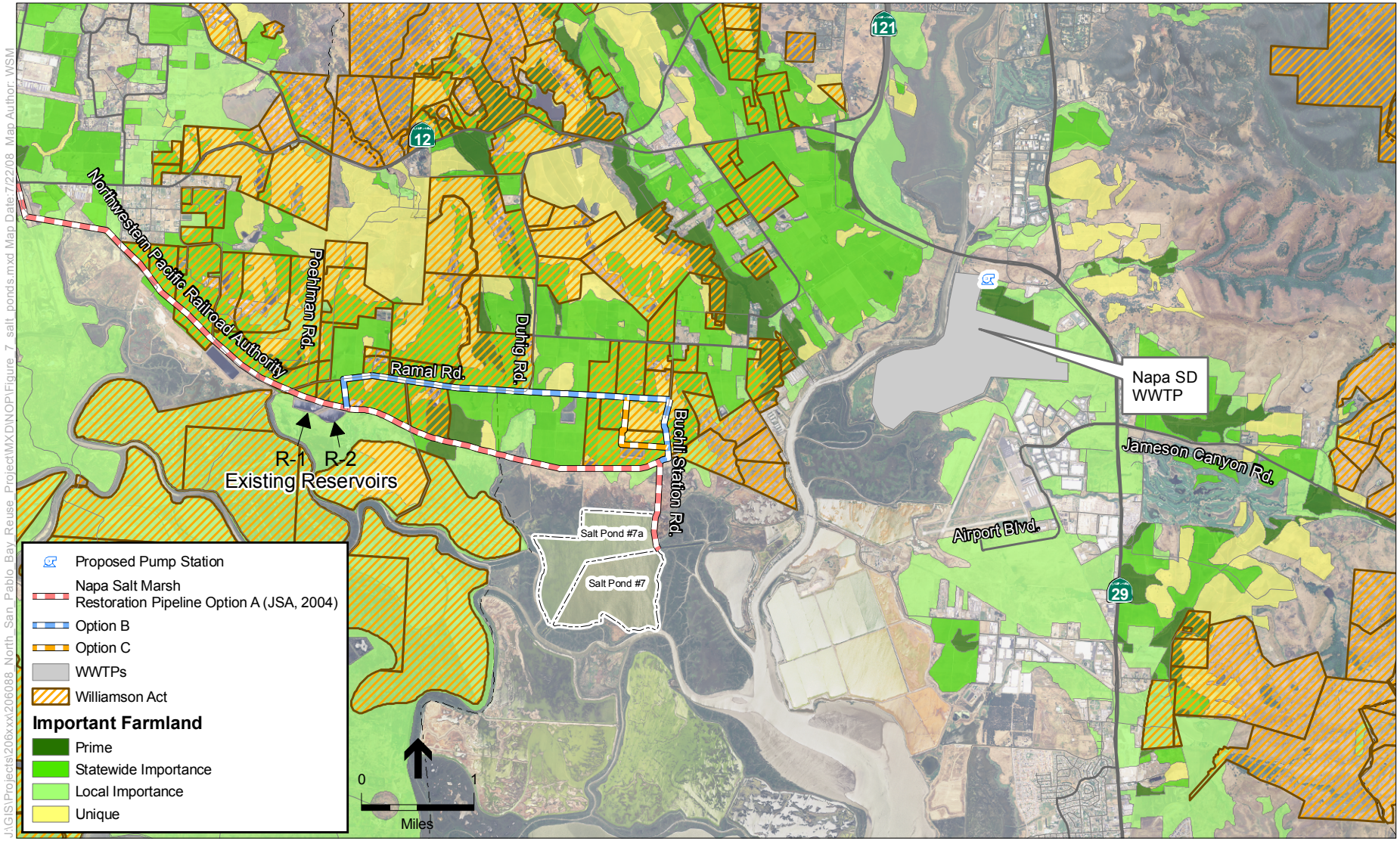
SOURCE: USDA, 2006; CDM, 2008; DOC, 2006; and ESA, 2008

Note: Existing Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.6-2

Sonoma Valley Recycled Water Project Area
Important Farmland and Williamson Contracted Land



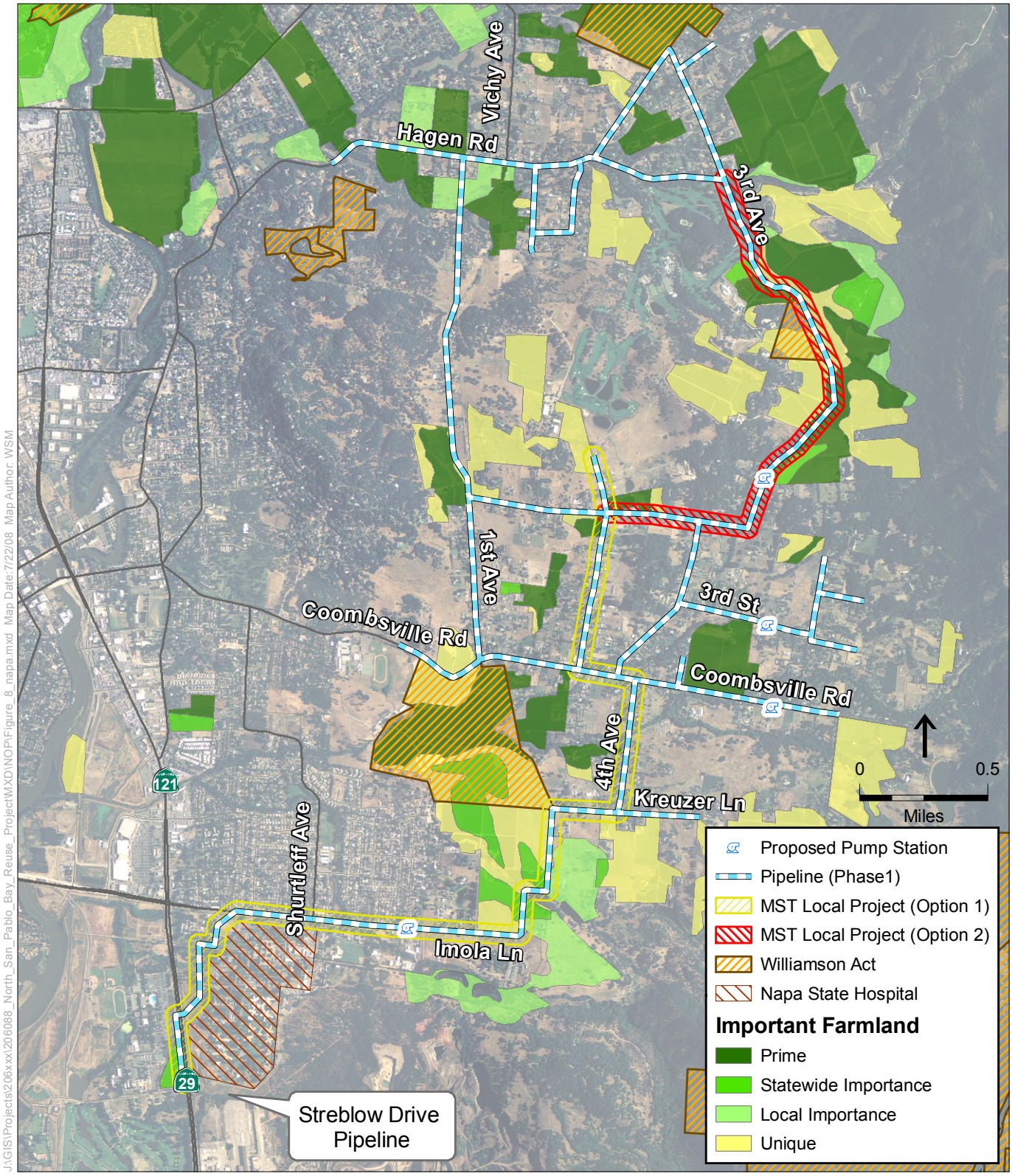
SOURCE: USDA, 2005; CDM, 2008; DOC, 2006; and ESA, 2008

Note: Existing Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.6-3

SVCSD Napa Salt Pond Pipeline
Important Farmland and Williamson Contracted Land



SOURCE: USDA, 2006; CDM, 2008; DOC, 2006; and ESA, 2008

Note: Existing Facilities Not Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3.6-4

Napa SD MST Area:
Important Farmland and Williamson Contracted Land

the City of San Rafael is the county seat for Marin County and has the largest population in the county. The city covers 22 square miles, five of which are water and tidelands. San Rafael has set aside 3,285 acres of open space within the city limits and almost 7,300 acres in its planning area (City of San Rafael, 2003). The existing land uses in San Rafael are parks/open space, single-family residential, and industrial and public areas. The NBWRP would extend from US 101 along existing North San Pedro Road. The pipeline would extend through China Camp State Park along existing trails and access roads to the Peacock Gap Golf and County Club which is located in a low-density residential area. Potential land use changes are along the existing trails. (see Section 3.13, Recreation section for further details)

Marin County

Marin County's total land and water area is approximately 606 square miles, of which about 87 percent (527 square miles) is unincorporated. Marin County is one of the nine counties that comprise the San Francisco Bay Area. It is linked to San Francisco by the Golden Gate Bridge and to the East Bay via the Richmond-San Rafael Bridge. The action area within Marin County is generally comprised of marshes, tidelands, and diked lands that were once wetlands or part of the bays, and adjacent largely undeveloped uplands. The action area is in what is known as the Baylands Corridor, as identified by the Marin Countywide Plan, encompasses much of the Bayfront Conservation Zone.

Novato SD

City of Novato

Incorporated in 1960, the City of Novato covers 28 square miles. In contrast to nearby cities, Novato's population density is low, one-half that of San Rafael and less than one-third that of Petaluma. This low density and the city's large segments of parks and open space create a rural character (City of Novato, 1996). In the action area, the commercial, manufacturing, and light industrial classifications include lands mostly near Highways 37 and 101. Residential and commercial land uses are concentrated downtown along Grant Avenue, Redwood Boulevard, and along the Highway 101.

The land uses affected by or adjacent to the project components in the North Service Area are primarily residential and commercial. The pipeline route from Olive Avenue to Atherton Avenue extends through local important farmland, however would be constructed entirely along existing roads, in the public right-of-way.

The land uses in and around the Central Service Area are residential and commercial. The proposed pipeline would extend along existing roadways from the Novato SD Street WWTP through the Vintage Oaks shopping center to the Ignacio WWTP site.

The South Service Area would lie within both the city of Novato and unincorporated Marin County. The first portion of the proposed pipelines would extend from State Access Road to Hangar Avenue ending along South Oakwood Drive, through the city of Novato along existing roadways adjacent to residential and commercial land uses. The second portion of the proposed

pipeline would extend from the Hamilton Field Pipeline to the LGVSD/ MMWD WWTP located north of the John F. Mcinnis County Park and Golf Center in unincorporated Marin County. The proposed pipeline would extend south from Hangar Avenue adjacent to local important farmland, agricultural and public land uses. A portion of this pipeline would traverse through an agricultural field located in local important farmland.

Marin County

Please refer to the Land Use setting for unincorporated Marin County above.

SVCSD

City of Sonoma

Originally recognized as a pueblo in 1835, the City of Sonoma became an incorporated city in 1881. The largest land use designation in the city is single-family residential, which amounts to about 44 percent of the land. Public lands, at almost 21 percent, constitute the next largest category (City of Sonoma, 2006).

Existing land use in the city of Sonoma consists of predominantly single and multiple family residential, and government uses. Portions of the NBWRP within the Sonoma city limits would be constructed in areas with low density housing, mixed use, and public facilities as the predominant existing land uses. The proposed pipelines would traverse through existing roadways. Alignment 1A would extend from the SVCSD WWTP southwest and then northwest through land under the Williamson Act including a vineyard and prime farmland to Arnold Drive. The pipeline along Arnold Drive would be constructed along existing roads adjacent to prime farmland and farmland of local and statewide importance. The pipeline would then continue east on Elm Avenue, cross a field to Arnold Drive, extend north on Arnold Drive, and end at Hanna Boys Center School (ESA, 2008). The Cement Mill secondary pipeline segment would begin on Arnold Drive, south of Fowler Creek Road near the Shamrock Cement Mill, and continue east through a field.

The main pipeline of Alignment 2 would be constructed entirely along existing roadways adjacent to commercial, low density residential, and public land uses. The East and West Bike Path secondary segments would continue along an existing bike path (see Section 3.13, Recreation, for details). Land uses adjacent to the main pipeline of Alignment 3 include agricultural, open space, and low density residential. The Arroyo Seco/Hyde Road secondary segment would extend east along a farm road. The Denmark Street/ 8th Street secondary segment would continue south along the abandoned railway tracks that border 8th Street East.

Sonoma County

The 1,500 square mile-Sonoma County spans a diverse mosaic of landforms, environments, and human settlements. The Maacamas Range forms the eastern boundary of the county. Along with the Sonoma Mountain range, it encloses the Sonoma Valley or "Valley of the Moon," a scenic agricultural valley which extends from near Santa Rosa southeastward to the city of Sonoma and the marshlands of San Pablo Bay. The 140,000 residents in unincorporated areas are concentrated

in urban areas located just outside several cities, notably Santa Rosa and Sonoma, and in a number of rural unincorporated communities (County of Sonoma, 2007).

The Napa Salt Marsh Restoration area is located at the intersection of the Sonoma and Napa Counties. The NBWRP includes two sections of main pipeline. Land uses adjacent to the SCVSD Recycled Water section of pipeline include agricultural lands, and parks/ dedicated open space. The pipeline would be constructed along the north side of the existing railroad line owned by the Northwestern Pacific Railroad Authority and would then continue south along the existing dirt access road for Ponds 7 and 7a, which is adjacent to parks/ dedicated open space land use.

Napa SD

City of Napa

The City of Napa, incorporated in 1872, has a land area of about 18 square miles (City of Napa, 2003). Napa has numerous neighborhood, community, and regional parks, as well as wetlands and natural open areas. The preservation of historic neighborhoods and buildings are balanced with mixed-use areas of retail, office, and commercial spaces.

The Milliken-Sarco-Tulocay (MST) area is located just outside the eastern edge of the Napa city limits at some locations. Existing land uses adjacent to the NBWRP are residential, parks and public areas, and undeveloped/ agricultural areas.

Napa County

Regional land use patterns in Napa County consist of dense urban centers associated with cities along Highway 29, 12, 121, 221, and 128, open space, natural resources, and agricultural activities with vineyard development as one of the most prominent activities. The majority of Napa County comprises unincorporated land.

The MST Area and the Carneros Area are primarily located in unincorporated Napa County. A majority of the pipelines would be constructed along existing roads. However one pipeline segment in the MST area would be installed from the end of the Streblow Drive through the Napa State Hospital grounds continuing north (see Section 3.11, Public Services and Utilities, for details). The new pipeline would also extend from the Napa SD WWTP facility under the Napa River into the Stanly Ranch region of South Los Carneros, traveling along dirt access roads along a creek to Stanly Lane. One segment of the pipeline would extend southeast along a dirt access road adjacent to agricultural fields and along existing Cutting Wharf Road and Los Amigos Road. The pipeline is analyzed as part of the Napa Salt Marsh Restoration Project, which is discussed above under SVCSD.

The Napa SD Wastewater Pipeline would be located entirely in unincorporated Napa County. Land uses adjacent to the Napa SD section of recycled water pipeline would be primarily agriculture and rural residential. The southern terminus of the South Carneros pipeline would be constructed along existing Buchli Station Road, which is adjacent to agricultural lands, and a commercial winery. This portion of the pipeline would terminate at the existing access road for Ponds 7 and 7a where it would connect with the other section of pipeline.

3.6.2 Regulatory Framework

Federal

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) was passed by Congress in 1981 as part of the Farm Bill. Its purpose is to minimize unnecessary conversion of farmland to nonagricultural uses as a part of federal programs. The FPPA established the Farm and Ranchland Protection Program (FRPP) and a Land Evaluation and Site Assessment system (LESA).[1] The Natural Resources Conservation Service (NRCS) administers the FRPP, which is a voluntary program that provides funds to help purchase development rights to keep productive farmland in agricultural uses. The program provides matching funds to state, local, and tribal government entities and nongovernmental organizations with existing farmland protection programs to purchase conservation easements. Participating landowners agree not to convert the land to nonagricultural uses, and retain all rights to the property for future agriculture. A minimum 30-year term is required for conservation easements, and priority is given to applications with perpetual easements. NRCS provides up to 50 percent of the fair market value of the easement (NRCS, 2004).

The federal LESA system is a tool used to rank lands for suitability and inclusion in the FPP. The federal LESA uses a Farmland Conversion Impact Rating (FCIR) form (Form AD-1006) to establish a farmland conversion impact rating score. The system evaluates several factors, including soil potential for agriculture, location, market access, and adjacent land use. These factors are used to rank land parcels for inclusion in the FPP based on local resource evaluation and site considerations (NRCS, 2005). The FCIR form can also be used to assess a project's impact to agricultural lands, and was used in this impact analysis.

State

California Farmland Mapping and Monitoring Program

The California Department of Conservation, under the Division of Land Resource Protection, has established the Farmland Mapping and Monitoring Program (FMMP). The FMMP monitors the conversion of the state's farmland to and from agricultural use. The map series identifies eight classifications and uses a minimum mapping unit size of 10 acres. The FMMP also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The FMMP maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years. Important farmlands are divided into the following five categories based on their suitability for agriculture.

1. **Prime Farmland.** Prime Farmland is land with the best combination of physical and chemical characteristics able to sustain long-term production of agricultural crops. This land has produced irrigated crops at some time within the four years prior to the mapping date.

[1] The federal Land Evaluation and Site Assessment system uses the same acronym, LESA, as used by the California Department of Conservation farmland evaluation and site assessment program.

2. **Farmland of Statewide Importance.** Farmland of Statewide Importance is land that meets the criteria for Prime Farmland but with minor shortcomings such as greater slopes or lesser soil moisture capacity.

3. **Unique Farmland.** Unique Farmland has even lesser quality soils and produces the state's leading agricultural crops. This land is usually irrigated but also includes non-irrigated orchards and vineyards.

4. **Farmland of Local Importance.** Farmland of Local Importance is land that is important to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

5. **Grazing Land.** Grazing Land is land on which the existing vegetation is suited to the grazing of livestock.

Williamson Act

The California Land Conservation Act of 1965, also known as the Williamson Act, is designed to preserve agricultural and open space lands by discouraging their premature and unnecessary conversion to urban uses (CDC, 2006). The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict their land to agricultural and compatible open-space uses. In return, Williamson Act contracts offer tax incentives by ensuring that land would be assessed for its agricultural productivity rather than its highest and best use. Contracts run for a period of ten years; however, some jurisdictions exercise the option of making them long term, up to twenty years. Contracts are automatically renewed unless the landowner files for non-renewal or petitions for cancellation. Williamson Act contracts can be divided into the following categories: Prime Agricultural Land, Non-Prime Agricultural Land, Open Space Easement, Built Up Land, and Agricultural Land in Non-Renewal.

San Francisco Bay Conservation and Development Commission, San Francisco Bay Plan

The San Francisco Bay Plan (SF Bay Plan), prepared by the San Francisco Bay Conservation and Development Commission (BCDC) in 1968 in accordance with the McAteer-Petris Act of 1965, is an enforceable plan that guides the protection and use of San Francisco Bay and its shoreline. Under the McAteer-Petris Act, BCDC has the authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction and to enforce policies aimed at protecting the bay and its shoreline. The SF Bay Plan designates shoreline areas that should be reserved for water-related purposes like ports, industry, public recreation, airports, and wildlife refugees. Since its adoption by BCDC in 1968, the SF Bay Plan has been amended periodically to keep pace with changing conditions and to incorporate new information concerning the bay. Proposed project facilities could encroach within the jurisdiction of the BCDC and could be subject to certain provisions contained in the SF Bay Plan (BCDC, 2006).

Local

The policies and regulations associated with impacts to land use within the affected jurisdictions are presented in **Appendix 3.6**.

3.6.3 Environmental Consequences/Impact Analysis

Significance Criteria

This environmental analysis evaluates whether the NBWRP has the potential to conflict with a general plan land use policy identified above. The standard for determining whether a project component would conflict with a general plan policy use is based on the *General Plan Guidelines*, published by the Office of Planning and Research (OPR): "An action, program, or project is consistent with the general plan if, considering all its aspects, it will further the objectives and policies of the general plan and not obstruct their attainment" (OPR, 2003).

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the *CEQA Guidelines*. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. The NBWRP would result in a significant land use effect if it would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating a significant environmental effect; or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Discussions of consistency with land use and zoning designations are provided below for the action alternatives. As explained in Appendix 3.6, the NBWRA and Member Agencies are not subject to local general plan and zoning regulations. However, discussions of consistency with the land use designations in the general plans applicable to their service areas are provided for context and to fully inform the public and the decision makers.

Significance standards for impacts related to agricultural resources through the implementation of the NBWRP would have a significant agricultural resource impact if it would:

- Directly or indirectly 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 Department of Conservation, to a non-agricultural use[2];
- Conflict with existing zoning for agricultural use, or a Williamson Act contract; or

[2] Based on the definition of agricultural use contained in the Williamson Act, conversion to "non-agricultural use" would mean that land previously used for producing an agricultural commodity for commercial purposes is no longer capable of serving this purpose.

- Involve other changes in the existing environment which, due to their location or nature, could result in the conversion of Farmland of Statewide Importance to non-agricultural use.

Approach to Analysis

Land Use

This analysis evaluates short-term impacts on existing land uses resulting from temporary construction activity as well as long-term impacts resulting from the siting of proposed facilities such as pipelines, pump stations and storage reservoirs. Impacts specific to recreational uses are discussed in Sections 3.13, Recreation.

Generally, construction and operation of the NBWRP would occur at existing facility sites or within existing utility rights-of-way such as easements or roadways. Some project components would be constructed outside of existing facility sites or rights-of-way, and additional new land would need to be acquired for facilities and/or for temporary construction easements or staging areas. Local planning documents and maps were reviewed to characterize existing land uses in the proximity of the proposed pipeline routes, pump station and storage facility sites, and existing WWTPs.

Potential physical environmental effects on surrounding land uses resulting from implementation of the NBWRP are addressed in, Sections 3.7, Transportation and Traffic; 3.8, Air Quality; 3.9, Noise and Vibration; 3.12, Cultural Resources; and 3.13, Recreational Resources.

Agriculture

For the purpose of this analysis, each project component was considered in relation to important farmland in the immediate site vicinity to identify any potential disruption that might be caused temporarily (during project construction) or permanently (due to project siting or operations on land that is currently in agricultural use). In addition, each project component was examined for its potential to affect land under Williamson Act contract.

Environmental Consequences/Impact Analysis

Impacts to land use and agricultural resources resulting from construction and operation of the NBWRP at both the project level and program level are discussed below. The impacts are considered for all project components, including both short-term construction and long-term operational phases.

Impact 3.6.1: Physically Divide a Community. The NBWRP would not physically divide an existing community. (No Impact)

The NBWRP would include components that are constructed within developed areas. Treatment upgrades and the siting of storage reservoirs or tanks would occur primarily within existing WWTP sites. Proposed pipelines would be installed below the ground surface and would not lie above ground. The footprint of the proposed pump stations would not be large enough to physically divide an established community. The NBWRP therefore, would not physically divide a community. No impact is expected.

No Project Alternative

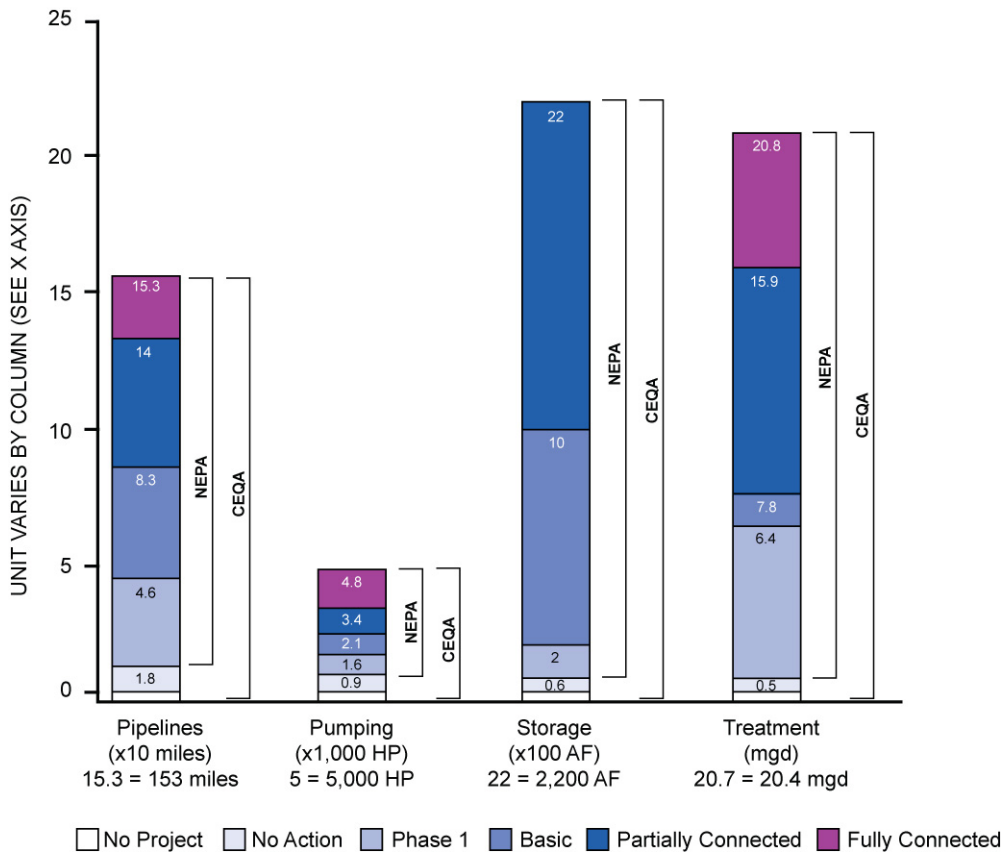
The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.6-1, No Action**).

CHART 3.6-1
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

Under future baseline (2020) conditions, land use conditions within the region would be similar to current land use, in accordance with anticipated development allowed under the approved General Plans within the region. A discussion of individual Member Agencies is provided below.

LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/ NMWD

The No Action Alternative would include implementation of recycled water distribution facilities within the North Service Area. Pipeline would be installed from the Novato SD WWTP north to Olive Avenue, then extend west and east along Olive Avenue to serve areas north of Atherton and along Redwood Boulevard and San Marin Avenue west of Highway 101. Pipelines would be installed underground and the installation would occur within existing roadways or public rights-of-way, therefore the project activities would not physically divide an existing community. Construction of the booster pump station would occur at the WWTP and would require limited grading with construction of underground piping to connect with proposed pipelines and structural foundation. The pump station site would be fitted with curbs, gutters and other drainage features. Project-related construction will be localized to the booster pump site and would not physically divide an existing community, therefore no impacts are expected.

SVCSD

The No Action Alternative would include Alignment 1A of the Sonoma Valley Recycled Water Project (SVRWP), consisting of installation of 5.2 miles of pipeline in Sonoma Valley and one booster pump station at the SVCSD WWTP. The SVRWP EIR (2006) provides environmental analysis of the components that are a part of the proposed NBWRP. As stated in the EIR, the main pipeline would originate from the SVCSD WWTP, extend southwest and then northwest through a vineyard to Arnold Drive. The pipeline installation would be primarily in rural and agricultural areas and would affect the following primary roadways: Arnold Drive, Highway 116 (Stage Gulch Road), Watmaugh Road, Leveroni Road, Elm Avenue. As stated in the EIR, there are two high voltage power lines that extend through the city of Sonoma. Pipeline installation would be similar to that discussed under Novato SD. Construction of the booster pump station would occur at the SVCSD WWTP would be similar to that discussed above. No impact is expected.

The No Action Alternative for the Napa Salt Marsh Project would include construction of 4.0 miles of pipeline from the WWTP to reservoir, as well as approximately 4 to 4.5 miles of pipeline depending upon the option selected. The pipeline route would be parallel to an existing pipeline that extends between SVCSD WWTP and the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. The pipeline and the ponds were discussed and analyzed under the Napa River Salt Marsh Restoration Project EIR/EIS (JSA, 2003) under the Water Delivery Project Component (Sonoma Pipeline). Two routes (Option B and Option C) would consist of a pipeline that would traverse north from the existing reservoirs

to Ramal Road, extend east along Ramal Road and south along Buchli Station Road toward the ponds. Option C extends south from Ramal Road to reach an existing reservoir before traversing south along Buchli Station Road towards the ponds.

Pipeline installation would occur primarily in vineyard and agricultural areas with no nearby residences and would affect the following roadways: Green Island Road, Las Amigas Road, Milton Road, Buchlis Station Road. Project construction would be similar to construction discussed above and would not physically divide an established community.

Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The land use impacts associated with proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD

Under Phase 1, LGVSD would upgrade tertiary treatment capacity at the LGVSD WWTP, construct a new booster pump station, and NMWD would install one of three pipeline options, described in **Chapter 2, Project Description**, which would connect the LGVSD WWTP Recycled Water Treatment Facility to facilities constructed by NMWD. The pipeline would be constructed along existing roadways or rights-of-way adjacent to grazing land along any one of the three route options. These facilities would not physically divide an established community. Primary roadways that would be affected in the Hamilton Field area include Main Gate Road, Palm Drive, South Oakwood Drive, Casa Grande Drive, and Hangar Avenue. Similarly, areas of undeveloped grazing land between the Novato SD WWTP and LGVSD WWTP would be temporarily affected during construction. As discussed above, construction and installation of pipeline, for any option, would be beneath the ground surface and within existing easements and roadways where feasible and would not physically divide an established community.

Novato SD/ NMWD

The Novato North and Central Service Areas would involve installation of pipeline and construction of two pump stations within the existing Novato SD WWTP and within a disturbed site on Atherton Avenue. Pipeline installation would occur primarily in residential and

commercial areas and would affect the following primary roadways: Atherton Avenue, Olive Avenue, H Lane, Rowland Boulevard, Hill Road, Diablo Avenue and Redwood Boulevard. Construction and installation of the pipelines and pump stations would be similar to that discussed above and would not physically divide an existing community.

SVCSD

Phase 1 would include components from the SVRWP and Napa Salt Marsh Restoration Project. As stated in the SVRWP EIR (2006) the project would involve installation of pipeline and construction of a booster pump station and a storage pond within the existing SVCSD WWTP. Pipeline installation would occur primarily in residential and commercial areas and would affect the following primary roadways: Arnold Drive, Orange Avenue, Leveroni Road, Watermaugh Road., Broadway, Napa Road, Specht Road, and 8th Street East. Pipeline installation would be similar to construction discussed above and would not physically divide an established community.

Construction of the booster pump station and rehabilitation of a storage pond would occur within the existing WWTP boundaries and project-related construction will be localized to WWTP site and would not physically divide an existing community.

