City of Palo Alto
Recycled Water Project

Draft Environmental Impact Report

State Clearinghouse No. 2011062037

Volume 1

Prepared by:

April 2015

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Acronyms

AB	Assembly Bill
ACS	American Community Survey
AD	Automobile Dealership Combining District
ADRP	archeological data recovery plan
AFY	acre-feet per year
APE	Area of Potential Effects
ARB	Architectural Review Board
AS3	Alternative Standards Overlay District Three
BAAQMD	Bay Area Air Quality Management District
bgs	Below ground surface
BMP	Best management practices
BMR	Below market value
BO	Biological Opinion
BRA	Biological resources assessment
BUOW	Burrowing owl
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAP	Clean Air Plan
CARB	California Air Resources Board
CCR	California Clapper Rail
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEC	Constituents of emerging concern
CEQA	California Environmental Quality Act
CH_4	Methane
CIMIS	California Irrigation Management Information system
CO	carbon monoxide
CO_2	Carbon dioxide
CO_2e	carbon dioxide-equivalents
CMA	congestion management agency
CNDDB	California Natural Diversity Database
CRAR	Cultural Resources Assessment Report
CRHR	California Register of Historical Resources
CRLF	California Red-legged frog
CPAU	City of Palo Alto Utilities
CR2C	Codiga Resource Recovery Center
CS	Service Commercial
CSSC	California Species of Special Concern
CWA	Clean Water Act
CY	Cubic yard
(D)	Site and Design Review Combining District
DAC	Disadvantaged communities
dB	Decibels
dBA	Decibels (A-weighed scale)

DDWEM	Division of Drinking Water and Environmental Management
dS/m	decisiemen/meter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EAC	Early Action Compact
EC_w	Electrical conductivity
EC_{sw}	Electrical conductivity in soil water
EIR	environmental impact report
EO	Executive Order
EPASD	East Palo Alto Sanitation District
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FPPA	Farmland Protection Policy Act
GHG	Greenhouse gas
GM	General Manufacturing District
gpm	Gallons per minute
GWDP	Groundwater degradation potential
H_2O	water
HCP	Habitat Conservation Plan
HDD	Horizontal directional drilling
hp	Horsepower
IS/MND	Initial Study/Mitigated Negative Declaration
ITAs	Indian Trust Assets
JPB	Joint Powers Board
Ksat	Saturated hydraulic conductivity
lbs	Pounds
L_{dn}	Day-Night Noise Level
L_{eq}	Equivalent Noise Level
LF	Leaching fraction
LOS	Level of service
LSM	Less than Significant with Mitigation (Significant but Mitigable)
LTGS	Long-Term Goals Study
LTS	Less than Significant
MBTA	Migratory Bird Treaty Act
MBTM	Microtunneling boring machine
meq/l	milliequivalent per liter
MEI	Maximally Exposed Individual
MGD	Million gallons per day
mg/L	Milligrams per liter
MHI	Median household income
MMRP	Mitigation and monitoring program
MMT	million metric tons
mph	Miles per hour
MPN	Most probable number
MT	Metric tons

MT/yr	Metric tons per year
MWh	Mega watt hours
N	nitrogen
N_2O	Nitrous oxide
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
ng/l	Nanograms per liter
NI	Not Impact
NO_2	nitrogen dioxide
NO_3	nitrate
NO_x	Nitrogen oxides
NOC	Notice of Completion
NOHA	Northern Harrier
NOI	Notice of intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O&M	Operations and Maintenance
OEHHA	Office of Environmental Health Hazard Assessment
OSHA	Occupational Safety and Health Administration
PAMC	Palo Alto Municipal Code
PC	Planned Community
PF	Public Facilities
PFC	perfluorochemicals
PG&E	Pacific Gas & Electric
PM_2	Fine particulate matter
PM_{10}	particulate matter
PRWISL	Proposed recycled water irrigation screening levels
Psi	Pounds per square inch
R-1	Single-Family Residence District
R&D	Research and development
RE	Residential Estate District
RM-15	Low Density Multiple-Family Residence District
RM-30	Medium Density Multiple-Family Residence District
RM-40	High Density Multiple-Family Residence District
ROG	Reactive organic gases
ROLM	Research, Office, and Limited Manufacturing District
ROLM(E)	Research, Office and Limited Manufacturing Subdistrict - Embarcadero
ROW	Rights-of-way
RP	Research Park District
RWQCB	Regional Water Quality Control Board

RWQCP	Regional Water Quality Control Plant
SAAQS	state ambient air quality standards
SAR	Sodium adsorption ratio
SAT	Soil aquifer treatment
SCADA	Supervisory control and data acquisition
SCVWD	Santa Clara Valley Water District
Sf	Square feet
SFBAAB	San Francisco Bay Area Air Basin
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation officer
SMCY	Salt Marsh Common Yellowthroat
SNMP	Salt and Nutrient Management Plan
SO_2	sulfur dioxide
SRF	State Revolving Fund
SU	Significant and Unavoidable
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic air contaminants
TDS	Total Dissolved Solids
TIRE	Traffic Infusion on Residential Environment
TPZ	Tree protection zone
UBC	Uniform Building Code
UFMP	Urban Forest Master Plan
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tanks
UV	Ultra-violet
UWMP	Urban water management plan
µg/L	Microgram per liter
V/C	volume/capacity ratio
VOC	Volatile Organic Compounds
VTA	Valley Transportation Authority
WDR	Waste discharge requirement
WSA	William Self Associates
WQO	Water quality objective

ES-1 Executive Summary

This environmental impact report (EIR) assesses the potential environmental impacts of the City of Palo Alto Recycled Water Project. This document has been prepared in accordance with California Environmental Quality Act (CEQA) statutes and guidelines. The City of Palo Alto is the lead agency for the CEQA process. Inquiries regarding this document and project should be directed to:

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ES-1.1 Project Overview

The City proposes the *City of Palo Alto Recycled Water Project*, which involves the construction and operation of an expanded recycled water system to deliver recycled water produced by the Regional Water Quality Control Plant (RWQCP) to customers in the City, within South Palo Alto including Alta Mesa Memorial Park, Stanford Research Park and others.

ES-1.1.1 Need for and Objectives of the Project

While the City has adequate potable water supply to meet current demands on average, it faces the need to improve supply reliability during drought periods and emergencies. The City can improve water supply reliability by taking steps locally to manage water demand by providing supplemental water sources, such as the proposed recycled water project.

The primary objective of extending the recycled water pipeline into Palo Alto would be to allow the City to maximize recycled water as a supplemental water source, and would achieve the following:

a. Improve potable water supply reliability by conserving drinking water, currently used for irrigation and other non-potable uses, for potable purposes;
b. Provide a dependable, locally controlled non-potable water source;
c. Increase recycled water use from the Regional Water Quality Control Plant;
d. Secure a non-potable water source that will be available even in droughts to serve irrigation and other non-potable uses; and
e. Reduce reliance on imported water.

The proposed Project would help the RWQCP and its Partners further preserve San Francisco Bay by reducing the wastewater constituent mass loadings to the Bay and provide long-term environmental and economic benefits to the community.

ES-1.1.2 Project Location

The proposed Project is located in the City of Palo Alto, California. The Project area under consideration is illustrated in **Figure ES-1**. The project area consists of up to a 30-foot wide corridor that follows each pipeline segment, and the proposed pump stations depicted in **Figure ES-1**.

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Figure ES-1
Map of Proposed Project Facilities

Pipeline Alignment
- Proposed Alignment
- Pipe Lateral

Alignment Options
- Option 1
- Option 2
- Connection Pipeline

- River
- Pump Station

0 0.5 1 Miles

RMC water and environment

N

San Francisco Bay

Regional Water Quality Control Plant (RWQCP)

See Figure 2-2

Mayfield Soccer Fields

Embarcadero Rd
Embarcadero Way
Oregon Expy
Matadero Creek
Bayshore Rd
Barron Creek
Middlefield Rd
E. Meadow Dr
Fabian Way
El Camino Real
El Dorado Ave
Cowper St
Alma St
Adobe Creek
S California Ave
Hansen Wy
Page Mill Rd
Hanover St
Foothill Expy
Hillview Ave
Deer Creek Rd
Arastradero Rd
101
82
280

SAN FRANCISCO
OAKLAND
PLEASANTON
HAYWARD
LIVERMORE
SAN MATEO
FREMONT
PALO ALTO
PROJECT LOCATION

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Document Path: S:\Projects\038 Palo Alto (SF)\0038-9 Palo Alto RW Facility Plan\D. GIS\EIR GIS\PaloAlto_Alternatives_2oct14.mxd

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ES-1.1.3 Proposed Project

The Palo Alto Recycled Water Project proposes the construction of a recycled water pipeline and associated facilities to provide an alternative water supply for non-potable uses. The proposed Project would involve the construction and operation of the following (see **Figure ES-1**):

- About 5 miles of 12- to 18-inch backbone pipelines;
- About 5 miles of 6- to 10-inch lateral pipelines to over 50 use sites;
- Up to 1,500-square-foot booster pump station along the proposed pipeline;
- Up to 1,600-square-foot pump station at the RWQCP;
- ~0.15 mile of connection pipeline in and north of the RWQCP (on Embarcadero Road);
- Up to 0.15 mile of connection pipeline on East Bayshore Road to connect the proposed pipeline to the existing Mountain View recycled water pipeline.

The Project would initially provide approximately 900 acre-feet per year (AFY) of recycled water, primarily to the Stanford Research Park Area. Future extensions could serve Stanford University and Los Altos Hills, as well as provide a loop by making a second connection to the Phase 2 Mountain View Project. These future extension projects would undergo project specific environmental review as they are proposed by the appropriate lead agency. The predominant use of recycled water for this Project would be landscape irrigation. Some industrial use, such as commercial and light industrial cooling towers, could also be included at a later date.

ES-1.1.4 Project Schedule

Construction of the proposed facilities would be expected to begin in 2018 pending availability of funding and be complete in approximately one year.

ES-1.2 Type of Document

This EIR contains a description of the project, description of the environmental setting, identification of project impacts, mitigation measures for impacts found to be significant, and an analysis of project alternatives. This document complies with CEQA Plus requirements, as the City is applying for State Revolving Fund (SRF) funding[1]. CEQA-Plus documentation includes evaluation of compliance with the Federal Endangered Species Act, National Historic Preservation Act, and the General conformity rule for the Clean Air Act. In addition, it requires evaluation of compliance with the Migratory Bird Treaty Act, policies for protection of wetlands, Coastal Zone Management Act, flood plain management, Farmland Protection Policy Act, and the Wild and Scenic Rivers Act. Because of potential Federal grant funding opportunities, this EIR has also been prepared in compliance with National Environmental Policy Act (NEPA) requirements. The United States Bureau of Reclamation (USBR or Reclamation), as a Lead Agency for NEPA compliance, would be able to use this EIR and other NEPA-required supporting documents, as a basis for decision making for the proposed Action. Thus, this EIR will cover requirements not normally covered under a CEQA-Plus document, including the evaluation of Environmental Justice and Indian Trust Assets.

Because the Project was previously evaluated in an Initial Study/Mitigated Negative Declaration (IS/MND) that was publicly circulated, this EIR focuses on those issues of primary concern identified during the 30-day public comment period for the Draft IS/MND and in the 30-day scoping comment period for the Draft EIR. Thus, three primary issue areas have been identified in *Chapter 3, Environmental Setting, Impacts and Mitigation Measures*. These topics include:

[1] SWRCB would be a responsible agency that will review and consider the information in the environmental document prior to approving the Project.

- Effects of recycled water use for irrigation of landscaped areas (Hydrology and Water Quality)
- Effects of recycled water use on the groundwater basin (Hydrology and Water Quality)
- Effects of recycled water use on the urban forest (Aesthetics)

The remaining environmental topics are addressed in **Appendix E, Environmental Checklist** which contains the Initial Study checklist for the Project. They are retained in the original checklist format to focus attention on the main topics. These sections have been updated as appropriate, to reflect changes in existing conditions and update any other relevant information.

ES-1.3 Summary of Impacts

Table ES-1 provides a summary of potential impacts by topic area, as analyzed in *Chapter 3, Setting, Impacts Analysis/Environmental Consequences, and Mitigation Measures* and **Appendix E**. Only the impacts in Chapter 3 have been assigned a numbering system. The impacts starting from Air Quality and onwards are based on the items identified in the environmental checklist. All identified environmental impacts associated with the proposed Project can be mitigated to less than significant levels, either with the implementation of standard project requirements proposed as part of the Project and/or mitigation measures identified in the analysis. No significant unavoidable impacts would occur from proposed Project implementation.

The potential significant impact of most concern to commenters on the earlier IS/MND draft was **Impact HYD-3** (see **Table ES-1** below), the potential for recycled water to affect redwood trees and other salt sensitive species during landscape irrigation. Stanford University, a key landowner and stakeholder, expressed the concern that Total Dissolved Solids (TDS[2]) in the recycled water exceeding 650 milligrams per liter (mg/L) could adversely affect the health of salt sensitive species. The City has adopted a goal of 600 mg/L TDS based on the engineering feasibility of reducing salinity, and has been pursuing source reduction in sewer lines to meet this goal. RWQCP has been working with its Partners to identify the sources of elevated TDS groundwater and to plan and implement projects that reduce infiltration of TDS into its wastewater and recycled water product. The City and RWQCP Partners have already completed projects that have substantially reduced TDS, and will continue to plan and implement projects that will further reduce TDS levels to strive toward the City's goal of 600 mg/L TDS. **Mitigation Measure HYD-3a** would ensure these projects continue and **Mitigation Measure HYD-3b** would ensure the City monitors water quality parameters to track success. A variety of factors contribute to the response of a landscape to recycled water, including the water quality of the irrigation water, soil characteristics (chemical characteristics, texture of the soil, soil profile, soil drainage, and soil structure), salt-tolerance of landscaped plants, suitability of the plant species to the location, irrigation method and frequency, rainfall amounts, temperature, and degree of soil leaching. TDS and other related parameters in recycled water are expected to achieve the desired concentrations by the time the Project is operated. But regardless of whether recycled water is used or not, it is possible for the health of any tree to decline under certain unfavorable circumstances influenced by the combinations of factors identified above. Proper site management (**Mitigation Measure HYD-3c**) would reduce such effects to less than significant. While not expected, in the unlikely event that the desired water quality is not achieved by the time of project operation, there is potentially a greater risk that certain salt-sensitive plants could be adversely affected by recycled water use. The City is sensitive to concerns of landowners whose properties may be dominated by salt-sensitive tree species, and thus has identified actions that would mitigate the potential for damage to those trees (**Mitigation Measure HYD-3d**).

[2] TDS is a measure of salinity.

Table ES-1: Palo Alto Recycled Water Project Impact Summary, Standard Project Requirements, and Proposed Mitigation Measures

Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Hydrology and Water Quality			
Impact HYD-1: Potential violation of water quality standards and/or waste discharge requirements or otherwise substantially degrade water quality.	LSM	*Best Management Practices – Storm Water Quality* The City shall require contractors to file a Notice of Intent with the Regional Water Quality Control Board (RWQCB) indicating compliance with the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit) and to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) outlining BMPs for construction/post-construction activities as specified by the City of Palo Alto's Pollution Prevention plan sheet, the California Stormwater Best Management Practices Handbook and/or the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures. The BMPs include measures guiding the management and operation of construction sites to control and minimize the potential contribution of pollutants to stormwater runoff from these areas. These measures address procedures for controlling erosion and sedimentation, and managing all aspects of the construction process to ensure control of potential water pollution sources. Erosion and sedimentation control practices typically include: • Performing equipment maintenance at least 100 feet from all water bodies and wetlands, with measures in place to contain spills of diesel fuel, gasoline, or other petroleum products.	No additional mitigation is required.

Notes:
[1]NI = No Impact; NA = Not Applicable; LTS = Less than Significant (no standard project requirements and/or mitigation measures required); LSM = Significant but Mitigable (standard project requirements and / or mitigation measure would reduce potentially significant impacts to less than significant); SU = Significant and Unavoidable.
[2]The determination of impact significance is based in part on the need to implement Standard Project Requirements. The Standard Project Requirements are described in *Chapter 2, Project Description*, and are proposed as part of the Project. However, they are also considered as part of the analysis to mitigate impacts to less than significant. Thus, the standard project requirements would be incorporated as part of the Mitigation Monitoring and Reporting Program (if the Project were to be approved and the EIR to be certified).

Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
HYD-1 (continued)		• Directing drainage from all work sites away from any water bodies or wetlands where feasible; • Preventing erosion of uplands and sedimentation of creeks, tributaries, and ponds; • Minimizing creek bank instability; • Preventing flooding; and • Returning grades to preconstruction contours. • Installation of silt fencing and/or straw wattle; • Soil stabilization; • Revegetation of graded and fill areas with a standard erosion control mix (approved by a native habitat restorationist); • Runoff control to limit increases in sediment in stormwater runoff (e.g., straw bales, silt fences, drainage swales, geofabrics, check dams, and sand bag dikes); A SWPPP that complies with the statewide General Permit shall be developed and implemented to protect water quality of the creeks that lie in the study area. Appropriate erosion and sediment control and non-sediment pollution control (i.e., sources of pollution generated by construction equipment and material) BMPs shall be prescribed in the SWPPP, and erosion and sediment control material included in the SWPPP shall be certified as weed free. Dewatering operations are covered under the General Construction Permit as an authorized non-stormwater discharge. The discharge from dewatering operations would be evaluated and made part of the Project SWPPP. In addition, the Project shall comply with RWQCB regulations and standards to maintain and improve the quality of both surface water and groundwater resources.	

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
HYD-1 (continued)		*Frac-Out Plan* Prior to constructing underground crossings of creeks or channels, a Frac-out Contingency Plan shall be developed. At minimum, the plan shall prescribe the measures to ensure protection of water quality and related biological resources (e.g., aquatic resources, and special-status plants and wildlife) including: • Procedures to minimize the potential for a frac-out associated with horizontal directional drilling; • Procedures for timely detection of frac-outs; • Procedures for timely response and remediation in the event a frac-out; and • Monitoring of drilling and frac-out response activities by a qualified biologist. *Discharge of Exceptional Wastewater* Hydrostatic test water and water collected from dewatering activities (including contaminated water) are discharged to the sanitary sewer with an Exceptional Waste Discharge Permit from RWQCP. The permit requires chemical constituents to be sampled and identifies limits for these constituents. To minimize impacts to water quality, the City shall obtain an Exceptional Wastewater Permit prior to discharge of such waters into the sanitary sewer.	

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Impact HYD-2: Potential to 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 which would result in substantial erosion or siltation on- or off-site.	LSM	See HYD-1 above	No additional mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Impact HYD-3: Potential to result in the substantial decline in health of redwood trees and other salt-sensitive plant species.	LSM	NA	**Mitigation Measure HYD-3a: Source Control of Saline Groundwater.** The City shall continue to line and repair existing sewers to minimize saline groundwater Infiltration. **Mitigation Measure HYD-3b: Monitoring.** The City shall immediately begin quarterly monitoring of salinity (and related constituents) of the recycled water and shall report the rolling 12-month average for comparison to the Palo Alto City Council goal of 600 mg/L TDS. The City shall monitor soil salinity and SAR through semi-annually soil analyses, preferably taken early and late in the irrigation season (approximately April and October). **Mitigation Measure HYD-3c: Site Management.** As a condition of recycled water use, the City shall require the site owners to: 1) Continue to irrigate with recycled water, even during droughts (because recycled water is a drought-proof supply), to meet the water demand of the subject plants and trees; and 2) conduct appropriate best management practices/management actions specified below in the event that protected, low-salt-tolerant trees irrigated with recycled water show signs of decline. a. To avoid plant damage to salt sensitive landscape plants, implement a leaching program to maintain soil salinity within the root zone below 2.0 dS/m and SAR below 6.0. For moderately salt-tolerant plants, maintain soil salinity below 4.0 dS/m. Where subsoils do not drain adequately, installation of subsurface drainage systems may be recommended. Rainfall will satisfy a portion of the leaching requirement, depending on the rate, volume, and distribution through the season. The frequency with which leaching applications should be made depends on several variables, and is triggered by approaching soil salinity thresholds defined above.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
HYD-3 (continued)			b. Apply gypsum prior to leaching when indicated by soil analysis. Gypsum is a soil amendment that, when combined with leaching, helps lower soil sodium concentrations. Gypsum application shall be considered when soil analyses reveal one or more of the following conditions: SAR exceeds 6.0, SAR increases 2 units or more (e.g. 2.3 to 4.3), and/or sodium concentration exceeds 5 meq/l (115 mg/L). The amount of gypsum needed and the frequency of application depend on site-specific soil and water characteristics, and shall be determined by laboratory analysis **Mitigation Measure HYD-3d: Other options to Reduce TDS.** In the event that monitoring results (see Mitigation Measure HYD-3b) show that optimal concentrations of TDS and related parameters will not be achieved prior to operation of the Project (i.e., recycled water application), the City will consider other actions to improve TDS levels, as follows: • The City shall amend its existing Recycled Water Ordinance to include an exemption for redwood trees (and/or other salt sensitive species) from use of recycled water and allow for the use of dual systems so the exempted trees could be irrigated separately using potable water, if desired by individual landowners. • The City shall blend Recycled Water and Potable Water prior to application; or • The City shall treat recycled water to reduce TDS prior to application.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Aesthetics			
Impact AES-1: Substantial degradation of the existing visual character or quality of the site and its surroundings or on a public view or view corridor.	LSM	*Compliance with the Tree Technical Manual* The City of Palo Alto Tree Technical Manual (Dockter 2001) is a separately published document issued by the City Manager, through the Departments of Planning and Community Environment and Public Works to establish specific technical regulations, standards and specifications necessary to implement the Tree Ordinance (Chapter 8.10, Tree Preservation and Management Regulations), and to achieve the City's tree preservation goals and natural resource conservation goals. Section 2.00 specifically addresses the protection of trees during construction; its objective is to reduce the negative impacts of construction on trees to a less than significant level. Construction projects within the tree protection zone (TPZ) of Regulated Trees are required to implement protective practices prior to and during construction. The City would be required to retain a certified arborist to prepare a Tree Protection and Preservation Plan if any activity is within the dripline of a Protected or Designated Tree. The Plan must include an assessment of impacts to trees, recommended mitigation to reduce impacts to a less than significant level, and identification of construction guidelines to be followed through all phases of a construction project.	Implement **Mitigation Measures HYD-3a, 3b, 3c, and 3d**. **Mitigation Measure AES-1: Restoration to Pre-construction Conditions.** The City shall require its contractors to restore disturbed areas to their pre-construction conditions, to the extent consistent with pipeline operations, so that short-term construction disturbance does not result in long-term visual impacts.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Impact AES-1 (continued)		Section 3.00 of the Tree Technical Manual outlines requirements associated with the removal and replacement of regulated trees. The standards and specifications for replacements of trees are dependent on the location where a Protected or Designated Tree would be replaced. If a tree is to be replaced on site, the replacement tree must be the same species unless the Director determines that another species would be more suitable for the location. The location of the replacement tree on site must be approved by the Director. If it is not possible to replace the tree on site, funding for the replacement of trees is calculated using a Tree Value Replacement Standard. The funding is then applied for planting of trees elsewhere. *Architectural Review and Site and Design Review* Architectural Review and/or Site and Design review will be required for all exterior modifications, including hanging pipes, pump stations, and landscaping. The individual components will require approval by the City's Architectural Review Board (ARB) for architectural review, and by the planning commission, ARB, and City Council for site and design review prior to project implementation	
Impact AES-2: Violation of the existing Comprehensive Plan policies regarding visual resources.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Impact AES-3: Creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	LTS	NA	No mitigation is required.
Environmental Justice			
Impact EJ-1: Creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	NI	NA	No mitigation is required.
Agricultural and Forest Resources			
The proposed Project would not result in any impacts related to agricultural and forest resources			
Air Quality			
a) Conflict with or obstruct with implementation of the applicable air quality plan (1982 Bay Area Air Quality Plan & 2000 Clean Air Plan.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.	LSM	*Bay Area Air Quality Management District (BAAQMD) Dust Control Measures* The following basic construction measures are identified by BAAQMD and shall be incorporated into contract specifications and implemented by the contractor. • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day; • All haul trucks transporting soils, sand, or other loose material off-site shall be covered; • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited; • All vehicle speeds on unpaved roads shall be limited to 15 mph • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used; • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.	**Mitigation Measure AIR-1. Two Crew Construction of Proposed Pipeline (using open trench construction technique) and Pump Station Restrictions.** To ensure NO_x emissions do not exceed the BAAQMD threshold, the City shall either: 1. Incorporate into contract specifications the requirement for contractors to limit open trench construction of the proposed pipeline to one crew (rather than two crews) and sequence the pump station construction so that it would be constructed one at a time, not concurrent with any other activity; or 2. Upon refinement of the construction details and assumptions for equipment use, dimensions of the trenches, rate of construction, backfill volume, the City shall rerun the air quality model analysis to confirm whether simultaneous construction of the proposed pipeline or pump stations would result in exceedance of BAAAMD NO_x emissions threshold. If NO_x threshold is exceeded, then the City shall implemented item 1 above. If NO_x threshold is not exceeded, then the City would be able to proceed with concurrent construction of two pipelines (using open trench construction) / two pump stations accordingly.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) (continued)		• Post a publicly visible sign with telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations. The following additional construction mitigation measures identified by BAAQMD shall be incorporated into contract specifications and implemented by the contractor, to supplement the proposed standard project requirement. • All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. • All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. • Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum50 percent air porosity. • Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.	

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) (continued)		• All trucks and equipment, including their tires, shall be washed off prior to leaving the site. • Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch or gravel. • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. • Idling time of diesel powered construction equipment shall be minimized to two minutes. • The project shall develop a plan demonstrating that off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NO_x reduction and 45 percent PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available. • Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings). • All construction equipment, diesel trucks and generators shall be equipped with Best Available Control Technology for emission reductions of NO_x and PM. • All contractors shall use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.	

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).	LSM	See Air Quality, item b) above	Implement **Mitigation Measure AIR-1** above.
d) Expose sensitive receptors to substantial levels of toxic air contaminants.	LTS	See Air Quality, item b) above	Implement **Mitigation Measure AIR-1** above to further reduce LTS impacts.
e) Create objectionable odors affecting a substantial number of people.	LTS	NA	No Mitigation is Required

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
f) Not implement all applicable construction emission control measures recommended in the *Bay Area Air Quality Management District CEQA Guidelines.*	NI	NA	No Mitigation is Required

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Biological Resources			

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	LSM	*Health and Safety and Hazardous Materials Management and Spill Prevention Control Plans*
		
		The City shall require the contractor to prepare a Health and Safety Plan and Hazardous Materials Management and Spill Prevention and Control Plan prior to commencement of construction that includes a project-specific contingency plan for hazardous materials and waste operations. The Health and Safety Plan shall be applicable to all construction activities, and shall establish policies and procedures according to federal and California Occupational Safety and Health Administration (OSHA) regulations for hazardous materials Health and Safety Plans, and the City of Palo Alto's Pollution Prevention plan sheet.
		
		Elements of the plan shall include, but not be limited to, the following:
		
		• Discussion of hazardous materials management, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;
		• Notification and documentation of procedures; and
		• Spill control and countermeasures, including employee spill prevention/response training.
		
		See HYD-1 for Best Management Practices – Stormwater Quality
			Mitigation Measure BIO-1: Protection of Sensitive Habitats and Jurisdictional Features. The proposed project has been designed to avoid impacts to sensitive habitats, including jurisdictional wetlands and waters. However, indirect impacts to jurisdictional waters could occur as a result of the proposed project. The following general measures will be implemented during the construction and operation of the proposed project to minimize indirect impacts to sensitive habitats and jurisdictional features:
			
			• All construction equipment will use identified staging areas and access roads located in upland areas. When accessing work sites, travel and parking of vehicles and equipment will be limited to pavement, existing roads, and previously disturbed areas (except where overland travel is required). Construction workers will not be allowed to enter sensitive areas that have been fenced or staked.
			• Ground disturbance and vegetation removal will not exceed the minimum amount necessary to complete work at the site.
			• The following BMPs shall be incorporated into the SWPPP as protective measures to address wind- or water-related erosion:
			  ○ No discharge of pollutants from vehicle and equipment cleaning will be allowed into storm drains, wetlands, or water courses.
			  ○ No vehicles may be refueled within 100 feet of wetlands, streams, or other waterways. Vehicles operating adjacent to wetlands and waterways must be inspected and maintained daily to prevent leaks.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)			○ Waste facilities will be maintained. Waste facilities include concrete wash-out facilities, portable toilets, and hydraulic fluid containers. Waste will be removed to a proper disposal site. • After construction is completed, a final cleanup will include removal of all stakes, temporary fencing, flagging, and other refuse generated by construction. **Mitigation Measure BIO-2: Protection of CRLF.** Construction activities associated with the creek crossing (Matadero Creek near Deer Creek Road) will be limited to the dry season (generally April 15 to October 15) to the extent feasible. **Mitigation Measure BIO-3: Employee Education Program (required for CRLF, BUOW, and CCR if preconstruction surveys determine they are present).** An employee education program will be conducted by a qualified biologist, consisting of a brief presentation to explain special-status species concerns to contractors, their employees, and any other personnel involved in the project. The program will include the following: a description of relevant special-status species and their habitat needs as they pertain to the project; a report of the occurrence of these species in the project vicinity, as applicable; an explanation of the status of these species and their protection under the MBTA, California Fish and Game Code, and other statutes; and, a list of measures being taken to reduce potential impacts to natural resources during project construction and implementation. A fact sheet conveying this information will be prepared for distribution to the above-mentioned people and anyone else who may enter the project area. Upon completion of training, employees will sign a form stating that they attended the training and understand all of the conservation and protection measures. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project area will be restricted to established roadbeds.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)			**Mitigation Measure BIO-4: Monitoring During Construction.** A qualified biologist will be retained to monitor construction activities associated with the creek crossing (Matadero Creek near Deer Creek Road). The biologist will have expertise with CRLF biology and ecology. The biologist will have the authority to halt work if a special-status species is observed. **Mitigation Measure BIO-5: General Measures to Reduce Impacts to Wildlife Species.** The following shall be relevant to the following species: California red-legged frog, burrowing owl, and the California Clapper Rail. • All excavations left open overnight will either be covered to prevent wildlife from becoming entrapped or will include escape ramps. In addition, excavations must be inspected for wildlife at the start of each workday and prior to back filling. The USFWS and/or CDFW will be contacted prior to removing or relocating any special-status wildlife within the excavation. • Food items may attract wildlife into construction areas, which would expose them to construction-related hazards. The construction areas will be maintained in a clean condition. All trash (e.g., food scraps, cans, bottles, containers, wrappers, cigarette butts, and other discarded items) will be placed in closed containers and properly disposed of. • If an animal is found at a work site and is believed to be a protected species, work must be halted until the animal leaves of its own accord or the USFWS and/or CDFW is consulted to relocate the species. Care shall be taken not to harm the species. No wildlife or plant species will be handled and/or removed from the site by anyone except approved biologists.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)			**Mitigation Measure BIO-6: Burrowing Owl Pre-Construction Surveys.** Pre-construction BUOW surveys will be conducted in suitable habitat for BUOW (i.e., in pastureland habitat between Deer Creek Road and Hillview Avenue and in the vicinity of the RWQCP) in accordance with the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation (Department of Fish and Game, March 2012). If no BUOW or BUOW sign is observed no further action will be required. If BUOW or BUOW sign is observed then no disturbance will occur within 160 feet of occupied burrows during the non-breeding season (September 1 through January 31) or within 250 feet during the breeding season (February 1 through August 31). A qualified biologist will be present in these locations to monitor construction and ensure the BUOW is not disturbed. **Mitigation Measure BIO-7: Buffer for California Clapper Rail or Survey.** Construction activities within 500 feet of the marshland habitat surrounding the RWQCP will be conducted outside the breeding season for CCR (i.e., September 1 through January 31). If this is not feasible, a qualified biologist will conduct protocol-level surveys for CCR in accordance with the California Clapper Rail Draft Survey Protocol (USFWS 2000). A qualified biologist is an individual who has experience conducting protocol-level surveys for CCR. Prior to commencement of the surveys, the biologist will prepare a brief letter report describing the survey design and submit it to the USFWS and the CDFW for review and approval. Upon the completion of the surveys, results will be submitted to the USFWS and CDFW for a final decision on the possibility of doing work during the breeding season for CCR.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)			**Mitigation Measure BIO-8: Measure to Protect Nesting Birds**. If equipment staging, site preparation, grading, excavation, or other project-related construction activities are scheduled to occur during the avian nesting season (generally February 1 to September 1), a focused survey for active nests will be conducted by a qualified biologists within 15 days prior to the beginning of project-related activities. Surveys will be conducted in all suitable habitat located at project work sites, and in staging or storage areas. Surveys will be conducted at the appropriate times of day (e.g., dawn or dusk), and during the appropriate nesting times and will concentrate on areas of suitable habitat. If a lapse in project-related activities of 15 days or longer occurs, another focused survey will be conducted. If no active nests are found, then no further mitigation is required. If an active nest is found within the surveyed areas, an appropriate exclusion buffer will be established by a qualified biologist and the exclusion buffer will be maintained until the young have fledged or will no longer be impacted by the project. A qualified biologist will be present to monitor construction activities in the vicinity of the nest and ensure the nesting species is not disturbed. If a species appears disturbed by construction activities (as determined by a qualified biologist) work will be halted and the USFWS and/or CDFW will be consulted. Project activities will not resume without approval from the USFWS and/or CDFW. **Mitigation Measure BIO-9: Bat Preconstruction Surveys.** Preconstruction day and night-roost surveys will be conducted to avoid impacts to bats. The survey will be conducted by a qualified bat biologist following the protocol in the Bats and Bridges Technical Bulletin (Erickson et al. 2003) to determine if bats are using the bridges as a roost site. If a roost is observed, the CDFW and/or USFWS will be consulted and additional mitigation measures will be implemented. Example measures include working during the daytime if night roosts are present, no clearing or grubbing adjacent to the roost, no work within 100 feet of the roost, no lighting near the roost where it could shine on the roost structure.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)			**Mitigation Measure BIO-10: Bats Breeding Season Surveys.** Construction activities near Adobe Creek crossing near Middlefield Road, the Barron Creek crossing near Cowper Street, and the Matadero Creek crossing near Cowper Street will be scheduled to avoid the bat breeding season (April through August) to the extent feasible. If work in these locations is required in the breeding season, a survey for bats will be conducted. The survey will be conducted by a qualified bat biologist following the protocol in the Bats and Bridges Technical Bulletin (Erickson et al. 2003) to determine if bats are using the bridges as a roost site. If a roost is observed, the CDFW and/or USFWS will be consulted and additional mitigation measures will be implemented. Example measures include excluding bats from directly affected work areas or replacing the roost location.

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b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, including federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LSM	See Biological Resources, item a) above	Implement **Mitigation Measures BIO-1**.

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c) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	LTS	NA	No mitigation is required.
d) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10).	LSM	See Biological Resources, item a) above See AES-1 above for *Compliance with the Tree Technical Manual*	Implement **Mitigation Measures BIO-1** through **BIO-10**.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
e) Conflict with any applicable Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Cultural Resources			
a) Directly or indirectly destroy a local cultural resource that is recognized by City Council resolution.	LSM	*Protection of Cultural Resources* Should any previously undiscovered historic or prehistoric archaeological deposits be discovered during construction, work shall stop within 50 feet of the discovery, until such time that the discovery can be evaluated by a qualified archaeologist and appropriate mitigative action taken as determined necessary in consultation with the lead Federal agency for NHPA Section 106 compliance, in accordance with 36 CFR Part 800.13, and the City. Measures might include preserving in situ the archaeological resource or an archaeological monitoring or data recovery program. Prehistoric archaeological site indicators include chipped chert and obsidian tools, and tool manufacturing waste flakes, grinding implements such as mortars and pestles, and darkened soil that contains dietary debris such as bone fragments and shellfish remains. Historic site indicators include, but are not limited to, ceramics, glass, wood, bone, and metal remains. Section 7050.5(b) of the California Health and Safety code will be implemented in the event that human remains, or possible human remains, are located during Project-related construction excavation. Section 7050.5(b) states:	**Mitigation Measure CR-1: Subsurface Testing.** A program of sub-surface testing shall be conducted to determine whether buried resources are present within the areas of high or high to moderate archaeological sensitivity that will be impacted by Project construction. Only those locations where design confirms that the proposed pipeline would be buried at archaeologically sensitive locations will require subsurface testing. A testing program will be developed to determine the best approach for each location, considering the physical constraints of the urban setting (e.g., structures, traffic). The testing program could consist of multiple core extractions at individual sites; the locations and depths of the bore holes would be determined on the basis of projected depths of excavation at the individual work areas. A qualified archaeologist would monitor the testing efforts, and inspect the cores for prehistoric archaeological site indicators (e.g., chipped chert and obsidian tools, and tool manufacturing waste flakes, grinding implements such as mortars and pestles, and darkened soil that contains dietary debris such as bone fragments and shellfish remains) and historic site indicators (e.g., ceramics, glass, wood, bone, and metal remains).