Under Phase 1, impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Phase 1 includes the Napa MST area project which would involve installation of pipeline and construction of four booster pump stations. Pipeline installation would occur primarily in residential and open spaces areas and would affect the following primary roadways: Imola Avenue, Wild Horse Valley Road, 4th Avenue, Coombsville Road, North Avenue, Hagen Road, 1st Avenue, 2nd Avenue, 3rd Avenue, and East 3rd Avenue. Project construction would be similar to construction discussed above. Construction and installation of the pipeline and booster pump stations would be similar to that discussed above and would not physically divide an established community.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The land use impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD

Under the Basic System, project construction would involve increasing tertiary treatment capacity at the LGVSD WWTP by 0.3 mgd through onsite improvements. Because facility improvements would be contained within the existing LGVSD WWTP site, the proposed facilities would not physically divide an established community. The Basic System would also involve conveyance pipelines that would be constructed adjacent to established roadways or within existing rights-of-way. Although pipelines would pass through developed areas within existing communities, pipelines would be buried underground, and roadways would be restored after construction. Pipelines would not physically divide the community; therefore, there is a less than significant impact to land uses along the pipeline alignment.

SVCSD/ NMWD

The Basic System would involve pipeline installation primarily in open space and agricultural areas north and east of the Phase 1 SVRWP alignment. Construction of the pipelines would be similar to that discussed under Phase 1 and would not physically divide an established community.

The Basic System would involve pipeline installation under the Napa Salt Marsh Restoration Project, which would occur primarily in open space along the Northwestern Pacific Railroad Authority railroad tracks between Ramal Road and the SVCSD WWTP. Construction and installation of the pipeline be similar to that discussed above would not physically divide an established community.

Novato SD

The Basic System would involve pipeline installation along existing roadways between the Novato SD WWTP and the Petaluma River. Impacts would be similar to those discussed above. The Basic System would not physically divide an established community.

Napa SD

The Basic System would involve pipeline installation and a tertiary treatment increase of 5.5 mgd at the Napa SD WWTP as part of the Carneros Area Project. Project construction would be similar to construction discussed above. Construction and installation of the pipeline and booster pump stations would be similar to that discussed above and would not physically divide an established community.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The land use impacts associated with the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under, the Partially Connected System project construction would involve installation of pipelines along existing roadways and a fire road through China Camp State Park to Peacock Gap Golf Course. Pipeline installation would occur mostly in open space and residential areas, however within existing roadways or public rights-of-way, therefore the impacts would be similar to those discussed under the Basic System would not physically divide an established community.

Novato SD/NMWD

The Partially Connected System would involve installation of a pipeline from the LGVSD WWTP north to connect with a pipeline extending from Novato SD WWTP. The pipeline installation would primarily occur in residential and commercial areas, however within existing roadways or public rights-of-way, therefore the impacts would be similar to those discussed under the Basic System. No impact is expected.

SVCSD

The Partially Connected System would include installation of pipelines in the southern Sonoma Valley and construction of additional system storage in the Carneros West Area. Pipeline installation would be similar to that discussed above and would be buried underground primarily in open space and agricultural areas with no nearby residences. As a result, implementation of the Partially Connected System would not physically divide an established community.

Napa SD

The Partially Connected System would involve installation of pipelines in the Carneros East Area and the MST Area, which are primarily characterized by rural residential, open space and agricultural uses. Pipeline installation would be similar to that discussed above and would not physically divide an established community.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The land use impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for the Partially Connected System above.

Novato SD/NMWD

The Fully Connected System would include installing additional pipelines to serve an extended Sears Point service area. Pipeline installation would primarily be in an open space area and would be similar to construction discussed above under the Partially Connected System and would not physically divide an established community.

SVCSD

The Fully Connected System would involve installation of pipelines north toward the Central Sonoma Service Area. The pipelines would extend north primarily in open space and agricultural areas. Pipeline installation would be similar to construction discussed above and would not physically divide an established community.

Napa SD

The impacts associated with the Fully Connected System would be equivalent to the impacts discussed for the Partially Connected System above.

Impact Significance: Less than significant.

Impact 3.6.2: Conflict with Existing Plans. The NBWRP would not conflict with applicable land use plans adopted for the purpose of avoiding or mitigating a significant environmental effect. (Less than Significant Impact)

The evaluation of plan consistency is based on the applicability of relevant land use plans and policies to the siting, construction, and operation of NBWRP facilities. Because the policy language in a land use plan is subject to varying interpretations, it is often difficult to determine whether the NBWRP is consistent or inconsistent with such policies. Further, because land use plans often contain numerous policies emphasizing differing legislative goals, the NBWRP 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 are also possible.

No local agency approvals would be needed for adoption of the programmatic portions of the project. The specific components under the NBWRP could, in select cases, require encroachment permits from local agencies. In addition, state law and judicial interpretation of state law mutually exempt public utilities and special-purpose local agencies (such as water and wastewater districts) from complying with local building and zoning ordinances when locating or constructing facilities for the production, generation, storage, treatment, or transmission of water and

wastewater (California Government Code Section 53090 et seq). Lastly if the planning agency of the affected jurisdiction of a project component disapproves the location, purpose or extent of such acquisition, disposition, or the public building or structure, the disapproval may be overruled by the NBWRA and its Member Agencies.

In light of these considerations, the consistency evaluation below represents the best attempt to advise the decision-makers as to whether the NBWRP is consistent with applicable land use plans and policies.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

Future baseline conditions (2020) for land use conditions within the region would be similar to current land use, in accordance with anticipated development allowed under the approved General Plans within the region. For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.6-1, No Action). A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD, SVCSD

The NBWRP is generally consistent with the goals and policies identified in each general plan related to community development, resource conservation, and agriculture.

Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and

65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The land use impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The project facilities proposed under Phase 1 in all service areas would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. The NBWRP includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new, and the rehabilitation of, existing reclaimed water storage reservoirs. Although construction of some of these facilities would result in impacts on air quality and natural resources, on the whole the NBWRP would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region.

The significance criteria used in this document align with the intent of the general plan goals and policies related to protecting the environment. As detailed throughout the other sections of Chapter 3, most of the environmental impacts attributable to the NBWRP would be associated with construction, and the impacts would be reduced to less-than-significant levels, either through measures proposed as part of the program or otherwise committed to by the NBWRA and its member agencies. The NBWRP would, on the whole, be consistent with all affected County and City General Plans.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The land use impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The project facilities proposed under the Basic System in all service areas would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. The NBWRP includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Although construction of some of these facilities would result in impacts on air quality and natural resources, on the whole the NBWRP would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region.

The significance criteria used in this document align with the intent of the general plan goals and policies related to protecting the environment. As detailed throughout the other sections of Chapter 3, most of the environmental impacts attributable to the NBWRP would be associated with construction, and the impacts would be reduced to less-than-significant levels, either through measures proposed as part of the program or otherwise committed to by the NBWRA and its member agencies. The NBWRP would, on the whole, be consistent with all affected County and City General Plans.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The land use impacts associated with the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The project facilities proposed under the Partially Connected System would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. The NBWRP includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Although construction of some of these facilities would result in impacts on air quality and natural resources, on the whole the NBWRP would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting

sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region.

The significance criteria used in this document align with the intent of the general plan goals and policies related to protecting the environment. As detailed throughout the other sections of Chapter 3, most of the environmental impacts attributable to the NBWRP would be associated with construction, and the impacts would be reduced to less-than-significant levels, either through measures proposed as part of the program or otherwise committed to by the NBWRA and its member agencies. The NBWRP would, on the whole, be consistent with all affected County and City General Plans.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The land use impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The project facilities proposed under the Fully Connected System would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. The NBWRP includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Although construction of some of these facilities would result in impacts on air quality and natural resources, on the whole the NBWRP would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region.

The significance criteria used in this document align with the intent of the general plan goals and policies related to protecting the environment. As detailed throughout the other sections of Chapter 3, most of the environmental impacts attributable to the NBWRP would be associated with construction, and the impacts would be reduced to less-than-significant levels, either through measures proposed as part of the program or otherwise committed to by the NBWRA and its member agencies. The NBWRP would, on the whole, be consistent with all affected County and City General Plans.

Impact Significance: Less than significant.

Impact 3.6.3: Impact to Farmland. Construction activities associated with the project could temporarily affect the agricultural use of important farmland. (Less than Significant with Mitigation)

Project construction activities would cause short-term disturbance of agricultural lands during all or part of the project construction period. Construction activities could cause direct disturbance to agricultural lands or indirectly disrupt agricultural lands and activities through such effects as disruption of irrigation systems, soil compaction affecting drainage, dewatering, and dust generation (See Section 3.8, Air Quality for additional information on these impacts and associated mitigation measures).

Construction dewatering of pipeline trenches could also affect agricultural drainage in fields next to the pipeline construction. Dewatering operations would be designed to maximize dewatering in the immediate area of the trench and minimize the amount of "drawdown" in areas outside the trench. Drawdown inside and outside the trench construction area would be temporary; the affected land could be returned to agricultural use after construction has ended.

In addition to the temporary direct disturbance of land, construction activities could indirectly affect agricultural operations on adjacent lands. Temporary impacts to farming activities may extend slightly beyond the easement to provide temporary farming access roads, temporary relocation of irrigation and drainage ditches, and/or turn rows for equipment maneuvering. Construction across agriculture fields for pipeline and pump station construction could also isolate areas and render them too small to effectively or economically farm during construction.

Table 3.6-2 shows the land acreage affected for each major project component, and lists impacts associated with pipeline segments, pump stations, and storage reservoirs. Impacts associated with treatment plant expansions are not included, as it is assumed that expansion would be contained within the existing treatment plant boundary. The estimated acreages affected by short-term construction do not include any permanent loss of agricultural land due to facility siting, which is discussed in Impact 3.6.4. Overall, temporary construction impacts to agricultural represent less than 1% of the total agricultural land in the entire action area for all alternatives.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity,

TABLE 3.6-2
TEMPORARY IMPACTS ON FARMLAND RESOURCES BY NBRWP ALTERNATIVES

	IMPORTANT FARMLAND (in Acres)						
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Grazing Land	TOTAL FARMLAND	Percentage of Action area Total (2006)
Pipelines							
Phase 1 (Alt 1)	17.5	24.2	8.0	46.0	0.9	96.6	<1%
Basic System	27.1	61.1	19.3	63.3	2.7	173.6	<1%
Partially Connected Alternative	24.6	20.8	6.7	57.3	16.6	125.9	<1%
Fully Connected Alternative	3.0	1.3	6.0	9.3	11.4	31.0	<1%
Pump stations and Storage Reservoirs							
All Alternatives	0.02	0.04	0	0.06	0	0.1	<1%

SOURCE: ESA, 2008

and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.6-1, No Action).

Under future baseline (2020) conditions, land use conditions within the region would be similar to current land use, within increased development under the approved General Plans within the region. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD

Pipelines under the No Action Alternative would be installed underground and the installation would occur within existing roadways or public rights-of-way and would have no impact on agricultural resources. Construction of the booster pump station would occur at the Novato SD WWTP and would require limited grading and construction of underground piping to connect with proposed pipelines and structural foundation. Project-related construction will be localized to the booster pump site and would have no impact on agricultural resources.

SVCSD

As stated in the SVRWP EIR, the main pipeline would originate from the SVCSD WWTP, extend southwest and then northwest through a vineyard to Arnold Drive. The pipeline installation would be primarily in rural and agricultural areas which could result in temporary

construction impacts to agricultural resources. Construction of the booster pump station would occur at the SVCSD WWTP and would have no impact on agricultural resources.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of a pipeline parallel to an existing pipeline that extends between SVCSD WWTP and the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road (see **Chapter 2, Project Description**).

The proposed pipeline alignment and the Alternative Routes would traverse areas of cultivated vineyard and open areas. Construction of the recycled water pipeline would result in impacts similar to those discussed for Novato SD above. Construction related impacts would be temporary, as pipelines would be buried underground, and disturbed areas would be restored. The pump station would be installed within the footprint of the existing WWTP, and would be generally consistent with the existing landscape. No impact is expected.

Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The agricultural land use impacts for Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD, Napa SD

Under Phase 1, construction activities would temporarily affect land that is currently under cultivation or used as grazing land during all or part of the construction period. As described above, construction would interfere with agriculture in both direct and indirect ways.

WWTPs. During construction of proposed treatment plant expansions, work would be confined to the existing treatment plant boundaries and would have no effect on important farmland or other farmlands.

Pipelines. A construction easement up to 25 feet wide has been evaluated for all segments of pipeline construction. Although not all of the construction easements for each pipeline would occur within active farmland, to provide a conservative impact analysis the impact to agricultural acreage is calculated on the full width of the construction easement. It is assumed that pipeline construction would result in both temporary impacts to approximately 17.5 acres of Prime

Farmland, 24.2 acres of Farmland of Statewide Importance, 8.0 acres of Unique Farmland, 46.0 acres of Farmland of Local Importance and less than an acre of Grazing Land. Construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Pump Stations and Storage Reservoirs. Several new proposed Pump Stations and storage reservoirs would be sited on land designated as important farmland. The construction and installation of the new pump stations and the construction of new and rehabilitated storage reservoirs would have a temporary effect on less than one tenth of an acre of Important Farmland. However, construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Alternative 1: Basic System (Program Level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The impacts to agricultural resources under the Basic Alternative would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD, Napa SD

Under the Basic System, construction activities would temporarily affect Important Farmland in addition to those impacts described above under the previous alternatives.

Treatment Plants. As with Phase 1, construction work associated with the proposed treatment plant expansions would be confined to the existing treatment plant boundaries and would have no effect on important farmland or other farmlands.

Conveyance Pipelines. In addition to the impacts described above under Phase 1, the Basic System would result in temporary construction impacts to approximately 27.1 acres of Prime Farmland, 61.1 acres of Farmland of Statewide Importance, 19.3 acres of Unique Farmland, 63.3 acres of Farmland of Local Importance and 2.7 acres of Grazing Land. Construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Pump Stations and Storage Reservoirs. As with Phase 1, the construction and installation of new pump stations and the construction of new and rehabilitated storage reservoirs associated with the Basic System, would have a temporary effect on less than one tenth of an acre of Important Farmland.

However, construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Alternative 2: Partially Connected System (Program Level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The agricultural land use impacts associated with the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Under the Partially Connected System, construction activities would temporarily affect Important Farmland in addition to those impacts described above under the previous alternatives.

Treatment Plants. As with the previous alternatives, construction work associated with the proposed treatment plant expansions would be confined to the existing treatment plant boundaries and would have no effect on important farmland or other farmlands.

Conveyance Pipelines. In addition to the impacts described above under the previous alternatives, the Partially Connected System would result in temporary construction impacts to approximately 24.6 acres of Prime Farmland, 20.8 acres of Farmland of Statewide Importance, 6.7 acres of Unique Farmland, 57.3 acres of Farmland of Local Importance and 16.6 acres of Grazing Land. Construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Pump Stations and Storage Reservoirs. As with the previous alternatives the construction and installation of new pump stations and the construction of new and the construction of new and rehabilitated storage reservoirs associated with the Partially Connected System, would have a temporary effect on less than one tenth of an acre of Important Farmland. However, construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Alternative 3: Fully Connected System (Program Level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity,

and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The agricultural land use impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD, Novato SD, SVCSD, Napa SD

Under the Fully Connected System, construction activities would temporarily affect Important Agricultural Land in addition to those impacts described above under the previous alternatives.

Treatment Plants. As with the previous alternatives, construction work associated with the proposed treatment plant expansions would be confined to the existing treatment plant boundaries and would have no effect on Important Farmland or other farmlands.

Conveyance Pipelines. In addition to the impacts described above under the previous alternatives, the Fully Connected System would result in temporary construction impacts to approximately 3.0 acres of Prime Farmland, 1.3 acres of Farmland of Statewide Importance, 6.0 acres of Unique Farmland, 9.3 acres of Farmland of Local Importance and 11.4 acres of Grazing Land. Construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Pump Stations and Storage Reservoirs. As with the previous alternatives the construction and installation of new pump stations and the construction of new and rehabilitated storage reservoirs associated with the Fully Connected System, would have a temporary effect on less than one tenth of an acre of Important Farmland. However, construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1**.

Mitigation Measures

Mitigation Measure 3.6.1: To support the continued productive use of Important Farmlands in the action area, the appropriate Member Agency shall implement the following measures during project construction:

- Replace soils over pipelines in a manner that will minimize any negative impacts on crop productivity. The surface and subsurface soil layers will be stockpiled separately and returned to their appropriate locations in the soil profile.
- To avoid over-compaction of the top layers of soil, monitor pre-construction soil densities and return the surface soil (approximately the top 3 feet) to within 5 percent of original density.
- Where necessary, rip the top soil layers to achieve the appropriate soil density. Ripping may also be used in areas where vehicle and equipment traffic have compacted the top soil layers, such as the construction staging areas.

- Avoid working or traveling on wet soil to minimize compaction and loss of soil structure. Before construction begins, geotechnical testing will be done to determine the moisture content limit above which work should not occur. Where working or driving on wet soil cannot be avoided, roadways will be capped with spoils that will be removed at the end of construction and/or ripped and amended with organic material as needed.

- Remove all construction-related debris from the soil surface. This will prevent rock, gravel, and construction debris from interfering with agricultural activities.

- Perform soil density monitoring during backfill and ripping to minimize excessive compaction and minimize effects on future agricultural land use.

- Remove topsoil before excavating in fields. Return it to top of fields to avoid detrimental inversion of soil profiles.

- Control compaction to minimize changes to lateral groundwater flow which could affect both irrigation and internal drainage.

Impact Significance after Mitigation: Less than significant. Implementation of mitigation measures would reduce the temporary impact to Important Farmland to a less-than-significant level.

Impact 3.6.4: Conversion of Farmland. The project would permanently convert Important Farmland to nonagricultural use. (Less than Significant with Mitigation)

Table 3.6-2 presents the acres of farmland affected by each project component. As noted in the Regulatory Setting, Important Farmlands are defined as Prime Farmland, Unique Farmland, Farmland of Statewide Importance Farmland of Local Importance and Grazing Lands.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.6-1, No Action).

Under future baseline (2020) conditions, land use conditions within the region would be similar to current land use, within increased development under the approved General Plans within the region. A discussion of individual Member Agencies is provided below.

LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/ NMWD

The No Action Alternative would include implementation of recycled water distribution facilities within the North Service Area. The pipeline would be installed from the Novato SD WWTP north to Olive Avenue, then extend west and east along Olive Avenue to serve areas north of Atherton and along Redwood Boulevard and San Marin Avenue west of Highway 101. Pipelines would be installed underground and the installation would occur within existing roadways or public rights-of-way and would have no impact on agricultural resources. Construction of the booster pump station would occur at the Novato SD WWTP and would require limited grading with construction of underground piping to connect with proposed pipelines and structural foundation. Project-related construction will be localized to the booster pump site and would have no impact on agricultural resources.

SVCSD

The No Action Alternative would include Alignment 1A of the SVRWP, consisting of installation of 5.2 miles of pipeline in Sonoma Valley and one booster pump station at the SVCSD WWTP. The SVRWP EIR (2006) provides environmental analysis of the components that are a part of the proposed NBWRP. As stated in the EIR, the main pipeline would originate from the SVCSD WWTP, extend southwest and then northwest through a vineyard to Arnold Drive. The pipeline installation would be primarily in rural and agricultural areas which could result in temporary construction impacts to agricultural resources. Construction of the booster pump station would occur at the SVCSD WWTP and would have no impact on agricultural resources.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of approximately 4 miles of pipeline parallel to an existing pipeline that extends between SVCSD WWTP and the SVCSD storage ponds located near the intersection of Northwestern Pacific Railroad and Ramal Road. From the ponds an additional 4.5 miles of new pipeline would be constructed to convey water to the salt pond mixing chamber in one of three alternative pipeline routes (see **Chapter 2, Project Description**).

The proposed pipeline alignment and the Alternative Routes would be primarily in rural and agricultural areas which could result in temporary construction impacts to agricultural resources; however it would not require permanent conversion of important farmland. Construction of the booster pump station would occur at the SVCSD WWTP and would have no impact on agricultural resources.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The land use impacts associated with proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD, Napa SD

Under this alternative development of the new pump stations and storage reservoirs would result in the conversion of less than one-tenth of an acre of Farmland of Statewide Significance. It is assumed that the proposed expansion of wastewater treatment facilities would be confined to the existing plant footprint, and would have no impact on Farmland of Statewide Significance. This is considered a less than significant impact.

Project construction activities, though temporary, could also result in the impairment of agricultural land that could contribute to permanent long-term loss of agricultural acreage to cultivation if protective measures are not taken. Pipeline construction through cultivated agricultural areas could result in adverse effects such as soil compaction, changes in groundwater or surface hydrology and drainage, and soil profile alteration.

The conveyance pipelines would primarily be constructed using a conventional trench design. The pipeline would be buried in a trench excavated to maintain a minimum 5-foot cover over the pipe. Proposed pipelines may also include some appurtenances installed in buried vaults that extend above ground (e.g., blow-off or air release valves). The pipeline would be sited at the edge of fields or within access roads, as feasible, minimizing effects on agricultural operations.

Other important agricultural considerations related to pipeline trench excavation are soil profile and compaction. Construction methods such as using scrapers to stockpile the top layer of soil can be implemented to ensure minimal soil profile alteration during trench backfill. Maximum compaction is a desirable construction result, but undesirable for areas intended for future plant growth. Excess compaction inhibits root, water, and air penetration in soil and thus plant growth. With insufficient compaction, soil may settle over time, potentially interfering with surface water flow and tractor traffic over the land. Geotechnical investigations and compaction monitoring during trench backfill are among methods that can be implemented to ensure appropriate compaction and minimize effects on the existing land use. With consideration of the agricultural concerns noted above included in the design, the presence of the buried pipeline would not preclude farming over

the pipeline alignment; therefore, no acreage of permanent agricultural land conversion is anticipated for any segment of the pipeline corridor proposed to traverse through agricultural areas.

Phase 1 would not result in permanent impacts on Prime Farmland or Unique Farmland. However, construction activities could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be less than significant with the incorporation of **Mitigation Measure 3.6.1** above.

Alternative 1: Basic System (Program Level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The land use impacts for the Basic Alternative would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Basic System would have the same impacts on farmland as those discussed above for Phase 1 because the Basic System would involve implementation of the same type of facilities such as expanded wastewater treatment facilities, conveyance pipelines, pump stations, and storage tanks. Under this alternative development of additional new pump stations and storage reservoirs would result in the conversion of less than one-tenth of an acre of Farmland of Statewide Importance. In addition, it is assumed that the proposed expansion of wastewater treatment facilities would be within the existing plant footprint, and would have no impact on Farmland of Statewide Significance. This is considered a less than significant impact.

As discussed under Phase 1, the presence of the buried pipelines would not preclude farming over the pipeline alignment with the incorporation of **Mitigation Measure 3.6.1** above; therefore, no acreage of permanent agricultural land conversion is anticipated for any segment of the pipeline corridor proposed to traverse through agricultural areas.

Alternative 2: Partially Connected System (Program Level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The land use impacts for Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Partially Connected System would have the same impacts on farmland as those discussed above for Phase 1 and the Basic System. Under this alternative development of the new pump stations and storage reservoirs would result in the conversion of less than one-tenth of an acre of Farmland of Statewide Significance. In addition, it is assumed that the proposed expansion of wastewater treatment facilities would be within the existing plant footprint, and would have no impact on Farmland of Statewide Significance. This is considered a less than significant impact.

As discussed under Phase 1 and the Basic System, the presence of the buried pipelines would not preclude farming over the pipeline alignment with the incorporation of **Mitigation Measure 3.6-1**; therefore, no permanent agricultural land conversion is anticipated for any segment of the pipeline corridor proposed to traverse through agricultural areas.

Alternative 3: Fully Connected System (Program Level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The land use impacts for Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/ NMWD, SVCSD, Napa SD

The Fully Connected System would have the same impacts on farmland as those discussed above for Phase 1, the Basic System and the Partially Connected System. Under this alternative development of additional new pump stations and storage reservoirs would result in the conversion of less than one-tenth of an acre of Farmland of Statewide Significance. In addition, expansion of wastewater treatment facilities would be within the existing plant footprint, and would have no impact on Farmland of Statewide Significance. This is considered a less than significant impact.

As discussed under Phase 1, the Basic System and the Partially Connected System, the presence of the buried pipelines would not preclude farming over the pipeline alignment with the incorporation of **Mitigation Measure 3.6.1** above; therefore, no acreage of permanent agricultural land conversion is anticipated for any segment of the pipeline corridor proposed to traverse through agricultural areas.

Impact Significance after Mitigation: Less than significant. Implementation **Mitigation Measure 3.6.1** would avoid permanent impacts to Important Farmland.

3.6.4 Impact Summary by Service Area

Table 3.6-3 provides a summary of potential land use and agriculture impacts associated with implementation of the NBWRP.

TABLE 3.6-3
POTENTIAL IMPACTS AND SIGNIFICANCE – LAND USE AND AGRICULTURE

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.6.1: Physically Divide an Established Community.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	NI	NI
Phase 1	NI	NI	NI	NI
Basic System	NI	NI	NI	NI
Partially Connected System	NI	NI	NI	NI
Fully Connected System	NI	NI	NI	NI
Impact 3.6.2: Conflict with Adopted Plans and Policies.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LTS	LTS	NI
Phase 1	LTS	LTS	LTS	LTS
Basic System	LTS	LTS	LTS	LTS
Partially Connected System	LTS	LTS	LTS	LTS
Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.6.3: Construction Impacts to Important Farmland.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	NI	NI
Phase 1	LSM	LSM	LSM	LSM
Basic System	LSM	LSM	LSM	LSM
Partially Connected System	LSM	LSM	LSM	LSM
Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.6.4: Conversion of Farmland.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	NI	NI	NI
Phase 1	LSM	LSM	LSM	LSM
Basic System	LSM	LSM	LSM	LSM
Partially Connected System	LSM	LSM	LSM	LSM
Fully Connected System	LSM	LSM	LSM	LSM

NI = No Impact
LTS = Less than Significant impact
LSM = Less than Significant with Mitigation

3.6.5 References

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3.7 Transportation and Traffic

This section describes the existing traffic conditions in the action area and the applicable regulations, and also evaluates potential impacts resulting from the North Bay Water Recycling Program (NBWRP) construction and operation activities on the traffic conditions. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.7.1 Setting

Regional Roadways

Regional access to the NBWRP's service areas (i.e., on Interstate and State freeways and major highways) varies from area to area, but in general, the Napa-Sonoma-Novato region connects with areas to the northeast via *Interstate 80 (I-80)*, with areas to the northwest and southwest via *U.S. Highway 101 (U.S. 101)*, with areas to the north via *State Route (SR) 12 and SR 29*, and with areas to the southeast via *SR 4 and I-580*.[1] Regional access is also provided by three state highways, *SR 37, SR 116 and SR 221*, each of which would be used to transport construction materials, equipment, and workers to and throughout action areas. The action areas are illustrated in figures in **Chapter 2, Project Description**.

LGVSD and Novato SD

SR 37 is a four-lane divided highway with a mix of at-grade intersections and freeway-like interchanges. In the Novato SD Service Area, SR 37 connects with Atherton Avenue via ramps. At the Atherton Avenue interchange, SR 37 has an annual average daily traffic (ADT) of about 36,000 vehicles and a peak month ADT of about 38,500 vehicles (Caltrans, 2008).[2]

SVCSD

SR 12 is a two-lane highway that passes through the service area. SR 12 widens to include turning lanes in both directions at its intersection with Watmaugh Road, and widens to four lanes plus turning lanes in both directions at its intersection with Leveroni Road – Napa Road. The current travel pattern within the City of Sonoma is dominated by SR 12, which passes through downtown Sonoma and includes portions of Broadway, West Napa Street, and the Sonoma Highway. SR 12 has an annual ADT that ranges from about 10,000 to 13,000 vehicles (a peak month ADT ranging from about 11,000 to 13,500 vehicles (Caltrans, 2008).

1 Although not located within the NBWRP area, SR 4 and I-580 are described to define the general characteristics of the Regional Roadway system.

2 The peak-month daily traffic volume represents average conditions for the month of heaviest traffic flow; the Caltrans publication does not identify the specific month in which these higher traffic volumes occur.

SR 116 is a two-lane highway that traverses the western border of the service area. On Arnold Drive, SR 116 has an annual ADT of about 15,000 vehicles and a peak month ADT of about 16,000 vehicles (Caltrans, 2008).

Napa SD

SR 221 is a four-lane divided highway that connects SR 29 with Imola Avenue (SR 121) at an at-grade intersection. At the Imola Avenue intersection, SR 221 has an annual average daily traffic (ADT) of 35,500 vehicles and a peak month ADT of 37,000 vehicles (Caltrans, 2008).

The local and county roadways that border, cross, or may be used to access the project corridor are described below. Some roadways would be affected by pipeline construction, while others would be used for access throughout project construction.

Local Roadways and Public Transit

LGVSD

Local Roadways

Nave Drive is a two-lane roadway that connects U.S. 101 with Main Gate Road, State Access Road, and North Hamilton Parkway. There are bike lanes, but no on-street parking, and Golden Gate Transit buses run on this road.

Main Gate Road is a two-lane roadway with 39 feet of pavement width (some segments with raised 11-foot-wide median). Its name changes to **Palm Drive** at the bridge over railroad tracks, continuing up to Hangar Avenue. This road serves as a bike route, has no on-street parking, and accommodates Golden Gate Transit buses and the Hamilton Field shuttle.

State Access Road is a two-lane roadway with a center two-way left-turn lane. There are bike lanes, but no on-street parking, and no public transit on this road.

North Hamilton Parkway is a two-lane roadway, with a center two-way left-turn lane. There are bike lanes, but no on-street parking, and Golden Gate Transit buses run on this road.

Hangar Avenue is a two-lane roadway, with a center two-way left-turn lane. There are bike lanes, but no on-street parking, and Golden Gate Transit buses and the Hamilton Field shuttle run on this road.

Oakwood Drive (North and South) is a two-lane roadway with 22 feet of pavement width. There are no bike facilities or on-street parking (though cars are parked on the sidewalk).

Public Transit

The action area is served by the following two Golden Gate Transit bus routes (GGBHTD, 2009):

Route 49 (Local Route) runs on Main Gate Road and North Hamilton Parkway, every hour between 6:00 AM and 9:00 PM (weekdays) and 7:00 AM to 8:00 PM (weekends).

Route 58 (Commute Route) runs on Main Gate Road and North Hamilton Parkway, with four weekday morning runs to San Francisco between 6:25 and 7:40 AM, and three weekday afternoon runs from San Francisco between 5:25 and 6:25 PM.

In addition, the Hamilton Field Association free shuttle operates on Main Gate Road, Palm Drive, and Hangar Avenue during weekday commute periods (6:00 to 9:00 AM, and 4:00 to 7:00 PM).

Bicycle and Pedestrian Transportation

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths are paved trails that are separated from the roadways. Bike lanes are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Bike routes are roadways that are designated for bicycle use with signs, but no separate lane width. All local roads described above have either striped bike lanes or signed bus routes.