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)		In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code. The County Coroner, upon recognizing the remains as being of Native American origin, is responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The Commission has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant. Sections 5097.98 and 5097.99 of the Public Resources Code also call for protection from inadvertent destruction. To achieve this goal, the construction personnel on the Project would be instructed as to the potential for discovery of cultural or human remains, the need for proper and timely reporting of such finds, and the consequences of failure thereof.	If the findings of the subsurface testing are negative, then no further actions (e.g., further testing or archaeological monitoring) would be recommended as necessary for NHPA Section 106 compliance, although consultation with SHPO would still be needed to formally complete the Section 106 process. If the findings of the subsurface testing are positive (and avoidance of the archaeological site is not feasible or practicable through project redesign), then a qualified archaeologist will develop an archeological data recovery plan (ADRP) in consultation with the City, the lead Federal agency, the SHPO and other appropriate consulting parties, as applicable, in accordance with the requirements of 36 CFR Part 800. The ADRP shall identify how the proposed data recovery program will used to evaluate and preserve the significant information the archaeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Implementation of the ADRP through the development and execution of an appropriate agreement document by the lead Federal agency, the SHPO, the City, and any other identified signatories, would satisfy the requirements of NHPA Section 106 as outlined at 36 CFR § 800.6. Whether the results of subsurface testing are negative or positive, if Federal funding for the Project is approved, full compliance with Section 106 of the NHPA as determined by the lead Federal agency will be required prior to Project construction.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5.	LSM	See Cultural Resources, item a)	Implement **Mitigation Measure CR-1.**
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	LSM	*Protection of Paleontological Resources* If paleontological resources are discovered during earthmoving activities, the construction crew would immediately cease work near the find. In accordance with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 2010), a qualified paleontologist would assess the nature and importance of the find and recommend appropriate salvage, treatment, and future monitoring and mitigation.	No additional mitigation is required.
d) Disturb any human remains, including those interred outside of formal cemeteries.	LSM	See Cultural Resources, item a)	Implement **Mitigation Measure CR-1.**

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
e) Adversely affect a historic resource listed or eligible for listing on the National and/or California Register, or listed on the City's Historic Inventory.	LSM	See Cultural Resources, item a)	Implement **Mitigation Measure CR-1**.
f) Eliminate important examples of major periods of California history or prehistory.	LSM	See Cultural Resources, item a)	Implement **Mitigation Measure CR-1.**

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Geology, Soils, and Seismicity			
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, groundshaking, liquefaction or landslides.	LSM	*Geologic Report for Potentially Affected Facilities* During the design phase for the Project, the City shall require preparation of a Geologic Report by a geologist registered in the State of California for facilities that could be affected by seismic-related hazards or unstable soils (e.g., liquefaction and expansive soils). The Geologic Report shall include an engineering analysis of liquefaction and the potential for expansive soils at the pump stations. This assessment shall include a liquefaction assessment study in accordance with the California Geological Survey Special Publication 117 Guidelines. If this report finds unstable soils would present potential risks associated with liquefaction, engineering recommendations for surface and subsurface drainage specifications and detailed design for fill placement and excavation shall be provided.	No additional mitigation is required.
b) Result in substantial soil erosion or the loss of topsoil.	LSM	*See HYD-1 for Best Management Practices – Stormwater Quality*	No additional mitigation is required.
c) Result in substantial siltation.	LSM	*See HYD-1 for Best Management Practices – Stormwater Quality*	No additional mitigation is required.

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d) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	LSM	See Geology and Soils, item a)	No additional mitigation is required.
e) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.	LSM	See Geology and Soils, item a)	No additional mitigation is required.

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f) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.	NI	NA	
g) Expose people or property to major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques.	NI	NA	

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Greenhouse Gas Emissions			
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	LTS	See Air Quality, item a) to further reduce emissions	Implement **Mitigation Measure AIR-1** to further reduce emissions.
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	LTS	See Air Quality, item a) to further reduce emissions	Implement **Mitigation Measure AIR-1** to further reduce emissions.

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Hazards and Hazardous Materials			
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LSM	See Biological Resources, item a) for *Health and Safety and Hazardous Materials Management and Spill Prevention Control Plans* *Storage, Handling, and Use of Hazardous Materials in Accordance with Applicable Laws* The City shall ensure that all construction-related hazardous materials and hazardous wastes are stored, handled, and used in a manner consistent with applicable federal, state, and local laws, and the City of Palo Alto's Pollution Prevention plan sheet. In addition, construction-related hazardous materials and hazardous wastes shall be staged and stored away from stream channels and steep banks to keep these materials a safe distance from near-by residents and prevent them from entering surface waters in the event of an accidental release. *Proper Disposal of Contaminated Soil and/or Groundwater* If contaminated soil and/or groundwater is encountered or if suspected contamination is encountered during Project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. A contingency plan to dispose of any contaminated soil or groundwater would be developed through consultation with appropriate regulatory agencies and consistent with the requirements of the City of Palo Alto's Pollution Prevention plan sheet and RWQCP's permit requirements for discharge of exceptional wastewater to the sanitary sewer. See HYD-1 for *Discharge of Exceptional Wastewater*	No additional mitigation is required.

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b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	LSM	See Hazards and Hazardous Material, item a)	No additional mitigation is required.
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	LSM	See Hazards and Hazardous Material, item a)	No additional mitigation is required.

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d) Construct a school on a property that is subject to hazards from hazardous materials contamination, emissions or accidental release.	NI	NA	No mitigation is required.
e) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.	LSM	See Hazards and Hazardous Material, item a)	No additional mitigation is required.

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f) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.	LTS	NA	No mitigation is required.
g) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working the project area.	NI	NA	No mitigation is required.

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h) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LSM	*Traffic Control Plan* The City's Transportation Section would require the contractor to have a full traffic control plan prepared by a registered traffic engineer. The traffic control plan shall be in accordance with the City's Traffic Control Requirements and would show specific methods for maintaining traffic flows to minimize construction impacts on traffic and parking. There are several schools in the vicinity of the Project. These areas would be evaluated more closely to determine whether the traffic control plan is appropriate or if additional measures are needed specific to school areas. Examples of traffic control measures to be considered include: • Identify all roadway locations where special construction techniques (e.g., directional drilling) would be used to minimize impacts to traffic flow; • Develop circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone; • Schedule truck trips outside of peak morning and evening commute hours; • Prohibit construction on collector and arterial streets during morning commute period before 9 a.m. and in the afternoon commute period after 4 p.m.; • Use haul routes, minimizing truck traffic on local roadways to the extent possible; • Consider detours for bicycles and pedestrians in all areas potentially affected by Project construction. Pedestrian and bicycle detours should not be required unless deemed necessary for safety reasons;	No additional mitigation is required.

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h) (continued)		• Use flagmen to maintain alternating one-way traffic while working on one-half of the street; • Use advance construction signs and other public notices to alert drivers of activity in the area; • Use "positive guidance" detour signing on alternate access streets to minimize inconvenience to the driving public; • Install traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones; • Develop and implement access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, ask affected jurisdictions to identify detours, which would then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of lane closures; • Store construction materials only in designated areas; and • Coordinate with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary. • Establish methods for minimizing for construction effects on parking (e.g., identifying designated areas for construction worker parking at staging areas).	

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i) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	NI	NA	No mitigation is required.
j) Create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination in excess of soil and ground water cleanup goals developed for the site.	NI	NA	No mitigation is required.

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Land Use and Planning			
a) Physically divide an established community.	LTS	NA	No mitigation is required.
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.	NI	NA	No mitigation is required.

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c) Conflict with any applicable habitat conservation plan or natural community conservation plan.	LTS	NA	No mitigation is required.
d) Substantially adversely change the type or intensity of existing or planned land use in the area.	NI	NA	No mitigation is required.
e) Be incompatible with adjacent land uses or with the general character of the surrounding area, including density and building height.	NI	NA	No mitigation is required.
f) Conflict with established residential, recreational, educational, religious, or scientific uses of an area.	NI	NA	No mitigation is required.

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g) Convert prime farmland, unique farmland, or farmland of statewide importance (farmland) to non-agricultural use.	NI	NA	No mitigation is required.
Mineral Resources			
The proposed Project would not result in any impacts to mineral resources			

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Noise			
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LSM	*Compliance with Local Noise Ordinance* According to the City of Palo Alto's Noise Ordinance (Palo Alto Municipal Code Chapter 9.10), for residential and non-residential property, construction, alteration and repair activities which are authorized by a valid city building permit shall be prohibited on Sundays and holidays and shall be prohibited except between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday, and 9:00 a.m. and 6:00 p.m. on Saturday, provided that the construction, demolition or repair activities during those hours meet the following standards: • No individual piece of equipment shall produce a noise level exceeding 110 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible. • The noise level at any point outside of the property plane of the Project shall not exceed 110 dBA.	**Mitigation Measure NOI-1: Noise Control Measures to Reduce Construction Noise.** Noise Control Measures to Reduce Construction Noise. The City shall incorporate into contract specifications r all of the following measures: • Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction will be hydraulically or electrically powered whenever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust would be used. This muffler can lower noise levels from the exhaust by up to 10 dBA. External jackets on the tools themselves would be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures will be used such as drilling rather than impact equipment whenever feasible. • Wherever possible, sonic or vibratory pile drivers will be used instead of impact pile drivers. If sonic or vibratory pile drivers are not feasible, acoustical enclosures will be provided as necessary to reduce noise levels. Engine and pneumatic exhaust controls on pile drivers will be required as necessary to ensure that exhaust noise from pile driver engines are minimized to the extent feasible. Where feasible, pile holes will be pre-drilled to reduce potential noise and vibration impacts.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
a) (continued)		• The holder of a valid construction permit for a construction project in a non-residential zone shall post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, materialmen and all other persons at the construction site, of the basic requirements of this measure. ○ The sign(s) shall be posted at least five feet above ground level, and shall be of a white background, with black lettering, which lettering shall be a minimum of one and one-half inches in height. ○ The sign shall read as follows: CONSTRUCTION HOURS FOR RESIDENTIAL (OR NON-RESIDENTIAL) PROPERTY (Includes Any and All Deliveries) MONDAY - FRIDAY.....8:00 a.m. to 6:00 p.m. SATURDAY.....9:00 a.m. to 6:00 p.m. SUNDAY/HOLIDAYS.....Construction prohibited. *Pump Station Design/Noise* For the pump station at the Mayfield Soccer Fields, a detailed analysis of the buildings' sound isolation would be conducted by a qualified acoustical consultant during the engineering design phase of the project. A post-construction field sound measurement shall be conducted by an acoustical consultant to verify that the project operational noise standards are in compliance with relevant City noise standards.	• All equipment and trucks used for project construction shall use the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) and be maintained in good operating condition to minimize construction noise impacts. All internal combustion engine-drive equipment shall be fitted with intake and exhaust mufflers which are in good condition. • Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would mean turning off equipment if it would not be used for five or more minutes. • Stationary noise-generating construction equipment, such as air compressors and generators, shall be located as far as possible from homes and businesses. • Staging areas shall be located as far as feasibly possible from sensitive receptors. **Mitigation Measure NOI-2: Pre-Construction Notification.** Prior to construction, written notification to residents within 500 feet of the proposed facilities undergoing construction shall be provided, identifying the type, duration, and frequency of construction activities. Notification materials shall also identify a mechanism for residents to register complaints with the City if construction related noise impacts should occur. **Mitigation Measure NOI-3: Design of the Pump Station to Reduce Noise.** To ensure the proposed pump station complies with the City's noise standards, structure openings, including air ventilation would employ acoustical rated louvers, silencers, or other noise-reduction devices, as appropriate, to reduce noise propagation to the outside of the building.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) Exposure of persons to or generation of excessive ground borne vibrations or ground borne noise levels.	LTS	NA	No mitigation is required.
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
e) For a project located within an airport land use plan or, where such a plan has not been adopted, would the project expose people residing or working in the project area to excessive noise levels.	LTS	NA	No mitigation is required.
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels	NI	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
g) Cause the average 24 hour noise level (Ldn) to increase by 5.0 decibels (dB) or more in an existing residential area, even if the Ldn would remain below 60 dB.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.
h) Cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.
i) Cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
j) Result in indoor noise levels for residential development to exceed an Ldn of 45 dB.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.
k) Result in instantaneous noise levels of greater than 50 dB in bedrooms or 55 dB in other rooms in areas with an exterior Ldn of 60 dB or greater.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.
l) Generate construction noise exceeding the daytime background Leq at sensitive receptors by 10 dBA or more.	LSM	See Noise, item a)	See **Mitigation Measures NOI-1** through **NOI-3**.
Population and Housing			
The proposed Project would not result in any impacts related to population and housing			
Public Services			
The proposed Project would not result in any impacts related to public services			

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Recreation			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	NI	NA	No mitigation is required.
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.	NI	NA	No mitigation is required.
c) Does the project affect recreational facilities.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
Transportation and Traffic			
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.	LSM	See Hazards and Hazardous Materials, Item h) above for *Traffic Control Plan*. *Restoration of Roads to Pre-construction Condition* Following construction, the City shall ensure that road surfaces, bicycle routes, and bus stop facilities that are damaged during construction are returned to their pre-construction condition or better.	**Mitigation Measure TRA-1: CMP Facilities.** The City shall work with VTA to determine when peak hour traffic starts on Page Mill Road, a CMP facility. If peak hour traffic starts around 3 p.m. on this road, then the City shall prohibit construction on this roadway after 3 p.m.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.	LSM	See Hazards and Hazardous Materials, Item h) above for *Traffic Control Plan* and Transportation and Traffic, item a).	Implementation **Mitigation Measure TRA-1**.
c) Result in change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.	NI	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	LSM	See Hazards and Hazardous Materials, Item h) above for *Traffic Control Plan*.	No additional mitigation is required.
e) Result in inadequate emergency access.	LSM	See Hazards and Hazardous Materials, Item h) above for *Traffic Control Plan*.	No additional mitigation is required.
f) Result in inadequate parking capacity that impacts traffic circulation and air quality.	LSM	See Hazards and Hazardous Materials, Item h) above for *Traffic Control Plan*.	**Mitigation Measure TRA-2: Coordinate construction with Businesses.** To reduce the disruption of business from the temporary reduction of parking, the City shall coordinate with individual businesses on the timing of construction.
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., pedestrian, transit & bicycle facilities).	LSM	See Hazards and Hazardous Materials, Item h) above for *Traffic Control Plan*.	No additional mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
h) Cause a local (City of Palo Alto) intersection to deteriorate below Level of Service (LOS) D and cause an increase in the average stopped delay for the critical movements by four seconds or more and the critical volume/capacity ratio (V/C) value to increase by 0.01 or more.	LTS	NA	No mitigation is required.
i) Cause a local intersection already operating at LOS E or F to deteriorate in the average stopped delay for the critical movements by four seconds or more.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
j) Cause a regional intersection to deteriorate from an LOS E or better to LOS F or cause critical movement delay at such an intersection already operating at LOS F to increase by four seconds or more and the critical V/C value to increase by 0.01 or more.	LTS	NA	No mitigation is required.
k) Cause a freeway segment to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment already operating at LOS F.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
l) Cause any change in traffic that would increase the Traffic Infusion on Residential Environment (TIRE) index by 0.1 or more.	LTS	NA	No mitigation is required.
m) Cause queuing impacts based on a comparative analysis between the design queue length and the available queue storage capacity? Queuing impacts include, but are not limited to, spillback queues at project access locations; queues at turn lanes at intersections that block through traffic; queues at lane	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
m) (continued) drops; queues at one intersection that extend back to impact other intersections, and spillback queues on ramps.			
n) Impede the development or function of planned pedestrian or bicycle facilities.	LSM	See Hazards and Hazardous Materials, Item h above.	No mitigation is required.
o) Impede the operation of a transit system as a result of congestion.	LSM	See Hazards and Hazardous Materials, Item h above.	No mitigation is required.
p) Create an operational safety hazard.	NI	NA	No mitigation is required.
Utilities and Service Systems			
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	NI	NA	No mitigation is required.
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	LTS	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.	NI	NA	No mitigation is required.
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	NI	NA	No mitigation is required.

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Impact Statement	Impact Significance After Standard Project Requirements / Mitigation[1,2]	Standard Project Requirements[2]	Mitigation Measure
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.	LTS	NA	No mitigation is required.
g) Comply with federal, state, and local statutes and regulations related to solid waste.	LTS	NA	No mitigation is required.
h) Result in a substantial physical deterioration of a public facility due to increased use as a result of the project.	LTS	NA	No mitigation is required.

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ES-1.4 Summary of Alternatives

This EIR considers three alternatives to the proposed Project/Action:

1. No Project Alternative
2. No Funding from USBR Alternative
3. No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative

Section 4.4, Alternatives Evaluation in *Chapter 4, Other CEQA/NEPA Considerations* contains a description of each alternative and compares the impacts of each; the comparison is summarized below.

The No Project Alternative would not implement any of the components described under the proposed Project in *Chapter 2, Project Description*. The City would continue to rely primarily on imported water from San Francisco Public Utilities Commission (SFPUC) to meet existing demands, and treated wastewater would continue to be discharged into San Francisco Bay. This alternative would not meet any of the objectives of the proposed Project, but would also not cause any of the construction-related impacts of the Project. However, a variety of other impacts could occur as water rationing takes place during droughts, including the restriction in use of the potable supplies for landscape irrigation (from the City's implementation of mandatory conservation measures), which could lead to degradation of the plant health and changes in the visual quality of the environment if such restrictions were to extend over long periods of time. For example, the drought of 2014 has severely impacted delivery of most surface water supplies in California, and the Department of Water Resources (DWR) State Water Project cutbacks, first to 0 percent and then to 5 percent in 2014 were the lowest on record. While the City of Palo Alto does not obtain its water from DWR, the risk of droughts now and in the future is high in California, and the SFPUC regional water system is subject to the risk of drought as stated in its 2010 Urban Water Management Plan (UWMP). Because of this risk, rationing and potentially outright limiting potable water for uses that do not require high quality drinking water such as landscape irrigation, toilet flushing, cooling towers, process uses and other uses for non-potable water could occur. If the City were to decide to conserve its potable supplies by restricting such uses, the consequences to landscape irrigation would be dire, similar to those impacts described for the No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative described below, and could be significant and unavoidable. There is also the possibility that it will not be up to the City to make the determination independently to prohibit uses of potable water for such uses listed above. The State Water Resources Control Board (SWRCB) could conceivably make a ruling requiring such restrictions in severe droughts. In 2014, the SWRCB mandated certain water use restrictions that the City adopted (see Staff Report 4973, Resolution 9449 and Staff Report 5051, Resolution 9460 in **Appendix M**). On March 17, 2015, the SWRCB voted to update and extend emergency drought regulations[3]. On April 1, Governor Jerry Brown issued Executive Order

[3] SWRCB's action on March 17 includes the following: Continue the prohibitions on potable water use (first adopted in 2014). These include prohibiting Californians from: 1) washing down sidewalks and driveways; 2) watering outdoor landscapes in a manner that causes excess runoff; 3) washing a motor vehicle with a hose, unless the hose is fitted with a shut-off nozzle; 4) operating a fountain or decorative water feature, unless the water is part of a recirculating system; and 5) irrigating turf or ornamental landscapes during and 48 hours following measureable precipitation. In addition, SWRCB added new prohibitions for commercial businesses, including: 1) restricting restaurants and other food service establishments from serving water to customers only upon request; and 2) requiring operators of hotels and motels to provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option. Water agencies are also required to: 1) limit the number of days per week that customers can irrigate outdoors, 2) notify customers when they are aware of leaks that are within the customer's control; and expand monthly reporting to include the limit on days for outdoor irrigation and a description of compliance and enforcement efforts. Local agencies can fine property owners up to $500 a day

B-29-15[4] to mandate substantial water reductions across the state. The Order contains four categories of provisions: 1) Save Water; 2) Increase Enforcement Against Waste; 3) Invest in New Technologies; and 4) Streamline Government Response. Directive 2 under the Save Water category directed SWRCB to "impose restrictions to achieve a statewide 25 percent reduction in potable urban water usage through February 28, 2016." Amongst other provisions, the Order also directed SWRCB to "impose strict restrictions to require that commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries immediately implement water efficiency measures to reduce potable water useage in an amount consistent with the reduction targets mandated by Directive 2 of this Executive Order," to "prohibit irrigation with potable water of ornamental turf on public street medians," and to "direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions." It is anticipated that SWRCB will adopt emergency rules that implement the directives in the Governor's executive order in May. The City will be required to adopt and enforce SWRCB regulations. If the current or future droughts are more severe, the SWRCB and the Governor may take additional actions to severely limit the use of potable water for irrigation and other uses that don't require potable water.

The No Funding from USBR Alternative is the same as the proposed Project, with the exception that no funding would be provided by USBR. It should be noted that if the City obtains state funding through the State Revolving Fund Program, then SWRCB, instead of Reclamation, would be responsible for initiating consultation with SHPO for compliance with NHPA Section 106 to meet CEQA-Plus requirements. All of the impacts, standard project requirements, and mitigation measures described for the proposed Project would apply to this alternative. Therefore, no further discussion is warranted.

The No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative would involve the City adopting regulations that restrict the use of potable water for landscape irrigation and other non-potable uses in the future. If there is no potable water available, then individual landowners (not the City) would have to find alternate water sources to meet landscape irrigation needs. Water source options could include: 1) groundwater; 2) recycled water from a satellite treatment plant (from Stanford University to Stanford Research Park lands only); or 3) a combination of options 1 and 2. This alternative would meet most of the objectives of the proposed Project, but would not achieve the primary objective of maximizing recycled water as a supplemental water source. Options 1 and 2 would have similar construction-related impacts and require the same standard project requirements and mitigation measures as those described for the proposed Project. While Option 1 could have additional impacts on the groundwater basin, it is assumed that for the purposes of this analysis, SCVWD would not grant permits for well development if additional wells would result in adverse impacts on the groundwater basin. This option would reduce this non-sustainable resource, affecting the City's emergency supply and the supply of others who rely on groundwater. Both options could generate long-term physical changes in the urban forest for those landowners who choose not to replace their current potable supply with a supplemental supply. The change could be the deterioration of the health and visual quality of the landscapes, or conversion to hardscape. This alternative would not reduce any significant impact of the proposed Project but would result in significant unavoidable impacts related to deterioration of plants and visual changes. The Satellite Treatment Alternative would be on Stanford lands and not within the control of the city of Palo Alto, the Lead Agency for this EIR.

Section 4.4, Alternatives Evaluation in *Chapter 4, Other CEQA/NEPA Considerations* concludes that the environmentally superior alternative is the proposed Project.

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for failure to implement conservation requirements and the SWRCB can issue cease and desist orders against water agencies that don't impose mandatory conservation measures upon their retail customers.

[4] The Executive Order is available for viewing at: http://gov.ca.gov/docs/4.1.15_Executive_Order.pdf

ES-1.5 Areas of Controversy

Table 1-3 in *Chapter 1, Introduction*, summarizes comments raised by agencies and the public during the scoping comment period. The main area of controversy is the following:

a. The approach to reducing salinity in recycled water for landscape irrigation of areas that include redwood trees and other trees/plants most sensitive to salinity, and on poor soils subject to salt build-up.

ES-1.6 Issues to be Resolved

The issues to be resolved prior to implementation of the proposed Project include:

a. Determination of the construction technique to install the proposed pipeline alignments during design. Depending on the construction methods selected for certain pipeline crossings, subsurface testing for cultural resources may be required.
b. Acquisition of relevant permits and easements from SCVWD, SFPUC, and Caltrans for pipeline crossings.
c. The approach to reducing salinity in recycled water (for use on redwood trees and other salt-sensitive plants), and soils. Specifically, the degree to which a "back-up" or "contingency" plan is needed above and beyond City's current strategy in reducing TDS (implementation of sewer line salt reduction projects).
d. Determination of whether two work crews could be simultaneously used during open trench construction / pump station construction without resulting in exceedance in the BAAQMD thresholds for nitrogen oxides (NO_x). Air quality modeling could be done upon refinement of the construction scenario assumptions if the open trench construction technique was selected as the desired approach.

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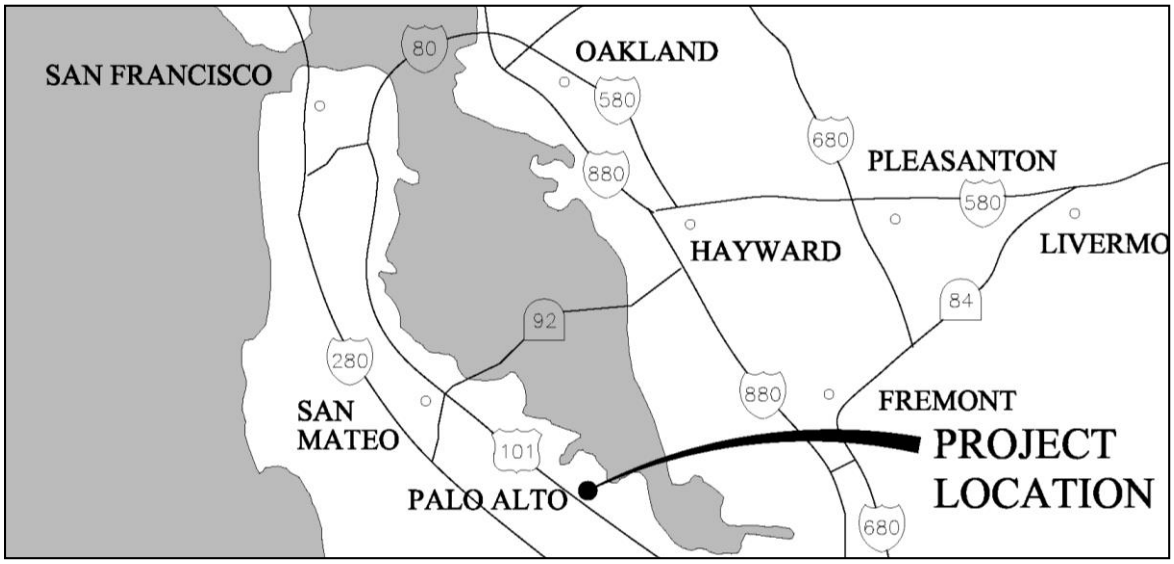
Chapter 1 Introduction and Project Background

1.1 Introduction

The City of Palo Alto (City) proposes to expand Palo Alto RWQCP's regional recycled water system to serve areas in the City (see **Figure 1-1**). The proposed City of Palo Alto Recycled Water Project (Project) is sponsored by the City of Palo Alto Utilities (CPAU) and Public Works Departments. The proposed Project would allow for the distribution of high-quality recycled water suitable for non-potable uses (uses other than drinking). The Project is an expansion of the City of Palo Alto's existing Water Reuse Program (described further below). The Program currently serves parts of the City of Palo Alto and Mountain View, and ultimately is envisioned to serve recycled water throughout the RWQCP's service area.

Figure 1-1: Project Location in South San Francisco Bay



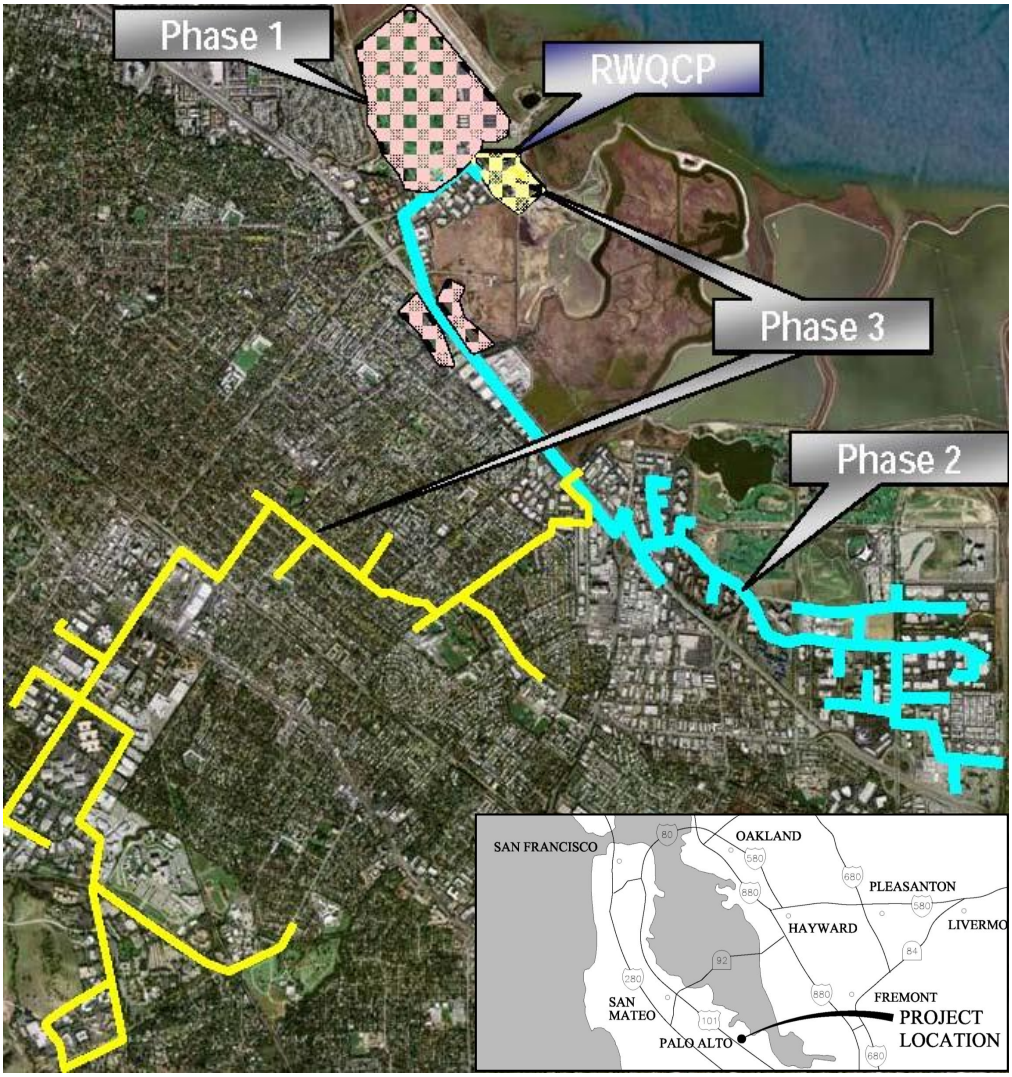
1.2 Project Background and History

1.2.1 Palo Alto Water Reuse Program

Palo Alto's Water Reuse Program began in the early 1980s with the delivery of recycled water to Shoreline Golf Links. The system was substantially modified to include the Palo Alto Municipal Golf course, Greer Park, and the Emily Renzel Marsh, in what is now considered Phase 1 of the RWQCP recycled water system (**Figure 1-2**). Palo Alto then completed a Water Reclamation Master Plan (Master Plan) for the Palo Alto RWQCP in 1992 and the accompanying Final Program Environmental Impact Report (EIR) in 1995 (CH2MHill, 1995). The Palo Alto RWQCP developed the Master Plan in conjunction with its member agencies to address two main goals:

1) reduce demand on drinking water supplies by providing recycled water suitable for non-potable uses and,
2) reduce metal discharge and improve overall water quality to the San Francisco Bay in part by reducing wastewater discharge to the bay.

Figure 1-2: RWQCP Ongoing Expansion Phases



In December 2001, the RWQCP published a Long-Term Goals Study (LTGS) Report that concluded a one-year, stakeholder driven effort to develop long-term goals for the RWQCP. Water recycling was identified as a key priority for the RWQCP. In addition, developing recycled water activities was considered as a key means to achieve a number of the other long-term goals such as improving water supply reliability, providing a dependable, locally controlled water source, and reducing reliance on imported water.

1.2.2 Mountain View/Moffett Field Area Recycled Water Pipeline Project (Phase 2)

Opportunities for funding from the State Water Resources Control Board (SWRCB) triggered the RWQCP decision in May 2003 to move forward with Phase 2 of the Palo Alto RWQCP's ongoing expansion of its regional recycled water system, the Mountain View/Moffett Field Area Recycled Water Pipeline Project (Mountain View Project) (**Figure 1-2**). The Mountain View Project is one of the projects identified in the 1992 Master Plan. In 2004, the RWQCP completed a facilities plan (RMC, 2004) and initiated design for the Mountain View Project. Design for the Mountain View Project was completed in early 2007. The project has been in operation since 2009. The Mountain View Project replaced an existing deteriorating pipeline to Shoreline Golf Course in Mountain View. The pipeline replacement restored the golf course connection

and provides recycled water services to the Shoreline community. The major new users of recycled water are the RWQCP, Palo Alto Animal Services, Palo Alto public works corporation yard, Google, Microsoft, and Shoreline Park and Amphitheatre. The Mountain View/Moffett Field Area Recycled Water pipeline is sized to serve future users in Moffett Field and the City of Palo Alto via several connections at Embarcadero Road and East Bayshore Road.

1.2.3 City of Palo Alto Recycled Water Project History (Phase 3) and IS/MND

In 2006, the City completed a Recycled Water Market Survey Report[1] (City of Palo Alto, 2008a) as a preliminary effort to determine potential locations of recycled water use within the City of Palo Alto. The objectives of the study were to review and update the list of potential recycled water users in the City of Palo Alto and to update the proposed Project cost estimate for the delivery of recycled water to the City of Palo Alto and future expansions. The Project included site investigations, market analysis, conceptual Project design, and preparation of a financing and revenue plan. The market survey estimated a total city-wide recycled water demand of 1,870 AFY, excluding Stanford University, and recommended an alignment that would convey water from the RWQCP through the City of Palo Alto, with a target customer base in South Palo Alto including the Stanford Research Park. A list of potential recycled water users is provided in **Appendix A**.

The City of Palo Alto prepared and publicly circulated an IS/MND for the City of Palo Alto Recycled Water Project (Phase 3 of the RWQCP recycled water system) in March 2009 (City of Palo Alto, 2009a)[2]. The Project, as described in the IS/MND, is similar to the proposed Project and consisted of the installation of a recycled water pipeline (5 miles of 12- to 18- inch backbone pipeline and 5 miles of lateral pipelines to over 50 sites), a booster pump station, and a pump station at the RWQCP. The Project would initially provide approximately 900 AFY of recycled water, mostly South Palo Alto including the Stanford Research Park Area, although future extensions could serve Stanford University and Los Altos Hills, as well as provide a loop by making a second connection to the Phase 2 Mountain View Project. The predominant use of recycled water is landscape irrigation; however, some industrial use could also be included at a later date. The differences between the Project as proposed in the IS/MND and in this EIR are that there were three backbone pipeline options evaluated and an emergency generator proposed in the IS/MND. The environmental document contained an initial study checklist that evaluated impacts to the environment associated with construction and operation of the Project. In accordance with California Environmental Quality Act (CEQA) Guidelines Section 15072, the City provided a Notice of Intent notifying the public of the publication of the Public Draft IS/MND. Additional notification was provided through the publication of a notice in the Palo Alto Weekly on March 13, 2009.

Seven comments were received during the 30-day public comment period, and the City completed a Response to Comments document in May 2009[3] (City of Palo Alto, 2009b) to address concerns raised during that period. **Table 1-1** shows the list of comment authors. The comments included, but are not limited to, concerns about the potential effect of recycled water use on trees and the urban forest and concern about salinity impacts on the groundwater basin.

The City did not take action on the IS/MND at that time. Since then, the City has decided to proceed with this EIR to investigate the potential for the Project to impact the environment.