Pedestrian facilities in the action area include sidewalks, crosswalks, and pedestrian signals at signalized intersections.

Novato SD

Local Roadways

Atherton Avenue is a two-lane roadway with an interchange with U.S. 101. The pavement width at “H” Lane is about 39 feet. There are bike lanes, but no on-street parking, and no public transit service on this road.

“H” Lane is a two-lane roadway with a pavement width that ranges from about 18 to 24 feet. It connects Atherton Avenue to Bugeia Lane. There are no bike facilities or on-street parking.

Olive Avenue is a two-lane roadway, with varying pavement widths and character. From Redwood Boulevard to Rose Court, the pavement ranges from 32 to 54 feet wide, with striped bike lanes, and areas of on-street parking and other areas with no parking. At Rose Court (to Atherton Avenue), the road narrows to 24 feet wide, with no on-street parking and the bike lane changes to a signed bike route. There is no public transit on Olive Avenue.

Redwood Boulevard is predominantly a four-lane, divided, roadway with bike lanes, varying provision for on-street parking, and Golden Gate Transit bus routes. It narrows to two lanes south of Scottsdale Pond Park, as it winds through a residential neighborhood and connects with South Novato Boulevard.

San Marin Drive is a four- to six-lane, divided, roadway. There are bike lanes, but no on-street parking, and Golden Gate Transit bus routes run on this road.

Rowland Boulevard is a four-lane, divided, roadway from east of South Novato Boulevard to Vintage Way, and two lanes (40 feet wide) west of South Novato Boulevard and south of Vintage Way. There are bike lanes, varying provision for on-street parking, and Golden Gate Transit bus routes on this road.

Vintage Way is a four-lane, divided, roadway that borders the Vintage Oaks Mall. There are bike lanes, but no on-street parking, and Golden Gate Transit bus routes run on this road.

South Novato Boulevard varies from a two-lane road with a two-way left-turn lane, to a four-lane, divided roadway. There are bike lanes, but no on-street parking, and Golden Gate Transit bus routes run on this road.

Hill Road is a two-lane road with on-street parking that passes through residential and commercial areas. There are no delineated bike lanes or Golden Gate Transit service along this road.

Arthur Street is a four-lane road that passes through residential and commercial areas. There are no delineated bike lanes, on-street parking capabilities, or Golden Gate Transit routes along this road.

Public Transit

The action area is served by the following eight Golden Gate Transit bus routes (GGBHTD, 2009).

Route 51 (Local Route) runs on Redwood Boulevard, Rowland Boulevard, and Vintage Way, every hour between 7:00 AM and 8:30 PM (weekdays only).

Route 52 (Local Route) runs on Redwood Boulevard, Rowland Boulevard, Vintage Way, and South Novato Boulevard, every hour between 7:00 AM and 7:00 PM (weekdays) and 7:35 AM to 8:45 PM (weekends).

Route 54 (Commute Route) runs on Redwood Boulevard, San Marin Drive, and South Novato Boulevard, with weekday morning runs to San Francisco between 4:40 and 7:30 AM, and weekday afternoon runs from San Francisco between 4:00 and 8:30 PM.

Route 56 (Commute Route) runs on San Marin Drive, with five weekday morning runs to San Francisco between 5:35 and 7:20 AM, and six weekday afternoon runs from San Francisco between 4:45 and 7:05 PM.

Route 58 (Commute Route) runs on Redwood Boulevard, with four weekday morning runs to San Francisco between 6:25 and 7:40 AM, and three weekday afternoon runs from San Francisco between 5:25 and 6:25 PM.

Route 70 (Basic Route) runs on Redwood Boulevard, primarily every hour between 5:15 AM and 12:30 AM (weekdays) and 5:25 AM to 12:30 AM (weekends).

Route 71 (Local Route) runs on Redwood Boulevard, every 30 to 60 minutes between 6:35 AM and 8:25 PM (weekdays), with three weekend runs to San Francisco between 7:00 AM to 10:20 AM, and five weekend runs from San Francisco between 11:25 AM and 7:30 PM.

Route 80 (Basic Route) runs on Redwood Boulevard, every hour between 4:55 AM and 1:25 AM (weekdays) and 5:00 AM to 1:25 AM (weekends).

Bicycle and Pedestrian Transportation

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths are paved trails that are separated from the roadways. Bike lanes are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Bike routes are roadways that are designated for bicycle use with signs, but no separate lane width. All local roads described above, except "H" Lane, have either striped bike lanes or signed bus routes.

Pedestrian facilities in the action area include sidewalks, crosswalks, and pedestrian signals at signalized intersections.

In addition, the NBWRP alignment on Olive Avenue would be constructed adjacent to the Olive Elementary School (Novato Unified School District [NUSD]). In the vicinity of the school, there are yellow school route crosswalks and the appropriate traffic control signs (i.e., speed control and school warning signs). Also, NUSD operates school buses on roadways along the project alignment.

SVCSD

Local Roadways

First Street West is a two-lane roadway. First Street West fronts the town plaza and provides diagonal parking, mid-block crossings, and sidewalks, with a pavement width of about 63 feet. Between the town plaza and the bike path, the pavement narrows to about 31 feet, with on-street parking and sidewalks.

Napa Street is an east-west roadway, named West Napa Street (and designated SR 12 – Sonoma Highway) west of Broadway. On the road segment affected by the project (adjacent to the town plaza), West Napa Street has four lanes and provides on-street parking and sidewalks.

Broadway is a four-lane roadway with a center left-turn lane from Napa Street south to MacArthur Street; it is designated SR 12 – Sonoma Highway. Broadway has on-street parking and sidewalks in this commercial area. South of MacArthur Street at the Sonoma Valley and Creekside Continuation High School, Broadway becomes a two-lane roadway with a center left-turn lane and then varies between a three- and four-lane roadway with a center left-turn lane until Napa Road. South of Napa Road, Broadway becomes a two-lane roadway with a pavement width of about 30 feet at its narrowest point, and no on-street parking.

Leveroni Road is a two-lane roadway with a pavement width of about 30 feet. Parking is not permitted. Leveroni Road becomes Napa Road east of Broadway.

Specht Road is a two-lane (dead-end) roadway with a pavement width of about 25 feet.

Watmaugh Road is a two-lane roadway with a pavement width of about 30 feet, except for the bridge, which is about 20 feet in width.

Arnold Drive is a two-lane roadway with a pavement width of about 40 feet. Parking is permitted along some segments. Bicycle lanes are present south of Craig Avenue.

Napa Road is a two-lane roadway with shoulders. East of Fifth Street East, on-street parking is not permitted. The pavement width is about 60 feet. Napa Road becomes Leveroni Road west of Broadway.

Denmark Road is a two-lane roadway that connects East Eighth Street with Napa Road. On-street parking is not permitted and shoulders are not present. The pavement width is about 20 feet.

Eighth Street East is a two-lane roadway with a pavement width of about 40 feet. On-street parking is permitted and shoulders are discontinuous.

Hyde Street is a two-lane roadway with a pavement width of about 15 to 20 feet. On-street parking is not permitted and shoulders are not present.

Duhig Road, Ramal Road, Buchli Station Road are two-lane roadways. On-street parking is not permitted and shoulders are not present.

Public Transit

The action area is served by the following five Sonoma County Transit bus routes that provide service throughout the City of Sonoma, and between the City of Sonoma and the surrounding cities (SCTA, 2008a). The main transfer station in Sonoma is located in the town plaza at Napa Street and Broadway.

Route 30 operates on Broadway (on the segment between MacArthur Street and Napa Street) on an irregular schedule on weekdays (6:15 AM to 9:40 PM) and four runs between 9:00 AM and 7:10 PM weekends.

Route 32 (local) operates on Broadway (on the segment between MacArthur Street and Napa Street), West Napa Street, Leveroni Road, and Arnold Drive every 45 minutes on weekdays between 8:15 AM and 4:25 PM, and every 90 minutes on Saturday between 9:00 AM and 5:15 PM.

Route 34 (express) operates weekdays on Leveroni Road and Broadway, with one morning run ending at the Sonoma Plaza at 8:00 AM, and two afternoon commute runs leaving the Sonoma Plaza at 4:35 and 5:30 PM.

Route 38 operates weekdays on West Napa Street, Broadway, Leveroni Road, and Arnold Drive, with one morning run arriving at the Sonoma Plaza at 6.25 AM, and one evening commute run arriving at the Sonoma Plaza at 7:05 PM.

Route 40 operates weekdays on Broadway, Leveroni Road, and Arnold Drive on an irregular schedule between 7:00 AM and 7:25 PM.

In addition to fixed-route transit services, Sonoma County Paratransit provides service in the action area, operating on demand and providing curb-to-curb transportation for individuals with disabilities.

Bicycle and Pedestrian Transportation

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths are paved trails that are separated from the roadways. Bike lanes are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Bike routes are roadways that are designated for bicycle use with signs, but no separate lane width. Within the vicinity of the project site, there are bike lanes on Arnold Drive and Broadway.

The Countywide Bicycle Advisory Committee and Sonoma Bicycle Advisory Committee support bicycle- and pedestrian-related development in the action area and surrounding vicinity. The Sonoma County Transit Authority's (SCTA) *Draft 2009 Countywide Transportation Plan for Sonoma County* indicates that bike lanes are planned on Arnold Drive (from SR 116 to Petaluma Avenue) and on Leveroni Road from Arnold Drive to Highway 12 (SCTA, 2008b).

A multi-use path provides pedestrian and bicycle access along an old railroad right-of-way north of Spain Street. The path has a pavement width of approximately 10 feet with clear shoulders on each side. The path crosses roadways at marked crosswalks.

Pedestrian facilities include sidewalks, crosswalks, and pedestrian signals. The project corridor currently contains pedestrian facilities along most roadways within the City of Sonoma.

In addition, the NBWRP alignment would be constructed in Broadway adjacent to the Sonoma High School and Creekside Continuation High School (Sonoma Valley Unified School District [SVUSD]). In the vicinity of the schools there are yellow school route crosswalks and the appropriate traffic control signs (i.e., speed control and school warning signs). Also, SVUSD operates school buses on roadways along the project alignment.

Napa SD

Local Roadways

Roadways affected by the projects in the Napa SD Service Area are generally two-lane roads, with pavement widths of about 24 feet, with no bike facilities, on-street parking, or public transit. These include the following: **4th Avenue, Coombsville Road – Wild Horse Valley Road, 3rd Avenue – North 3rd Avenue, East 3rd Avenue, Biava Lane, 1st Avenue, North Avenue, Hagan Road, Loma Heights Road, La Londe Lane,** and **Olive Hill Lane**. Exceptions to the above character of road are as follows:

Magnolia Drive is a four-lane, divided, roadway. There is on-street parking, but no public transit service on this road.

Imola Avenue is a four-lane roadway between SR 29 and Soscol Avenue (designated SR 121), and a two-lane roadway east of Soscol Avenue. The pavement width on the two-lane portion of the road varies from 24 to 30 feet. There are no bike facilities or on-street parking, but a portion of Imola Avenue has public transit service.

Kreuzer Lane, Kirkland Avenue, and **2nd Avenue** are two-lane roadways, with a pavement width of about 20-22 feet. There is no on-street parking or public transit service on these roads.

Public Transit

Imola Avenue, west of Granada Street, accommodates Napa County VINE Bus Route 2, which runs hourly between 6:50 AM and 6:50 PM (NCTPA, 2007).

Bicycle and Pedestrian Transportation

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths are paved trails that are separated from the roadways. Bike lanes are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Bike routes are roadways that are designated for bicycle use with signs, but no separate lane width. None of the local roads described above have bike facilities.

Pedestrian facilities in the action area include sidewalks and pedestrian signals at signalized intersections.

In addition, the NBWRP alignment would be constructed in roadways adjacent to three schools located in the Napa Valley Unified School District (NVUSD), including Mount George Elementary School on 2nd Avenue, Silverado Middle School on Coombsville Road, and Wintun School on Wintun Court off Imola Avenue. In the vicinity of the schools, there are yellow school route crosswalks and the appropriate traffic control signs (i.e., speed control and school warning signs). Also, NVUSD operates school buses on roadways along the project alignment. Similarly, the Napa County Children's Center, Napa County Community School, and Napa Infant Preschool Program are also located in the action area on Imola Avenue.

3.7.2 Regulatory Framework

State

The California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. The action areas include several roadways that fall under Caltrans' jurisdiction (i.e., U.S. 101 and SR 37 in Novato; SR 12, SR 116, and SR 121 in Sonoma; and SR 29, SR 121, and SR 221 in Napa).

Caltrans' construction practices require temporary traffic control planning during any time the normal function of a roadway is suspended (Caltrans, 2006). In addition, Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials,

and for construction-related traffic disturbance. Caltrans regulations would apply to construction of the pipeline within and immediately adjacent to roadways, as well as the transportation of construction crews and construction equipment throughout the action area (Caltrans, 2007).

Local

The local general plans, policies, and regulations associated with impacts to transportation and traffic within the affected jurisdictions are presented in **Appendix 3.7** of this EIR/EIS.

3.7.3 Environmental Consequences/ Impacts

Significance Criteria

The thresholds for determining the significance of impacts for this transportation and circulation analysis are based on the environmental checklist in Appendix G of the *CEQA Guidelines*. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects.

A project would normally result in an impact on transportation and circulation if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system. The direct impacts of project construction would not be long-term, ongoing effects. Occasional post-construction maintenance activities would briefly affect only local road segments and would constitute a less-than-significant impact. The duration of potentially significant impacts related to short-term disruption of traffic flow and increased congestion generated by construction vehicles would be limited to the period of time needed to complete construction of the project components. Therefore, mitigation measures identified in this EIR/EIS are focused on reducing the short-term project construction effects; long-term mitigation measures are not needed.

For this analysis, the project would be considered to have a significant impact on transportation and circulation if it would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Substantially impede access to local streets or adjacent uses, including access for emergency vehicles;
- Substantially affect alternative transportation or alternative transportation facilities; or
- Result in inadequate parking capacity.

In addition to the above-listed criteria, the following criteria are derived from common engineering practice to apply to the project-specific analysis presented herein:

- Substantially increase traffic safety hazards due to increased traffic volumes; or
- Cause substantial damage or wear of public roadways by increased movement of heavy vehicles

This analysis relies upon available information and field reconnaissance of roadway characteristics (e.g., pavement widths and existence of on-street parking). Impacts to traffic and circulation that would result from increases in traffic volumes, loss of travel lanes and/or parking areas, and potential safety effects associated with construction were evaluated. Construction characteristics, including proposed manpower and equipment, location of construction, and rate of construction were used to conservatively determine the potential number of vehicles that could be required for the NBWRP.

Several of the criteria included in Appendix G of the CEQA guidelines do not apply to this analysis and are not used, as explained below.

> *Exceedance of LOS Standards Established by the County Congestion Management Agency*. As discussed above, long-term operation of any project facility is anticipated to be similar to the existing traffic and circulation conditions within the action area, with the addition of a minimal increase in maintenance worker trips. Increases in traffic volumes generated by construction projects end when construction activities end. As such, county LOS standards are not used to judge potential project impacts presented herein.
>
> *Air Traffic Patterns*. NBWRP facilities would not affect air traffic patterns of nearby airports. Construction equipment would not exceed height restrictions within this area. Therefore, the NBWRP would not alter air traffic patterns nor result in substantial safety risks associated with airport operations.
>
> *Increased Hazards Due to a Design Feature or Incompatible Uses*. The NBWRP would not include new design features (e.g., new facilities or obstructions within public roadways) or alterations of existing features (e.g., road realignment). In addition, traffic generated by the NBWRP would be compatible with the mix of vehicle types (autos and trucks) currently using action area roads. Therefore, the NBWRP would not result in hazards caused by a design feature or incompatible use.
>
> *Conflicts with Adopted Policies, Plans, or Programs Supporting Alternative Transportation*. The NBWRP would not directly or indirectly eliminate alternative transportation corridors or facilities (e.g., bike paths, lanes, bus turnouts, etc.) both because of facility locations and because of the short-term nature of construction activities where potential effects could occur. In addition, the NBWRP would not include changes in policies or programs that support alternative transportation. Therefore, the NBWRP would not conflict with adopted policies, plans, or programs supporting alternative transportation.

Environmental Consequences/Impact Analysis

Impact 3.7.1: Temporary Congestion and Delays. Project construction activities could adversely affect traffic and transportation conditions in the action area. (Less than Significant with Mitigation)

Trip Generation – Overview

Traffic-generating construction activities related to the construction of the pipelines would consist of the daily arrival and departure of constructions workers, trucks hauling equipment and

materials to the construction site, the hauling of excavated soils, and importing of new fill. The pipelines would be located in the paved cross-section of several public roadways.

Assuming up to two construction crews of 10 workers per day for pipeline construction (10 workers per day for construction of storage facilities, and 5 workers per day for construction of booster pump stations), construction worker trips traveling to and from the work sites would not exceed 30 round trips (60 one-way trips) per day (i.e., 40 one-way commute trips, and 20 one-way midday trips). Accounting for the delivery of construction components (which would be shipped on demand to the project site and the staging areas throughout the construction period), based on earthwork quantities (excavation and backfill), and assuming a haul load of 10 cubic yards per truck, the peak number of off-site construction truck trips would range up to the following:

- *Pipelines*: about 25 to 45 truck round trips (50 to 90 one-way truck trips) per work day (tied to a range of maximum construction rate of 200 feet per day for paved roadways, and 400 feet per day for open land).
- *Storage Facilities*: about 60 truck round trips (120 one-way truck trips) per work day.
- *Booster Pump Stations*: about 10 truck round trips (20 one-way truck trips) per work day.

Project Impact – Common to All Facilities

Phase 1 would include construction associated with approximately 47 miles of new pipeline, new storage facilities, and treatment upgrades at existing WWTPs. Phase 1 would not introduce any new uses to the project corridor that would generate noticeable long-term changes in traffic; operational traffic would be limited to infrequent trips by maintenance personnel and by vehicles delivering chemicals to treatment plants. Thus potential traffic and transportation effects would be confined to construction of the proposed facilities. Construction-generated traffic would be temporary and therefore would not result in any long-term degradation in operating conditions or level of service on any project roadways. The primary impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks compared to passenger vehicles.

Proposed hours of construction are between 8:00 AM and 7:00 PM; no construction would occur between 10:00 PM and 7:00 AM, unless stipulated (in coordination with responsible jurisdiction) that night construction could be used to minimize impacts to traffic flow. Most project-related hauling and deliveries would be dispersed throughout the day, thus lessening the effect on peak-hour traffic. Project truck traffic occurring weekdays during the hours of 7:00 to 9:00 AM and 4:00 to 6:00 PM would coincide with peak-period traffic, and therefore, would have the greatest potential to impede traffic flow. As specified in **Mitigation Measure 3.7.1b**, below, the deliveries would be restricted to the hours of 9:00 AM and 3:30 PM, or other hours if approved by the appropriate local jurisdiction, which would avoid such peak-period effects.

Pipelines

Construction of the proposed recycled water pipelines would involve one of the four potential methods: open trenching; jack and bore tunneling; directional drilling; or suspending the pipe (such as in the presence of a bridge). In the first three methods, the proposed recycled water pipelines would be installed beneath the ground surface or underneath the existing roads, while in the fourth method the proposed recycled water pipeline might be attached to an existing bridge and would remain aboveground.

Open Trenching includes clearing of the construction site, saw cutting of the pavement where applicable, trench excavation, pipe installation, backfill operations, and re-paving where applicable. In undeveloped areas, a 25-foot wide corridor for construction would be utilized to maximize construction efficiency. In areas encumbered by existing improvements, high-volume roadways, or environmentally sensitive areas, a narrower construction corridor of approximately 25 feet would be used.

The estimated trench dimensions for a 14-inch-diameter pipeline (average size) would be about 30 inches wide by about 56 inches deep; however, the dimensions would vary with the location along the route and the diameter of the pipeline. Pipeline installation would occur at a rate of about 100 to 200 feet per day in developed areas, where there are narrow construction corridors, higher traffic volumes, and more utilities. Where the pipelines would cross open land or low-use sections of roadways, the construction rate would average approximately 300 to 400 feet per day. All spoils excavated along roadways would be hauled offsite to appropriate disposal facilities, and backfill material would be imported. In open space areas, native excavated soils would be retained for backfill.

During construction, trenches would be temporarily closed at the end of each work day, either by covering with steel trench plates, backfill material, or installing barricades to restrict access depending on physical conditions and conditions of the encroachment permit (along roadways). If the area is paved prior to construction, a temporary patch or covering would be used until final repaving of the affected area occurs. Final paving would occur approximately two to six weeks after recycled water pipeline construction is complete within a given road segment.

For *jack and bore tunneling*, each bore and jack undercrossing would require a jacking pit measuring approximately 30 feet by 10 feet, and a maximum depth of 20 feet.

Horizontal Directional Drilling is another trenchless construction method that could be use to install underground pipelines without disturbing the ground surface.

Pipeline Suspension is a fourth construction alternative and could occur at locations with bridges that cross streams. Pipeline construction at these crossings would disrupt traffic flow on area roadways to a lesser degree (limited to increase traffic generated by construction workers and trucks).

As discussed above, project construction activities could generate up to 30 off-site construction worker vehicle round trips (60 one-way trips) and up to 45 off-site truck round trips (90 one-way

truck trips) per day. These project-generated trips, spread over the course of the work day, would not be substantial relative to existing volumes on roadways in the affected areas, and would fall within the daily fluctuations of traffic volumes for these roadways. Therefore, this short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project / No Action Alternative. The primary impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks compared to passenger vehicles. In addition, drivers could experience delays if they were traveling behind a construction truck.

Open trenching would result in temporary lane closures (for varying durations at different locations) along project corridors. If the construction zone were to reduce the number of travel lanes during peak traffic periods, the NBWRP would significantly affect roadway segments and intersections on all segments adjacent to or in the roadway by causing either roadway or intersection levels of service to be unacceptable. The decrease in traffic volumes outside the peak periods typically, but not universally, is sufficient to allow the reduced number of travel lanes to accommodate the traffic flow without significant delays. Delays also would be experienced by drivers during off-peak hours, but because of the lower volume during that time of the day, fewer people would be affected by the delays during those periods.

Project construction would include temporary closure of one lane of traffic on area roadways (as described below for the specific service areas), which would require alternate one-way traffic flow on two-lane roads to be managed by flaggers. There are roadways within proposed pipeline segments for which the construction zone would result in insufficient remaining width to maintain alternate one-way traffic flow, requiring detour routing (if available), or roadway closures (if no detour is available); affected roadways are described below for the specific service areas.

Storage Facilities

Construction of new open storage reservoirs would include site preparation and clearing, excavation, earth movement, linear placement, embankment construction, and hydro-seeding. Assuming a surface storage facility of about 50 acre-feet, about 100,000 cubic yards of material would be excavated to a depth of approximately six feet. It is expected that no excavated material would need to be off-haul (i.e., it would be used to build embankments or spread over the nearby surrounding area).

Project construction activities could generate up to 20 off-site construction worker vehicle round trips (40 one-way trips) and about 60 off-site truck round trips (120 one-way truck trips) per work day. These project-generated trips, spread over the course of the work day, would not be substantial relative to existing volumes on roadways in the affected areas, and would fall within the daily fluctuations of traffic volumes for these roadways. Therefore, this short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project and No Action Alternatives. The primary impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities

due to slower movements and larger turning radii of the trucks compared to passenger vehicles. In addition, drivers could experience delays if they were traveling behind a construction truck.

Booster Pump Station and Distribution Pump Station

Rough grading, and additional excavation or filling would bring the site to final grade and prepare the soil for underground piping and structural slabs. Site work would involve installing manholes, structural foundations, curbs, site drainage, and sidewalks; erecting the structure; installing electrical equipment; and installing pull boxes, conduits, and cables.

Project construction activities could generate up to 8 off-site construction worker vehicle round trips (16 one-way trips) and about 10 off-site truck round trips (20 one-way truck trips) per work day. These project-generated trips, spread over the course of the work day, would not be substantial relative to existing volumes on roadways in the affected areas, and would fall within the daily fluctuations of traffic volumes for these roadways. Therefore, this short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project and No Action Alternatives. The primary impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks compared to passenger vehicles. In addition, drivers could experience delays if they were traveling behind a construction truck.

Staging Areas

At various locations within the construction zones, staging areas would be required to store pipe, construction equipment, and other construction related items. In some cases, staging areas may be used for the duration of the NBWRP. In other cases, as pipeline construction moves along the route, the staging area may also be moved to minimize hauling distances and avoid disrupting any one area for extended periods of time. Member Agencies are expected to negotiate short-term temporary easements for staging areas. The location of the staging areas would be determined by the contractor and would typically be located every three miles along the pipeline alignment.

No Project Alternative

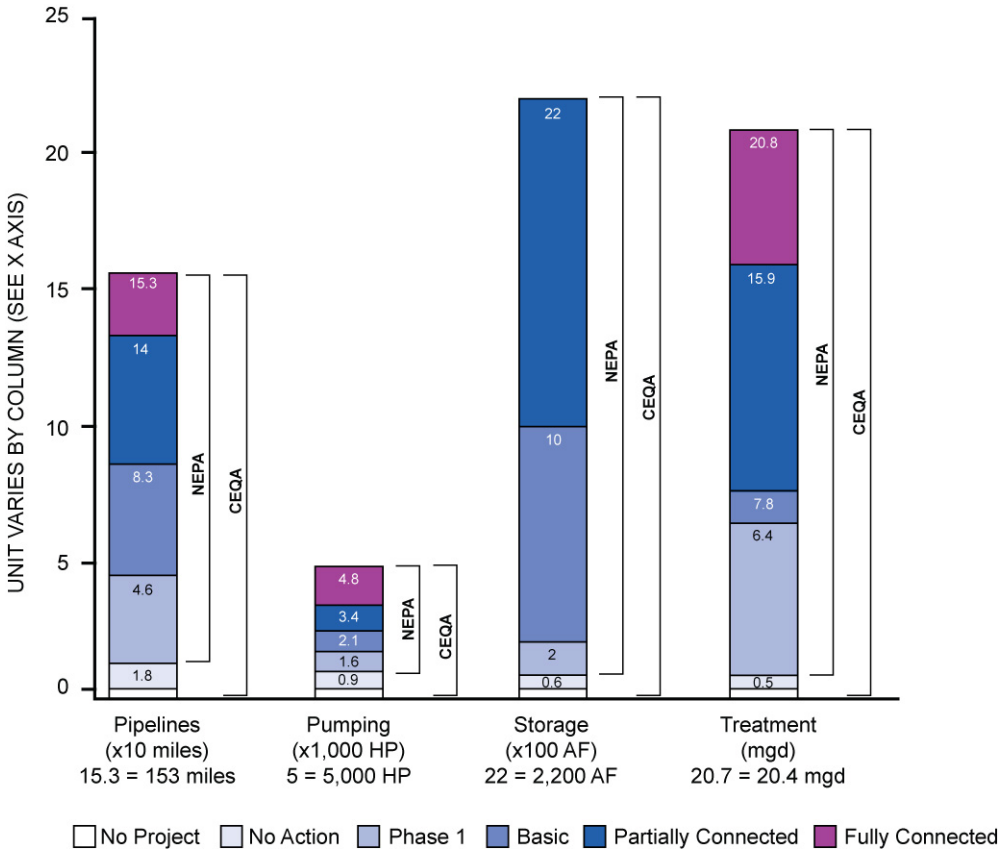
The NBWRP would not be implemented under the No Project Alternative, therefore no impact is expected. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.7-1, No Action**).

CHART 3.7-1
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

Under future baseline (2020) conditions, traffic conditions within the region would likely be exacerbated by build-out identified under the local city and county general plans for the next 20 years. Roadways adjacent to or within the service areas would be subject to the traffic impacts. However implementation of **Mitigation Measures 3.7.1a** through **3.7.1e**, which include Compliance with local road encroachment permits and the *Work Area Protection and Traffic Control Manual*, preparation of a Traffic Control Plan, identification of roadways that require special construction techniques, development of a circulation and detour plan, and consultation with local transit service providers, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD

Novato SD No Action Alternative would include implementation of recycled water distribution facilities within the North Service Area. This consists of pipeline installation from the Novato SD Davidson WWTP north to Olive Avenue, then extension west and east along Olive Avenue to serve areas north of Atherton Avenue and along Redwood Boulevard and San Marin Avenue west of U.S. 101. Pipeline installation would be similar to construction for Phase 1 projects, i.e., a less-than-significant impact with mitigation, except on Olive Avenue (with not enough pavement width to accommodate at least alternate one-way traffic flow past the construction zone, therefore causing significant impacts, which would be mitigated to less-than-significant levels). Construction of the Davidson Street booster pump station would be within the Davidson Street WWTP and project-related construction will be localized to the booster pump site, and the short-term increase in vehicle trips generated by construction of the pump station would not significantly affect level of service and traffic flow on roadways.

SVCSD

The SCVSD No Action Alternative would include Alignment 1A of the Sonoma Valley Recycled Water Project, consisting of pipeline installation in Sonoma Valley and one booster pump station at the SVCSD WWTP. Pipeline installation would affect the following primary roadways: Arnold Drive, Orange Avenue, Elm Avenue, and Leveroni Road. Pipeline installation would be similar to construction for Phase 1 projects, i.e., a less-than-significant impact with mitigation. The short-term increase in vehicle trips generated by construction of the pump station would not significantly affect level of service and traffic flow on roadways.

Under the No Action Alternative, the Napa Salt Marsh Restoration Project would include construction of a pipeline along Northwestern Pacific Railroad and then along Ramal Road. The short-term increase in vehicle trips generated by construction of either of the three alternative pipeline alignments would not significantly affect level of service and traffic flow on roadways.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The traffic impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. As described above, open trenching for pipeline

installation would result in temporary lane closures along project corridors. A discussion of roadways affected by such lane closures are discussed below for the by Member Agency.

LGVSD/NMWD

Under Phase 1, LGVSD would upgrade tertiary treatment capacity at the LGVSD WWTP, construct a new booster pump station, and NMWD would install one of three pipeline options, described in **Chapter 2, Project Description**, which would connect the LGVSD WWT Recycled Water Treatment Facility to facilities constructed by NMWD.

Installation of Pipeline Options A, B, or C would not obstruct traffic patterns or cause road closures; however project construction of pipelines for the Coast Guard Housing Distribution Loop System would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) on the following roads: Hangar Avenue, North Hamilton Parkway, and State Access Road. The width of Oakwood Drive (North and South) would not accommodate traffic flow during construction work hours, and Oakwood Drive would need to be closed during construction work hours, with detour routing on other roads in the area (e.g., Sunset Drive and San Jose Drive). Due to their short-term duration, and implementation of **Mitigation Measures 3.7.1a** through **3.7.1e**, impacts would be reduced to a less than significant level.