[1] The final Recycled Water Market Survey Report is an appendix to the City of Palo Alto Recycled Water Facility Plan completed in 2008.
[2] The IS/MND is available for viewing and download at the City's website: http://www.cityofpaloalto.org/civicax/filebank/documents/15163/
[3] The Response to Comments Document is available for viewing and download at the City's website:http://www.cityofpaloalto.org/civicax/filebank/documents/15979/

Table 1-1: IS/MND Comment Letters

Number	Comment Author, Title and Affiliation	Comment Letter Date
1	Lisa Carboni, District Branch Chief, Local Government – Intergovernmental Review, California Department of Transportation	April 8, 2009
2	Patrick Lee, Project Manager, Brownfield and Environmental Restoration Program, California Department of Toxic Substances Control	April 14, 2009
3	Catherine Martineau, Executive Director, CANOPY	April 14, 2009
4	Usha Chatwani, P.E., Associate Civil Engineer, Community Projects Review Unit, Santa Clara Valley Water District (SCVWD)	April 15, 2009
5	James Hockenberry, Environmental Scientist, State Water Resources Control Board Division of Financial Assistance	April 16, 2009
6	Roy Molseed, Senior Environmental Planner, Santa Clara Valley Transportation Authority	April 16, 2009
7	William T. Phillips, Senior Associate Vice President, and Jim Inglis, Director of Design & Construction, Stanford University Real Estate Office.	April 17, 2009

1.2.4 Ongoing Stakeholder Involvement

The City, through the RWQCP, has actively included stakeholders in recycled water related projects. This involvement included EIR preparation for the Recycled Water Master Plan in 1992, stakeholder workshops for the LTGS preparation between 2000 and 2002, stakeholder workshops for the Mountain View Recycled Water Project facility planning in 2004, public meetings as part of IS/MND preparation for the Mountain View Project, and surveys of potential customers for the Palo Alto Recycled Water Market Assessment in 2006, Additional public and individual meetings were held in 2007, in 2009 as part of the IS/MND preparation, and in 2011 and 2014 as part of EIR preparation, as further described below:

- **Facility managers meeting on June 13, 2007.** Facility managers are staff who manage a property's utilities, such as energy use (electric and gas), water use, and wastewater. The Facility managers meeting included employees of large businesses such as Roche, Hewlett Packard and Varian, as well as public facilities such as parks (primarily for water use and irrigation). The managers are typically responsible for maintaining and operating irrigation systems and cooling towers on their properties. The facility managers were given an overview of the Project and were given the opportunity to ask questions and make comments regarding the Project.
- **Public scoping meeting for the proposed Project on September 18, 2007.** In 2007, the City held a scoping meeting for the proposed Project prior to the preparation of the IS/MND to obtain input from the public regarding the environmental effects of the proposed Project and mitigation measures that could be considered. All interested members from the public were welcome to attend. The City specifically invited the LTGS stakeholders, who represented a wide range of environmental and socioeconomic interests of the community, and the facility managers to attend and participate in the meeting. Announcements for the meeting were published in the Palo Alto Daily News and Palo Alto Weekly. A comment form was made available at the public scoping meeting for the public to send comments to the City and to be added to the mailing list for the Project. The Project mailing list was used to send updates and notices about the Project. The Project description was posted on the City of Palo Alto website.

- **Public meeting for the proposed Project on April 6, 2009.** During the 30-day comment period for the Public Draft IS/MND, the City held a public meeting to discuss the project and receive comments on the Public Draft IS/MND.
- **Individual meetings with individual organizations and agencies.** The City met with several groups individually during the 30-day IS/MND comment period to discuss concerns related to the Project. These include Canopy, the Santa Clara Valley Water District (SCVWD), and Stanford University.
- **Public scoping meeting for the proposed Project on July 12, 2011.** A Notice of Preparation (NOP) of an Environmental Impact Report was issued on June 16, 2011. During the 30-day comment period for the NOP, the City held a public meeting to discuss the Project and receive comments on the NOP. **Appendix B** includes the NOP and the sign-in sheet from that meeting. Please also see Section 1.3.2, under Scoping for more information regarding this meeting.
- **Additional meetings with Stanford in 2014.** The City conducted meetings with Stanford University staff to discuss the Project.

Additional public involvement is planned in the future, including a public meeting to be held during the 45-day comment period for this Draft EIR.

1.3 Compliance with CEQA

1.3.1 State Requirements

CEQA requires that all state and local government agencies consider the environmental consequences over which they have discretionary authority before taking an action that has the potential to affect the environment. In conformance with CEQA (California Public Resources Code, Section 21000 et seq.), CEQA Guidelines (California Code of Regulations Title 14 Section 15000 et seq.), and City of Palo Alto policies and procedures, the City of Palo Alto is the Lead Agency for compliance with the CEQA environmental review process for the Recycled Water Project. The City has conducted the CEQA process, including the preparation and circulation of this EIR, to provide to the public and Responsible and Trustee Agencies reviewing this project, information about the project's potential effects, both beneficial and adverse, on the local and regional environment. This Draft EIR was prepared in compliance with Section 15121 of the *State CEQA Guidelines*, which states that the purpose of an EIR is to serve as an informational document that:

> "...will inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project..."

This document has been prepared as a Project EIR because of public concerns about the irrigation of redwood trees and other plants using recycled water proposed under the Project. The purpose of the EIR is to provide sufficient project-specific impact analysis for the Project to comply with CEQA. This document is limited to the assessment of environmental impacts associated with the construction and operation of the proposed pipeline, pump station, and booster pump station. Additional environmental documentation and compliance with CEQA would be required for future recycled water system expansions by the appropriate lead agencies.

1.3.2 CEQA EIR Process

Notice of Preparation

In accordance with Sections 15082(a), 15103, and 15375 of the CEQA Guidelines, the City prepared an NOP for this EIR (see **Appendix B**). The NOP was circulated to local, state, and federal agencies and other

interested parties for 30 days, beginning on June 16, 2011. In addition, an ad stating that the NOP would be available on June 16 was published in the Palo Alto Weekly. The NOP was also posted on the City of Palo Alto's website (http://www.cityofpaloalto.org) in advance of the June 16 date. The NOP provided a description of the proposed Project, a map and description of where the Project would be constructed, and a brief description of construction methods.

Scoping

Following noticing in the local newspaper and on the City's website, on July 12, 2011, a public scoping meeting for the EIR was held at the Fireside Room at the Lucie Stern Center in the City of Palo Alto. The purpose of the meeting was to describe the proposed Project to interested parties and to solicit their input about issues and concerns that are germane to the scope and content of this EIR. **Table 1-2** lists written comments received during the 30-day public scoping period. **Table 1-3** summarizes issues and concerns raised during the scoping period for the City of Palo Alto Recycled Water Project EIR, and identifies the sections in which they are addressed. **Appendix C** includes the list of agencies or organizations that received the NOP (distribution list) and the comment letters received during the scoping period.

Table 1-2: Written Comments Received During the Scoping Period

Number	Comment Author, Title and Affiliation	Comment Letter Date
1	Catherine Martineau, Executive Director, CANOPY	June 21, 2011
2	Lisa Lee, Environmental Scientist, State Water Resources Control Board Division of Financial Assistance	June 28, 2011
3	William T. Phillips, Senior Associate Vice President, and Jim Inglis, Director of Design & Construction, Stanford University Real Estate Office.	July 14, 2011
4	Katy Sanchez, Program Analyst, Native American Heritage Commission	July 18, 2011
5	Gary Arnold, District Branch Chief, California Department of Transportation	July 18, 2011
6	Roy Molseed, Senior Environmental Planner, Santa Clara Valley Transportation Authority	July 18, 2011

Draft Focused EIR

This document constitutes the Draft EIR. It contains a description of the Project, description of the environmental setting, identification of Project impacts, mitigation measures for impacts found to be significant, and an analysis of Project alternatives. This document complies with CEQA Plus requirements, as the City is applying for SRF funding[4]. CEQA-Plus documentation includes evaluation of compliance with the Federal Endangered Species Act, Federal National Historic Preservation Act, and the General conformity rule for the Clean Air Act. In addition, it requires evaluation of compliance with the Migratory Bird Treaty Act, policies for protection of wetlands, Coastal Zone Management Act, flood plain management, Farmland Protection Policy Act, and the Wild and Scenic Rivers Act. Because of potential Federal grant funding opportunities, this EIR has also been prepared in compliance with NEPA requirements. USBR, as a Lead Agency for NEPA compliance, would be able to use this EIR and other NEPA-required supporting documents, as a basis for decision making for the proposed Action. Thus, this EIR will cover requirements not normally covered under a CEQA-Plus document, including the evaluation of Environmental Justice and Indian Trust Assets.

[4] SWRCB would be a responsible agency that will review and consider the information in the environmental document prior to approving the Project.

Table 1-3: Scoping Comments Considered in the Draft EIR

Issues/Concerns	Comment Author	Section Addressing Issues
Transportation/Roads/Access		
Requested preparation of a Traffic Impact Study (to determine Project impacts to the State Highway System and on transit systems, pedestrians, and bicyclists). Specified need for encroachment permit for work within a State right-of-way.	Gary Arnold, CalTrans	• **Appendix E** (*Section E.14, Transportation and Traffic section*) describes traffic-related effects from Project implementation. A Traffic Impact Study was not prepared as the Project would generate minimal construction-related truck trips. The Project would also generate minimal truck trips related to operations and maintenance activities. • *Chapter 2, Project Description*, describes the permits needed for this Project.
Requested review of the Traffic Control Plan when complete and clarification of mitigation measure for bus facilities.	Roy Molseed, Santa Clara Valley Transportation Authority	• *Chapter 2, Project Description* describes the Traffic Control Plan. The Final Traffic Control Plan will be provided to VTA upon completion and prior to construction activities. • **Appendix E** (*Section E.14, Transportation and Traffic section*) describes impacts on and mitigation measures related to the transit system.
Hydrology and Water Quality / Biological Resources / Aesthetics		
Specified that the NOP fails to address the effect of the Project on the Palo Alto urban forest. Requested the EIR present a comprehensive assessment of the potential risk (quantified) associated with the use of recycled water for landscape irrigation on trees along the distribution areas. A few questions were asked, including the estimated value of the investment made in the trees within the targeted irrigation areas). Requested consultation with independent experts, City staff familiar with effect of recycled water on trees, and stakeholders involved in the drafting of the Urban Forest Master Plan (UFMP)	Catherine Martineau, Canopy	• *Chapter 3, Environmental Setting, Impacts and Mitigation Measures* describes Project effects on trees irrigated with recycled water and the City's Salinity Reduction Strategy, as it relates to hydrology and water quality and visual resources. • It should be noted that CEQA does not require an assessment of economic effects. • ***Appendix D*** describes the study conducted by HortScience examining the use of recycled water to irrigate plants, which focuses on recycled water quality from 2007-2008, not the water quality that is anticipated to be achieved by the time this Project is implemented, if approved. • The City retained the independent experts from HortScience to conduct studies for the Project and City staff, who have been involved in the UFMP, have reviewed the EIR during its development.

		•
Requested that the EIR addresses the City's plans for implementing its Salinity Reduction Policy and all impacts of using recycled water. Specified that EIR address all impacts of use of recycled water (including landscaping) and all soil conditions at Stanford Research Park and all other foreseeable locations (including all landscaping). Specified also that EIR cannot defer analysis of impacts. Incorporated the comments from previous letters to the City (suggested guidelines for recycled water quality for landscape irrigation at Stanford Research Park; indicated an EIR should be prepared to address the impacts irrigating plants with recycled water; indicated Adaptive Management Plan proposed under the IS/MND is reactive; requested the booster pump station/back up-generator be evaluated more fully in the IS/MND; requested for clarification on the biological resources mitigation measures; requested evaluation of recycled water irrigation on creeks and biological resources)	Jim Inglis and William Phillips, Stanford Real Estate Office	• *Chapter 2, Project Description,* describes the projects that have been implemented to reduce total dissolved solids (TDS) toward the Salinity Reduction Policy goal. • *Chapter 3, Environmental Setting, Impacts and Mitigation Measures* addresses the impacts of recycled water use on landscaped areas both from the water quality and visual perspective. It also provides an analysis of proposed facilities' impacts on the visual environment. • **Appendix D** summarizes the studies conducted by HortScience and others for this and other projects related to the issue of salinity effects on trees and soil, • **Appendix E** *(Section E.3, Biological Resources)* addresses the impacts of recycled water use on biological resources.
Cultural Resources		
Specified that impacts related to discovery and/or disturbance of historical and Native American resources and artifacts should be addressed.	Lisa Lee, SWRCB; Katy Sanchez, NAHC	*Chapter 2, Project Description*; **Appendix E** (*Section E.4, Cultural Resources*) describes the methods taken in the cultural resources investigation and the anticipated effects from Project implementation. **Appendix K** includes the Cultural Resources Assessment Report.
Public Information/General		
Provided information regarding compliance with CEQA-Plus requirements; requested CEQA documents for project.	Lisa Lee, SWRCB	• Section 1.3.2, CEQA Process (under heading "Draft Focused EIR" describes CEQA-Plus requirements; as this EIR would meet NEPA requirements, it would also meet all CEQA-Plus requirements. • All requested CEQA documentation will be sent to the SWRCB.

Because the Project was previously evaluated in an IS/MND that was publicly circulated, this EIR focuses on those issues of primary concern identified during the 30-day public comment period for the Draft IS/MND and in the 30-day scoping comment period for the Draft EIR. Thus, three primary issue areas have been identified in *Chapter 3, Environmental Setting, Impacts and Mitigation Measures*, under the topics specified in the parentheses. These topics include:

- Effects of recycled water use for irrigation of landscaped areas (Hydrology and Water Quality)
- Effects of recycled water use on the groundwater basin (Hydrology and Water Quality)
- Effects of recycled water use on the urban forest (Aesthetics)

The remaining environmental topics are addressed in **Appendix E**, which contains the Initial Study checklist for the Project. They are retained in the original checklist format to focus attention on the main topics. These sections have been updated as appropriate, to reflect changes in existing conditions and update any other relevant information.

Significance criteria have been developed for each environmental issue analyzed in this EIR, and are identified at the beginning of each impact analysis in **Chapter 3** or within the environmental checklist tables under each section in **Appendix E**. The standard project requirements and the mitigation measures presented in this EIR would be implemented if the Project is approved.

All of the impacts analyzed in this EIR, including those determined to be less than significant, are summarized in **Table ES-1** in the Executive Summary of this document.

Public Review of Draft Focused EIR

Upon completion of the Draft Focused EIR, the City of Palo Alto filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the 45-day public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft EIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR is available for review at the City's main office, located at the address provided below, or online at http://www.cityofpaloalto.org. Agencies, organizations, and interested parties, including those not previously contacted, or who did not respond to the NOP, currently have the opportunity to comment on the Draft EIR during the public review period.

Written comments on this Draft EIR should be addressed to:

City of Palo Alto
2501 Embarcadero Way
Palo Alto, CA 94303

Attn: Karin North, Watershed Protection Manager
Phone: (650) 329-2104
Email: Karin.North@cityofpaloalto.org

During this 45-day review period, the City will conduct a public meeting to receive oral comments on the Draft Focused EIR.

Final EIR Circulation

Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review at least 10 days prior to the public hearing before the City of Palo Alto City Council on the Recycled Water Project, at which certification of the Final EIR will

be considered. Comments received and the responses to comments will be included as part of the record for consideration by the City Council. Upon EIR certification, Council will consider whether to adopt a resolution approving the Project as described and to direct staff to proceed with filing funding applications for the Project consistent with the project description.

Action on the Project

In making its decision about the Project, the City Council will consider the environmental impacts and required mitigation in the form of "Findings."

Mitigation Monitoring and Reporting

CEQA Section 21081.6(a) requires lead agencies to "adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment." The mitigation monitoring and reporting program (MMRP) required by CEQA does not need to be included in an EIR. However, throughout this EIR, measures have been identified in order to facilitate the establishment of an MMRP. All standard project requirements proposed as part of the Project and any mitigation measures adopted as a condition of approval of the Project will be included in the City of Palo Alto's Recycled Water Project MMRP to verify compliance.

1.4 Purpose and Need

1.4.1 Need for Project

Recycled water use is expanding in the South San Francisco Bay Area. Key goals of the City of Palo Alto, the RWQCP and its partners, and other stakeholders such as the SCVWD, are water supply management and improving protection of the San Francisco Bay by reducing the discharge of wastewater that could impact the sensitive Bay environment. A recycled water project within the City of Palo Alto would assist in achieving these goals.

The City of Palo Alto relies primarily on SFPUC's Hetch Hetchy system for water supply. During emergencies, the City supplements the SFPUC supply with local groundwater wells. While the City has adequate supply to meet current demands on average, it faces the need to improve supply reliability during drought periods and emergencies. The SFPUC has been undergoing a major capital improvement program to upgrade the Hetch Hetchy water supply system, due to vulnerability in a number of facilities to potential disruption and outage, particularly during a significant earthquake. Climate change effects also contribute to the uncertainty in available water supply in the future. Communities, including the City of Palo Alto, which rely on the Hetch Hetchy system, can improve their water supply reliability by taking steps locally to manage potable water demand by providing supplemental water sources, such as the proposed recycled water Project.

The RWQCP discharges treated municipal and industrial wastewater to the southern reach of the San Francisco Bay (South Bay) via a man-made channel. The quantity of pollutants in the RWQCP's effluent has continually decreased over time as a result of improved source control and treatment efforts. However, since the South Bay receives less dilution and mixing from tidal action than other areas of the San Francisco Bay, the presence of minute quantities of pollutants in the effluent, and the potential effects of those pollutants on the South Bay environment continue to be of concern. The RWQCP is regulated by its National Pollutant Discharge Elimination System (NPDES) permit, issued by the RWQCB. The most recent permit was adopted in June 2014 and became effective in August 2014.

1.4.2 Project Objectives

The primary objective of extending the recycled water pipeline into Palo Alto would be to allow the City to maximize recycled water as a supplemental water source. Other objectives include the following:

- Improve potable water supply reliability by conserving drinking water, currently used for irrigation and other non-potable uses, for potable purposes;
- Provide a dependable, locally controlled non-potable water source;
- Increase recycled water use from the Regional Water Quality Control Plant;
- Secure a non-potable water source that will be available even in droughts to serve irrigation and other non-potable uses; and
- Reduce reliance on imported water.

In addition, the Project would help RWQCP and its partners further conserve the San Francisco Bay by reducing the wastewater constituent mass loadings[5] to the Bay.

Finally, the Project would provide the following benefits to the community:

- An alternative water supply for irrigation during droughts when potable water use is restricted;
- Beneficially reuse the wastewater generated by the City;
- Reduce future potable water supply infrastructure costs to the City by offsetting the need for new potable water supplies and the associated need to expand the potable water system; and
- Uphold state guidelines and policies relative to recycled water, including the California Water Code, Section 13510, and Section 461.

1.5 Regulatory Framework Related to the Palo Alto Recycled Water Project

1.5.1 State Recycled Water Policy

SWRCB adopted the Recycled Water Policy on February 3, 2009 (Resolution No. 2009-0011) and revised it on January 22, 2013 (Resolution 2013-003). The purpose of the Policy is to increase the use of recycled water from municipal wastewater sources. The Policy has four goals, of which two relate to recycled water, as shown below:

- Increase the use of recycled water over 2002 levels by at least one million AFY by 2020 and by at least two million AFY by 2030; and
- Included in these goals is the substitution of as much recycled water for potable water as possible by 2030.

Additional information regarding this policy is provided in Section 3.1.2 in *Chapter 3, Environmental Setting, Impacts and Mitigation Measures*.

1.5.2 State Waste Discharge Requirements for Recycled Water

The SWRCB adopted the General Waste Discharge Requirements for Recycled Water Use (Order No. 2014-0090-DWQ) in January 2014. This order authorizes the use of recycled water by Producers, Distributors, and Users for all Title 22 uses except groundwater recharge. The Recycled Water General Permit establishes requirements to manage recycled water for landscape irrigation uses in a manner that is protective of public health and the environment. The Recycled Water General Permit allows the use of disinfected tertiary recycled water produced for landscape irrigation, on parks, greenbelts, and playgrounds, school yards, athletic fields, golf courses, cemeteries, residential landscaping, common areas, commercial landscaping (except eating areas), industrial landscaping (except eating areas), freeway, highway, and street landscaping. The waste discharge requirements establish specific prohibitions and specifications regarding

[5] Mass loading refers in this case to the net input of chemical constituents entering the Bay.

the use and application of recycled water. However, it should be noted that the City is not covered by this permit but rather Order No. 93-160 as described in Section 1.5.5 below.

1.5.3 City of Palo Alto Recycled Water Ordinance

On May 12, 2008, the City Council adopted an ordinance to promote the use of recycled water (CMR 203:08, Ordinance No.5002) for irrigation, toilet and urinal flushing and floor trap priming (also Chapter 16.12, Recycled Water, of the City of Palo Alto Municipal Code). The City recognizes that potable water is a scarce, natural resource and is dedicated to conserving the potable water supply. Because recycled water is a sustainable water source that reduces potable water consumption and is not subject to rationing during drought, "the City of Palo has determined that recycled water shall be used within the boundaries of the Recycled Water Project Areas for construction, toilet and urinal flushing and irrigation purposes whenever it is available and beneficial to the customer." Per the Ordinance, all recycled water users must comply with the California Department of Public Health regulations and with the City of Palo Alto Water Reuse Rules and Regulations. In addition, all users must obtain a Recycled Water Permit from the City, which specifies the applicant's use of recycled water. Section 16.12.050 of the Ordinance also establishes an exemption process if recycled water has an adverse effect on the applicant's landscaping. Specifically, "[r]equests for an exemption or adjustment may be made consistent with state law and shall be based on the finding by the Director of Public Works that the use of recycled water demonstrates an adverse effect to the applicant's landscaping installed prior to the effective date of the ordinance codified herein." The exemption process is an appropriate forum for property owners to establish that the record demonstrates the use of recycled water would harm salt-sensitive species at specific sites (City of Palo Alto, 2008b).

1.5.4 City of Palo Alto Salinity Reduction Policy (Resolution 9035)

The City of Palo Alto adopted the Recycled Water Salinity Reduction Policy in January 2010. The purpose of the policy is to ensure that the RWQCP is taking all practical steps to reduce salinity in recycled water. Salinity can increase when water is used by people and industrial processes, and is therefore a consideration for all recycled water projects. The TDS levels in the recycled water are about 780 mg/L at the end of 2013 (*see Chapter 2, Project Description*). Regulatory limits for salinity levels for landscape irrigation do not exist, but the Salinity Reduction Policy creates a goal of lowering TDS levels to below 600 mg/L for recycled water (City of Palo Alto, 2010).

The main contribution of increased salinity (beyond normal human and commercial activity, and the potable water supplies themselves) to the RWQCP is the infiltration of saline groundwater near San Francisco Bay. In response, the City established the goal of cost effectively minimizing infiltration/inflow in the City of Palo Alto Sewer System Management Plan (2009). Other sources of controllable salt are also being explored. The Salinity Reduction Policy identifies activities that have been completed by the City, such as estimating salinity levels and developing actions to reduce salinity levels.

The City and RWQCP Partners have already identified sources of saline intrusion and have made substantial investments in implementing projects that will reduce TDS levels in the wastewater stream. Please see *Chapter 2, Project Description*, for a discussion of the efforts that the City and its RWQCP Partners have already undertaken and will undertake to reduce TDS levels in the recycled water.

1.5.5 RWQCP Water Reclamation Requirements (Order No. 93-160)

The City currently provides recycled water under its waste discharge requirements for the City of Palo Alto RWQCP (Order No. 93-160). It authorizes the diversion of approximately nine million gallons per day (mgd) of tertiary-treated effluent from the RWQCP to further treat and distribute to recycled water users. The Order specifies recycled water quality specifications (e.g., numeric thresholds for dissolved oxygen), identifies prohibitions, and includes provisions (e.g., the need for recycled water use agreements for each user). Prohibitions include but are not limited to the following:

- No recycled water used for irrigation shall be applied during periods of rainfall or when soils are saturated such that runoff occurs;
- No recycled water used for irrigation shall be allowed to escape to areas outside the designated use areas by surface flow or by airborne spray.
- No recycled water shall be discharged from the treatment facilities, irrigation holding tanks, storage ponds, man-made marsh, or other containment, other than for irrigation or industrial reuse in accordance with this Order or for discharge to a municipal sewage collection system.

1.6 Related Planning Efforts

1.6.1 Mountain View Shoreline Trunk Sewer Rehabilitation Project

This project consists of rehabilitating approximately 3,800 feet of Shoreline Park Sewer Trunk and nine manholes in the Shoreline Regional Park located in the City of Mountain View (City of Mountain View, 2012). Based on the results of a sampling program conducted by both the cities of Palo Alto and Mountain View, it was determined that saline groundwater was entering the pipeline along this segment. Thus, one of the objectives of the project, in addition to sewer rehabilitation, was to eliminate saline groundwater inflow and infiltration to reduce the salinity of flows conveyed to the RWQCP. As this reach of the pipeline alignment is located in a closed landfill and covered with buried refuse, a cured-in-place pipe lining was used to line the existing pipeline. This project was completed in 2013, and reduced existing effluent TDS levels at the RWQCP substantially (see *Chapter 2, Project Description*).

1.6.2 RWQCP Landscaping Project

The RWQCP renovated the landscaping within and around the periphery of the 25-acre wastewater treatment plant (located at 2501 Embarcadero Way, Palo Alto) to provide visual screening for visitors to the surrounding Baylands. The goals of the landscaping project include improving deteriorated landscape screening around the periphery of the Plant, defining a path system at the corner of Embarcadero and Harbor Road for safer pedestrian travel, demonstrating sustainable landscape design (plants are irrigated with approximately 4 million gallons of recycled water per year), and improving aesthetics within the RWQCP (City of Palo Alto, 2011). The project was implemented in 2014.

1.6.3 Palo Alto Urban Forest Master Plan

The City released a draft UFMP in April 2014. The City Council will consider adoption of the UFMP in May 2015. The purpose of the plan is to establish long-term management goals and strategies to foster a sustainable urban forest in Palo Alto. Palo Alto's urban forest consists of all trees in the City on public and private property. This forest includes street trees, park trees, forested parklands and trees in many private ownership settings. The UFMP identifies alternative waters for landscape irrigation, including recycled water (City of Palo Alto, 2014).

1.6.4 Salt and Nutrient Planning Effort and the Salt and Nutrient Management Plan

SCVWD led the salt and nutrient management planning process for the Santa Clara Groundwater Subbasin in collaboration with local water and wastewater entities, contributors of salts and nutrients, and stakeholders[6]. The purpose of the Santa Clara Salt and Nutrient Management Plan (SNMP) is to identify all sources of salts and nutrients loading to groundwater in the Santa Clara Groundwater Subbasin and to

[6] Stakeholders include the California Water Services Company, City of Milpitas, City of Mountain View, City of Palo Alto, City of San Jose, City of Santa Clara, City of Sunnyvale, San Francisco Bay Regional Water Quality Control Board, San Jose Water Company, Santa Clara Basin Watershed Management Initiative, Santa Clara County Farm Bureau, South Bay Water Recycling, and Stanford University.

evaluate existing and future assimilative capacity, as required by the SWRCB 2009 Recycled Water Policy. In addition, the SNMP would develop recycled water and stormwater goals and objectives, provide a plan for long term groundwater monitoring of salts and nutrients, and identify measures to manage salt and nutrient loading to groundwater on a sustainable basis. Four stakeholder meetings have been held from 2001 to 2013, and the effort is ongoing. The Final SNMP was published on February 9, 2015[7]. The SNMP analysis found that current and planned recycled water use by 2035 causes only minor water quality changes to the Santa Clara Subbasin with respect to salts and nutrients (SCVWD, 2014).

1.7 Organization of this EIR

This Draft Focused EIR is organized into the following main chapters:

Executive Summary. This chapter includes an overview of the project evaluated in this Focused EIR. It includes a table that summarizes the impacts, mitigation measures, and level of significance after mitigation measures are incorporated. In addition, the Executive Summary provides a summary of the alternatives considered, a discussion of the areas of controversy and issues to be resolved.

Chapter 1: Introduction and Project Background. This chapter provides an introduction and history of the Project, a summary of the CEQA review process, the purpose and need for and objectives of the Project, relevant regulatory framework related to recycled water, and related planning efforts.

Chapter 2: Project Description. This chapter includes a detailed description of the proposed Palo Alto Recycled Water Project. Project location, operations, equipment and processes, and construction methods are discussed.

Chapter 3: Environmental Setting, Impacts, and Mitigation Measures. The topics covered in this chapter include a description of the environmental setting, methodology, significance criteria, impacts, mitigation measures, and significance after mitigation.

Section 3.1: Hydrology and Water Quality. This section evaluates impacts on water resources and water quality.

Section 3.2: Aesthetics. This section evaluates impacts on visual and scenic resources.

Section 3.3: Environmental Justice. This section evaluates the potential for disproportionate impacts on high-minority or low-income populations. This section is provided to comply with NEPA requirements.

Chapter 4: Other CEQA/NEPA Considerations. This chapter describes potential for growth-inducing impacts associated with the Palo Alto Recycled Water Project, cumulative impacts when considered with other past, present and foreseeable future projects, and the Project's significant and unavoidable impacts and irreversible environmental changes. In addition, this chapter compares the impacts of the Palo Alto Recycled Water Project with other alternatives considered by the City, including the No Project Alternative, the No Funding from USBR Alternative, and the No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative. The environmentally superior alternative is evaluated. Other NEPA requirements are also included in this chapter.

Chapter 5: References and List of Preparers. This chapter lists the authors that assisted in the preparation of the Draft Focused EIR, by name and company or agency affiliation.

[7] The Final SNMP is dated November 2014 in its cover letter, although the Final document was published in February 2015.

Appendices. This section includes all notices, public comment letters received on the NOP, as well as all technical material prepared to support the analysis. In addition, the appendices include the updated sections associated with the other environmental topics not covered in **Chapter 3**. The list of appendices are as follows:

Appendix A: Potential Recycled Water Customers

Appendix B: Notice of Preparation and NOP Scoping Meeting Sign-In Sheet

Appendix C: Distribution List and Public Comments Received on the NOP

Appendix D: Literature Review of Studies Related to Effects of Recycled Water on Landscapes

Appendix E: Environmental Checklist

Appendix F: RWQCP Partners Salinity Reduction Resolutions

Appendix G: Evaluation of Use of Recycled Water for Landscape Irrigation

Appendix H: Tree Inventory of Seven Properties in the Stanford Research Park Area, Palo Alto Recycled Water Project, Phase 3

Appendix I: Air Quality Emissions Calculations

Appendix J: Biological Resources Assessment

Appendix K: Cultural Resources Assessment Report

Appendix L: Hazardous Materials Database Search Results

Appendix M: City of Palo Alto Resolutions 9449 and 9460

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Chapter 2 Project Description

2.1 Project Location

The proposed Project is located in the South San Francisco Bay area, within the City of Palo Alto, California. **Figure 1-1** in Chapter 1 shows the Project's regional location. **Figures 2-1 and 2-2** provide an aerial view of the proposed pipeline alignments.

The City of Palo Alto Recycled Water Project is an extension of the City of Palo Alto Water Reuse Program. Phase 1, completed in 1980, serves the City of Palo Alto. Phase 2, completed in 2009, is the Mountain View Recycled Water project which serves the City of Mountain View. The proposed Project (the subject of this EIR) would serve customers in the City of Palo Alto, potentially including Alta Mesa Memorial Park, Stanford Research Park, and others (see **Appendix A** for a listing of potential recycled water customers).

2.2 Existing Facilities

2.2.1 Regional Water Quality Control Plant

The RWQCP is located adjacent to the San Francisco Bay in the northeastern portion of the City of Palo Alto (see **Figure 2-3**). It provides wastewater treatment and disposal services to the cities of Palo Alto, Mountain View, and Los Altos, the Town of Los Altos Hills, the East Palo Alto Sanitation District (EPASD), and Stanford University, known collectively as the RWQCP Partners. The RWQCP has a design average dry-weather flow capacity of 39 mgd and a current flow of about 18 mgd.

Most of the effluent from the RWQCP is treated to meet disinfected secondary-23[1] recycled water criteria and discharged to San Francisco Bay through an effluent outfall. The RWQCP also has a 4.5-mgd recycled water facility that filters and disinfects the effluent to meet the requirements for tertiary treated water[2]. The RWQCP also has ultra-violet (UV) disinfection facilities that could increase the recycled water production capacity to 6.3 mgd at 65 percent UV transmittance, with the potential to further increase capacity to 8.6 mgd at 65 percent UV transmittance in the future. Recycled water produced by the RWQCP is used by two of the RWQCP Partners: Mountain View (48 percent) and Palo Alto (52 percent). Recycled water is currently delivered to more than 30 connections throughout the north of Bayshore Area (bounded by US101, Shoreline Blvd, and San Antonio Rd.) in the City of Mountain View and City of Palo Alto. Existing customers in Palo Alto include the Palo Alto Municipal Golf Course, Greer Park, CalTrans landscaping, Palo Alto Animal Services, Mountain View Golf Course, and the RWQCP.

[1] Recycled water that has been oxidized and disinfected so that the median concentration of coliform bacteria in the disinfected effluent does not exceed a most probably number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

[2] Specifically the RWQCP treats effluent to meet the requirements for disinfected tertiary recycled water without conventional treatment for "unrestricted use" in landscape irrigation and "restricted use" in recreational impoundments as defined in California Code of Regulations, Title 22, Sections 60301 through 60355. Title 22 requires that the wastewater has been filtered and disinfected to meet specified requirements for removal of bacteria and viruses.

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Figure 2-1
Map of Proposed Project Facilities

Pipeline Alignment

- Proposed Alignment
- Pipe Lateral

Alignment Options

- Option 1
- Option 2
- Connection Pipeline

- River
- Pump Station

0 0.5 1 Miles

RMC water and environment

N

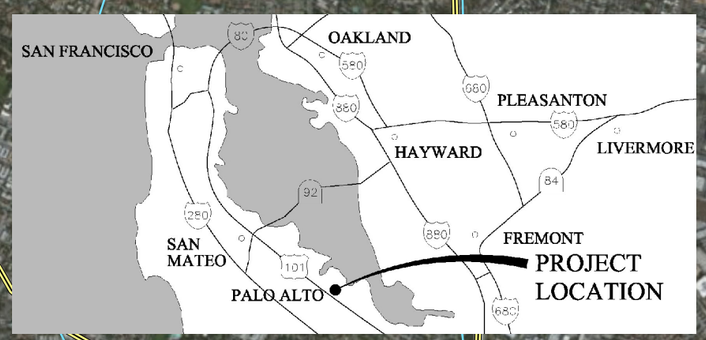
San Francisco Bay

Regional Water Quality Control Plant (RWQCP)

See Figure 2-2

Mayfield Soccer Fields

Embarcadero Rd
Embarcadero Way
Oregon Expy
Matadero Creek
Bayshore Rd
Barron Creek
Italian Way
El Camino Real
El Dorado Ave
Cowper St
Middlefield Rd
E. Meadow Dr
Adobe Creek
Alma St.
S California Ave
Hansen Wy
Page Mill Rd
Hanover St
Foothill Expy
Hillview Ave
Deer Creek Rd
Arastradero Rd
101
82
280