The existing MMWD tertiary treatment plant (accessed from U.S. 101 via Smith Ranch Road, a four-lane, divided, roadway that narrows when it reaches the McInnis County Park) would be upgraded, and a new pump station would be constructed. In addition, new storage would be provided at the existing Reservoir Hill Tank (accessible from U.S. 101 via Nave Drive, Main Gate Road and Palm Drive). As stated above, the short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project / No Action Alternative.

Novato SD/NMWD

Project construction of pipelines would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) on the following roads: Atherton Avenue (near Olive Avenue and “H” Lane), Olive Avenue (between Redwood Boulevard and Rose Court), Redwood Boulevard (south of Scottsdale Pond Park to South Novato Boulevard), and South Novato Boulevard (east of Redwood Boulevard). The width of “H” Lane and Olive Avenue (between Rose Court and Atherton Avenue) would not accommodate traffic flow during construction work hours, and those roads would need to be closed during construction work hours. Detour routing is available for “H” Lane (i.e., Bugeia Lane), but there is no readily available detour for Olive Avenue. Other methods, such as night construction, periodic trench closure or road closure may be necessary. Such measures would be identified by the local jurisdiction’s roadway encroachment permit. Due to their short-term duration, and implementation of **Mitigation Measures 3.7.1a** through **3.7.1e**, impacts would be reduced to a less than significant level.

The existing Davidson WWTP (accessed from U.S. 101 via DeLong Avenue and Davidson Street) would be upgraded, and a new pump station would be constructed. In addition, new

storage would be provided at the existing Plum Street Tank, and a booster pump would be installed at Atherton Avenue. As stated above, the short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project / No Action Alternative.

SVCSD

Project construction of pipelines would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) on the following roads: First Street West, Broadway (south of Napa Road – Leveroni Road), Napa Road, Leveroni Road, Arnold Drive, and Watmaugh Road (except for the bridge). Detour routing is generally available for those roads.

Storage reservoirs and pump stations would be constructed adjacent to the SVCSD WWTP (accessed from SR 121/12 via Eighth Street East, a two-lane roadway. As stated above, the short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project / No Action Alternative.

Under Phase 1, impacts related to the Napa Salt Marsh Restoration Project would be equivalent to those under the No Action Alternative.

Napa SD

Project construction of pipelines would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) on the following roads: Imola Avenue, 4th Avenue, Coombsville Road – Wild Horse Valley Road, 3rd Avenue – North 3rd Avenue, East 3rd Avenue, Biava Lane, 1st Avenue, North Avenue, Hagan Road, Loma Heights Road, La Londe Lane, and Olive Hill Lane. Pipeline installation in Magnolia Drive, a four-lane, divided, roadway, would require temporary closure of one lane of traffic, but two-way traffic flow would be maintained. The width of Kreuzer Lane, Kirkland Avenue, and 2nd Avenue would not accommodate traffic flow during construction work hours, and those roads would need to be closed during construction work hours. Detour routing is available for 2nd Avenue (except the segment north of North Avenue), but there is no readily available detour for Kreuzer Lane and Kirkland Avenue (neither of which has an outlet). Other methods, such as night construction, periodic trench closure or road closure may be necessary. Such measures would be identified by the traffic control plan and the local jurisdiction's roadway encroachment permit. Due to their short-term duration, and implementation of **Mitigation Measures 3.7.1a** through **3.7.1e**, impacts would be reduced to a less than significant level.

Four new booster pump stations would be constructed at locations accessed on Imola Avenue, Coombsville Road – Wild Horse Valley Road, East 3rd Avenue and North 3rd Avenue, all two-lane roadways. As stated above, the short-term increase in vehicle trips would not significantly affect level of service and traffic flow on roadways compared to the No Project / No Action Alternative.

Mitigation Measures

Mitigation Measure 3.7.1a: The appropriate Member Agency for each project component shall obtain and comply with local road encroachment permits for roads that are affected by construction activities.

The *Work Area Protection and Traffic Control Manual* includes requirements to ensure safe maintenance of traffic flow through or around the construction work zone, and safe access of police, fire, and other rescue vehicles (CJUTCC, 1996). In addition, the Traffic Management Plan (subject to local jurisdiction review and approval) required by **Mitigation Measure 3.7.1b**, below, would direct how traffic flow is safely maintained during project construction.

Mitigation Measure 3.7.1b: The construction contractor for each project component shall prepare and implement a Traffic Control/Traffic Management Plan subject to approval by the appropriate local jurisdiction prior to construction. The plan shall:

- Identify hours of construction (between 8:00 AM and 7:00 PM; no construction shall be permitted between 10:00 PM and 7:00 AM);
- Identify hours for deliveries (Monday – Friday, 9:00 AM to 3:30 PM, or other hours if approved by the appropriate local jurisdiction);
- Include a discussion of haul routes, limits on the length of open trench, work area delineation, traffic control and flagging;
- Identify all access and parking restriction, pavement markings and signage requirements (e.g., speed limit, temporary loading zones);
- Layout a plan for notifications and a process for communication with affected residents and businesses prior to the start of construction. Advance public notification shall include posting of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access point/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints;
- Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times;
- Include a plan to coordinate all construction activities with the appropriate local school district at least two months in advance. The school district shall be notified of the timing, location, and duration of construction activities. Coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. The construction contractor for each project component shall be required to maintain vehicle, pedestrian, and school bus service during construction through inclusion of such provisions in the construction contract. The assignment of temporary crossing

guards at designated intersections may be needed to enhance pedestrian safety during project construction;

- Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and
- Specify the street restoration requirements pursuant to agreements with the local jurisdictions.

Mitigation Measure 3.7.1c: The appropriate Member Agency for each project component shall identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling or night construction) will be used to minimize impacts to traffic flow.

Mitigation Measure 3.7.1d: The appropriate Member Agency for each project component shall develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.

Mitigation Measure 3.7.1e: The appropriate Member Agency for each project component shall encourage construction crews to park at staging areas to limit lane closures in the public right-of-way.

Mitigation Measure 3.7.1f: The appropriate Member Agency for each project component shall consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.

Impact Significance after Mitigation: Less than Significant.

Impact 3.7.2: Temporary Disruption to Access. Project construction activity would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers). (Less than Significant with Mitigation)

The NBWRP would have temporary effects on traffic flow, particularly with pipeline construction within road rights of way. Pipeline construction within or across streets could result in delays for emergency vehicle access. The NBWRP would also obstruct pedestrian, bicycle, and vehicle access to schools, thus disrupting the Safe Routes to School programs that are currently in place. Construction along the pipeline alignments would cause delays to school buses and limit access to school bus stops.

Construction of the operational and capacity storage reservoirs, pump stations, and upgrades to existing WWTPs would not directly interfere with circulation patterns near sensitive land uses because no schools, hospitals, fire stations, police stations, or other emergency providers are located adjacent to these proposed facilities. However, construction could indirectly disrupt

circulation patterns near sensitive land uses, as haul route could pass by sensitive land uses, and traffic may divert to roadways with sensitive land uses due to construction activity.

Proposed pipeline alignments would be constructed in roadways that provide emergency vehicle access. For example, there is a fire station located on Broadway (in Sonoma), a police station on First Street West (north of Napa Street in Sonoma); Sonoma Valley Hospital is two blocks west of Broadway (south of Napa Street); San Rafael Fire Department on San Pedro Road and Civic Center Drive; and the Napa County Fire Department.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative; therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.7-1, No Action).

Under future baseline (2020) conditions, roadways in the affected service areas would be subject to the traffic impacts. However implementation of **Mitigation Measures 3.7.2a** and **3.7.2b**, which include construction scheduling techniques and coordination with local school districts, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD and Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD and SVCSD

The traffic impacts associated with the proposed facilities under No Action Alternative would similar to those discussed above for Impact 3.7.1.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects

would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The traffic impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 1: Basic System (Program)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The traffic impacts to proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The traffic impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The traffic impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

As described in the Setting for each service area, proposed pipeline alignments would be constructed in roadways that provide access to public schools, including Olive Elementary School (Novato Unified School District); Sonoma High School and Creekside Continuation High School (Sonoma Valley Unified School District); and Mount George Elementary School, Silverado Middle School, and Wintun School (Napa Valley Unified School District).

Implementation of **Mitigation Measures 3.7.2a** and **3.7.2b** would require the appropriate Member Agency for each project component to coordinate with the appropriate local school district regarding construction schedule in the vicinity of schools and school access routes during construction. Implementation of **Mitigation Measure 3.7.1b** would require the construction contractor to establish methods for maintaining traffic flow in and along the project corridor and minimizing disruption to emergency vehicle access to land uses along the alignment. Specific requirements that may be included in the traffic control/traffic management plan regarding emergency access and access to public schools are identified under **Mitigation Measure 3.7.1b**. Implementation of **Mitigation Measures 3.7.2a, 3.7.2b,** and **3.7.1b** would ensure that potential impacts associated with temporary effects on emergency access and access to public schools would be mitigated to a less-than-significant level.

Mitigation Measures

Mitigation Measure 3.7.2a: Pipeline construction near schools shall occur when school is not in session (i.e., summer or holiday breaks). If this is not feasible, a minimum of two months prior to project construction, the appropriate Member Agency for each project component shall coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods.

Mitigation Measure 3.7.2b: A minimum of two months prior to project construction, the appropriate Member Agency for each project component shall coordinate with the appropriate local school district to identify alternatives to their Safe Routes to School program, alternatives for the school busing routes and stop locations, and other circulation provisions, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.7.1a**).

Mitigation Measure 3.7.2c: Implement **Mitigation Measure 3.7.1b.**

Impact Significance after Mitigation: Less than Significant.

Impact 3.7.3: Temporary Disruption to Access. Project construction activity would have temporary effects on alternative transportation or alternative transportation facilities. (Less than Significant with Mitigation)

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative; therefore no impacts would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.7-1, No Action).

Under future baseline (2020) conditions, traffic conditions within the region would be exacerbated by increased development anticipated under the local city and county general plans. Roadways in the affected service areas would be subject to the traffic impacts. However implementation of **Mitigation Measure 3.7.1e**, which includes encouraging construction crews to park at staging areas to limit lanes closures, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD and Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD and SVCSD

The traffic impacts associated with the proposed facilities under No Action Alternative would similar to those discussed above.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The temporary disruption to access as a result of implementation of the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action

Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 1: Basic System (Program)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The temporary disruption to access as a result of implementation of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary disruption to access as a result of implementation of the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary disruption to access under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

The NBWRP would have no long-term impact on demand for alternative transportation or on alternative transportation facilities (i.e., for transit and bicyclists). However, pipeline construction could disrupt access to bus stops and slow bus movements for bus routes provided by the transit

service providers in the affected areas (i.e., Golden Gate Bridge, Highway and Transportation Transit, Sonoma County Transit, and Napa VINE); see *Public Transit* discussion in the Setting above.

Implementation of **Mitigation Measure 3.7.1f** would require the construction contractor to establish methods for minimizing construction effects on transit service. Specific requirements that may be included in the traffic control/traffic management plan are identified under **Mitigation Measure 3.7.1f**. Implementation of **Mitigation Measure 3.7.1f** would ensure potential impacts associated with temporary disruptions to transit service would be mitigated to a less than significant level.

Mitigation Measures

Mitigation Measure 3.7.3: Implement **Mitigation Measure 3.7.1f**.

Impact Significance after Mitigation: Less than Significant.

Impact 3.7.4: Temporary Displacement of Parking. Project construction activity would temporarily create parking demand for construction workers and construction vehicles, and displace parking spaces. (Less than Significant with Mitigation)

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative; therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.7-1, No Action**).

Under future baseline (2020) conditions, traffic conditions within the region would be exacerbated by increased development anticipated under the local city and county general plans. Roadways in the affected service areas would be subject to the traffic impacts. However implementation of **Mitigation Measure 3.7.1e**, which includes encouraging construction crews to park at staging areas to limit lanes closures, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD and Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD and SVCSD

The traffic impacts associated with the proposed facilities under No Action Alternative would similar to those discussed above.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The temporary disruption to access as a result of implementation of the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 1: Basic System (Program)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The temporary disruption to access as a result of implementation of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary disruption to access as a result of implementation of the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary disruption to access under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The NBWRP would create limited new, temporary parking demand for construction workers and construction vehicles as the crew moves along the construction alignment. The NBWRP would not generate a substantial number of construction workers along the alignment at any one location; therefore, the number of parking spaces required would not be substantial. Parking is not allowed on most roadways in the action areas, and construction along those alignments would not displace on-street parking. However, parking along some roads (e.g., Olive Avenue from Redwood Boulevard to Rose Court; Redwood Boulevard; Rowland Boulevard; Broadway; Arnold Drive) would be temporarily displaced during construction.

Although some construction workers would park at a pump station or staging area, some would park near that day's construction site and would require a lengthened construction zone to accommodate parking needs. Nonetheless, given the proposed rate of pipeline construction, impacts would be relatively brief at any one location along the alignment. Construction workers for the upgrades at the pump station would park on-site.

Implementation of **Mitigation Measure 3.7.1e** would require the construction contractor to encourage construction crews to park at pump stations to limit lane closures in the public right-of-way, thus minimizing construction effects from parking. Implementation of **Mitigation Measure 3.7.1e** would ensure potential impacts associated with the temporary loss of roadway width because of parking in the roadway right-of-way would be mitigated to a less than significant level.

Mitigation Measures

Mitigation Measure 3.7.4: Implement **Mitigation Measure 3.7.1e.**

Impact Significance after Mitigation: Less than Significant.

Impact 3.7.5: Temporary Potential Traffic Hazards. Project construction activity would temporarily increase the potential for accidents on project roadways. (Less than Significant with Mitigation)

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative; therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.7-1, No Action).

Under future baseline (2020) conditions, traffic conditions within the region would be exacerbated by increased development anticipated under the local city and county general plans. Roadways in the affected service areas would be subject to the traffic impacts. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD and Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD and SVCSD

The traffic impacts associated with the proposed facilities under No Action Alternative would similar to those discussed above.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The temporary disruption to access as a result of implementation of the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 1: Basic System (Program)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The temporary traffic hazards as a result of construction of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary traffic hazards as a result of construction of the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary traffic hazards under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The NBWRP would not change the long-term configuration (alignment) of area roadways, and would not introduce types of vehicles that are not already traveling on area roads. However, construction zones in the public right-of-way and heavy equipment operating adjacent to or within a road right-of-way would increase the potential for accidents. Construction-generated trucks on action area roadways would interact with other vehicles. Potential conflicts also

could occur between construction traffic and alternative modes of transportation (e.g., bicyclists and buses).

Implementation of **Mitigation Measure 3.7.1b** requires the contractor to prepare a traffic control/traffic management plan in accordance with professional engineering standards prior to construction, including compliance with roadside safety protocols, so as to reduce the risk of accidents. Specific requirements that may be included in the traffic management plan are identified under **Mitigation Measures 3.7.1b** through **3.7.1f**. Thus, implementation of **Mitigation Measures 3.7.1b** through **3.7.1f** would ensure temporary increases in the potential for accidents would be mitigated to a less than significant level.

Mitigation Measures

Mitigation Measure 3.7.5: Implement **Mitigation Measure 3.7.1b** through **3.7.1f.**

Impact Significance after Mitigation: Less than Significant.

Impact 3.7.6: Road Wear. Project construction activity would increase wear and tear on the designated haul routes used by construction vehicles to access the project work sites. (Less than Significant with Mitigation)

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative; therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.7-1, No Action).

Under future baseline (2020) conditions, traffic conditions within the region would be exacerbated by increased development anticipated under the local city and county general plans. Roadways in the affected service areas would be subject to the traffic impacts. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD and Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/NMWD and SVCSD

The traffic impacts associated with the proposed facilities under No Action Alternative would similar to those discussed above.

Phase 1

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The increased road wear as a result of implementation of the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 1: Basic System (Program)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The increased road wear as a result of construction of the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The increased road wear as a result of construction of the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The increased road wear under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD, Napa SD

The use of big trucks to transport equipment and material to and from the project work site(s) for the NBWRP could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The NBWRP impacts are expected to be negligible on those roads. Residential streets are generally not built with a pavement thickness that would withstand substantial truck traffic volumes.

Implementation of **Mitigation Measure 3.7.6**, which requires the appropriate sanitary district for each project component to enter into an agreement prior to construction that would detail pre- and post-construction conditions on project haul routes and pipeline segments and repair damaged roads, would reduce impacts to less than significant.

Mitigation Measures

Mitigation Measure 3.7.6: Roads damaged by construction shall be repaired to a structural condition equal to that which existed prior to construction activity as per conditions of the encroachment permit (see **Mitigation Measure 3.7.1a**).

Impact Significance after Mitigation: Less than Significant.

Alternative 1: Basic System, Alternative 2: Partially Connected System, Alternative 3: Fully Connected System (Program level)

The impacts associated with the Basic, Partially Connected, and Fully Connected Systems would be equivalent to the impacts discussed for Phase 1 above in addition to the impacts associated with the additional components as shown in **Table 3.7-1**.

TABLE 3.7-1
PROJECT COMPONENTS AND RELATED TRAFFIC IMPACTS

	LGVSD	Novato SD	SVCSD	Napa SD
Alternative 1: Basic System		Novato Urban Recycled Water Pipeline	SVRWP Pipeline and Napa Salt Marsh Restoration Pipeline	Incremental upgrade to the Napa SD WWTP, Carneros East Pipeline and Napa Salt Marsh Restoration Pipeline
Alternative 2: Partially Connected System	Peacock Gap Golf Course Pipeline; upgrade to the existing MMWD recycled water distribution system and rehabilitation of the existing water reservoir near the Peacock Gap Golf Course	more-extensive Novato Urban Recycled Water Pipeline and the Sears Point Area Pipeline	rehabilitation of two drinking water reservoirs; construction of the Southern Sonoma Valley Pipeline	Napa SD MST Pipeline; extension of Carneros East Pipeline, new storage reservoir, and upgrade to the existing WWTP
Alternative 3: Fully Connected System		Extended pipeline to Sears Point area	Central Sonoma Pipeline	

SOURCE: ESA, 2008

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The impacts 3.7.1 through 3.7.6, discussed above under Phase 1 would occur during construction of the additional components shown in Table 3.7-1. The impacts under the Basic, Partially Connected, and Fully Connected System would be incrementally greater as additional components are constructed over those under the No Action Alternative. As discussed above, the impacts would be less than significant with mitigation, except on roadways that would need to be closed to traffic (because the road would not have enough pavement width to accommodate at least alternate one-way traffic flow past the construction zone, and for which no detour routing is available). This could cause significant impacts, which would be mitigated to less-than-significant levels. Impact determination for project components under the Basic, Partially Connected, and Fully Connected System would require project-level analyses when specific pipeline alignments are defined.

3.7.4 Impact Summary by Service Area

Table 3.7-2 provides a summary of potential traffic and transportation impacts associated with implementation of the NBWRP.

TABLE 3.7-2
POTENTIAL IMPACTS AND SIGNIFICANCE – TRAFFIC AND TRANSPORTATION

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.7.1: Project construction activities could adversely affect traffic and transportation conditions in the action area.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.7.2: Project construction activities would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers).				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.7.3: Project construction activities would have temporary effects on alternative transportation or alternative transportation facilities.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.7.4: Project construction activities would temporarily create parking demand for construction workers and construction vehicles, and displace parking spaces.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.7.5: Project construction activities would temporarily increase the potential for accidents on roadways.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM

TABLE 3.7-2 (Continued)
POTENTIAL IMPACTS AND SIGNIFICANCE – TRAFFIC AND TRANSPORTATION

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD	Novato SD	SVCSD	Napa SD/ Napa County
Impact 3.7.5: Project construction activities would temporarily increase the potential for accidents on roadways. (cont.)				
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.7.6: Project construction activities would increase wear-and-tear on the designated haul routes used by construction vehicles to access the project work sites.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1: Basic System	LSM	LSM	LSM	LSM
Alternative 2: Partially Connected System	LSM	LSM	LSM	LSM
Alternative 3: Fully Connected System	LSM	LSM	LSM	LSM

NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

3.7.5 References

California Department of Transportation (Caltrans), *California Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*, September 2006.

California Department of Transportation (Caltrans), *Construction Manual*, last revised September 2007.

California Department of Transportation (Caltrans), *2007 Traffic Volumes on California State Highways*, 2008.

California Joint Utility Traffic Control Committee (CJUTCC), 2006. *Work Area Protection and Traffic Control Manual*, 4th Edition, April 2006.

City of Napa, *City of Napa General Plan (Envision Napa 2020)*, adopted December 1998, revised as of January 1, 2007.

City of Napa *City of Napa Municipal Code*, Chapter 12.12: Encroachments, 2008.

City of Novato, Community Development Department, *City of Novato General Plan*, adopted 8 March 1996, revised 25 March 2003 by Resolution No. 33-03.

City of Novato, *Novato Municipal Code*, Chapter XV: Encroachments, as of June 2008.

City of Sonoma, *City of Sonoma 2020 General Plan*, adopted October 2006.

City of Sonoma, *Sonoma Municipal Code*, 2008.

Golden Gate Bridge, Highway and Transportation District (GGBHTD), Golden Gate Bus & Ferry Transit Guide (March-June 2009), 2009.

Marin County, Community Development Agency, *Marin Countywide Plan 2020*, adopted November 6, 2007.

Napa County, Department of Conservation, Development & Planning, *Napa County General Plan*, adopted June 4, 2008.

Napa County Transportation & Planning Agency, VINE Bus Route Information, effective September 10, 2007.

Sonoma County, Permit and Resource Management Department, *Sonoma County General Plan 2020*, adopted September 23, 2008.

Sonoma County Transportation Authority (SCTA), Sonoma County Transit Route Information, effective November 2008 (2008a).

Sonoma County Transportation Authority (SCTA), *Draft Comprehensive Transportation Plan*, 2008 (2008b).

3.8 Air Quality

This section presents the current air quality conditions in the North Bay Water Recycling Program (NBWRP) area, the applicable regulatory framework, and the potential impacts on ambient air quality from project construction and operation. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.8.1 Affected Environment/Setting

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Other important factors are meteorological and topographical conditions. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The action area is located in the counties of Napa, Sonoma, and Marin and is within the boundaries of the San Francisco Bay Area Air Basin (Air Basin), which encompasses the nine-county regions including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. Within the Air Basin, 11 subregions have been defined based on their unique climatology and topography. The action area spans three of these subregions: the Marin County Basin; the Napa Valley; and the Sonoma Valley (BAAQMD, 1999).

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of criteria pollutants. Existing levels of air quality in the action area can generally be inferred from ambient air quality measurements conducted by BAAQMD stations in the area. The monitoring stations record concentrations of various pollutants including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM10), and particulate matter less than 2.5 microns in diameter (PM2.5). Ozone and particulate matter concentrations are of most concern because concentrations of these pollutants periodically exceed regulatory standards in the Air Basin.

Climate, topography, and air quality conditions characteristic of the each of the Member Agencies included in the proposed action are discussed in more detail below.

LGVSD and Novato SD

The LGVSD and Novato SD service areas are located in the Marin County Basin subregion of the Air Basin. The climate varies throughout this subregion depending on proximity to the Pacific Ocean and San Pablo and San Francisco bays (referred collectively here as the Bay). It is mainly characterized by warm dry summers and cool moist winters. San Francisco Bay and the Pacific

Ocean have a moderating influence on the climate, especially near the coast. There is a high percentage of sunshine away from the coast, particularly in summer. Movements of marine air, which in large part determine the temperature, humidity, wind, and precipitation throughout the year, depend upon the location and strength of the dominant Pacific high-pressure system and the coastal temperature gradient. Coastal temperatures are usually in the low 60's in the summer and the high 50's in the winter, while the inland areas average maximum summer temperatures in the low 80's and average minimum winter temperatures in the low 40's (BAAQMD, 1999).

Air pollution potential is highest on the eastern side of Marin County, which has semi-sheltered valleys and largest population centers. Currently, most of the development lies along the Bay, particularly in southern Marin County. In the south, the developed areas lie closer to the ocean, therefore the influence of the marine air keeps the pollution levels low. As the developed areas extend further north where the valleys are more sheltered from the sea breeze, the potential for pollution increases (BAAQMD, 1999).

The BAAQMD air quality monitoring station closest to and most representative of air quality conditions in the LGVSD and Novato SD service areas is located in the city of San Rafael, which is located between 5 and 15 miles southeast of the service areas. The San Rafael station monitors O_3 and PM10. **Table 3.8-1** provides most recent air pollutant concentrations and applicable state and federal ambient air quality standards.

TABLE 3.8-1
AIR POLLUTANT SUMMARY FOR LGVSD AND NOVATO SD SERVICE AREAS[a]

Pollutant	Standard[b]	2003	2004	2005	2006	2007
Ozone (O_3)						
Highest 1-hr average, ppm		0.09	0.09	0.08	0.09	0.07
Number of State standard exceedance	0.09	0	0	0	0	0
Highest 8-hr average, ppm		0.07	0.06	0.06	0.06	0.06
Number of State standard exceedance	0.07	0	0	0	0	0
Number of federal standard exceedance	0.075	0	0	0	0	0
Particulate Matter-10 Micron (PM10)[c]						
Highest 24-hr average, $\mu g/m^3$		41	52	39	68	56
Number of State standard exceedance[d]	50	0	6	0	6	6
Number of federal standard exceedance[d]	150	0	0	0	0	0
State Annual Geometric Mean, $\mu g/m^3$	20	18	18	17	18	18
Exceedance?		No	No	No	No	No

NOTE: Underlined values indicate an excess of applicable standard.
ppm – parts per million.
$\mu g/m^3$ – micrograms per cubic meter.

[a] Data are from 4th Street Monitoring Station in San Rafael, California.
[b] State standards are not to be exceeded. Federal 1-hour ozone standard revoked in June 2005.
[c] Measured every six days.
[d] Represents estimated number of days that concentrations would have been greater than the level standard if each day had been monitored.

SOURCE: CARB, 2008a.

Sensitive receptors in the vicinity of proposed facilities within the LGVSD and Novato SD include various single- and multi-family residences, Our Lady of Loretto School, Novato High School, Creekside Village School, Noah's Arc Pre-School, Hamilton School, the Novato Charter School, and Novato Community Hospital.

SVCSD

The SVCSD service area is located in the Sonoma Valley subregion of the Air Basin. In Sonoma Valley, the strongest up-valley winds occur in the afternoon during the summer and the strongest down-valley winds occur during clear, calm winter nights. Prevailing winds follow the axis of the valley, northwest/southeast, while some upslope flow during the day and down-slope flow during the night occurs near the base of the mountains. Summer average maximum temperatures measured in degrees Fahrenheit are usually in the high 80's, and summer minimums are around 50. Winter maximums are in the high 50's to the mid 60's, with minimums ranging from the mid 30s to low 40s (BAAQMD, 1999).

The BAAQMD air quality monitoring station on 5th Street in Santa Rosa, located approximately 30 miles northwest of the SVCSD WWTP is closest to and most representative of air quality conditions in the area. The station monitors O_3 and PM10. The most recent data available from this monitoring station are shown in **Table 3.8-2** provides most recent air pollutant concentrations and applicable state and federal air quality standards.

TABLE 3.8-2
AIR POLLUTANT SUMMARY FOR THE SVCSD SERVICE AREA[a]

Pollutant	Standard[b]	2003	2004	2005	2006	2007
Ozone (O_3)						
Highest 1-hr average, ppm		0.10	0.08	0.07	0.08	0.07
Number of State standard exceedance	0.09	1	0	0	0	0
Highest 8-hr average, ppm		0.08	0.06	0.05	0.06	0.06
Number of State standard exceedance	0.07	1	0	0	0	0
Number of federal standard exceedance	0.075	0	0	0	0	0
Particulate Matter-10 Micron (PM10)[c]						
Highest 24-hr average, $\mu g/m^3$		36	48	39	90	37
Number of State standard exceedance[d]	50	0	0	0	12	0
Number of federal standard exceedance	150	0	0	0	0	0
State Annual Geometric Mean, $\mu g/m^3$		17	18	16	19	17
Exceedance?	20	No	No	No	No	No

NOTE: Underlined values indicate an excess of applicable standard.
ppm – parts per million.
$\mu g/m^3$ – micrograms per cubic meter.

[a] Data are from 5th Street Monitoring Station in Santa Rosa, California.
[b] State standards are not to be exceeded. Federal 1-hour ozone standard revoked in June 2005.
[c] Measured every six days.
[d] Represents estimated number of days that concentrations would have been greater than the level standard if each day had been monitored.

SOURCE: CARB, 2008a.

Sensitive receptors in the vicinity of the SVCSD WWTP and proposed facilities include various single- and multi-family residences, Altamira Middle School, Sonoma Valley High School, Hanna Boys Center, Sonoma Seventh Day Adventist School, Prestwood Elementary School, and Sonoma Valley Hospital.

Napa SD

The Napa SD service area is located within the Napa Valley subregion of the Air Basin. Up-valley winds frequently develop during warm summer afternoons drawing from the air flowing through San Pablo Bay. Down-valley winds develop during evenings in the winter. The average maximum temperatures in summer are in the low 80's at the southern end of the valley and in the low 90's at the northern end with minimum temperatures in the low 50's. The average maximum temperatures in winter are in the high 50's with minimum temperatures in the high to mid 30's. Winter extreme low temperatures range from the high 20's to the mid 20's (BAAQMD, 1999).

The potential for air pollution in the valley is high. Summer and fall prevailing winds can transport non-local and locally generated ozone precursors northward where the valley narrows, effectively trapping and concentrating the pollutants under stable conditions. The local upslope and down-slope flows setup by the surrounding mountains may also re-circulate pollutants adding to the total burden. Also, the high frequency of light winds and associated stable conditions during the late fall and winter, contribute to the buildup of particulates and CO from automobiles, agricultural burning, and fireplace burning (BAAQMD, 1999).

The BAAQMD air quality monitoring station on Jefferson Avenue in Napa, located within two miles of the Napa SD service area is closest to and most representative of air quality conditions the area. The station monitors O_3 and PM10. **Table 3.8-3** presents the most recent data available from this monitoring station and compares the pollutants to applicable state and federal air quality standards.

Sensitive receptors in the vicinity of the Napa SD WWTP and proposed facilities include various single- and multi-family residences, the Napa County Children's Center, the Napa County Community School, the Napa County Special Education School, the Chamberlain School, the Napa Infant Preschool Program, Mount George Elementary School, and the Napa State Hospital.

3.8.2 Regulatory Framework

Air Pollutants of Concern

Criteria Air Pollutants

Regulation of air pollution is achieved through both national and State ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the United States Environmental Protection Agency (USEPA) has identified criteria pollutants and has established national ambient air quality standards (NAAQS) to protect public health and welfare. The NAAQS are defined as the maximum acceptable concentration

TABLE 3.8-3
AIR POLLUTANT SUMMARY FOR THE NAPA SD SERVICE AREA[a]

Pollutant	Standard[b]	2003	2004	2005	2006	2007
Ozone (O_3)						
Highest 1-hr average, ppm		0.11	0.09	0.09	0.10	0.07
Number of State standard exceedance	0.09	2	0	0	1	0
Highest 8-hr average, ppm		0.08	0.07	0.07	0.07	0.06
Number of State standard exceedance	0.07	3	3	0	2	0
Number of federal standard exceedance	0.075	0	0	0	0	0
Particulate Matter-10 Micron (PM10)[c]						
Highest 24-hr average, $\mu g/m^3$		31	*	14	*	*
Number of State standard exceedance[d]	50	*	*	*	*	*
Number of federal standard exceedance	150	*	*	*	*	*

NOTE: Underlined values indicate an excess of applicable standard.
ppm – parts per million.
$\mu g/m^3$ – micrograms per cubic meter.
* – there was insufficient (or no) data available to determine the value.