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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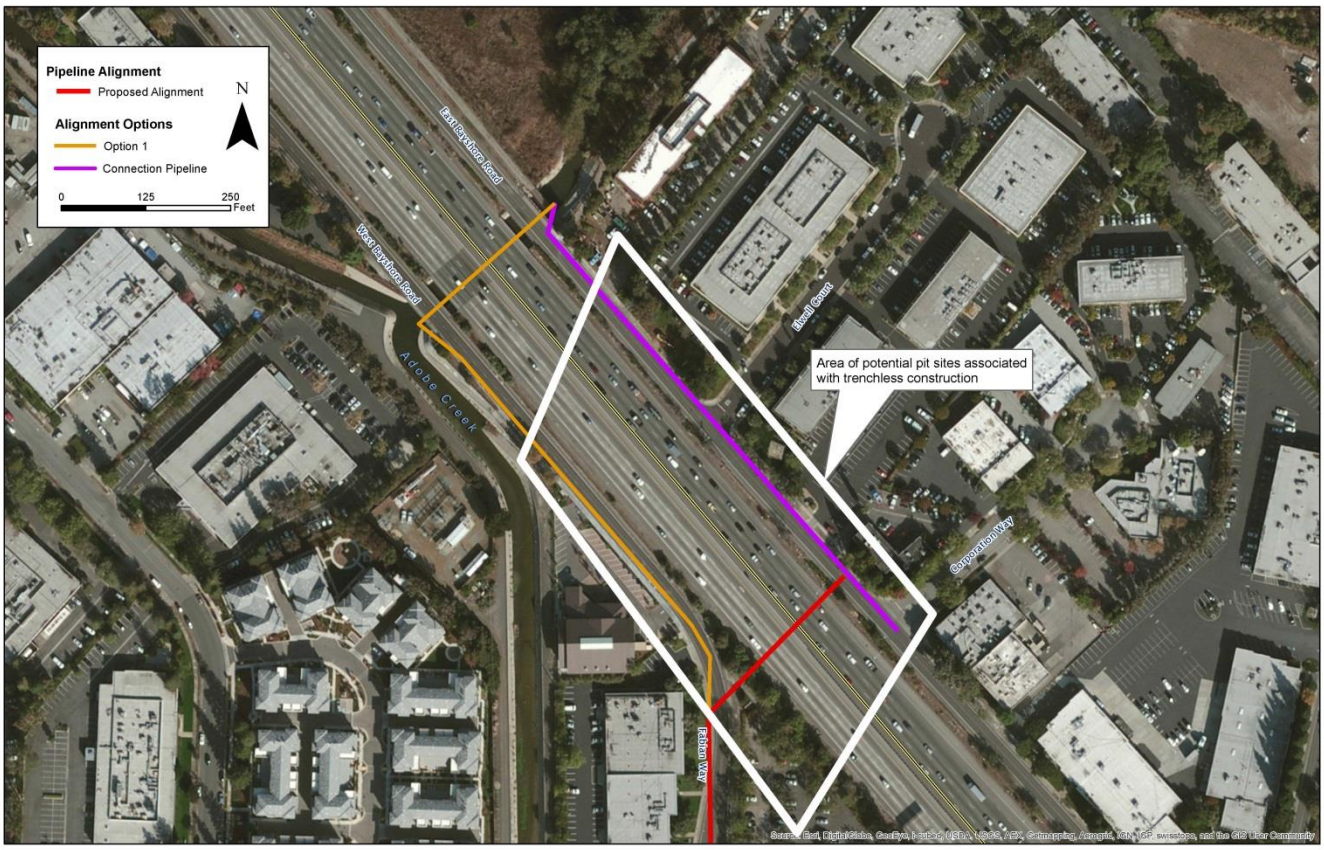
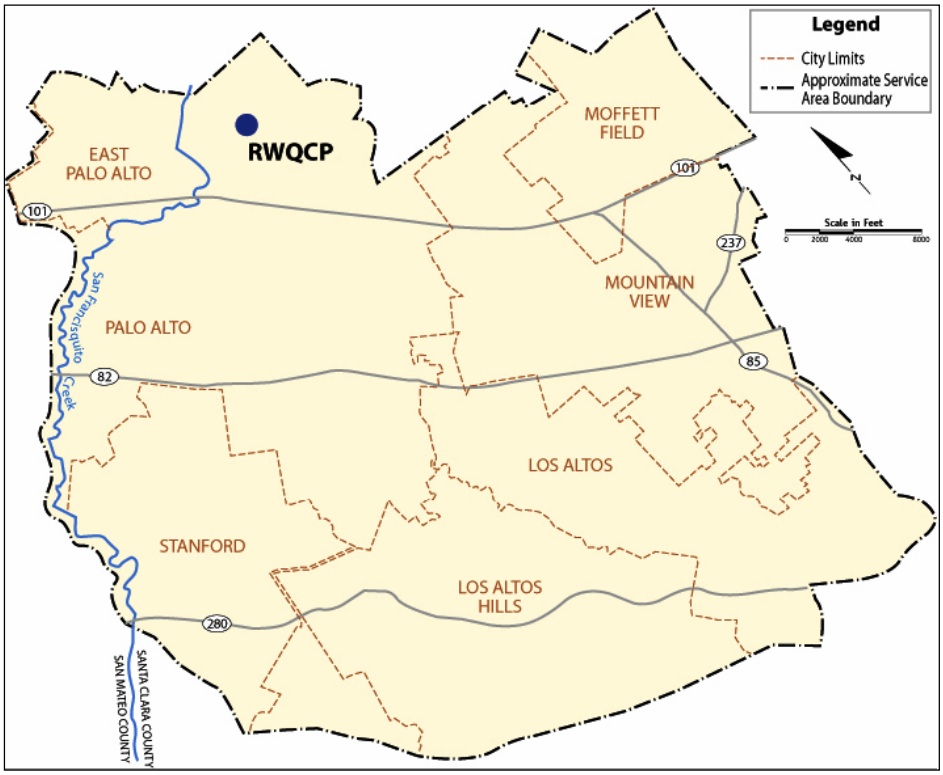
Figure 2-2: Proposed Work Area in the Vicinity of US 101



The recycled water provides a good source of supplemental water supply for both the cities of Mountain View and Palo Alto, and the quality of the water has been suitable for most uses served to date in both cities. Because the salinity of the recycled water is higher than the potable water in these cities, and some irrigation areas have saline soils (such as the Palo Alto Municipal Golf Course), blending of recycled water with potable water has been implemented. For other use areas and plant/turf species, this has not been necessary. As the City of Palo Alto broadens its recycled water irrigation and reuse program to other more salt sensitive uses, recycled water salinity will need to be monitored and tracked so that recycled water users can maximize the benefits of integrating recycled water into their landscaping practices. The City has been monitoring RWQCP Partners' TDS levels monthly, and has been cooperating with the RWQCP Partners to implement projects that will achieve the goal established in the City's Salinity Reduction Policy (see Section 1.5.4 in *Chapter 1, Introduction and Project Background* regarding this policy). Based on the projects that have been implemented to date, TDS levels have been reduced substantially (please see Section 2.4 below).

Figure 2-3: RWQCP Service Area



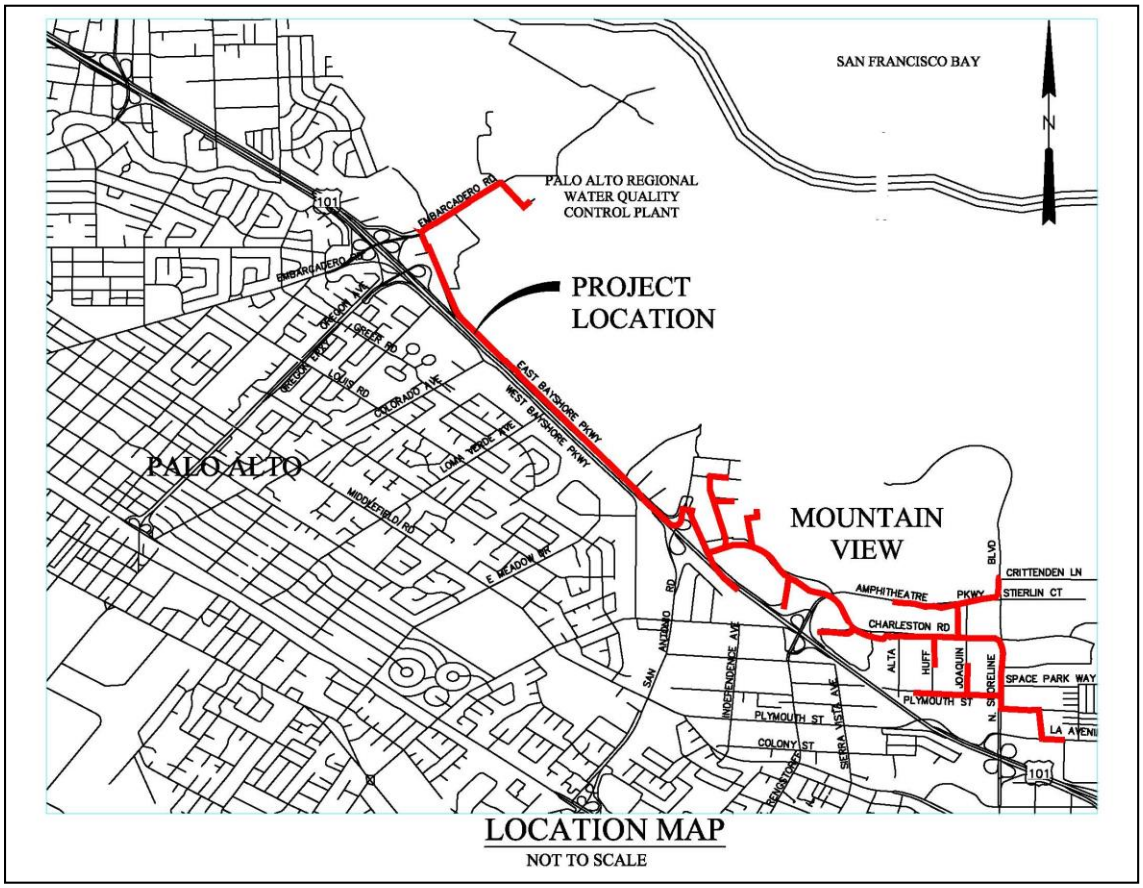
2.2.2 Mountain View/Moffett Field Area Recycled Water Pipeline Project

The Mountain View/Moffett Field Area Recycled Water Pipeline Project (Mountain View Project), described in Chapter 1, replaced an existing deteriorating pipeline to Shoreline Golf Course in Mountain View (**Figure 2-4**). The pipeline replacement restored the golf course connection and provides recycled water services to the Shoreline community. Construction for the Mountain View Project was completed in 2009. The RWQCP, Palo Alto Animal Services, Palo Alto public works corporation yard, Google, Microsoft, and Shoreline Park and Amphitheatre are the existing major users of recycled water. The Mountain View/Moffett Field Area Recycled Water pipeline is sized to serve future users in Moffett Field and the City of Palo Alto via several connections at Embarcadero Road and East Bayshore Road.

2.3 Project Description

The Palo Alto Recycled Water Project proposes the construction of a recycled water pipeline and associated facilities to provide an alternative water supply for non-potable uses. The proposed Project would involve the construction of approximately 5 miles of 12- to 18-inch pipes, approximately 5 miles of 6- to 10-inch lateral pipelines to over 50 use sites, an up to 1,500-square-foot booster pump station along the proposed pipeline, and an up to 1,600-square-foot pump station at the RWQCP. The Project would initially serve approximately 900 AFY of recycled water, primarily to the Stanford Research Park Area. Future extensions could serve Stanford University and Los Altos Hills, as well as provide a loop by making a second connection to the Phase 2 Mountain View Project. These future extension projects would undergo project specific environmental review by the appropriate lead agency as they are proposed. The predominant use of recycled water for this Project is landscape irrigation. Some industrial use, such as toilet flushing, commercial and light industrial cooling towers, could also be included at a later date. The locations of the proposed Project components are shown in **Figure 2-1**.

Figure 2-4: The Mountain View/Moffett Field Area Recycled Water Pipeline Project



2.3.1 Pipelines

The proposed distribution system consists of a backbone pipeline and offshoots, or lateral pipelines. The pipeline would be located in urban areas, along existing road rights-of-way (ROW) (see **Figure 2-1**). The proposed backbone pipeline alignment would begin in the north with a connection point to the existing 24-inch recycled water pipeline that was constructed as part of the Mountain View Project, in the vicinity of East Bayshore Road and Corporation Way (see **Figure 2-2**). The pipeline would cross under US 101, and run along Fabian Way to East Meadow Drive where it would cross Adobe Creek. The pipeline would run along East Meadow Drive across Middlefield Road, and then continue along East Meadow Drive, Cowper Street, and El Dorado Avenue to Alma Street, along Alma Street to Page Mill Road, and along Page Mill Road to El Camino Real. The pipeline would continue across El Camino Real, along Page Mill Road to Hanover Street, and along Hanover Street and Hillview Avenue to Arastradero Road. Two pipeline alignment options could potentially replace segments of the proposed backbone pipeline alignment depending on constructability and design considerations, as shown in **Figure 2-1**. Roads included in the backbone pipeline alignment, including the options, are detailed in **Table 2-1**.

Lateral pipeline alignments would run along existing side streets from the proposed backbone pipeline alignment or alignment options to serve individual users as shown in **Figure 2-1**.

2.3.2 Booster Pump Station

A booster pump station would be constructed as part of the proposed Project to maintain a minimum delivery pressure of 65 pounds per square inch (psi) for end users. The proposed booster pump station would be located at

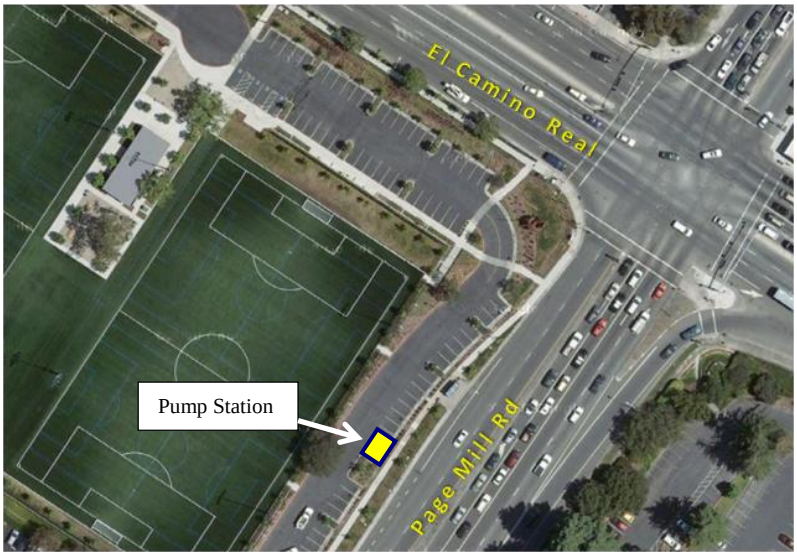
Table 2-1: Proposed Backbone Pipeline Alignment

Alignment Location	Starting Cross Street	Ending Cross Street	Proposed Construction Method at Crossings
Proposed Backbone Pipeline Alignment			
Under US 101	E. Bayshore Rd. at Corporation Way	Fabian Way	Trenchless under 101
Fabian Way	West Bayshore Road	East Meadow Drive	Open-Cut[1]
East Meadow Drive	Fabian Way	Cowper Street	Open-Cut; Potential trenchless[2] section across Adobe Creek Bridge
Cowper Street	East Meadow Drive	El Dorado Avenue	Open-Cut; Potential trenchless sections across Barron Creek Bridge and Matadero Creek Bridge
El Dorado Avenue	Cowper Street	Alma Street	Open-Cut
Alma Street	El Dorado Avenue	Page Mill Road	Open-Cut
Page Mill Road	Alma Street	Hanover Street	Open-Cut; Trenchless section under railroad crossing; Potential trenchless section under El Camino Real
Hanover Street	Page Mill Road	Hillview Avenue	Open-Cut
Hillview Avenue	Hanover Street	Arastradero Road	Open-Cut; Potential trenchless section across SFPUC Easement and Foothill Expressway
Proposed Pipeline Alignment Option 1			
Adobe Creek	US 101	West Bayshore Road	Trenchless (hang from the bridge)
West Bayshore Road	Adobe Creek	Fabian Way	Open-Cut
Pipeline Alignment Option 2			
El Camino Real	Page Mill Road	Hanson Way	Open-Cut
Palo Alto Square Parking	Hanson Way	Hanover Street	Open-Cut

[1] The open-cut construction method involves long, narrow excavations in the ground to accommodate the placement of the pipelines. An alternate construction method to open-trench is Horizontal Directional Drilling. Both types of construction methods are described in Section 2.5 below.
[2] All of the bridge crossings would be trenchless (constructed with the pipe attached to the side of the bridge or installed underneath the bridge). The construction method has not been finalized. Neither method would require work to be done in the creeks.

2700 El Camino Real, near the southeast corner of the Page Mill Road and El Camino Real intersection at the Mayfield Soccer Fields, within an existing parking area (see **Figure 2-5**). The site is on the proposed pipeline alignment and located in a strategic area for delivering recycled water to the majority of demands along the pipeline. The park is owned by Stanford and leased to the City of Palo Alto.

Figure 2-5: Proposed Booster Pump Station Site at Mayfield Soccer Fields



The proposed booster pump station would be constructed below grade at the parking lot because of the prominent visual location and to avoid effects on existing recreational uses. The pump station would have a peak flow rate of 2,860 gallons per minute (gpm) which would require a total installed horsepower (hp) of 400 hp, including standby pumps. The footprint would be approximately 50 x 30 feet (1,500 square feet).

The proposed pump station would be designed to minimize noise. Above grade structures include an access hatch and ventilation located above the buried structure, on the parking surface, flush to the ground. A transformer (to step down the voltage) would be located on a pad up to 8 by 8 feet and would be up to 6 feet high. Concrete bollards would be needed at 2 feet off of the pad edges in any direction with vehicle traffic to prevent cars from accidentally driving into or over these components; the bollards would be spaced at 4 feet apart from one another at a height of approximately 3 feet. A communication system (e.g., supervisory control and data acquisition [SCADA][3]) may also be needed to monitor pump station operations. This would require an antenna to be installed at the site, which could vary in height. All above-ground improvements would be subject to the City's design review to address all aesthetic concerns. Specifically, the proposed aboveground facility would require architectural review during the design phase of the Project and the design would need to satisfy the requirements of the Architectural Review Board (ARB).

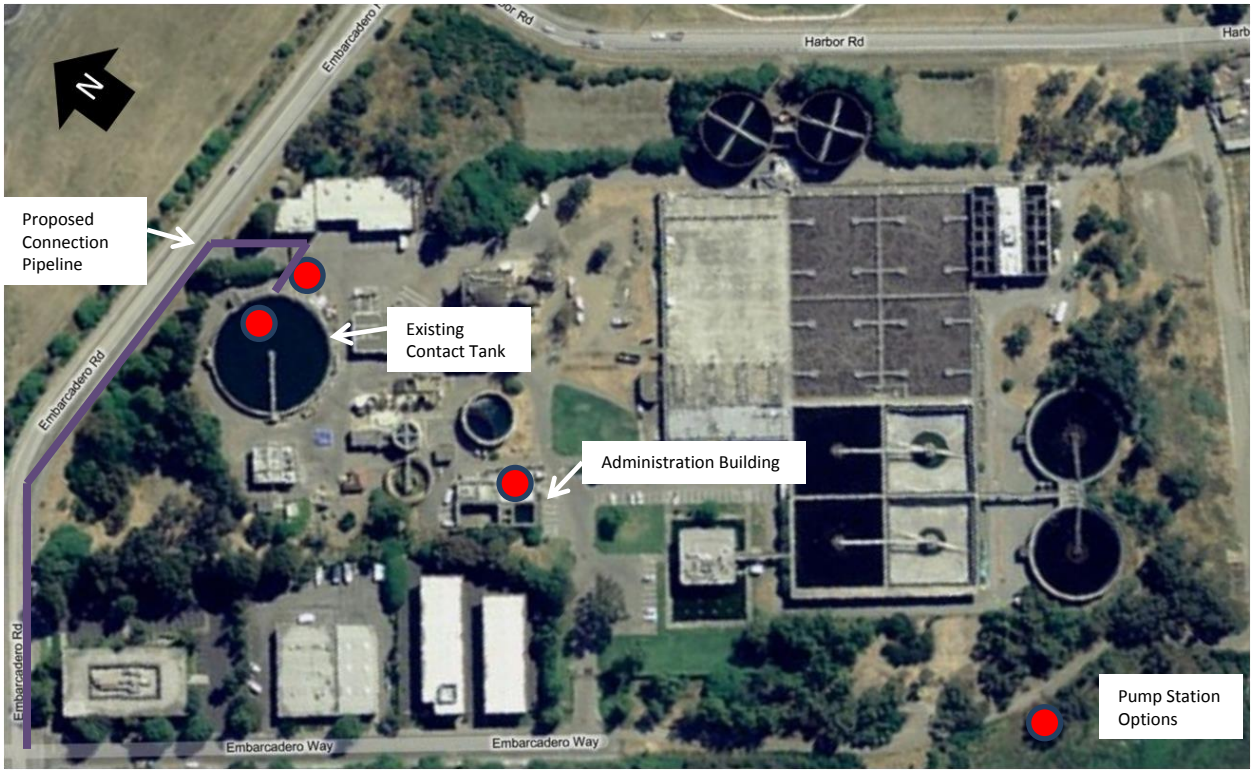
2.3.3 RWQCP Pump Station

To accommodate the Project and achieve the minimum acceptable pressure at the Phase 2 connection point during peak flows, additional pumping capacity would be necessary at the RWQCP. The RWQCP pump station would have a capacity of 4.8 mgd (3,310 gpm) requiring a 350-hp facility. Several preliminary siting options have been

[3] SCADA is a communication that system that allows control of the pump station remotely.

identified for the pump station, as shown in **Figure 2-6** and listed below**.** The final site would be determined during detailed design. It is possible that a pump station could be located elsewhere on the north side of the plant, but it would be located entirely within the plant footprint and would avoid removal of trees. Options include the following:

Figure 2-6: Proposed Pump Station Site at the RWQCP



- Installation of the additional pump in the basement of the existing administrative building and relocation of the existing marsh pump to the contact tank outlet box[4]. No new piping is needed for this option to connect to the recycled water system, as existing pipes are in place.
- Construction of the pump station within the existing, empty chlorine contact tank in the northwestern portion of the plant. A new 30-inch pipeline would be needed to connect to the existing recycled water system. The pipeline would likely be routed on paved ground through the northern entrance of the plant (located northeast of the chlorine tank), then along Embarcadero Road to its connection with the existing 30-inch pipeline on Embarcadero Way.
- Construction of the pump station adjacent to and northeast of the existing contact tank. While excavation would be 5 to 6 feet, the pump cylinders could be up to 20 feet down for the pump station. Similar to the above option, a new pipeline would be needed.