[a] Data are from the Jefferson Avenue Monitoring Station in Napa, California.
[b] State standards are not to be exceeded. Federal 1-hour ozone standard revoked in June 2005.
[c] Measured every six days.
[d] Represents estimated number of days that concentrations would have been greater than the level standard if each day had been monitored.

SOURCE: CARB, 2008a.

that may be reached, but not exceeded more than once per year. The USEPA has established the NAAQS for O_3, CO, NO_2, SO_2, particulate matter (i.e., PM10, PM2.5), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

To protect human health and the environment, the USEPA has set "primary" and "secondary" maximum ambient thresholds for all criteria pollutants. Primary thresholds are set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards are set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

California has adopted more stringent ambient air quality standards (i.e., California Ambient Air Quality Standards [CAAQS]) for most of the criteria air pollutants. **Table 3.8-4** presents the national and state ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established state ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, air emissions of these pollutants are not expected to occur under NBWRP therefore are not discussed further in the section.

TABLE 3.8-4
AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUATANTS

Pollutant	Averaging Time	State Standard	National Standard	Health Effects	Pollutant Characteristics and Major Sources
Ozone	1 Hour 8 Hour	0.090 ppm 0.070 ppm	– 0.075 ppm	Short term exposures to high concentrations can irritate eyes and lungs. Long-term exposure may cause permanent damage to lung tissue.	Ozone is a secondary pollutant that is formed in the atmosphere through reactions between reactive organic gases (ROGs) and nitrogen oxides (NOx) in the presence of sunlight. Major sources of ROGs and NOx include combustion processes (including motor vehicle engines) and evaporative solvents, paints and fuels.
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen. Exposure to high CO concentrations can cause headaches, dizziness, fatigue, unconsciousness, and even death.	CO is an odorless, colorless gas that is formed by incomplete combustion of fuels. The primarily source of CO is the internal combustion engine, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide (NO_2)	1 Hour Annual	0.18 ppm 0.030 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract.	NO_2 is a reddish brown gas that is a by-product of combustion. Motor vehicles and industrial operations are the main sources of NO_2.
Sulfur Dioxide (SO_2)	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	SO_2 is a colorless acid gas with a strong odor. Fuel combustion, chemical plants, sulfur recovery plants, and metal processing are the main sources of this pollutant.
Respirable Particulate Matter (PM_{10})	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 50 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Solid or liquid particles in the atmosphere. Sources include dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 Hour Annual	– 12 µg/m^3	35 µg/m^3 15.0 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Solid or liquid particles in the atmosphere. Major sources include fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. PM2.5 may also be formed from photochemical reactions of other pollutants, including NOx, SO_2, and organics.
Lead	Monthly Quarterly	1.5 µg/m^3 –	– 1.5 µg/m^3	Disturbs the nervous system, kidney function, immune system, reproductive and developmental systems and the cardio vascular system.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

ppm = parts per million
µg/m^3 = micrograms per cubic meter

SOURCE: BAAQMD, 1999; CARB, 2008b; and USEPA, 2008.

Greenhouse Gas Emissions and Climate Change

Some gases in the atmosphere affect the earth's heat balance by absorbing infrared radiation. These gases can prevent the escape of heat in much the same way as glass in a greenhouse. This is often referred to as the "greenhouse effect," and it is responsible for maintaining a habitable climate. On earth, the gases believed to be most responsible for global warming are water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6). Enhancement of the greenhouse effect can occur when concentrations of these gases exceed the natural concentrations in the atmosphere. Of these gases, CO_2 and methane are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane primarily results from off-gassing associated with agricultural practices and landfills. SF_6 is a greenhouse gas (GHG) commonly used in the utility industry as an insulating gas in transformers and other electronic equipment. SF_6, while comprising a small fraction of the total GHGs emitted annually world-wide, is a very potent GHG with 23,900 times the global warming potential as CO_2.[1] There is widespread international scientific agreement that human-caused increases in GHGs has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Some of the potential resulting effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, larger forest fires, and more drought years (CARB, 2008c). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but according to a report published by the Intergovernmental Panel on Climate Change (IPCC), effects are expected to include the following (IPCC, 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

In addition, there are several secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be high.

[1] Global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. CO_2 is assigned a global warming potential of 1.

Federal

Clean Air Act

The federal Clean Air Act (CAA) is a comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the USEPA to establish NAAQS to protect public health and the environment. The CAA specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas that do not meet the standards. The SIPs must include pollution control measures that demonstrate how the standards would be met.

Federal Conformity Requirements

Federal projects are subject to either the Transportation Conformity Rule (40 Code of Federal Regulations [CFR], Part 51, Subpart T), which applies to federal highway and transit projects, or the General Conformity Rule (40 CFR, Part 51, Subpart W), which applies to all other federal projects. Because the proposed action is not a federal highway or transit project, it is subject to the General Conformity Rule.

The purpose of the General Conformity Rule is to ensure that federal projects conform to applicable SIPs so that they do not interfere with strategies employed to attain the NAAQS. The rule applies to federal projects in nonattainment areas for any of the criteria pollutants for which the USEPA has established these national standards and in areas designated as “maintenance” areas. The rule covers direct and indirect emissions of criteria pollutants or their precursors that result from a federal project, that are reasonably foreseeable, and that can be practicably controlled by the federal agency through its continuing program responsibility. The rule applies to all federal projects, including project approvals and funding, except:

- Projects specifically included in a transportation plan or program that is found to conform under the federal transportation conformity rule;
- Projects with associated emissions below specified “de minimis” threshold levels (i.e., levels beyond which an air quality effect is considered significant); or
- Certain other projects that are exempt or presumed to conform.

Sources that are exempt include those that require a permit under the New Source Review or Prevention of Significant Deterioration program. Projects presumed to conform are those that are presumed to result in insignificant quantities of emissions, including routine maintenance and repair, routine operations, and prescribed burning. The proposed action does not fall under the exempt categories and would be subject to the General Conformity Rule.

Class 1 Areas

The federal CAA of 1977 set a long-term goal of improving visibility by 2064 to achieve natural conditions in selected national parks and wilderness areas of the United States, known as Class 1 Areas. California has 29 mandatory Class 1 Areas managed by either the National Parks Service

or the U.S. Forest Service. The closest Class I Area is the Point Reyes Wilderness Area, located along the Marin County coast, at a distance of approximately 10 miles from the action area.

In 1999, the USEPA promulgated a regional haze regulation that calls for states to establish goals and emission reduction strategies to make initial improvements in visibility at their respective Class 1 Areas. The CARB is preparing a Regional Haze Plan for California demonstrating reasonable progress in reducing haze by 2018, the first benchmark year on the path to natural visibility by 2064.

The USEPA funded five Regional Planning Organizations throughout the country to coordinate regional haze rule-related activities between states in each region. California belongs to the Western Regional Air Partnership (WRAP), the consensus organization of western states, tribes, and federal agencies, which oversees analyses of monitoring data and preparation of technical reports regarding regional haze in the western United States.

State

The California Air Resources Board (CARB) is responsible for establishing and reviewing the State standards, compiling the California SIP and securing approval of the plan from the USEPA, conducting research and planning, and identifying toxic air contaminants. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. County or regional air quality management districts, such as the BAAQMD, are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal CAA and the California CAA.

Assembly Bill 32 – California Global Warming Solutions Act

In 2005, Executive Order S-3-05 was established, which set forth a series of target dates (listed below) by which statewide emissions of GHG would be progressively reduced:

- By 2010, reduce emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), which requires CARB to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing an approximate 30 percent reduction in emissions from "business as usual").

In June 2007, CARB directed staff to pursue 37 early actions for reducing GHG emissions under AB 32. The broad spectrum of strategies to be developed, including a Low Carbon Fuel Standard, regulations for refrigerants with high global warming potentials, guidance and protocols for local

governments to facilitate GHG reductions, and green ports, reflects that the serious threat of climate change requires action as soon as possible (CARB, 2007a).

The CARB staff evaluated all the recommendations submitted on the GHG reduction strategies and published the *Expanded List of Early Action Measures To Reduce Greenhouse Gas Emissions In California* (CARB, 2007a). Based on its additional analysis, CARB staff is recommending the expansion of the early action list to a total of 44 measures. Nine of the strategies meet the AB 32 definition of discrete early action measures. Discrete early action measures are measures that will be in place and enforceable by January 1, 2010. The discrete early action items include: low carbon fuel standards for ethanol, biodiesel, hydrogen, electricity, compressed natural gas, liquefied petroleum gas and biogas; restrictions on high global warming potential refrigerants; landfill methane capture, smartway truck efficiency; (5) port electrification; reduction of perfluorocarbons from the semiconductor industry; reduction of propellants in consumer products; a tire inflation program; and SF_6 reductions from non-electricity sector. The entire list of early action strategies is shown in **Table 3.8-5**.

The 2020 target reductions are currently estimated to be 174 million metric tons of CO_2 equivalent (CO_2e). In total, the 44 recommended early actions have the potential to reduce GHG emissions by at least 42 million metric tons of CO_2e emissions by 2020, representing about 25 percent of the estimated reductions needed by 2020. CARB staff has developed 1990 and 2020 GHG emission inventories in order to refine the projected reductions needed by 2020. The 44 measures are in the sectors of fuels, transportation, forestry, agriculture, education, energy efficiency, commercial, solid waste, cement, oil and gas, electricity, and fire suppression.

State Office of Planning and Research

Senate Bill (SB) 97 “2007 Statutes, Ch. 185” acknowledges that local agencies must analyze the environmental impact of GHG under the California Environmental Quality Act (CEQA). Furthermore, the bill requires the State Office of Planning and Research (OPR) to develop CEQA guidelines for analyzing and mitigating GHG emissions. To comply with requirements set forth in SB 97, OPR published a technical advisory titled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*. This advisory acknowledges the need for a threshold for GHG emissions and notes that OPR has asked CARB to recommend a method for setting thresholds to encourage consistency and uniformity in GHG analyses in CEQA documents throughout the State (OPR, 2008).

In response to OPR’s request, CARB has recommended that industrial projects that meet interim CARB performance standards for construction and transportation emissions, and emit no more than 7,000 metric tons of CO_2e per year from non-transportation related GHG sources, should be presumed to have a less than significant impact related to climate change. Non-transportation sources include combustion related components/equipment, process losses, purchased electricity, and water usage and wastewater discharge (CARB, 2008f).

TABLE 3.8-5
RECOMMENDED AB32 GREENHOUSE GAS MEASURES TO BE INITIATED BY CARB BETWEEN 2007 AND 2012

ID #	Sector	Strategy Name	ID #	Sector	Strategy Name
1	Fuels	Above Ground Storage Tanks	23	Commercial	SF_6 reductions from the non-electric sector
2	Transportation	Diesel – Off-road equipment (non-agricultural)	24	Transportation	Tire inflation program
3	Forestry	Forestry protocol endorsement	25	Transportation	Cool automobile paints
4	Transportation	Diesel – Port trucks	26	Cement	Cement (A): Blended cements
5	Transportation	Diesel – Vessel main engine fuel specifications	27	Cement	Cement (B): Energy efficiency of California cement facilities
6	Transportation	Diesel – Commercial harbor craft	28	Transportation	Ban on HFC release from Motor Vehicle AC service / dismantling
7	Transportation	Green ports	29	Transportation	Diesel – off-road equipment (agricultural)
8	Agriculture	Manure management (methane digester protocol)	30	Transportation	Add AC leak tightness test and repair to Smog Check
9	Education	Local gov. Greenhouse Gas (GHG) reduction guidance / protocols	31	Agriculture	Research on GHG reductions from nitrogen land applications
10	Education	Business GHG reduction guidance / protocols	32	Commercial	Specifications for commercial refrigeration
11	Energy Efficiency	Cool communities program	33	Oil and Gas	Reduction in venting / leaks from oil and gas systems
12	Commercial	Reduce high Global Warming Potential (GWP) GHGs in products	34	Transportation	Requirement of low-GWP GHGs for new Motor Vehicle ACs
13	Commercial	Reduction of perfluorocarbons (PFCs) from semiconductor industry	35	Transportation	Hybridization of medium and heavy-duty diesel vehicles
14	Transportation	SmartWay truck efficiency	36	Electricity	Reduction of SF_6 in electricity generation
15	Transportation	Low Carbon Fuel Standard (LCFS)	37	Commercial	High GWP refrigerant tracking, reporting and recovery program
16	Transportation	Reduction of HFC-134a from DIY Motor Vehicle AC servicing	38	Commercial	Foam recovery / destruction program
17	Waste	Improved landfill gas capture	39	Fire Suppression	Alternative suppressants in fire protection systems
18	Fuels	Gasoline disperser hose replacement	40	Transportation	Strengthen light-duty vehicle standards
19	Fuels	Portable outboard marine tanks	41	Transportation	Truck stop electrification with incentives for truckers
20	Transportation	Standards for off-cycle driving conditions	42	Transportation	Diesel – Vessel speed reductions
21	Transportation	Diesel – Privately owned on-road trucks	43	Transportation	Transportation refrigeration – electric standby
22	Transportation	Anti-idling enforcement	44	Agriculture	Electrification of stationary agricultural engines

SOURCE: CARB, 2007a.

Local

Bay Area Air Quality Management District (BAAQMD)

BAAQMD is the regional agency with jurisdiction over the nine-county region located in the Air Basin. The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

The BAAQMD is responsible for bringing and/or maintaining air quality in the Air Basin within federal and State air quality standards. Specifically, the BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Basin and to develop and implement strategies to attain the applicable federal and State standards.

In December 1999, the BAAQMD adopted its *CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The *BAAQMD CEQA Guidelines* is an advisory document and local jurisdictions are not required to utilize the methodology outlined therein. The document describes the criteria that the BAAQMD uses when reviewing and commenting on the adequacy of environmental documents. The document recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts.

The BAAQMD is classified as non-attainment for State PM10 and PM2.5 standards as well as State 1- and 8-hour ozone standards. With respect to federal standards, the BAAQMD is classified as marginal non-attainment for the 8-hour ozone standard. For all other federal and State criteria air pollutant standards, the BAAQMD is classified as either unclassified or as attainment. As discussed previously, the federal CAA and the California CAA require SIPs to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the State PM10 standard). The BAAQMD is currently preparing the *2009 Bay Area Clean Air Plan*, which will replace the existing *Bay Area 2005 Ozone Strategy*. This plan will include ozone control measures and will also consider the impacts of these control measures on particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan (BAAQMD, 2008). Until the new plan is published, the *Bay Area 2005 Ozone Strategy* is the applicable air quality plan for the action area.

The *2005 Bay Area Ozone Strategy* explains how the Air Basin will achieve compliance with the State one-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The Strategy also discusses related air quality issues of interest including the public involvement process, climate change, fine particulate matter, the BAAQMD's Community Air Risk Evaluation program, local

benefits of ozone control measures, the environmental review process, national ozone standards, and photochemical modeling (BAAQMD, 2006).

Local General Plans

The policies and regulations associated with impacts to air quality within the affected jurisdictions are presented in **Appendix 3.8** of this EIR/EIS.

3.8.3 Environmental Consequences/ Impacts

Significance Criteria under CEQA

Appendix G of the *CEQA Guidelines* indicates that a project would have a significant effect on the environment with respect to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under a federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people; or
- Conflict with the State strategies for reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32, California Global Warming Solutions Act of 2006.

Short-term Construction

Criteria Pollutant Emissions Thresholds

For analyzing short-term construction emissions, the BAAQMD emphasizes implementation of effective and comprehensive control measures rather than requiring a detailed quantification of construction emissions. The BAAQMD has identified a set of feasible PM10 control measures including measures recommended at all construction sites as well as enhanced measures that are recommended for larger construction sites. According to the BAAQMD CEQA guidelines, significance with respect to construction emissions should be determined based on a consideration of the control measures to be implemented (BAAQMD, 1999).

GHG Emissions Thresholds

According to the CARB's interim significance thresholds for GHGs, the project should meet interim CARB performance standards for construction-related emissions for impacts to be considered less than significant (CARB, 2008f).

Long-term Operations

Criteria Pollutant Emission Thresholds

To determine impacts from NBWRP operations, BAAQMD suggests that total emissions during operations be compared to thresholds set forth in **Table 3.8-6**. Thresholds have been established for reactive organic gas (ROG) and nitrogen oxide (NO_x), which are the precursors of ozone, as well as particulate matter (PM10), which contributes to health problems and smog. Any project that generates air pollution emissions in excess of the annual or daily thresholds set forth in Table 3.8-6 would be considered to have a significant air quality impact. Generally, the BAAQMD does not recommend a detailed quantification of operation emissions if a project generates less than 2,000 vehicle trips per day (BAAQMD, 1999).

TABLE 3.8-6
BAAQMD THRESHOLDS OF SIGNIFICANCE FOR PROJECT OPERATIONS

Pollutant	Tons per year	Pounds per day
ROG	15	80
NO_x	15	80
PM10	15	80

ROG = reactive organic gases
NO_x = nitorgen oxide
PM10 = particulate matter$\leq$ 10 microns

SOURCE: BAAQMD, 1999.

GHG Emissions Thresholds

There are no adopted regulatory, statutory or other thresholds for assessing the significance of GHG emissions in CEQA analyses. For the purposes of this EIR/EIS, the CARB interim thresholds shall be used to determine the significance of GHG emissions impacts. According to the CARB's interim significance thresholds for GHGs, a project should not emit more than 7,000 metric tons of CO_2e ($MTCO_2e$ or metric tons CO_2 equivalent) per year from non-transportation related GHG sources which addresses approximately 90 percent of all industrial section emissions. Non-transportation related sources include the following: combustion-related components/equipment; process losses (fugitive, working, evaporative, etc.); purchased electricity; and water usage and wastewater discharge (CARB, 2008f).

Toxic Air Contaminants

Any project that would have the potential to expose sensitive receptors to substantial levels of toxic air contaminants that would result in an incremental cancer risk of 10 in one million or greater or a hazard index of 1 or greater would be considered to have a significant impact to sensitive receptors (BAAQMD, 1999).

Odors

For odors, BAAQMD recommends that potential impacts be evaluated if a potential source of objectionable odors is proposed at a location near existing sensitive receptors or if sensitive receptors are proposed to be located near an existing source of objectionable odors. It is recommended that wastewater treatment plants not be sited within one mile of sensitive receptors (BAAQMD, 1999). The proposed action involves existing WWTPs, and does not propose locating a new source of odors within close proximity to sensitive receptors. Therefore, the proposed action would not create objectionable odors that would affect a substantial number of sensitive receptors. No impact would occur; therefore, this issue is not discussed further in this document.

Approach to Analysis under NEPA

For the purposes of the NEPA review, the lead agency must establish the project's applicability to the General Conformity Rule, to determine if the project would be in compliance with all NAAQS and the SIP. According to 40 CFR 93.153, conformity determinations are required only for federal actions that occur in nonattainment or maintenance areas and result in generation of emissions that exceed established de minimis levels that are based on the specific classification of non-attainment status. **Table 3.8-7** summarizes the federal de minimis emissions thresholds applicable to this project.

TABLE 3.8-7
FEDERAL GENERAL CONFORMITY CRITERIA
AIR POLLUTANT EMISSION THRESHOLDS

Pollutant	Federal Threshold (tons/year)
NO_x	100
ROG	50
CO	100

SOURCE: USEPA, 2006.

A federal project that does not exceed the de minimis threshold rates may still be subject to a general conformity determination if the sum of direct and indirect emissions would exceed 10 percent of the emissions of the nonattainment or maintenance area. If emissions would exceed 10 percent, the federal project is considered "regionally significant," and thus general conformity rules would apply. If the emissions would not exceed the de minimis levels and are not regionally significant, then the project is assumed to conform, and no further analysis or determination is required. Other air quality concerns unique to NEPA are related to whether the project would be subject to New Source Review and if the project would affect an area designated as Class I under the federal CAA.

Impact 3.8.1: Temporary Construction Emissions of Criteria Pollutants. Project construction activities could result in substantial short-term criteria pollutant emissions. (Less than Significant with Mitigation)

Construction would cause fugitive dust emissions during earth moving activities and emissions of criteria pollutants from equipment and vehicle exhaust. Impacts would occur during installation of the proposed recycled water pipelines, and construction of storage facilities and pump stations.

The recycled water pipelines would be installed by trenching, jack and bore tunneling, directional drilling, and/or pipeline suspension. All methods would involve some earth disturbance thereby generating fugitive emissions, however fugitive dust emissions would be greatest during open trenching activities. Exhaust emissions would result from the use of equipment such as boring machines, jackhammers, backhoes/loaders, excavators, and other heavy-duty construction equipment.

Construction of storage reservoirs and pump stations would include site preparation, clearing, excavation, line placement, embankment construction, and hydro-seeding. Excavation and export of material would result in fugitive dust emissions. Exhaust emission would result from the use of heavy-duty construction equipment such as earthmovers, bulldozers and excavators.

Treatment upgrades within the existing WWTPs would involve transportation of treatment units or filters via trucks to the existing WWTPs and installation within the existing WWTP buildings. Construction-related emissions, therefore would be minimal and would be associated with exhaust emissions from the equipment hauling and employee trucks.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

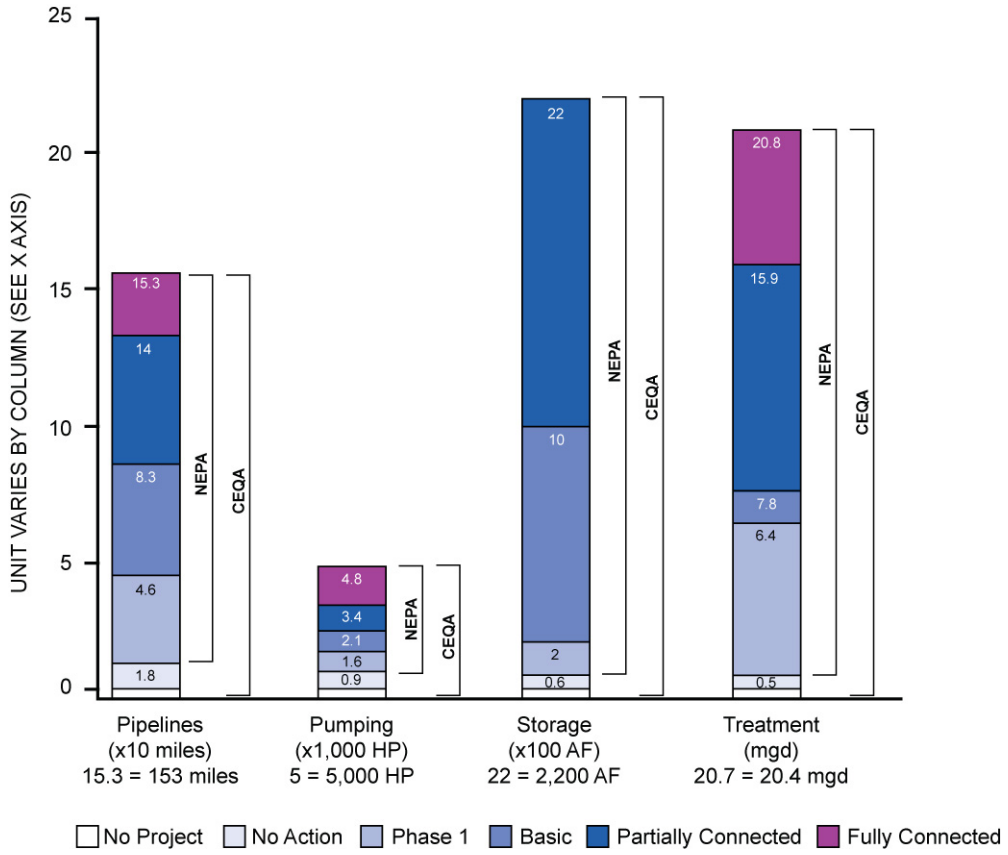
No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.8-1, No Action**).

Future baseline conditions (2020) for air quality are anticipated to improve over time due to the implementation of the *Bay Area 2005 Ozone Strategy* (BAAQMD, 2006). The BAAQMD has conducted a detailed emissions inventory for ozone precursors (ROG and NO_x) within the Bay Area. The inventory includes projections for ROG and NOx on a typical summer day in the Bay

CHART 3.8-1
COMPARISON OF CEQA AND NEPA BASELINE FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

Area out to year 2020. Based on the BAAQMD's analysis, total emissions of ROG and NO_x in the Bay Area are expected to decrease by approximately 25% and 40%, respectively, between the years 2005 and 2020 (BAAQMD, 2006).

Emissions associated with construction of the No Action Alternative were analyzed for each Member Agency. A discussion of individual Member Agencies is provided below.

To present the worst-case annual emissions, it was assumed that individual projects within each Member Agency would be constructed concurrently within the same calendar year. Assumptions used to estimate emissions are discussed in detail in above in the Regulatory Framework. **Table 3.8-8** presents estimated worst-case annual construction emissions of criteria pollutants expressed in tons per year. As indicated in the table, maximum combined annual emissions for construction of the No Action Alternative would not exceed applicable federal de minimus thresholds.

TABLE 3.8-8
NO ACTION CONSTRUCTION EMISSIONS BY AGENCY (WORST CASE)

	Construction Emissions (Tons per Year)			
Agency	**ROG**	**CO**	**NO_x**	**PM10[a]**
LGVSD	0	0	0	0
Novato SD	1	4	6	4
SVCSD	2	8	15	12
Napa SD	0	0	0	0
Total Annual Emissions (All Agencies)	3	12	21	16
General Conformity Thresholds	50	100	100	NA
Exceed Conformity Threshold (Yes or No?)	**No**	**No**	**No**	**NA**
2006 Regional Emissions in the Basin	134,685	704,085	179,580	NA
Project Percentage of Regional Emissions	0.002%	0.002%	0.012%	NA
More than 10% of Regional Emissions?	**No**	**No**	**No**	**NA**

[a] Includes fugitive dust emissions from grading and removal of pavement. These estimates do not include reductions for dust control measures required by BAAQMD.

'NA = Not Applicable

SOURCE: URBEMIS 2008 and CARB, 2007c.

Although emissions from construction of the No Action Alternative would not exceed the de minimus thresholds, the project must also be analyzed with respect to regional emission levels. According to emissions estimates published by CARB, the average regional emissions of ROG, CO, and NO_x in the Air Basin in 2006 approximately 369 tons per day, 1,929 tons per day, and 492 tons per day, respectively (CARB, 2007c). When considered on an annual basis, these amounts would be equivalent to 134,685 tons of ROG; 704,085 tons of CO; and 179,580 tons of NO_x. Therefore, based on emissions estimates presented in Table 3.8-8, construction emissions associated with the No Action Alternative would represent approximately 0.002 percent of total ROG emissions, 0.002 percent of total emissions of CO, and 0.012 percent of total emissions of NO_x in the Air Basin. Since emissions associated with construction of the No Action Alternative would be well below 10 percent of the total emissions of ROG, CO, or NO_x, construction of the project would not trigger the need for a detailed conformity analysis and short term NEPA construction impacts are considered to be less than significant. Consequently, the No Action Alternative would be in compliance with the NAAQS and the SIP.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46.4 miles of new pipeline, 1,873 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28.8 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The air quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The additional facilities proposed under Phase 1 for each service area would increase the average annual emissions anticipated from construction activities. However, as shown in Table 3.8-8, emissions from the construction of the No Action Alternative would be well below the general conformity de minimus thresholds. Therefore, even if average annual emissions were to double under construction of Phase 1, impacts would remain less than significant. Emissions associated with construction of Phase 1 projects were analyzed for each Member Agency. To present the worst-case annual emissions, it was assumed that individual projects within each Member Agency would be constructed concurrently within the same calendar year. Assumptions used to estimate emissions are discussed in detail in **Appendix 3.10**. **Table 3.8-9** presents estimated worst-case annual construction emissions of criteria pollutants expressed in tons per year. As indicated in the table, maximum combined annual emissions for construction of Phase 1 projects would not exceed applicable federal de minimus thresholds.

TABLE 3.8-9
PHASE 1 CONSTRUCTION EMISSIONS BY AGENCY (WORST CASE)

	Construction Emissions (Tons per Year)			
Agency	**ROG**	**CO**	**NO_x**	**PM10[a]**
LGVSD	1	5	8	5
Novato SD	2	8	13	7
SVCSD	3	15	25	21
Napa SD	2	10	16	10
Total Annual Emissions (All Agencies)	8	38	62	43
General Conformity Thresholds	50	100	100	NA
Exceed Conformity Threshold (Yes or No?)	**No**	**No**	**No**	**NA**
2006 Regional Emissions in the Basin	134,685	704,085	179,580	NA
Project Percentage of Regional Emissions	0.006%	0.005%	0.03%	NA
More than 10% of Regional Emissions?	**No**	**No**	**No**	**NA**

[a] Includes fugitive dust emissions from grading and removal of pavement. These estimates do not include reductions for dust control measures required by BAAQMD.

'NA = Not Applicable

SOURCE: ESA, 2009

Although the Phase 1 projects would not exceed the de minimus thresholds, the project must also be analyzed with respect to regional emission levels. According to emissions estimates published by CARB, the average regional emissions of ROG, CO, and NO_x in the Air Basin in 2006 approximately 369 tons per day, 1,929 tons per day, and 492 tons per day, respectively (CARB, 2007c). When considered on an annual basis, these amounts would be equivalent to 134,685 tons of ROG; 704,085 tons of CO; and 179,580 tons of NO_x. Therefore, based on emissions estimates presented in Table 3.8-8, construction emissions associated with Phase 1 would represent approximately 0.006 percent of total ROG emissions, 0.005 percent of total emissions of CO, and 0.03 percent of total emissions of NO_x in the Air Basin. Since emissions associated with construction of Phase 1 would be well below 10 percent of the total emissions of ROG, CO, or NO_x, construction of the project would not trigger the need for a detailed conformity analysis and short-term construction impacts are considered to be less than significant when evaluated according to NEPA criteria. Consequently, the NBWRP would be in compliance with the NAAQS and the SIP.

With regard to CEQA, Phase 1 construction activities would need to comply with BAAQMD's CEQA requirements for control of fugitive dust emissions. **Mitigation Measure 3.8-1a** includes all applicable fugitive dust control measures that would need to be implemented for Phase 1 construction activities to be deemed less than significant under CEQA review. Additionally, while BAAQMD does not have a set threshold of significance for construction exhaust emissions, it does recommend that construction exhaust emissions are mitigated to the maximum extent feasible.

Implementation of **Mitigation Measure 3.8.1b** would mitigate construction exhaust emissions by enforcing idling restrictions, requiring the use of higher tier engines, and requiring use of other control technologies such as diesel particulate filters. By using Tier 2 engines in place of older, uncontrolled engines, NO_x emissions can be reduced by as much as 65 percent, ROG emissions by as much as 85 percent, and PM emissions by as much as 73 percent (SCAQMD, 2008). Diesel particulate filters can reduce PM emissions by as much as 85 percent (CARB, 2008d). Implementation of **Mitigation Measures 3.8.1a** and **3.8.1b** would ensure that CEQA impacts associated with construction activities would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,345 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65.7 miles of new pipeline, 1,433 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The air quality impacts associated with proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The additional facilities and improvements proposed under the Basic System in all of the service areas would be constructed over a longer time span. Therefore annual average construction emissions would be similar to those anticipated from Phase 1 construction and it would be unlikely that emissions from construction of the Basic System would trigger the need for a General Conformity determination; therefore, NEPA impacts would be less than significant. Furthermore, implementation of **Mitigation Measures 3.8-1a** and **3.8-1b** would reduce fugitive and exhaust emissions to less-than-significant levels with respect to the CEQA review.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 140 miles of new pipeline, 3,656 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122.5 miles of new pipeline, 2, 744 HP of pumping capacity, treatment facilities providing 15.0 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts associated with proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Assuming that construction of proposed facilities in all service areas would be phased over a longer time period due to the greater number of facilities to be constructed, annual emissions would not increase substantially beyond those anticipated from construction of the Basic System, and therefore the project would be exempt from a federal General Conformity analysis and impacts evaluated according to NEPA criteria would be less than significant. However, construction associated with the Partially Connected System would result in a greater amount of emissions over the life of the project compared to that under the Basic System. Implementation of **Mitigation Measures 3.8-1a** and **3.8-1b** would ensure that CEQA impacts would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135.8 miles of new pipeline, 4,109 HP of pumping capacity, treatment facilities providing 19.9 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/ NMWD, Novato SD/ NMWD, SVCSD, Napa SD

While the Fully Connected System would include additional construction activities and earth moving than what would be associated with construction of the Partially Connected System, it is assumed that these activities would be spread over a longer time period. Thus, annual emissions would not be substantially higher than those anticipated from construction of the Partially Connected System. Therefore, a federal General Conformity determination would not be required and NEPA impacts would be less than significant. Furthermore, implementation of **Mitigation Measures 3.8.1a** and **3.8.1b** would ensure that impacts from fugitive dust and exhaust emissions would be less than significant when evaluated according to CEQA criteria.

Mitigation Measures (Applicable to all Member Agencies)

Mitigation Measure 3.8.1a: Construction Fugitive Dust Control Plan. The appropriate Member Agency shall require its contractor(s) to implement a dust control plan that shall include the following dust control procedures during construction as required by the BAAQMD:

- Water all active construction areas at least twice daily, taking into consideration temperature and wind conditions.
- Cover all trucks hauling soil, sand, and other loose materials *or* require trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways, consistent with **Mitigation Measure 3.1.2**, Erosion Control.
- Replant vegetation in disturbed areas as quickly as possible.

Mitigation Measure 3.8.1b: Construction Exhaust Emissions Control Plan. The appropriate Member Agency shall require its contractor(s) to implement an exhaust emissions control plan that shall include the following controls and practices:

- On road vehicles with a gross vehicular weight rating of 10,000 pounds or greater shall not idle for longer than five minutes at any location as required by Section 2485 of Title 13, Division 3, Chapter 10, Article 1 of the California Code of Regulations.

This restriction does not apply when vehicles remain motionless during traffic or when vehicles are queuing.

- Off road equipment engines shall not idle for longer than five minutes per Section 2449(d)(3) of Title 13, Division 3, Chapter 9, Article 4.8 of the California Code of Regulations. All vehicle operators shall receive a written idling policy to inform them of idling restrictions. The policy shall list exceptions to this rule that include the following: idling when queuing; idling to verify that the vehicle is in safe operating condition; idling for testing, servicing, repairing or diagnostic purposes; idling necessary to accomplish work for which the vehicle was designed (such as operating a crane); idling required to bring the machine to operating temperature as specified by the manufacturer; and idling necessary to ensure safe operation of the vehicle.

- Off road engines greater than 50 horsepower shall, at a minimum, meet Tier 2 emissions standards. When available, higher Tier engines shall be utilized. Additionally, contractor(s) shall comply with current CARB and BAAQMD regulations for off-road engines greater than 50 horsepower.

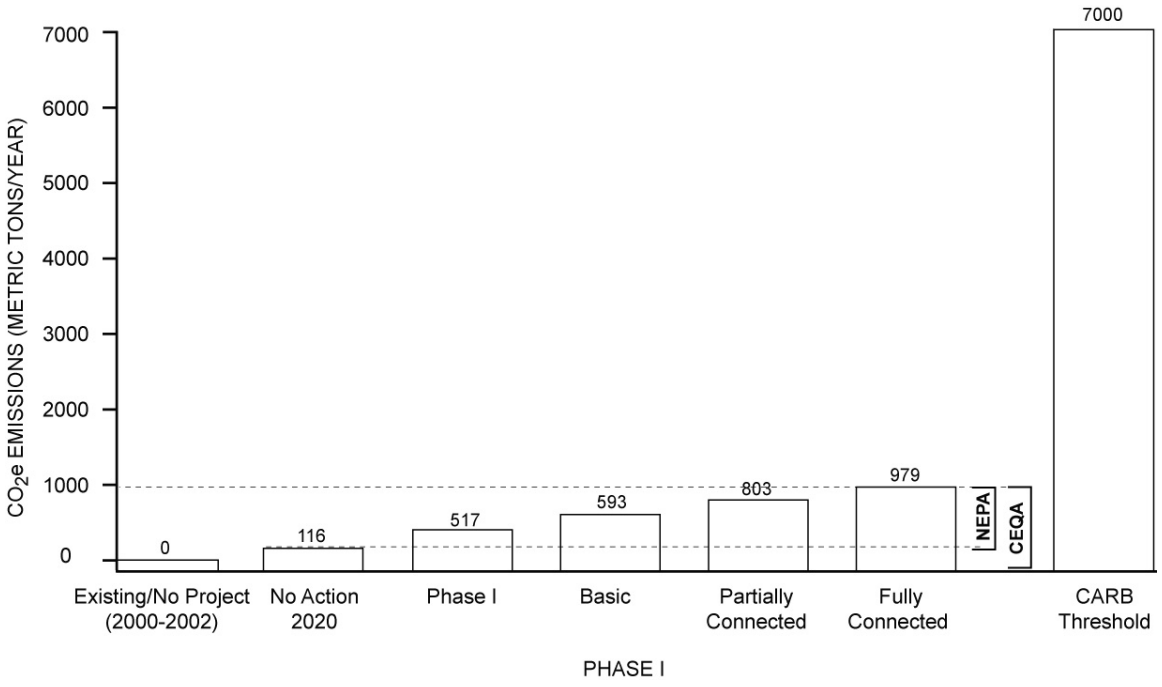
Impact 3.8.2: Long-term emissions of criteria pollutants. Project operations could result in criteria pollutant emissions from powering pumps and from maintenance/repair trips. (Less than Significant)

Operations of the proposed action would not include the use of new power generators. New booster pump stations would be powered by the existing electrical grid.

Chart 3.8-2 summarizes the amount of pumping horsepower provided by each alternative. Electricity obtained from the grid would be generated at one or more offsite power plants. Since these emissions would not occur within the project vicinity they would not impact local air quality in the proposed action area. In regards to regional emissions, there is no way to determine if electricity would even come from power plants located within the Basin, therefore it is impossible to determine if such emissions would exceed the BAAQMD significance thresholds. However, since power plant emissions are subject to the rules and regulations of the air district in which they are located and are subject to their own CEQA review it can be assumed that these emissions would already be accounted for in regional planning. Therefore, impacts associated with criteria pollutant levels from increased electricity usage are considered to be less than significant. Please refer to Impact 3.8.4 for a discussion of potential impacts relating to greenhouse gas (GHG) emissions.

Proposed action components, once in-place, would not result in an increase in the labor-force at the existing WWTPs. New pipelines and storage reservoirs not located at the existing WWTPs would require routine inspection and maintenance. These activities would generate a small number of vehicle trips, but would occur infrequently and would therefore not result in a substantial increase in vehicle miles traveled. The additional trips would not exceed the BAAQMD screening threshold of 2,000 trips per day.

CHART 3.8-2
COMPARISON OF CEQA AND NEPA BASELINE -
PUMPING CAPACITY (HORSEPOWER), BY ALTERNATIVE



SOURCE: ESA, 2008.

Under NEPA, operational emissions associated with the proposed action would be lower than those presented in Table 3.8-8 for construction activities. Therefore, the project would be in compliance with the NAAQS and the SIP. In addition, the proposed action would not affect any area designated as Class I under the Clean Air Act because long-term emissions associated with the project would be less than significant and the nearest Class I area is the Point Reyes Wilderness Area, located approximately 10 miles west of the proposed site. Further, annual operational phase emissions associated with the proposed action would be negligible for each criteria pollutant. Therefore, the proposed action would not be subject to New Source performance standards and would not be subject to any emissions limitations. All NEPA related operational impacts would be less than significant.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

Future baseline conditions (2020) for air quality are anticipated to improve over time due to the implementation of the Bay Area 2005 Ozone Strategy (BAAQMD, 2006). The BAAQMD has conducted a detailed emissions inventory for ozone precursors (ROG and NO_x) within the Bay Area. The inventory includes projections for ROG and NOx on a typical summer day in the Bay Area out to year 2020. Based on the BAAQMD's analysis, total emissions of ROG and NO_x in the Bay Area are expected to decrease by approximately 25% and 40%, respectively, between the years 2005 and 2020 (BAAQMD, 2006).

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.8-2). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato/NMWD SD and SVCSD

Under the No Action Alternative, vehicle trips associated with maintenance of these pipelines would still occur, although fewer trips would be required than those anticipated under operation of the proposed action. Therefore, the worker trips generated by the No Action Alternative would be expected to be substantially below the BAAQMD screening threshold of 2,000 trips per day. Therefore, impacts would be less than significant.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46.4 miles of new pipeline, 1,873 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28.8 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The air quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the

facilities constructed under this alternative (see Chart 3.8-2, Phase 1). A discussion by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

As mentioned previously, maintenance of WWTP upgrades would not require additional staff. Inspection and maintenance of new pipelines and offsite storage ponds would generate vehicle trips that would result in air pollutant emissions. However, trips would occur infrequently and would not exceed the BAAQMD screening threshold of 2,000 trips per day. Therefore, impacts from Phase 1 operations would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,345 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65.7 miles of new pipeline, 1,433 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The air quality impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative.

LGVSD, Novato SD, SVCSD, and Napa SD

The Basic System would result in additional vehicle trips for the additional pipelines not included in Phase 1. It is anticipated that the additional trips associated with maintenance of this additional length of pipeline would be minimal and would not exceed the BAAQMD screening threshold of 2,000 trips per day. The impact would therefore be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 140 miles of new pipeline, 3,656 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122.5 miles of new pipeline, 2, 744 HP of pumping capacity, treatment facilities providing 15.0 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts associated with the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

Implementation of the Partially Connected System would result in additional vehicle trips associated with the maintenance of the additional project components. However, truck/vehicle trip rates would not exceed 2,000 trips per day; therefore, impacts from vehicle trips would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135.8 miles of new pipeline, 4,109 HP of pumping capacity, treatment facilities providing 19.9 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, and Napa SD

The Fully Connected System would result in additional vehicle trips associated with maintenance of the additional project components, however, the trips would be significantly higher than those under the Partially Connected System and would not exceed the BAAQMD screening threshold of 2,000 trips per day. The impact would be less than significant.

Impact 3.8.3: Long term increase in toxic air contaminant (TAC) levels. Project operation could result in emissions of TACs that would have the potential to harm sensitive receptors located in the project vicinity. (Less than Significant)

Wastewater treatment can result in emissions of TACs such as benzene and chloroform,. The proposed action would involve an increase in existing tertiary treatment capacity. Tertiary treatment activities would not result in a substantial increase in TACs. Additionally, current air permits would be reviewed by BAAQMD to ensure TACs resulting from operations would not expose sensitive receptors to harmful pollutant concentrations. Emissions of TACs would be regulated by BAAQMD through its permitting and compliance process, therefore impacts would be less than significant.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no change impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. Future baseline conditions (2020) for air quality are anticipated to improve over time due to the implementation of the Bay Area 2005 Ozone Strategy (BAAQMD, 2006). The BAAQMD has conducted a detailed emissions inventory for ozone precursors (ROG and NO_x) within the Bay Area. The

inventory includes projections for ROG and NO_x on a typical summer day in the Bay Area out to year 2020. Based on the BAAQMD's analysis, total emissions of ROG and NO_x in the Bay Area are expected to decrease by approximately 25% and 40%, respectively, between the years 2005 and 2020 (BAAQMD, 2006).

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.8-1, No Action). A discussion of air quality impacts by Member Agency is provided below.

LGVSD/NMWD and Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/NMWD and SVCSD

Under the No Action Alternative, tertiary treatment capacity would increase by approximately 0.5 million gallons per day (mgd). The Member Agencies would ensure the use of best management practices at the WWTPs. Impacts would be less than significant through review of the air permits issued by BAAQMD and regulation of TAC emissions from the WWTPs.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46.4 miles of new pipeline, 1,873 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28.8 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The air quality impact under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities under this alternative (see Chart 3.8-1, Phase 1). A discussion of air quality impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

As discussed previously, all increases in treatment capacity would need to meet BAAQMD permit requirements which would ensure that sensitive receptors are not exposed to harmful concentrations of TACs. Impacts would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,345 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65.7 miles of new pipeline, 1,433 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The air quality impacts under the Basic System would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative (see Chart 3.8-1, Basic System). A discussion of air quality impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

As discussed previously, all increases in treatment capacity would need to meet BAAQMD permit requirements which would ensure that sensitive receptors are not exposed to harmful concentrations of TACs. Impacts would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 140 miles of new pipeline, 3,656 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122.5 miles of new pipeline, 2, 744 HP of pumping capacity, treatment facilities providing 15.0 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative (see Chart 3.8-1, Partially Connected). A discussion of air quality impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Partially Connected System would require an additional 8.3 mgd of tertiary treatment capacity, which represents a total increase of 15.3 mgd over existing conditions. As discussed previously, all increases in treatment capacities would need to meet BAAQMD permit conditions in order to operate. These permit conditions would ensure that sensitive receptors are not exposed to harmful levels of TACs; impacts would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135.8 miles of new pipeline, 4,109 HP of pumping capacity, treatment facilities providing 19.9 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative (see Chart 3.8-1, Fully Connected). A discussion of air quality impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

As discussed previously, all increases in treatment capacities would need to be covered under existing BAAQMD air permits or existing permits would need to be revised to cover increased treatment capacity. Permit conditions would require use of best management practices and would ensure that sensitive receptors are not exposed to harmful levels of TACs. Impacts would be less than significant.

Impact 3.8.4: Long term Increase in GHG Emissions. Project construction and operation would increase GHG emissions potentially interfering with the State's GHG reduction goals. (Less than Significant)

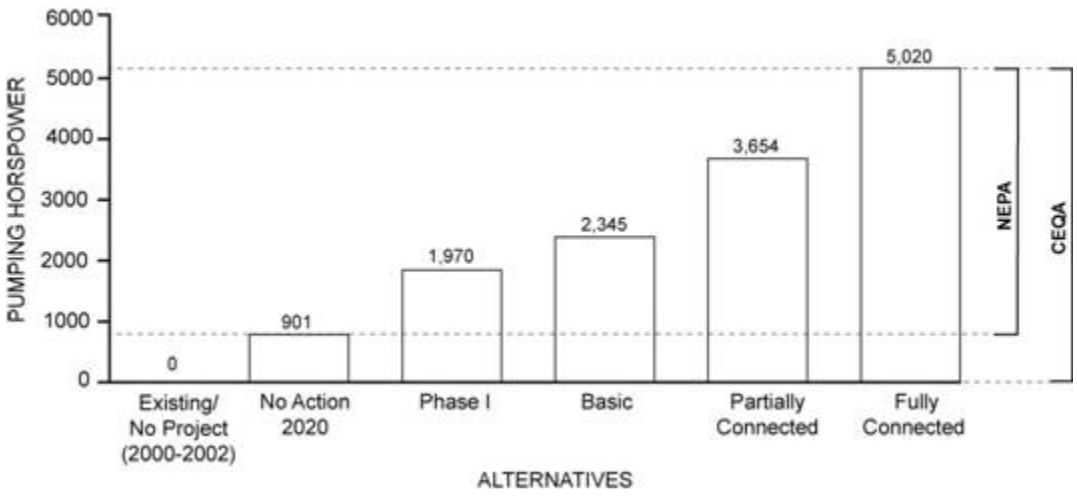
As with other individual small projects (e.g., projects that are not cement plants, oil refineries, electric generating facilities/providers, co-generation facilities, or hydrogen plants or other stationary combustion sources that emit more than 25,000 MTCO2e per year), the emissions increases that would result under the Action Alternatives would not be expected to individually have a significant impact on global climate change (CAPCOA, 2008) and the primary concerns would be whether implementation of the project would conflict with the State goals for reducing greenhouse gas emissions and whether the NBWRP would have a cumulatively considerable impact on global climate change. According to the CARB's interim significance thresholds for GHGs, the project should meet interim CARB performance standards for construction-related emissions (previously discussed under Impact 3.8.1). In regards to operations, a project would be considered significant if it would emit more than 7,000 metric tons of CO_2e per year from non-transportation related emissions (CARB, 2007f).

Currently, alternative sources of energy are being utilized at LGVSD, Novato SD, SVCSD, and Napa SD WWTPs. The solar power plant at the LGVSD WWTP produces approximately 850,000 kilowatt-hour per year. The solar plant at the SVCSD WWTP provides at least one third of the energy needed to power the current operations at the WWTP. The Novato SD and Napa SD utilize co-generation technology, which utilizes electricity and heat produced by the cogeneration system, to reduce purchased electricity and natural gas. As discussed under **Impact 3.8.2**, operation of the proposed action is not expected to generate a significant increase in vehicle trips. However, to provide worst case emission estimates for GHGs generated by inspection and maintenance activities, it was assumed that the entire length of the proposed pipeline would be inspected once a week throughout the entire year. Therefore, to determine total annual vehicle miles traveled a worst case scenario was developed that assumed weekly inspection and maintenance activities involving roundtrips through the length of the proposed pipelines. Vehicle emission rates for CO_2 and CH_4were determined using the emissions inventory program EMFAC2007. Based on this program, CO_2 emissions rates would be approximately 2.6 pounds per mile and CH_4 emission rates would be approximately 0.0002 pounds per mile. EMFAC2007 does not provide N_2O emission rates; therefore the emission rate of 0.004 pounds per mile from the California Climate Action Registry was used (CCAR, 2008). Assuming that CH_4 has a global warming potential of 23 and N_2O has a global warming potential of 296, emission rates of CO_2

from vehicle trips would be 2.7 pounds per mile. This emission rate is used below to evaluate GHG emissions from project operations.

Increased electricity usage would increase the amount of indirect GHG emissions generated as part of the project. The following emission rates were used to calculate GHG emissions: 524 pounds per megawatt-hour (lbs/MWh) of CO_2, 0.0037 lbs/MWh of CH_4, and 0.0067 lbs/MWh of N_2O (PG&E, 2008 and CCAR, 2008). Energy usage was determined based on the assumption that pumping would occur 120 days per year for 6 hours per day. Impacts from each of the alternatives relative to the CARB recommended threshold of 7,000 metric tons per year is summarized in **Chart 3.8-3**, and discussed by Member Agency below. **Table 3.8-10** shows the equivalent number of annual vehicles for each alternative, based on PG&E's carbon calculator (PG&E, 2009). This assumes annual mileage of 12,000 miles in a vehicle that averages 21 miles per gallon.

CHART 3.8-3
ESTIMATED CO2E EMISSIONS (METRIC/TONS ANNUALLY)
VERSUS CALIFORNIA AIR RESOURCE BOARD INTERIM THRESHOLD



SOURCE: ESA, 2008.

TABLE 3.8-10
CARBON DIOXIDE EMISSIONS AND VEHICLE EQUIVALENCY

Alternative	CO2 Generated by Alternative Operations	Equivalent in Vehicles per Year
No Action Alternative	116.9	23.2
Phase 1 (Project level)	517.5	102.9
Alternative 1: Basic System (Program level)	593.3	118.0
Alternative 2: Partially Connected System (Program level)	803.3	159.8
Alternative 3: Fully Connected System (Program level)	979.7	194.8

SOURCE: ESA, 2008

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no change impact would occur.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

Future baseline conditions (2020) for air quality are anticipated to improve over time due to the implementation of the Bay Area 2005 Ozone Strategy (BAAQMD, 2006). The BAAQMD has conducted a detailed emissions inventory for ozone precursors (ROG and NOx) within the Bay Area. The inventory includes projections for ROG and NO_x on a typical summer day in the Bay Area out to year 2020. Based on the BAAQMD's analysis, total emissions of ROG and NO_x in the Bay Area are expected to decrease by approximately 25% and 40%, respectively, between the years 2005 and 2020 (BAAQMD, 2006).

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.8-1, No Action). A discussion of individual Member Agencies is provided below.

LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Novato SD/ NMWD and SVCSD

Under the No Action Alternative, projects may be implemented in the Novato SD and SVCSD service areas. Vehicle trips associated with maintenance would still occur, although fewer trips would be required and trips would be shorter in distance than those anticipated under operation of the proposed action. Also, near term pumping requirements would be less therefore indirect GHG emissions from electricity usage would be less. **Table 3.8-11** shows an estimate of GHG emissions from operation of the No Action Alternative.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46.4 miles of new pipeline, 1,873 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and

TABLE 3.8-11
GHG EMISSION RATES FROM PROJECT OPERATION – NO ACTION ALTERNATIVE

Emission Source	CO_2e Emissions (metric tons per year)				
	LGVSD	Novato SD	SVCSD	Napa SD	All Districts
Indirect (Electricity Usage)	0.0	31.9	76.7	0.0	108.7
Direct (Vehicle Exhaust)	0.0	0.6	0.8	0.0	1.4
Total Emissions	0.0	32.5	77.5	0.0	**110.0**

NOTE: Totals may appear to not add up due to rounding.

See Appendix AQ for detailed calculation sheets.

65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28.8 miles of new pipeline, 961 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The air quality impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. Construction activities would meet interim performance standards set by CARB; therefore impacts from construction would be less than significant. A discussion of impacts by Member Agency is provided below. With regard to operations, impacts from GHG emissions would occur from inspection and maintenance of new pipelines as well as from increased electricity consumption. **Table 3.8-12** shows an estimate of GHG emissions that would result from implementation of Phase 1. Vehicle emissions were estimated based on the assumption that the entire length of pipeline proposed in each service area would be inspected and maintained once per week, a conservative assumption.

TABLE 3.8-12
GHG EMISSION RATES FROM PROJECT OPERATION – PHASE 1

Emission Source	CO_2e Emissions (metric tons/year)				
	LGVSD	Novato SD	SVCSD	Napa SD	All Districts
Indirect (Electricity Usage)	9.3	33.1	112.5	356.7	511.5
Direct (Vehicle Exhaust)	0.8	1.3	1.7	2.2	5.9
Total Emissions	10.0	34.4	114.1	358.9	**517.5**

NOTE: Totals may appear to not add up due to rounding.

See Appendix AQ for detailed calculation sheets.

The average energy that would be consumed within the LGVSD, Novato SD, and SVCSD service areas is estimated at 1,120 kilowatt-hour per acre-feet per year (kWh/AFY) of potable water served (CDM, 2009). The average energy consumption under Phase 1 would be approximately

402 kWh/AFY of recycled water served[2] (CDM, 2009). The resulting potential energy savings of approximately 718 kWh/AFY would have a corresponding reduction in greenhouse gas emissions associated with energy use. Further, as shown, GHG emissions from implementation of Phase 1 would be well below CARB's interim GHG threshold of 7,000 metric tons of CO_2e per year (see Chart 3.8-3, Phase 1). Therefore, impacts would be less than significant.

LGVSD/NMWD

As shown in Table 3.8-12 indirect and direct CO_2e emissions generated by operations for LGVSD would total approximately 10.0 metric tons per year. This estimate is based on the assumption that all 5.9 miles of new pipeline are inspected once per week. These emissions would be below the interim GHG threshold and impacts would be less than significant.

Novato SD/ NMWD

As shown in Table 3.8-12, operation of Phase 1 projects in the Novato SD area would cause a total increase in GHG emissions of approximately 34.4 metric tons per year. This value is based on the assumption that 9.9 miles of new pipeline would be constructed. This value is well below the interim GHG threshold; therefore impacts would be less than significant.

SVCSD

Phase 1 would involve an additional 13.2 miles of pipeline in the SVCSD area. As demonstrated in Table 3.8-12, this would result in a total of 114.1 metric tons of indirect and direct CO_2e emissions per year. These emissions are well below the interim GHG significance threshold of 7,000 metric tons of CO_2e per year. Therefore, impacts would be less than significant

Napa SD

Phase 1 implementation would involve construction of 17.5 miles of new pipeline to move water from the Napa SD WWTP. As shown in Table 3.8-12, direct and indirect emissions associated with improvements under Phase 1 implementation would total approximately 358.9 metric tons of CO_2e per year. This value is below the interim GHG threshold. Therefore, the impacts would be less than significant.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,345 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65.7 miles of new pipeline, 1,433 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

[2] Energy consumption under current conditions does not include Napa. The data assumes that all of the Sonoma Valley water demand in Phase 1 is currently served with potable water. Energy use for groundwater pumping in Sonoma Valley are not available.

The air quality impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Under the Basic System construction of additional facilities would result in greater GHG emissions from use of construction equipment, haul trucks and worker vehicles. However, construction activities would comply with CARB's interim performance standards and impacts would be less than significant.

The impacts associated with operation of the Basic System would be equivalent to the impacts discussed for Phase 1 above in addition to the following impacts. Electricity usage associated with pumping would increase at the SVCSD and Napa SD WWTPs. The number of vehicle miles traveled to inspect new pipeline would increase as a result an additional 24 miles of pipeline. **Table 3.8-13** provides estimated GHG emissions from project operations under the Basic System.

TABLE 3.8-13
GHG EMISSION RATES FROM PROJECT OPERATION – BASIC SYSTEM

	CO_2e Emissions (metric tons/year)				
Emission Source	**LGVSD**	**Novato SD**	**SVCSD**	**Napa SD**	**All Districts**
Indirect (Electricity Usage)	9.3	33.1	169.9	370.5	582.8
Direct (Vehicle Exhaust)	0.8	1.6	4.3	4.0	10.6
Total Emissions	10.0	34.7	174.2	374.4	**593.3**

NOTE: Totals may appear to not add up due to rounding.

See Appendix AQ for detailed calculation sheets.

The average energy that would be consumed within the LGVSD, Novato SD, and SVCSD service areas is estimated at 1,212 kWh/AFY of potable water served (CDM, 2009). The average energy consumption under the Basic System would be approximately 257 kWh/AFY of recycled water served[3] (CDM, 2009). The resulting potential energy savings of approximately 955 kWh/AFY would have a corresponding reduction in greenhouse gas emissions associated with energy use. Further, as shown in Table 3.8-13, indirect and direct CO_2e emissions from the Basic System operations would total approximately 593.3 metric tons of CO_2e per year. Operation of the NBWRP would not result in GHG emissions above the interim GHG threshold (see Chart 3.8-3, Basic System). Therefore, impacts would be less than significant.

LGVSD/NMWD

Impacts from operation of upgrades associated with the LGVSD WWTP would be equivalent to those associated with operation of Phase 1. Impacts would be less than significant.

[3] Energy consumption under current conditions does not include Napa. The data assumes that all of the Sonoma Valley water demand in Phase 1 is currently served with potable water. Energy use for groundwater pumping in Sonoma Valley are not available.

Novato SD/NMWD

The Basic System would include construction of additional pipelines beyond those under Phase 1, thereby increasing direct GHG emissions from inspection and maintenance activities. No additional electricity would be required, thus impacts from indirect emissions would be the same as those expected from implementation of Phase 1. As shown in Table 3.8-13, these emissions would still be well below the interim threshold for GHG emissions. Impacts would be less than significant.

SVCSD

Under the Basic System, operation of upgrades associated with the SVCSD WWTP would increase indirect GHG emissions from increased electricity usage and direct GHG emissions through additional vehicle trips required to inspect and maintain additional pipelines. However, as demonstrated in Table 3.8-13, these emissions would be well below the interim GHG threshold. Impacts would be less than significant.

Napa SD

As shown in Table 3.8-13, both direct and indirect GHG emissions from project operation under the Basic System would increase above those expected under Phase 1 implementation. This increase would occur due to increased electricity usage and increased vehicle trips required to maintain new pipelines. These increases in GHG emissions would be well below the interim GHG threshold. Impacts would be less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 140 miles of new pipeline, 3,656 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122.5 miles of new pipeline, 2, 744 HP of pumping capacity, treatment facilities providing 15.0 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts associated with proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Construction of additional facilities under the Partially Connected System would result in greater emissions of GHGs over those under the Basic System from use of construction equipment, haul trucks and worker vehicles. However, as discussed previously, these Partially Connected System and Basic System activities would be conducted in compliance with CARB's interim construction performance standards. Therefore, impacts would be less than significant.

With respect to operations, the additional 57 miles of pipeline under the Partially Connected System would increase the amount of vehicle miles traveled, thus increasing total GHG emissions. Furthermore, increased pumping requirements would result in an increase of indirect

GHG emissions generated at power plants. **Table 3.8-14** shows total indirect and direct emissions associated with operation of the Partially Connected System.

TABLE 3.8-14
GHG EMISSION RATES FROM PROJECT OPERATION – PARTIALLY CONNECTED SYSTEM

Emission Source	CO_2e Emissions (metric tons/year)				
	LGVSD	Novato SD	SVCSD	Napa SD	All Districts
Indirect (Electricity Usage)	43.1	74.6	260.6	407.2	785.5
Direct (Vehicle Exhaust)	2.3	4.6	5.3	5.6	17.8
Total Emissions	45.4	79.2	266.0	412.8	**803.3**

NOTE: Totals may appear to not add up due to rounding

See Appendix AQ for detailed calculation sheets.

The average energy that would be consumed within the LGVSD, Novato SD, and SVCSD service areas is estimated at 686 kWh/AFY of potable water served (CDM, 2009). The average energy consumption under the Partially Connected System would be approximately 231 kWh/AFY of recycled water served[4] (CDM, 2009). The resulting potential energy savings of approximately 455 kWh/AFY would have a corresponding reduction in greenhouse gas emissions associated with energy use. Further, as shown in Table 3.8-14, the emissions would be well below the interim GHG significance threshold (see Chart 3.8-3, Partially Connected). Therefore, impacts would be less than significant.

LGVSD/NMWD

As shown in Table 3.8-14, impacts from both indirect and direct emissions sources under the Partially Connected System would be substantially higher than those anticipated under operation of the Basic System. However, as demonstrated in the table, total emissions would be substantially lower than the interim GHG significance threshold. Therefore, impacts would be less than significant.

Novato SD/NMWD

As shown in Table 3.8-14, the Partially Connected System would increase indirect GHG emissions associated with electricity usage and pipeline inspection and maintenance. Total emissions would be well below the interim GHG significance threshold. Impacts would be less than significant.

[4] Energy consumption under current conditions does not include Napa. The data assumes that all of the Sonoma Valley water demand in Phase 1 is currently served with potable water. Energy use for groundwater pumping in Sonoma Valley are not available.

SVCSD

As demonstrated in Table 3.8-14, the Partially Connected System would increase both indirect and direct emissions above those anticipated under operation of Alterative 1. Nevertheless, these increases would be well below the interim GHG significance threshold; therefore, impacts would be less than significant.

Napa SD

As shown in Table 3.8-14, indirect emissions associated with increased electricity usage at the Napa SD WWTP and direct emissions from pipeline inspection and maintenance would increase the emissions above those anticipated from implementation of the Basic System. Despite these increases, implementation of the Partially Connected System would not be expected to exceed the interim GHG significance threshold; impacts would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135.8 miles of new pipeline, 4,109 HP of pumping capacity, treatment facilities providing 19.9 mgd of tertiary capacity, and 2,155 AF of storage.

The air quality impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Construction of additional facilities would result in greater emissions of GHGs from construction equipment, haul trucks and worker vehicles. However, as discussed previously, the Fully Connected System the Basic System the Partially Connected System activities would be conducted in compliance with CARB's interim construction performance standards. Therefore, impacts would be less than significant. The additional 15 miles of pipelines included as part of the Fully Connected System would be inspected and maintained and additional electricity would be needed to increase pumping capacity throughout the system. **Table 3.8-15** shows indirect and direct GHG emissions anticipated from implementation of the Fully Connected System.

The average energy that would be consumed within the LGVSD, Novato SD, and SVCSD service areas is estimated at 561 kWh/AFY of potable water served (CDM, 2009). The average energy consumption under the Fully Connected System would be approximately 277 kWh/AFY of recycled water served[5] (CDM, 2009). The resulting potential energy savings of approximately 284 kWh/AFY would have a corresponding reduction in greenhouse gas emissions associated with energy use. Further, as shown in Table 3.8-15, total annual CO_2e emissions would be approximately 979.7 metric tons per year. This is well below the interim GHG threshold of 7,000 metric tons of CO_2e per year (see Chart 3.8-3). Therefore, impacts would be less than significant.

[5] Energy consumption under current conditions does not include Napa. The data assumes that all of the Sonoma Valley water demand in Phase 1 is currently served with potable water. Energy use for groundwater pumping in Sonoma Valley are not available.

TABLE 3.8-15
GHG EMISSION RATES FROM PROJECT OPERATION – THE FULLY CONNECTED SYSTEM

Emission Source	CO_2e Emissions (metric tons/year)				
	LGVSD	Novato SD	SVCSD	Napa SD	All Districts
Indirect (Electricity Usage)	57.4	123.4	372.1	407.2	960.1
Direct (Vehicle Exhaust)	2.3	6.0	5.6	5.6	19.5
Total Emissions	59.7	129.4	377.8	412.8	**979.7**

-- Data not available to determine value.

See Appendix 3.8 for detailed calculation sheets.

LGVSD/NMWD

As shown in Table 3.8-15, indirect emissions would increase from increased pumping requirements associated with implementation of the Fully Connected System. Direct emissions from vehicle trips would be the same as those anticipated under the Partially Connected System.

Despite increases in indirect GHG emissions, implementation of the Fully Connected System would not be expected to exceed the interim GHG significance threshold. Impacts would be less than significant.

Novato SD/NMWD

As shown in Table 3.8-15, implementation of the Fully Connected System would result in increased indirect GHG emissions from increased electricity requirements at the Novato SD WWTP. Also, new pipelines connecting the Novato SD with the SVCSD would need to be maintained and inspected thereby increasing direct GHG emissions. The emissions are not expected to exceed the interim GHG significance threshold; therefore, impacts would be less than significant.

SVCSD

As shown in Table 3.8-15, implementation of the Fully Connected System would result in increased indirect and direct GHG emissions. However, these emissions would not exceed the interim GHG significance threshold and impacts would be less than significant.

Napa SD

As shown in Table 3.8-15, direct and indirect GHG emissions from operation of the Napa SD WWTP would be equivalent to those expected under implementation of the Partially Connected System. Impacts would be less than significant.

Mitigation Measures

Implement Mitigation Measure 3.8.1b: Construction Exhaust Emissions Control Plan, discussed under Impact 3.8.1.

3.8.4 Impact Summary by Service Area

Table 3.8-16 provides a summary of potential air quality impacts associated with implementation of the proposed action.

TABLE 3.8-16
POTENTIAL IMPACTS AND SIGNIFICANCE – AIR QUALITY

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.8.1: Temporary Construction Emissions of Criteria Pollutants.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LSM	LSM	LSM	LSM
Phase 1	LSM	LSM	LSM	LSM
Basic System	LSM	LSM	LSM	LSM
Partially Connected System	LSM	LSM	LSM	LSM
Fully Connected System	LSM	LSM	LSM	LSM
Impact 3.8.2: Long-term Emissions of Criteria Pollutants.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Basic System	LTS	LTS	LTS	LTS
Partially Connected System	LTS	LTS	LTS	LTS
Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.8.3: Long-term Increase in Toxic Air Contaminant Levels.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Basic System	LTS	LTS	LTS	LTS
Partially Connected System	LTS	LTS	LTS	LTS
Fully Connected System	LTS	LTS	LTS	LTS
Impact 3.8.4: Long-term Increase in GHG Emissions.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	LTS	LTS	LTS	LTS
Phase 1	LTS	LTS	LTS	LTS
Basic System	LTS	LTS	LTS	LTS
Partially Connected System	LTS	LTS	LTS	LTS
Fully Connected System	LTS	LTS	LTS	LTS

NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

3.8.5 References

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3.9 Noise

This section presents the existing noise conditions and evaluates potential impacts associated with noise and vibration levels from construction and operation of the North Bay Water Recycling Program (NBWRP). The analysis is based on review of the guidance developed by regulatory agencies and local noise ordinances and regulations set by the cities and counties in the action area. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts. Determination of significance of impacts in this EIR/EIS apply only to CEQA, not to NEPA.

3.9.1 Affected Environment/Setting

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. The decibel measurement system is a logarithmic unit of measurement, such that a ten-fold change in sound pressure is represented by an increase of 10 dB. Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a result, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. In fact, community noise varies continuously with time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. Background noise levels change throughout a typical day, but do so gradually,

corresponding with the addition and subtraction of distant noise sources and atmospheric conditions. The addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) makes community noise constantly variable throughout a day.

These successive additions and deletions of sound to the community noise environment change the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.

L_{dn}: Day-Night Average Sound Level, or the energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises. It should be noted that the L_{dn} is sometimes referred to as the DNL.

CNEL: Similar to the L_{dn}, the Community Noise Equivalent Level (CNEL) adds a 5-dBA *penalty* for the evening hours between 7:00 p.m. and 10:00 p.m.

Effects of Noise on People

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

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

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

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

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference when the change in noise is perceived but does not cause a human response;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. A ruler is a *linear* scale, which has marks corresponding to equal quantities of distance, (i.e., the ratio of successive intervals is equal to one). A *logarithmic* scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1, 10, 100, 1,000, 10,000, etc., doubling the variable plotted on the x-axis. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather they combine logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate (lessen) at a rate of 7.5 dBA per doubling of distance from the source, assuming that the ground surface between the source and receptor is primarily soft (e.g., dirt, grass, scattered vegetation) (Caltrans, 1998). For the purposes of this analysis, it is assumed that noise from a point source attenuates at a rate of 7.5 dBA per doubling of distance to account for the absorption of noise waves due to soft ground surfaces and intervening features and structures.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square amplitude is most frequently used to describe the affect of vibration on the human body. The root mean square amplitude is defined as the average of the squared amplitude of the signal. Decibel notation is commonly used to measure root mean square amplitude. The decibel notation acts to compress the range of numbers required to describe vibration (FTA, 2006). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

LGVSD and Novato SD

Regional Noise Environment

Vehicle traffic is the most significant source of noise in the cities of San Rafael and Novato. Roadways in the action area include Highway 101, Rowland Drive, Bel Marin Keys Boulevard, Ignacio Boulevard, and State Route 37 (SR 37). U.S. 101 is the primary noise source and has a 60-dBA contour that extends approximately 4,000 feet from the centerline of the highway (City of Novato, 1996). Noise levels are substantially lower at locations that are shielded from freeway noise by hills than at locations that have a direct exposure to the freeway noise. Aircraft operations at Gnoss Field also contribute to the noise environment. Other noise sources in the city include emergency medical vehicles, public transit vehicles, power tools, and machinery.

Sensitive Receptors

Sensitive receptors located in the LGVSD and Novato SD service areas that may be impacted by NBWRP include the following:

> *Schools and Churches*. Our Lady of Loretto Church and School, Novato High School, Creekside Village School, Quest Christian Church, Church of Christ, New Life Christian Center and Noah's Arc Pre-School, Unity of Marin Christian Church, Hamilton School, Novato Charter School, and Dunham Academy.
>
> *Hospitals/Nursing Homes*. The closest health care facility to the Novato WWTP is the Novato Community (Sutter Health) Hospital located east of U.S. 101 on Rowland Boulevard. The closest health care facility to the LGVSD WWTP is the Smith Ranch Care Center located on Silveira Parkway.
>
> *Residential*. Residential development in the action area includes multiple neighborhoods throughout the cities of Novato and San Rafael. Most of the proposed pipeline that would be located west of U.S. 101 would cross through existing residential neighborhoods. East of U.S. 101, the proposed pipelines would extend through residential neighborhoods located along Olive Avenue, Palm Avenue, Hangar Avenue, and San Pedro Road.
>
> *Parks and Recreation*. There are a few parks in Novato that are located in close proximity to the action area including Lynwood Hill Park located on Lynnwood Drive, Hill Recreation Area on Hill Road, Arroyo Avichi Park on Taft Court, Olive Park located along Olive Avenue, and Slade Park on Manuel Drive. Parks in San Rafael that would be located within close proximity of the proposed pipeline routes would include the John F. McInnis County Park, China Camp State Park, and Peacock Park.

SVCSD

Regional Noise Environment

According to the City of Sonoma General Plan, the primary noise source within the city is generated by traffic on major roadways such as Highway 12, Leveroni Road, Napa Road, Napa Street, and Eighth Street East. Based on continuous 24-hour measurements obtained in October 2003, major roadways such as those listed above generate 50 to 60 dBA at 50 feet from the roadway centerline. Stationary noise sources found in the city include car washes and commercial loading areas (City of Sonoma, 2006). The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the County.

Proposed facilities associated with the SVCSD are located in the City of Sonoma and in unincorporated areas of Sonoma County. The primary contributors to the noise environment in the action area include vehicle traffic; farm machinery on a seasonal basis; airplane over-flights; sounds emanating from residential neighborhoods, including voices, noises from household appliances, and radio and television broadcasts; and naturally occurring sounds such as wind and wind-generated rustling. Additional noise sources may include electrical and industrial devices and other man-made localized sources in the action area.

The Sonoma Valley and Sonoma Skypark airports, located in unincorporated Sonoma County, influence the County's ambient noise environment. The airports generate intermittent, intrusive noise at nearby sensitive receptors; however, noise from aircrafts is negligible in most of the County. There is no airport located within Sonoma City limits.

Sensitive Receptors

Sensitive receptors located within the SVCSD service area that may be impacted by the NBWRP include the following:

> *Schools*. Altimira Middle School, Sonoma Valley High School, Hanna Boys Center, Sonoma Seventh Day Adventist Church and School, Prestwood Elementary School.
>
> *Hospitals/Nursing Homes*. The closest health care facility to the action area is Sonoma Valley Hospital at 347 Andrieux Street, located west of Broadway.
>
> *Residential*. Residential development in the action area includes various single and multi-family residences. The highest density of residences occurs west of Broadway.
>
> *Parks and Recreation*. There are a few parks and recreation areas in the action area, including Los Arroyos Golf Club located on Stage Gulch Road, Maxwell Farms Regional Park on El Verano Avenue, Ernie Smith Community Park and Sonoma Golf Club both adjacent to the proposed pipeline on Arnold Drive, Sonoma Plaza located at Broadway and West Napa Street, and Huichica Creek Unit of the Napa-Sonoma Marshes Wildlife Area located on Buchli Station Road.
>
> *Public Assembly Buildings*. A public assembly building is located at Broadway and Napa Street.

Napa SD

Regional Noise Environment

Generally, areas within unincorporated Napa County are relatively quiet. Typical noise levels range from 20 to 25 dBA at 3 a.m. in isolated areas to 50 dBA near roadways during the day. Noise sources such as small aircraft, vineyard frost fans, diesel pumps in vineyards, heavy vehicle traffic, and train horns occasionally emit noise at levels considerably higher than the ambient levels (Napa County, 1990).

The prevailing environmental noise in the City of Napa is generated by motor vehicles. Automobiles, trucks, buses and motorcycles will most likely continue to be the major sources of noise through the year 2020. The most significant noise sources in Napa are highways (e.g., Highways 29, 121, and 221) and arterial streets (e.g., Jefferson and Trancas Streets, Soscol and Lincoln Avenues, Redwood Road, and the traffic corridor between First and Fourth Streets from Highway 29 through the downtown area).

Sensitive Receptors

Sensitive receptors located in the Napa SD service area that may be affected by noise generated by the NBWRP include the following:

> *Schools*. There are three schools, located in the Napa Valley Unified School District, including Mount George Elementary School located on 2nd Avenue, Silverado Middle School on Coombsville Road, and Wintun School on Wintun Court off Imola Avenue. The Napa County Children's Center, Napa County Community School, and Napa Infant Preschool Program are also located in the action area on Imola Avenue.
>
> *Hospitals/Nursing Homes*. Napa State Hospital is located in the action area at the corner of Highway 221 and Imola Avenue.
>
> *Residential*. Residential development in the action area includes neighborhoods situated directly north of Imola Avenue and west of 1st Avenue. Other residential development near the action area includes the development on the west side of Highway 121.
>
> *Parks and Recreation*. Camille Park located on Shurtleff Avenue and Shurtleff Park on Russell Street are approximately 0.5 miles from the action area. Skyline Park is located less than 0.5 miles south of the action area.

3.9.2 Regulatory Framework

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while local agencies regulate stationary sources. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans tend to identify general principles intended to guide and influence development plans, while local noise ordinances establish standards and procedures for addressing specific noise sources and activities. The policies and regulations associated with noise impacts within the affected jurisdictions are presented in **Appendix 3.9** of this EIR/EIS.

3.9.3 Environmental Consequences/Impacts

As a joint EIR/EIS, the impact analysis considers two baselines; the CEQA baseline standard, which requires a project to review its impacts relative to "change from existing conditions," as well as the NEPA baseline standard, which requires a comparison between the Action Alternatives and the No Action Alternative. In general, the CEQA impact analysis captures the NEPA impact analysis. Where appropriate the incremental level of impact relative to the NEPA baseline standard should be discussed.

Significance Criteria under CEQA

Based on the *CEQA Guidelines*, a project would have a significant effect on the environment with respect to noise and/or ground-borne vibration if it would 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;
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Exposure of people residing or working in the action area to excessive noise levels (for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport); or
- Exposure of people residing or working in the action area to excessive noise levels (for a project within the vicinity of a private airstrip).

For the purposes of this EIR/EIS, temporary impacts during construction are considered significant if they would substantially interfere with affected land uses. Substantial interference could result from a combination of factors, including: exposing sensitive receptors to noise levels in excess of regulatory standards or codes, which could result in a considerable nuisance; the generation of substantial (i.e., equal to or greater than 90 dBA) noise levels at sensitive receptor locations lasting long periods of time at any one location (i.e., more than one week); and/or construction activities that would affect noise-sensitive uses during the nighttime.

The project's long term operational impacts on the ambient noise environment would be considered substantial if it would expose sensitive receptors or other identified land uses to noise levels in excess of regulatory standards or codes. In addition to concerns regarding the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing ambient noise environment. If the ambient noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur.

A numerical threshold to identify the point at which a vibration impact occurs has not been identified by local jurisdictions in the applicable standards or municipal codes. In the absence of local regulatory significance thresholds for vibration from construction equipment, it is appropriate to use a California Department of Transportation (Caltrans) identified PPV thresholds for adverse human reaction and risk of architectural damage to buildings, which are 0.010 inches per second and 0.20 inches per second respectively (Caltrans, 2002).

Regarding the last two significance criteria, because NBWRP would not involve the development of noise-sensitive land uses that would be exposed to excessive aircraft noise, there would be no impacts associated with these criteria. Therefore, impacts associated with aviation noise are not addressed further.

Impact 3.9.1: Temporary construction noise. Construction activity would violate standards established in the local general plans or noise ordinances, and/or would adversely affect nearby sensitive receptors. (Less than Significant with Mitigation)

NBWRP would require construction of new pipelines and storage facilities as well as upgrades to existing WWTPs. Pipelines would be installed using a combination of the following methods: trenching; jack and bore tunneling; directional drilling; and pipeline suspension. Storage facilities would be constructed using excavation and earth movement techniques as well as embankment construction and hydro-seeding. Upgrades to existing facilities would include construction of new booster pump stations as well as other infrastructure required to increase tertiary treatment capacity at the WWTPs. These activities would require rough grading and excavation or filling to bring the site to final grade.

Table 3.9-1 demonstrates typical noise levels generated by equipment that would be used during construction of the NBWRP. As shown, equipment noise levels at 50 feet would range between 74 dBA to up to 101 dBA. The highest noise levels would occur during jack and bore tunneling and directional drilling, which would produce noise levels comparable to those generated by pile driving operations and rock drilling operations, respectively. Jack and bore tunneling and directional drilling would only be used to construct pipelines when open cut trenching is not feasible due to limited construction area, geotechnical conditions, or presence of sensitive biological resources such as wetlands or riparian habitat.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

TABLE 3.9-1
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level (dBA) 50 feet from Source
Air Compressor	81
Backhoe	80
Compactor	82
Crane, Mobile	83
Dozer	85
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pile Driver (Impact)	101
Rock Drill	98
Roller	74
Saw	76
Truck	88

SOURCE: FTA, 2006.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see **Chart 3.9-1, No Action**).

Under future baseline (2020) conditions, noise conditions within the region would likely continue being regulated by the local ordinances. Construction and operation of proposed facilities would contribute to noise. However, implementation of **Mitigation Measure 3.9.1**, which includes notifying residences and sensitive receptors of construction activities, locating noise-generating equipment away from sensitive receptors, and limiting the hours of construction, would reduce the impact to a less-than significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/ NMWD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

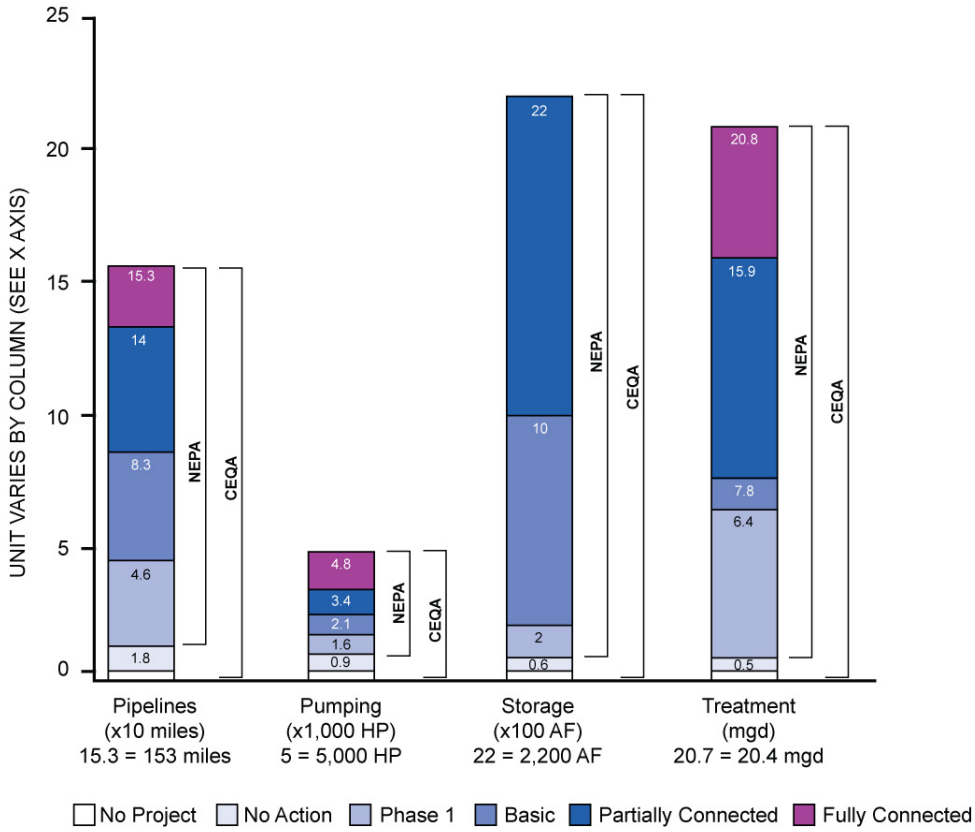
Novato SD/ NMWD and SVCSD

Refer to the discussion under Phase 1 below.

Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

CHART 3.9-1
COMPARISON OF NEPA AND CEQA BASELINES FOR PROPOSED FACILITIES, BY ALTERNATIVE



SOURCE: CDM, 2009

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The temporary construction noise impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of noise impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, LGVSD would upgrade tertiary treatment capacity at the LGVSD WWTP and construct a new booster pump station; NMWD would install one of three pipeline options,

described in **Chapter 2, Project Description**, which would connect the LGVSD WWTP Recycled Water Treatment Facility to facilities constructed by NMWD. As shown in Table 3.9-1, equipment used to construct new pipelines would generate substantial noise levels especially when jack and bore tunneling or directional drilling would be required. Furthermore, the proposed pipeline would pass through two different jurisdictions in the LGVSD and would therefore be subject to different noise ordinances depending on the location of the activities.

Some pipeline construction for Options A, B, and C from the LGVSD WWTP would occur in unincorporated Marin County while the remaining in the city of Novato. Pipeline for Options A and C would begin at the exiting LGVSD WWTP, approximately 2,000 feet north of residences. Construction for Options A and C would occur within 50 feet of residences where the pipelines connect with the NMWD facilities. Pipeline for Option C, heading north from the WWTP, would be installed along the levee road by Miller Creek to South Oakwood Drive, where it would connect with the Coast Guard Housing Distribution Loop. The Coast Guard Housing Distribution Loop pipeline would pass within 50 feet of residential property lines located along Club View Drive, Bolling Circle, South Oakwood Drive, Hangar Avenue, and Main Gate Road. Noise levels from pipeline construction activity could range up to 101 dBA at these residences from jack and bore tunneling or directional drilling or up to 89 dBA if neither technique is used. Additionally, the new pipeline would pass within close proximity to the Unity in Marin Church located on Palm Drive.

The Marin County Code restricts construction activities to between the hours of 7 a.m. and 6 p.m. on Monday through Friday and between the hours of 9 a.m. and 5 p.m. on Saturdays. Construction activities in Marin County are strictly prohibited on Sundays and holidays. Furthermore, loud noise-generating construction equipment such as backhoes, generators, and jackhammers may only be used from 8 a.m. to 5 p.m. on Monday through Friday. Special exemptions to this rule may occur for public utility projects. In addition to rules set forth in the Marin County Code, the Marin Countywide Plan requires as a condition of permit approval for large construction projects, that construction management shall develop a noise reduction plan and designate a disturbance coordinator to implement the plan.

The City of Novato noise ordinance limits construction hours to between the hours of 7 a.m. and 6 p.m. on weekdays and between the hours of 10 a.m. and 5 p.m. on Saturdays. Construction activities in the city of Novato are not permitted on Sundays or on any federal holidays. Authorized grading activities are only permitted on weekdays when City inspectors are available to monitor activities.

A new pump station would be constructed at the existing LGVSD WWTP. The nearest sensitive receptors to the proposed pump station site are located over 2,000 feet to the southwest. Maximum noise levels at these receptors would be approximately 49 dBA. Therefore, noise increases generated during construction would be barely perceptible at these sensitive receptors. Furthermore, the city of San Rafael’s noise ordinance would restrict construction activities to between the hours of 7 a.m. and 6 p.m. on Monday through Friday and between the hours of 9 a.m. and 5 p.m. on Saturdays. Construction activities on Sundays and holidays would be strictly prohibited. In addition, the City’s noise ordinance requires that noise levels do not exceed 90 dBA outside of the project plane.

An existing 0.5-million-gallon storage tank located north of the Hangar Avenue and Palm Drive intersection would be rehabilitated to store recycled water. Nearby sensitive receptors would include residences located approximately 500 feet to the east and west of the storage tank. Noise levels at 500 feet would be approximately 64 dBA, which could represent an increase in ambient noise levels. However, construction activities would be required to comply with the City of Novato's noise ordinance as described previously.

As described above, noise levels would be limited to hours set forth in applicable noise ordinances. Construction of pipelines would progress in a linear fashion; thus, receptors would only be exposed to excessive noise levels for a few days. Implementation of **Mitigation Measure 3.9.1** would ensure that the short-term construction noise would not result in significant nuisance impacts by requiring effective sound control devices for stationary construction equipment and by requiring pre-construction notification to nearby residences and sensitive receptors. Implementation of this mitigation measure would ensure that construction noise impacts associated with Phase 1 would be less than significant.

Novato SD/NMWD

Under Phase 1, the Novato SD would construct 9.9 miles of new pipeline to expand its existing service area. Major roadways affected by construction would include Atherton Avenue, Olive Avenue, Redwood Boulevard, DeLong Avenue, Novato Boulevard and S. Novato Boulevard. A large portion of these new pipelines would pass within 50 to 100 feet of existing residential receptors. Other sensitive receptors located near the proposed pipeline route include the Novato Community Hospital, Noah's Ark Preschool, Church of Christ, Montessori School of Novato, Novato United Methodist Church, Pleasant Care Convalescent Hospital, Terry's Teddy Bear Preschool, Hill Middle School, Nova High School, and Olive Elementary School. As shown in **Table 3.9-1**, construction equipment could generate substantial increase in noise levels. Pipeline construction noise levels at 50 to 100 feet can be expected to be up to approximately 101 and 93.5 dBA respectively, assuming that jack and bore tunneling would be required.

Most of the 9.9 miles of new pipeline would be subject to the City of Novato's noise ordinance as defined previously. A small portion of the project located just north of Atherton Avenue would be subject to noise restrictions set forth in the Marin County Code and the Marin Countywide Plan.

Two new pump stations associated with the Novato SD would be constructed as part of Phase 1 implementation. The first pump station would be located at the existing Davidson Street WWTP. The nearest sensitive receptors to the WWTP are residences located approximately 150 feet north of the WWTP. Noise levels could be as high as 77 dBA at these receptors. The WWTP is located in the city of Novato and construction would therefore be subject to the noise restrictions for the City as described above. The second pump station would be installed near the intersection of Atherton Avenue and Olive Avenue. There are residential receptors located along Atherton Avenue that could be affected by construction noise. Construction activities at this site would fall under the jurisdiction of unincorporated Marin County, and would be required to abide by Marin County construction noise restrictions as described above.

A 0.5-million gallon storage tank located north of Olive Avenue would be rehabilitated and used for recycled water storage. The nearest sensitive receptor is a residence located approximately 100 feet south of the existing storage tanks. This receptor could be exposed to noise levels up to 81.5 dBA; however construction would be limited by noise restrictions set forth in the City of Novato's municipal code.

As described above, noise levels generated during construction of Phase 1 would be limited by the noise ordinance set forth in the City of Novato Municipal Code and the Marin County Code. The construction activities within the Novato SD would not likely violate a local code or standard. With implementation of **Mitigation Measure 3.9.1**, potential noise impacts from construction activities would be less than significant.

SVCSD

Phase 1 would include construction of approximately 5.2 miles of new pipeline to distribute treated wastewater from the SVCSD WWTP. The new pipeline alignments would be constructed primarily along existing roads, including: Highway 116 (Stage Gulch Road); Arnold Drive; and Watmaugh Road. There are a number of residential properties located within 50 feet of the western edge of Arnold Drive between Leveroni Road and Watermaugh Road. Broadway is also lined with residential receptors. Other sensitive receptors that could be affected by construction noise include Adele Harrison Middle School, Sonoma Valley High School, Presentation School, and Sonoma Seventh Day Adventist Church. Some of these receptors are located within 100 feet of Broadway. The noise levels would be similar to those discussed under Novato SD above.

The proposed pipelines associated with the SVCSD system would be located in the city of Sonoma and in unincorporated Sonoma County. The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the County. However, pursuant to **Mitigation Measure 3.9-1**, construction activities in unincorporated Sonoma County would be limited to between the hours the 7 a.m. and 6 p.m. on weekdays and from 9 a.m. to 5 p.m. on Saturdays. According to the City of Sonoma noise ordinance, construction activities are only permitted between the hours of 8 a.m. and 6 p.m. on Monday through Friday, between 9 a.m. and 6 p.m. on Saturdays, and between 10 a.m. and 6 p.m. on Sundays and holidays. Additionally, pursuant to the City code, noise levels generated by construction equipment must not exceed 90 dBA at any point outside of the construction site. Noise levels generated from jack and bore tunneling and directional drilling could exceed 90 dBA outside of the construction sites and would remain above 90 dBA up to a distance of approximately 150 feet, which would be an apparent violation of the City's municipal code. Depending on the specific locations of the jack and bore and directional drilling locations relative to existing sensitive receptor locations, project impacts could be potentially significant.

A new pump station and pond would be constructed at the existing SVCSD WWTP. There are a few residential receptors located within approximately 500 feet of the existing WWTP. Therefore, nearby receptors could be exposed to noise levels as high as 64 dBA. Construction activities would be limited by the City of Sonoma's noise ordinance as defined above.

As described above, noise levels during construction of Phase 1 would be limited to the hours set forth in the City of Sonoma noise ordinance. Implementation of **Mitigation Measure 3.9.1** would further reduce potential noise impacts to less than significant levels, with the exception of jack and bore and hammer bore construction activities, which could remain potentially significant and unavoidable depending on the specific locations of those activities.

Under Phase 1, the Napa Salt Marsh Restoration Project would include construction of one of the three alternative pipelines to the salt ponds as discussed in **Chapter 2, Project Description**). Both the proposed pipeline alignment and the Alternative Routes would traverse areas of cultivated vineyard and open areas. There are no sensitive receptors along the proposed alignment. There is one winery located near Ramal Road and Buchli Station Road that would potentially be affected by construction activities for a short period. A new pump station would be constructed at the existing WWTP. There are a few residential receptors located within approximately 500 feet of the existing WWTP. Therefore, nearby receptors could be exposed to noise levels as high as 64 dBA. Construction activities would be limited by the City of Sonoma's noise ordinance as defined above. As described above, noise levels during construction of Phase 1 would be limited to the hours set forth in the City of Sonoma noise ordinance. Implementation of **Mitigation Measure 3.9.1** would further reduce potential noise impacts to less than significant levels, with the exception of jack and bore and hammer bore construction activities, which could remain potentially significant and unavoidable depending on the specific locations of those activities.

Napa SD

Construction of new pipelines associated with the Napa SD would cause temporary increases in ambient noise levels. The proposed pipelines would primarily be constructed along Imola Avenue, 4th Avenue, Kreuzer Lane, Coombsville Road, Wild Horse Valley Road, First Avenue, Hagen Road, Second Avenue, Third Avenue, East 3rd Avenue, North 3rd Avenue, North Avenue, Olive Hill Lane, Magnolia Drive, Biava Lane, Kirkland Road, La Londe Lane, and Loma Heights Road. There are a number of residences along these roadways that could be impacted by temporary construction noise. Other sensitive receptors located within close proximity of the proposed pipelines include the Napa Children's Center and Mount Saint George Elementary School. The noise levels would be similar to those discussed under Novato SD and SVCSD.

The portion of pipeline that would extend from Highway 29 along Imola Avenue to Soscol Avenue would be located in the City of Napa. The remainder of the proposed pipeline would be within unincorporated Napa County.

Construction activities within the city of Napa are limited to between the hours of 7 a.m. to 7 p.m. on Monday through Friday and between the hours of 8 a.m. and 4 p.m. on weekends and holidays. The City also prohibits start up of machines and equipment prior to 8 a.m. and prohibits delivery of material prior to 7:30 a.m. and after 5:00 p.m. on Monday through Friday. Furthermore, all muffler systems on construction equipment used in the City must be properly maintained and construction and grading equipment must be shut down when not in use.

Construction activities within Napa County are limited to between the hours of 7 a.m. to 7 p.m. Furthermore, it is recommended that when economically and technically feasible, construction noise levels shall not exceed 75 dBA at residential receptors, 80 dBA at commercial receptors, and 85 dBA at industrial receptors. Assuming that there would be residences located within 50 feet of construction activities, it is likely that noise levels at residential receptors would exceed the recommended noise level of 75 dBA, especially if jack and bore tunneling or directional drilling is required near residential receptors. However, due to the nature of the linear nature of pipeline construction, construction equipment would not remain within close proximity to any one receptor for an extended period of time. Furthermore, implementation of **Mitigation Measure 3.9-1** would reduce noise levels and associated nuisance impacts to the maximum extent feasible, resulting in less than significant impacts.

Four new pump stations associated with the Napa SD would be constructed under implementation of Phase 1. These pump stations would be installed adjacent to Imola Avenue, Coombsville Road/Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. The pump station on Imola Avenue would be located within close proximity to the Napa Children's Center as well as a number of existing residences. The pump stations on Coombsville Road/Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue would be located in more rural areas; however, there would still be some residential receptors in the vicinity of the new pump stations. Construction activities associated with these pump stations would be subject to the noise restrictions for Napa County as described previously. As with construction of pipelines, it is likely that these activities would result in noise levels above 75 dBA at residential receptors. However, implementation of **Mitigation Measure 3.9.1** would reduce these impacts to the maximum extent feasible and impacts from pump station construction would be less than significant.

Upgrades to the existing WWTP could result in noise levels from construction equipment. However there are no sensitive receptors located within a mile of the existing WWTP; therefore, these levels would not negatively impact a sensitive receptor.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The temporary construction noise impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. However, implementation of **Mitigation Measure 3.9.1** would reduce these impacts to less than significant. A discussion of temporary construction noise impacts by Member Agency is provided below.

LGVSD/NMWD

In addition to impacts associated with construction of Phase 1, the Basic System would require additional upgrades to the existing LGVSD WWTP and rehabilitation of one existing 0.5 million gallon reservoir in the southern portion of the Novato Urban Recycled Water Action area. Equipment used during these activities would generate temporary substantial noise levels; however, use of this equipment would be regulated by noise restrictions set forth in applicable noise ordinances. Therefore, with implementation of **Mitigation Measure 3.9.1** for the additional components, the impacts would be less than significant.

Novato SD/NMWD

The Basic System would include additional pipeline to extend the Novato SD service area to the northern and central portions of the Novato Urban Recycled Water Action area, including the Stone Tree Golf Course. This new pipeline would generally follow Highway 37 and would pass by a few residential receptors located within close proximity to Stone Tree Golf Course, thereby temporarily increasing noise levels at these residences. However, construction activities would be limited by the City of Novato and Marin County noise ordinances as described above. Furthermore, implementation of **Mitigation Measure 3.9.1** would reduce any additional impacts to a less than significant level.

One existing 0.5-million gallon reservoir in the northern portion of the Novato Urban Recycled Water Action area would be rehabilitated for recycled water use and upgrades would be made to the existing Novato SD WWTP. Equipment used during these activities could generate temporary substantial noise levels; however, use of this equipment would be regulated by applicable noise ordinances. With implementation of **Mitigation Measure 3.9.1**, impacts would be less than significant.

SVCSD

In addition to pipelines constructed under Phase 1, the pipeline along Arnold Drive would extend north to bring recycled water towards the Sonoma Valley Golf Club. Along Arnold Drive, construction equipment would pass within close proximity to a number of existing residents as well as the Little Shepherd Pre-School and Altimira Middle School. As mentioned previously, County of Sonoma has not set noise limitations for construction activities. However, **Mitigation Measure 3.9.1** would restrict construction activities to daytime hours within unincorporated areas of Sonoma County. With implementation of **Mitigation Measure 3.9.1**, the impacts would be less than significant, with the exception of jack and bore and hammer bore construction activities, which could remain potentially significant depending on the specific locations of those activities.

A new recycled water pond would be constructed near the existing SVCSD WWTP. Please refer to the discussion under Phase 1. With implementation of **Mitigation Measure 3.9.1**, the impact would be less than significant.

Napa SD

The Basic System would include construction of additional pipeline to serve the Carneros East Service Area. This pipeline would primarily cross through agricultural and open space lands and

would therefore be unlikely to affect a sensitive receptor. In addition to new pipeline, existing ponds at the Napa SD WWTP would be reconfigured for recycled water storage. As mentioned previously, there are no sensitive receptors within a mile of the Napa SD WWTP. Please refer to the discussion under Phase 1. Implementation of **Mitigation Measure 3.9.1** would further reduce any potential impacts.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary construction noise impacts associated with the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. As with Phase 1 and the Basic System, implementation of **Mitigation Measure 3.9.1** would reduce impacts to a less-than-significant level. A discussion of temporary construction noise impacts by Member Agency is provided below.

LGVSD/NMWD

Under the Partially Connected System, the existing LGVSD pipeline system would be extended to serve the Peacock Gap Golf Course Reuse Area. This pipeline would extend within close proximity to a number of residents, schools and churches located on or near North San Pedro Drive as well as residents located near the Peacock Gap Golf Course. Therefore, temporary increases in noise levels from construction activities could negatively impact these receptors. Portions of the proposed pipeline would fall under the jurisdiction of the city of San Rafael; however, most of the pipeline would be located in unincorporated Marin County. As discussed previously, the City of San Rafael requires that construction noise levels do not exceed 90 dBA at any point outside the property line. Therefore, if jack and bore tunneling or directional drilling would be required within 150 feet of the construction site boundary, impacts would be potentially significant. Implementation of **Mitigation Measure 3.9.1** would reduce impacts to the most extent feasible.

An existing 0.5-million gallon drinking water reservoir near the Peacock Gap Golf Course would be rehabilitated for recycled water storage. Construction activities associated with reservoir rehabilitation would be limited by noise restrictions set forth by the Marin County Code. Therefore, with implementation of **Mitigation Measure 3.9.1** impacts would be less than significant.

Novato SD/NMWD

Novato SD would install additional pipelines to serve the northern, central and western portions of the Novato Urban Recycled Water Action area. New pipeline heading north from Hill Road and Diablo Avenue would traverse through an existing residential community and would potentially pass within close proximity to a number of schools and churches. New pipeline heading south from Main Gate Road would also be likely to pass through existing residential

neighborhoods. These new pipelines would be located in either the city of Novato or Marin County and would therefore be subject to the noise ordinances for these jurisdictions. As with Alternative 1, construction noise impacts would be less than significant with implementation of **Mitigation Measure 3.9.1**.

Two existing 0.5-million gallon drinking water reservoirs in the northern and western portions of the Novato Urban Recycled Water Action area would be rehabilitated for recycled water storage. Construction equipment used for rehabilitation could result in substantial noise levels that would have the potential to affect a sensitive receptor; however, these activities would be limited by applicable noise ordinances. Furthermore, implementation of **Mitigation Measure 3.9.1** would reduce any potentially significant noise impacts to less than significant.

SVCSD

Under the Partially Connected System, SVCSD would construct additional pipeline to serve the Carneros West service area as well as the Southern Sonoma Valley service area. New pipeline in the Carneros West service area would transverse through primarily agricultural and open space lands. The Napa County noise ordinance would limit construction activities associated with the Carneros East pipeline. New pipeline used to serve the Southern Sonoma Valley service area would generally pass through rural and agricultural areas, only passing within close proximity to a few residential receptors. This pipeline would fall under the jurisdiction of Sonoma County. With implementation of **Mitigation Measure 3.9.1**, impacts from construction of these pipelines would be less than significant.

SVCSD would construct a new storage pond near the existing SVCSD WWTP and would also develop additional system storage in the Carneros Service Area. These activities could generate substantial noise levels; however with implementation of **Mitigation Measure 3.9.1** impacts would be less than significant.

Napa SD

Napa SD would extend service to the Napa MST service area under implementation of the Partially Connected System. This would require construction of a new pipeline that would potentially pass within close proximity to existing residential receptors. Construction activities would generate substantial noise levels; however the Napa County noise ordinance would restrict these levels. Implementation of **Mitigation Measure 3.9.1** would reduce impacts to less than significant.

In addition to new pipelines, Napa SD would construct a new 1.5-million gallon storage reservoir in the MST area. Construction activities associated with the proposed reservoir could impact a number of sensitive receptors depending on where the reservoir is located; however, construction activities used to develop the new reservoir would be required to comply with all applicable noise ordinances. Furthermore, implementation of **Mitigation Measure 3.9.1** would reduce impacts to less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary construction noise impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. However, with implementation of **Mitigation Measure 3.9.1** these impacts would be less than significant. A discussion of temporary construction noise impacts by Member Agency is provided below.

LGVSD/NMWD

Additional upgrades at the LGVSD WWTP could generate temporary noise increase. However, as discussed above for the other alternatives, these impacts would be limited by applicable noise ordinances. Furthermore, with implementation of **Mitigation Measure 3.9.1** impacts would be less than significant.

Novato SD/NMWD

Upgrades to the Novato SD WWTP could generate temporary noise increase from use of heavy duty equipment. However, as discussed above for the other alternatives, these impacts would be limited by applicable noise ordinances. Furthermore, with implementation of **Mitigation Measure 3.9.1** impacts would be less than significant.

SVCSD

SVCSD would construct an additional pipeline segment to connect to the Novato SD, thereby connected all four systems. This pipeline would be constructed through the Sears Point area and would not pass by a large number of sensitive receptors. As mentioned previously, Sonoma County has not adopted a noise ordinance; therefore the construction activities associated with this additional length of pipeline would be subject to the City of Sonoma noise ordinance. With implementation of **Mitigation Measure 3.9.1** impacts would be less than significant.

Napa SD

Upgrades to the Napa SD WWTP could generate temporary noise increase from use of heavy duty equipment. However, as discussed above for the other alternatives, there are no sensitive receptors located within close proximity to the facility. Furthermore, with implementation of **Mitigation Measure 3.9.1** impacts would be less than significant.

Mitigation Measures

Mitigation Measure 3.9.1: The appropriate Member Agency shall develop and implement a Construction Noise Reduction Plan that requires, at a minimum, the following:

- The contractor shall locate all stationary noise-generating equipment, including hammer bore and drill rigs, as far as possible from nearby noise-sensitive receptors. Stationary noise sources located within 500 feet of noise-sensitive receptors shall be equipped with noise reducing engine housings, and the line of sight between such sources and nearby sensitive receptors shall be blocked by portable acoustic barriers.
- The contractor shall assure that construction equipment with internal combustion engines have sound control devices at least as effective as those provided by the original equipment manufacturer. No equipment shall be permitted to have an un-muffled exhaust.
- All construction activities within unincorporated Sonoma County shall be limited to between the hours of 7 a.m. and 6 p.m. on weekdays and between 9 a.m. and 5 p.m. on Saturdays.
- Residences and other sensitive receptors within 200 feet of a construction area shall be notified of the construction schedule in writing, at least two weeks prior to the commencement of construction activities. This notice shall indicate the allowable hours of construction activities as specified by the applicable local jurisdiction or as defined by this mitigation measure. The construction contractor shall designate a noise disturbance coordinator who would be responsible for responding to complaints regarding construction noise. The coordinator shall determine the cause of the complaint and ensure that reasonable measures are implemented to correct the problem. A contact number for the noise disturbance coordinator shall be conspicuously placed on construction site fences and entrances and included in the construction schedule notification sent to nearby residences and sensitive receptors.

Impact Significance after Mitigation: Less than Significant.

Impact 3.9.2: Temporary vibration impacts. Construction activities could expose sensitive receptors to excessive ground-borne vibration levels. (Less than Significant with Mitigation)

Building damage is typically the primary issue concerning temporary construction impacts from vibration. Construction activities that may result in temporary vibration impacts include jack and bore tunneling and directional drilling. These construction techniques would be used when open trenching is not feasible due to limited construction area, geotechnical conditions, or presence of sensitive biological resources such as wetlands or riparian habitat.

Table 3.9-2 displays typical vibration levels associated with jack and bore tunneling and directional drilling. Sturdy buildings constructed with reinforced-concrete, steel or timber can typically be exposed to PPV levels of up to 0.50 inches per second without being damaged; however, more fragile buildings can be damaged by a PPV level of 0.12 inches per second (FTA, 2006). As shown, jack and bore tunneling could cause damage to sturdy structures within 25 feet of the construction site or to fragile structures within 75 to 100 feet of the construction site. Therefore, impacts from vibration generated during jack and bore tunneling would be potentially significant. Directional drilling activities would not cause ground borne vibrations that could cause structural damage to existing buildings; therefore, directional drilling activities would have a less–than-significant impact in regards to vibration.

TABLE 3.9-2
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

	Peak Particle Velocity (inches per second)	
Distance (feet)	**Jack and Bore[a]**	**Directional Drilling[b]**
25	0.644	0.089
50	0.228	0.031
75	0.124	0.017
100	0.081	0.011
150	0.044	0.006

[a] Peak particle velocities from jack and bore operations were assumed to be comparable to impact pile driving techniques.
[b] Peak particle velocities from directional drilling operations were assumed to be comparable to drilling techniques.

SOURCE: FTA, 2006.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. Therefore, there would be a decreased chance that jack and bore tunneling would cause damage to existing structures. Nevertheless, if jack and bore tunneling would be employed within 100 feet of a fragile structure or 25 feet of a sturdy structure, impacts would be potentially significant.

For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.9-1, No Action).

Under future baseline (2020) conditions, noise conditions within the region would likely continue being regulated by the local ordinances. Operation of proposed facilities could contribute to noise. However implementation of **Mitigation Measure 3.9.2**, which includes development and implementation of a Construction Vibration Mitigation Plan and the use of trenchless technology, would reduce the impact to less-than-significant-level. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Novato SD/ NMWD and SVCSD

Refer to the discussion above and **Mitigation Measure 3.9.2**.

Napa SD

There would be no project facilities constructed under the No Action Alternative; therefore, no impact would occur.

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

Under Phase 1, LGVSD would upgrade tertiary treatment capacity at the LGVSD and construct a new booster pump station; NMWD would install one of three pipeline options, described in **Chapter 2, Project Description**, which would connect the LGVSD WWT Recycled Water Treatment Facility to facilities constructed by NMWD. The temporary vibration impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative.

Most of the pipeline, for all options, under Phase 1 would be installed along existing roadways and would not require use of jack and bore tunneling. However, if jack and bore tunneling would be required near existing structures, impacts from ground borne vibration would be potentially significant. Implementation of **Mitigation Measure 3.9.2** would require the construction contractor to use alternatives to jack and bore tunneling when activities would take place within 100 feet of an existing structure. If use of other trenchless technologies such as directional drilling or pipeline suspension would not be feasible, the contractor would be required to develop a Construction Vibration Mitigation Plan to ensure that no structures would be damaged by proposed activities. With implementation of **Mitigation Measure 3.9.2**, impacts would be less than significant. A discussion of temporary vibration impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, impacts associated with construction of pipelines at stream crossings would be similar to those discussed above. The impacts would occur in primarily residential areas and open recreational areas. With implementation of **Mitigation Measure 3.9.2**, impacts would be less than significant.

Novato SD/NMWD

A jack and bore crossing under U.S. 101 from Rowland Boulevard to Redwood Boulevard is proposed as part of Novato SD's Phase 1 projects. This crossing would be located within close

proximity to a number of existing structures and would therefore have a potentially significant vibration impact. Please refer to the discussion under LGVSD.

SVCSD and Napa SD

Please see discussion above.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The temporary vibration impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of temporary vibration impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Implementation of the Basic System would include construction of an additional 24 miles of new pipeline not included as part of Phase 1. Most of this additional pipeline would be installed in rural or undeveloped lands where use of jack and bore tunneling to construct the additional pipeline would be less likely to cause damage to existing structures. However, if jack and bore tunneling would be required near existing structures, impacts from ground borne vibration would be potentially significant. As with Phase 1, implementation of **Mitigation Measure 3.9.2** would reduce impacts from the Basic System construction to less than significant.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary vibration impacts associated with the proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of temporary vibration impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The impacts associated with Partially Connected System would be essentially equivalent to the impacts discussed for the Basic System; however, the Partially Connected System would include construction of an additional 57 miles of new pipeline. A significant portion of this pipeline

would pass within close proximity to existing structures. Therefore, use of jack and bore tunneling during construction of this additional pipeline would have an increased potential to cause damage to existing structures in the area. Implementation of **Mitigation Measure 3.9.2** would reduce these impacts to less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The temporary vibration impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of temporary vibration impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Most of the new pipeline proposed under the Fully Connected Alternative would be constructed in rural or undeveloped areas. Therefore, it is unlikely that jack and bore tunneling from the Fully Connected System would have an increased risk of causing damage to existing structures. Implementation of **Mitigation Measure 3.9.2** would help ensure that ground borne vibrations would not cause damage to existing structures and impacts would be less than significant.

Mitigation Measure

Mitigation Measure 3.9.2: The appropriate Member Agency will implement the following measure:

> The construction contractor shall use a trenchless technology (e.g., horizontal directional drill, lateral drilling, etc.) other than jack and bore when there are structures within 100 feet of the proposed activities. If the construction contractor provides the Member Agency with acceptable documentation indicating that alternative trenchless technology is not feasible for the crossing, the contractor shall develop and implement a Construction Vibration Mitigation Plan to minimize construction vibration damage using all reasonable and feasible means available, including siting the jack and bore as far a possible from all nearby structures. The plan shall provide a procedure for establishing thresholds and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan should also include the development of a vibration monitoring plan to be implemented during construction of particular crossing.

Impact Significance after Mitigation: Less than Significant

Impact 3.9.3: Permanent increases to ambient noise levels. Operational activities could permanently generate noise levels above existing ambient levels in the vicinity of sensitive receptor locations. (Less than Significant with Mitigation)

Operation of the facilities included in the NBWRP would not require extensive operation and maintenance activities. Therefore, operational noise levels resulting from mobile sources as a result of employee commute trips or material haul trip would not be expected to increase ambient noise levels in the project vicinity. Impacts would be less than significant from all vehicle trips associated with operation and maintenance of the NBWRP.

New recycled water pipelines would be located beneath the ground and would not generate noise that would be audible at sensitive receptors. Therefore, operational noise impacts from the pipelines would be less than significant.

New storage facilities developed under the NBWRP would involve passive storage of recycled water and would therefore not generate noise levels that could increase existing ambient noise levels. Therefore, operation of all new storage facilities constructed as part of the NBWRP would have a less than significant impact on ambient noise levels.

Distribution and booster pump stations could generate noise levels that would have the potential to permanently increase ambient noise levels. **Table 3.9.3** shows typical noise levels generated by operation of pumps at various distances. These values are based on the assumption that a typical pump produces a noise level of up to 76 dBA at 50 feet from the source.

TABLE 3.9-3
TYPICAL NOISE LEVELS FROM OPERATION OF NEW PUMP STATIONS

Distance (Feet)	Noise Level (dBA)[a]
50	76.0
100	68.5
250	58.5
500	51.0
1000	43.5
2000	35.9

[a] Noise levels are based on how noise attenuates across a soft site.

SOURCE: FTA, 2006.

No Project Alternative

The NBWRP would not be implemented under the No Project Alternative, therefore no impact would occur. For a discussion of the No Project under future conditions, see No Action Alternative below.

No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding.

Under future baseline conditions (2020), noise conditions within the region would likely continue being regulated by the local ordinances. For comparison to the Action Alternatives, it is estimated that approximately 17.5 miles of new pipeline, 912 HP of pumping capacity, treatment facilities providing 0.5 mgd of tertiary capacity, and approximately 65 AF of storage would be constructed by Member Agencies on an individual basis (see Chart 3.9-1). However, implementation of **Mitigation Measure 3.9.3** would reduce potentially significant impacts to less-than-significant levels. A discussion of individual Member Agencies is provided below.

LGVSD/NMWD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur

Novato SD/NMWD and SVCSD

Refer to the discussion above and **Mitigation Measure 3.9.3**.

Napa SD

There would be no project facilities constructed under the No Action Alternative, therefore no impact would occur

Phase 1 (Project level)

Compared to the CEQA Baseline, Phase 1 projects would provide 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 6.4 mgd of tertiary capacity, and 65 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Phase 1 projects would provide 28 miles of new pipeline, 743 HP of pumping capacity, treatment facilities providing 5.9 mgd of tertiary capacity, and no additional storage.

The ambient noise impacts associated with the proposed facilities under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of ambient noise impacts by Member Agency is provided below.

LGVSD/NMWD

Implementation of Phase 1 would require modifications at the LGVSD WWTP, and installation of a new booster pump station at the existing LGVSD WWTP. The nearest residential receptors that could potentially be affected by operation of NBWRP components at the WWTP site are located approximately 2,000 feet south west of the WWTP. As demonstrated in Table 3.9.3, noise levels generated by typical pump stations would be approximately 35.9 dBA at these receptors. Therefore, noise generated by the new pump station would not exceed the City of San Rafael's

exterior noise level standards of 50 dBA during daytime hours and 40 dBA during nighttime hours at residential receptors. The impact associated with the pump station would be less than significant.

Novato SD/NMWD

Two new pump stations associated with the Novato SD would be constructed under Phase 1 implementation. The first pump station would be located at the existing Davidson Street WWTP. The nearest sensitive receptors to the Davidson Street WWTP are residences located approximately 150 feet north of the WWTP. Noise levels could be as high as 64.1 dBA at the nearest receptors. This new pump station would be located in the City of Novato, which limits exterior noise levels at residential receptors to 60 dBA during daytime hours and 45 dBA during nighttime hours. Therefore, the new pump station would have the potential to violate exterior noise standards and impacts would be potentially significant.

The second pump station would be installed near the intersection of Atherton Avenue and Olive Avenue. The new pump station could be located with 100 feet of residential receptors located along Atherton Avenue. The Marin County Code does not set exterior noise level standards; however, it can be assumed that noise levels of 68.5 dBA at nearby receptors would be potentially significant and could result in an increase in ambient noise levels.

Implementation of **Mitigation Measure 3.9.3** would reduce potentially significant impacts from new pump stations by reducing noise levels by a minimum of 20 dBA. Therefore, the impacts would be less than significant with mitigation.

SVCSD

A new pump station would be constructed at the existing SVCSD WWTP. There are a few residential receptors located within approximately 500 feet of the existing WWTP. As demonstrated in Table 3.9-3, receptors at 500 feet could be exposed to noise levels up to 51 dBA from operation of the proposed pump station. This would exceed the County of Sonoma's noise level standards of 50 dBA during daytime hours and 45 dBA during nighttime hours. Implementation of **Mitigation Measure 3.9.3** would reduce noise levels by a minimum of 20 dBA, thereby reducing the impacts from the new pump station to less than significant.

Napa SD

Four new pump stations associated with the Napa SD would be installed under implementation of Phase 1. These pump stations would be located on Imola Avenue, Wild Horse Valley Road, East 3rd Avenue and 3rd Avenue. The pump station on Imola Avenue would be located within a few hundred feet of residential receptors. Therefore, assuming worst-case conditions, nearby residences would be exposed to noise levels of 68.5 dBA from pump station operations. These noise levels would be well above the Napa County exterior noise levels of 55 dBA during daytime hours and 45 during nighttime hours at suburban residential receptors. Therefore, the impacts would be potentially significant.

The pump stations on Coombsville Road/Wild Horse Valley Road, East 3rd Avenue and 3rd Avenue would be located primarily in the rural areas of the County; however, they would still have the potential to be located within close proximity to rural residences. Assuming that residential receptors are located within 100 feet of the proposed pump station, these receptors could be exposed to noise levels of up to 68.5 dBA. Such noise levels would be well above the Napa County exterior noise level limits of 50 dBA during daytime hours and 45 dBA during nighttime hours at rural residential receptors. Therefore, the impacts would be potentially significant. Implementation of **Mitigation Measure 3.9-3** would reduce impacts from pump operations. to less than significant levels.

Alternative 1: Basic System (Program level)

Compared to the CEQA Baseline, the Basic System projects would provide 83 miles of new pipeline, 2,158 HP of pumping capacity, treatment facilities providing 7.8 mgd of tertiary capacity, and 1,020 AF of storage. Compared to the No Action Alternative (NEPA Baseline), Basic System would provide 65 miles of new pipeline, 1,246 HP of pumping capacity, treatment facilities providing 7.3 mgd of tertiary capacity, and 955 AF of storage.

The ambient noise impacts associated with the proposed facilities under the Basic System would be equivalent to and greater than the impacts discussed for Phase 1, in proportion to the facilities constructed under this alternative. A discussion of ambient noise impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

Implementation of the Basic System would increase power from new and existing pump stations by approximately 460 horsepower more than required under implementation of Phase 1. Operation of new and upgraded pump stations could result in increases to ambient noise levels at existing sensitive receptors depending on where the stations are located with respect to sensitive receptors. Implementation of **Mitigation Measure 3.9.3** would ensure that all new and upgraded pump stations would be designed and located so they would not violate applicable noise standards at nearby residences. Therefore, any potentially significant impacts from operation of new and upgraded pump stations would be mitigated to less than significant levels.

Alternative 2: Partially Connected System (Program level)

Compared to the CEQA Baseline, the Partially Connected System would provide 139 miles of new pipeline, 3,454 HP of pumping capacity, treatment facilities providing 15.9 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Partially Connected System would provide 122 miles of new pipeline, 2, 542 HP of pumping capacity, treatment facilities providing 15.4 mgd of tertiary capacity, and 2,155 AF of storage.

The ambient noise impacts to proposed facilities under the Partially Connected System would be equivalent to and greater than the impacts discussed for the Basic System, in proportion to the facilities constructed under this alternative. A discussion of ambient noise impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/ NMWD, SVCSD, Napa SD

Implementation of the Partially Connected System would increase power from new and existing pump stations by almost 1,600 horsepower above that required under implementation of the Basic System. Operation of new or upgraded pump stations could result in increases to ambient noise levels at existing sensitive receptors; therefore, impacts would be potentially significant. However, with implementation of **Mitigation Measure 3.9.3**, impacts would be less than significant.

Alternative 3: Fully Connected System (Program level)

Compared to the CEQA Baseline, the Fully Connected System would provide 153 miles of new pipeline, 5,021 HP of pumping capacity, treatment facilities providing 20.8 mgd of tertiary capacity, and 2,220 AF of storage. Compared to the No Action Alternative (NEPA Baseline), the Fully Connected System would provide 135 miles of new pipeline, 3, 907 HP of pumping capacity, treatment facilities providing 20.3 mgd of tertiary capacity, and 2,155 AF of storage.

The ambient noise impacts under the Fully Connected System would be equivalent to and greater than the impacts discussed for the Partially Connected System, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD, Novato SD/NMWD, SVCSD, Napa SD

The Fully Connected System would require approximately 1,360 horsepower of additional pumping capabilities than required under implementation of the Partially Connected System. This additional capacity would be achieved through upgrades to existing pump stations along with construction of new pump stations. Operation of new and upgraded facilities could result in permanent increases to ambient noise levels and would have the potential to violate an applicable noise ordinance. However, implementation of **Mitigation Measure 3.9.3** would reduce these impacts to less than significant.

Mitigation Measure

Mitigation Measure 3.9.3: The appropriate Member Agency shall implement the following measure:

- All new pump stations shall be located within enclosed structures with adequate setback and screening to achieve acceptable regulatory noise standards for industrial uses as well as to achieve acceptable levels at the property lines of nearby residences, as determine by the applicable local jurisdiction. Noise enclosures shall be designed to reduce equipment noise levels by at least 20 dBA.

Impact after Significance: Less than Significant.

3.9.4 Impact Summary by Service Area

Table 3.9-4 provides a summary of potential land use impacts associated with implementation of the NBWRP.

TABLE 3.9-4
POTENTIAL IMPACTS AND SIGNIFICANCE – NOISE

Proposed Action	Impact by Member Agency Service Areas			
	LGVSD/ NMWD	Novato SD/ NMWD	SVCSD	Napa SD/ Napa County
Impact 3.9.1: Temporary increase in noise levels.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1	LSM	LSM	LSM	LSM
Alternative 2	LSM	LSM	LSM	LSM
Alternative 3	LSM	LSM	LSM	LSM
Impact 3.9.2: Temporary vibration.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LSM	LSM	LSM	LSM
Alternative 1	LSM	LSM	LSM	LSM
Alternative 2	LSM	LSM	LSM	LSM
Alternative 3	LSM	LSM	LSM	LSM
Impact 3.9.3: Permanent increases to ambient noise levels.				
No Project Alternative	NI	NI	NI	NI
No Action Alternative	NI	LSM	LSM	NI
Phase 1	LTS	LSM	LSM	LSM
Alternative 1	LSM	LSM	LSM	LSM
Alternative 2	LSM	LSM	LSM	LSM
Alternative 3	LSM	LSM	LSM	LSM

NI = No Impact
LTS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

3.9.5 References

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