[4] The existing contact tank outlet box is a 10- by 10- by 20 foot (width, length and height) facility connected to the existing, empty contact tank. The marsh pump would only require installation within the existing structure and would not require any land excavation.

If located outside existing structures, the pump station could require a footprint of up to 40 feet x 42 feet (1,680 square feet) and would be up to 12 feet tall and enclosed or covered. This structure would be subject to the City's design review to address all aesthetic concerns.

2.4 Recycled Water Quality

The Project would provide 900 AFY of recycled water to customers for irrigation of landscaped areas, at parks and in commercial areas.

The existing Title 22 Water Recycling Criteria address treatment requirements for three types of recycled water uses: Landscape Irrigation, Recreational Impoundments, and Industrial Uses. The treatment requirements are intended to protect public health based on the expected degree of human contact with recycled water under each type of use. Treatment requirements are expressed as treatment process requirements (e.g., bio-oxidation, coagulation) as well as performance standards (e.g., disinfection standards and contaminant reduction). The existing Title 22 standards are among the most stringent standards in the world for public health protection. Under Title 22, the RWQCP's tertiary recycled water qualifies for the highest level of nonpotable uses, including general use in landscape irrigation and restricted use in recreational impoundments. To be used as a source supply for this designation, the recycled water shall be at all times adequately oxidized, coagulated, clarified, filtered, and disinfected water. Because the recycled water is not treated using sedimentation basins between coagulation and filtration, it cannot be used for unrestricted recreational impoundments where there is body-contact (e.g., swimming), but it can be used for restricted recreational impoundments (e.g., boating, fishing, etc.).

The California Department of Public Health (CDPH) (prior to the transition of the Division of Drinking Water and Environmental Management [DDWEM] to the SWRCB from CDPH) has also produced specific requirements applicable to recycled water use areas receiving recycled water that meets Title 22 Water Recycling Criteria. The requirements to protect public health that are applicable to the proposed Project are contained in Title 22, Article 4, Section 60310 – Use Area Requirements. The requirements focus on application and management specifications for various recycled water uses, including general use requirements and landscape irrigation requirements.

As discussed in Section 1.5.5 of *Chapter 1, Introduction and Project Background*, The City currently provides recycled water in compliance with its waste discharge requirements for the City of Palo Alto RWQCP (Order No. 93-160). The Order provides stringent specifications on the recycled water quality and prohibitions regarding its use. The City has considered the comments received during the public comment period for the previously-prepared Public Draft IS/MND, and the public comments received during the scoping period for this EIR, which identified concerns regarding the use of recycled water for irrigation of redwood trees and other salt sensitive plants. Though the potential for adverse effects on salt sensitive species such as redwood trees depends upon a variety of factors (e.g., soil type and salinity, irrigation practices, weather and rainfall patterns), added salinity from irrigation water (either recycled water or potable supplies) can adversely affect such species, depending upon how all the above factors interplay. As a result, the City continues to strive to meet the goals of the Salinity Reduction Policy (see Section 1.5.4 in *Chapter 1*, *Introduction and Project Background*), and has been working with the RWQCP Partners to identify the sources of elevated TDS groundwater and to plan and implement projects that reduce infiltration of TDS into its wastewater and recycled water product. The City and RWQCP Partners have already completed projects that have substantially reduced TDS, and will continue to plan and implement projects that will further reduce TDS levels to meet the City's goal of 600 mg/L TDS. The 600 mg/L goal was based upon the engineering feasibility of making changes that would keep saline groundwater out of the sewer system. To demonstrate the collective commitment to reducing salinity, the key RWQCP Partners have adopted salinity reduction resolutions to reduce the salinity of recycled water (see **Appendix F**). The projects that have been completed, are in progress, or are planned for the next several years that would further reduce TDS concentrations are described below in **Table 2-2**.

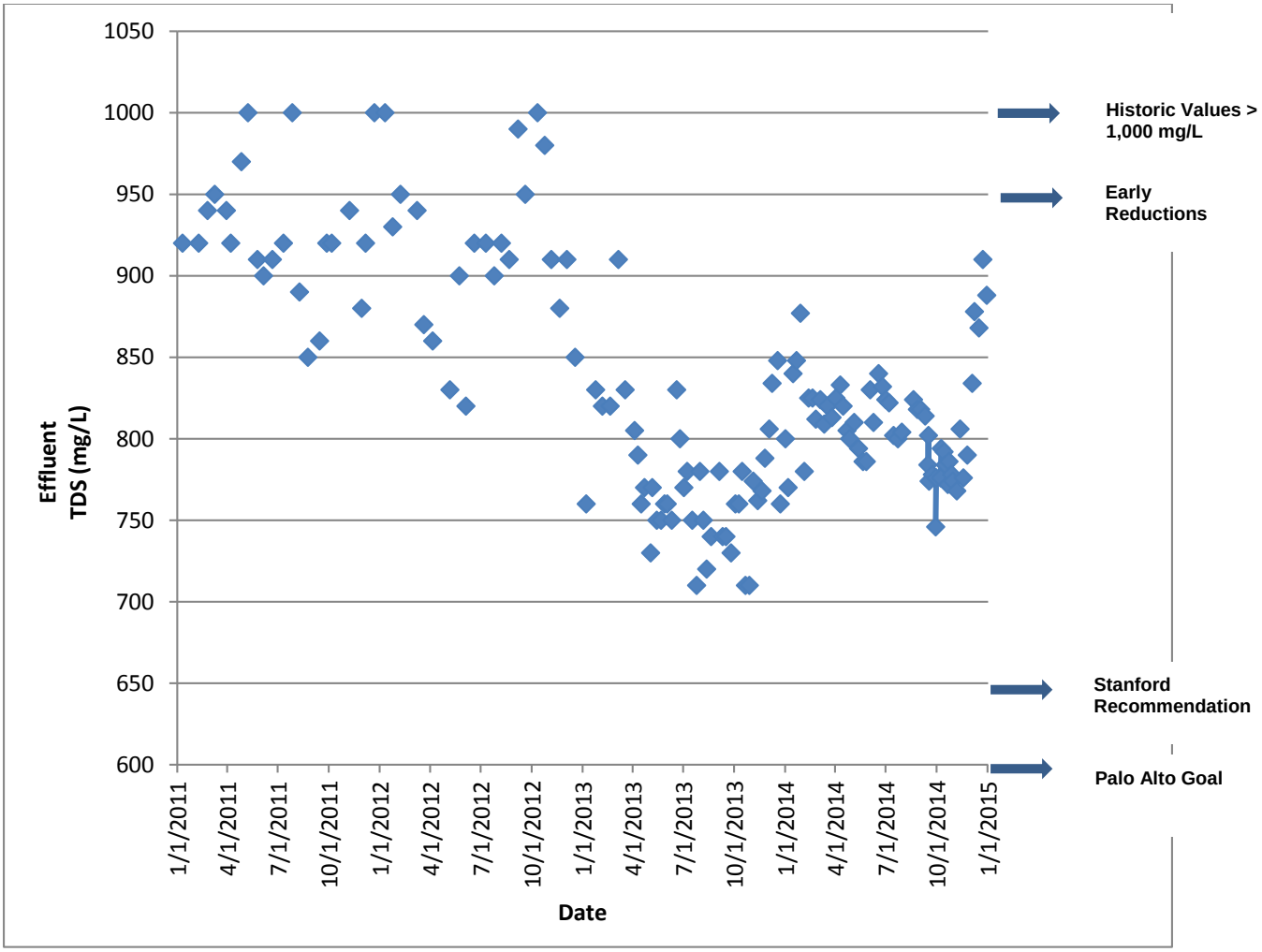
Table 2-2: Recently Completed and Planned Wastewater Facilities Improvement Projects to Reduce Effluent TDS Concentrations

Project Name	Description	Status	Reduction in TDS
City of Mountain View Shoreline Trunk Sewer Rehabilitation Project	To address infiltration of saline groundwater into their trunk sewer main in the shoreline, the City of Mountain View implemented this project. The project consisted of rehabilitating approximately 3,800 feet of trunk sewer main and nine manholes in the Shoreline at Mountain View Regional Park.	Completed in 2013	Approximately 100 mg/L.[1]
The City of Mountain View Landfill Barrier Extraction Well Removal Project	Removal of two saline wells from the edge of the Mountain View landfill. Water extracted was previously discharged into the sanitary sewer.	Completed in September 2014	Approximately 45 mg/L
EPASD Manhole Project	EPASD repaired a manhole near the Bay where saline water leaks into the system.	Completed in 2014	Cannot be quantified
City of Los Altos Trunk 101 to Meter Station project	Rehabilitation of sewer line	June 2014	Cannot be quantified
City of Palo Alto, City of Los Altos, City of Mountain View, and EPASD	72-inch Trunk Project located along the marsh and Palo Alto Landfill between San Antonio Road and the RWQCP.	Research anticipated in 2015	Approximately 70 mg/L
EPASD Master Plan Projects	EPASD has identified other sources of saline infiltration and is currently in preparation of a Master Plan that will address salinity. This includes improvements to the trunkline along the Bay.	Anticipated in 2015	Approximately 10 mg/L
City of Mountain View Sewer Relining	The City of Mountain View is tentatively planning to reline 17,500 feet of large diameter sewer main over the next eight years. Salt intrusion is a consideration in prioritizing the work. One of the prioritized projects is the Mountain View Pump Station to Meter Station project.	Anticipate to start in 2015	Not yet determined
City of Palo Alto Kenneth Avenue Project	Repair lateral along Kenneth Ave where brackish water instruction was identified	Completion expected prior to project implementation	Approximately 40 mg/L
Mountain View Shoreline Amphitheatre	The cities of Palo Alto and Mountain View have recently identified the source of brackish infiltration near Shoreline Amphitheatre (from a potential Well A3 that discharges to the sanitary sewer within the landfill) and are developing a plan of action to address this issue.	Completion expected prior to project implementation	Approximately 3 mg/L

[1] The 12-month average TDS in the Mountain View pipeline decreased about 300 mg/L which would equate to a reduction in influent of about 100 mg/L. Because this estimate is based on actual past data, the actual project reduction may have been larger, with the remainder masked by conservation and changes in commercial property demographics.

The City has limited historic data on TDS concentrations of effluent generated from the RWQCP. Based on available data in the late 1980s, TDS was approximately 1,100 mg/L. Between 2009 and 2012, the effluent TDS levels were reduced to approximately 920 mg/L from some initial improvement projects that were implemented. The Mountain View Shoreline Trunk Sewer Rehabilitation Project further reduced TDS levels from January 2013 to November 2013. **Figure 2-7** shows the fluctuating salinity levels in the 2010 to 2012 period and the subsequent decline in 2013 to 780 mg/L as a result of the early projects. Future projects are expected to further reduce TDS levels towards the Salinity Reduction Strategy goal of 600 mg/L. One commenter on the Project (Stanford University's Real Estate Office) believes that there will be no salinity impact on Redwood trees or similar salt sensitive species at TDS levels below 650 mg/L, but that there could be impacts above that level.

Figure 2-7: Effluent TDS Concentrations Trends by Project Implementation



Salinity reductions due to the planned projects are expected to result in a cumulative reduction to below 650 mg/L within the next several years, before the Project is completed. Ongoing monitoring and surveillance would confirm reductions, track success and identify other potential sources. Key projects are due for completion in the next several years, in advance of the operation of the proposed recycled water delivery system (2019). Therefore, it is estimated

that TDS levels would be below the commenter's indicated TDS impact level (650 mg/L) by the time this Project is completed and water is delivered. TDS levels in the RWQCP effluent and recycled water will be reported to interested parties quarterly, using a rolling 12-month average to compare to the City's 600 mg/L goal. In the unlikely event that TDS levels do not drop below 650 mg/L by the time the Project is implemented (recycled water is delivered), then the City shall consider other actions, including inclusion of a blanket exemption in the City's Recycled Water Policy for salt sensitive species (including redwood trees), blending of recycled water with potable water, or other additional treatment of recycled water prior to application.

TDS levels increased somewhat in late 2014 as a result of the 2013-2014 drought. There are several reasons for the slight increase. Water conservation by customers has increased as a result of the drought, which has resulted in less wastewater generated (the average plant flow has dropped from 22 mgd to 18 mgd), and this tends to increase salinity. Another reason is that potable water is drawn from the lower reaches of reservoirs and the source water going to customers is of higher salinity. A third key reason is that the water table drops in droughts, and less low-TDS water enters the sewer system, tending to increase salinity. However, these are expected to be short-term effects that would tend to be reversed over time.

The City will continue to strive to meet the goals of the Salinity Reduction Policy, and current and anticipated TDS concentrations in recycled water are suitable for almost all plant types found in the Plant's service area. However, the City recognizes that there are particular combinations of plant types, soil conditions, locations and weather types, in which irrigation with recycled water could have a detrimental effect on sensitive plant species regardless of the particular TDS concentration. Therefore, the City and its Partner Agencies will continue to implement TDS reduction projects to meet the Salinity Reduction Goal by the time of the Project's implementation. Recycled water is commonly used throughout the state for landscaped irrigation (golf courses, parks, schools, and medians), including in the San Francisco Bay Area (e.g., San Jose, Santa Clara, Milpitas, Redwood City, San Rafael, Concord, Martinez, Pleasant Hill, Antioch, Pittsburg, Dublin, San Ramon, Alameda, Berkeley, Oakland, Richmond), Central Coast, and Southern California. TDS concentrations of recycled water vary tremendously depending on the location, and can be comparable to other water supply sources including groundwater and imported water.

As specified above, Title 22 and the SWRCB's waste discharge requirements for recycled water have identified recycled water use requirements that are protective of public health, and groundwater and surface water resources. Specifically they require application of recycled water at reasonable agronomic rates considering soil, climate, and nutrient demand, require areas irrigated with recycled water be managed to prevent nuisance conditions, and establish a Monitoring and Reporting Program, which includes inspections and regular maintenance of areas irrigated with recycled water. Thus, site management is an integral part of irrigating with recycled water. The City's Waste Discharge Requirement, Order No. 93-160 (see Section 1.5.5 in *Chapter 1, Introductions and Project Background*, for more information about this order), also includes prohibitions similar to those specified in the Recycled Water Permit regarding the prohibition of applying recycled water during rainfall periods or letting recycled water escape designated areas. Title 22, SWRCB's waste discharge requirements, and Order 93-160 do not identify specific water quality standards for TDS or other salinity related constituents (e.g., chloride, sodium, and boron) in plant tissues or salts in irrigation water. However, in some very specific situations, the irrigation of landscaped areas with recycled water could affect the health of vegetation. Specifically, in areas where the soil conditions limit infiltration (e.g., soils high in clay content) and the existing vegetation is of low salt-tolerance, impacts on plants could occur. Inadequate irrigation regime, limited wet season flushing, drought and general plant health (disease, age) also may affect any given plant's tolerance. Under these conditions, the use of recycled water, at any TDS concentration, could affect these plants, and potentially could require more management by site managers to maintain the level of landscape. In some situations it may be better to modify the plant palette to accommodate more salt tolerant plants to ensure long-term viability of the landscaped areas.

The South Bay Water Recycling[5] prepared a Regional Landscape Guide that addresses the use of irrigation water on landscapes. The purpose of the guide is to provide information on plant and soil types to those designing landscaping where recycled water may be used. The guide provides best management practices for irrigating landscaped areas with recycled water and identifies the appropriate palette of salt-tolerant plants that are adapted to the local Bay Area environment.

2.5 Project Construction

2.5.1 Construction Methods

The following section outlines the pipeline installation techniques under consideration for use in the proposed Project. Final plans have not been completed and one or more of the techniques described below may be used in the construction of the Project.

All pipeline construction would occur within public roadways. An easement from the California Department of Transportation (Caltrans) would be required to construct the pipeline across and along US 101. An easement from SCVWD would be required to cross all creeks and SCVWD ROW. This includes easements to install hanging pipes on bridges. A Peninsula Corridor Joint Powers Board (JPB) Property Access Agreement may be required for the railroad crossings. Construction of the backbone and lateral pipelines would generally consist of open-cut construction, except at crossings (e.g., creek, railroad, road). A variety of trenchless construction methods could be employed at these locations. Alternatively, horizontal directional drilling (HDD) may be used along the entire alignment, except at pipeline tie-ins (i.e., connection to existing pipelines). A description of each technique is described below.

Open-Cut Pipeline Construction

Open-cut construction (also referred to as open trench with shoring or cut-and-cover) is the proposed option for installing the majority of the pipeline along existing roadways. The open-cut trench would be about 2.5 to 4.5 feet wide and approximately 5 to 8 feet deep. Shoring may be required to provide trench stability. Where this method is used within roadways, the existing pavement would be cut, removed and replaced during the course of the construction. To prevent discharge into creeks, requirements for erosion control would be included in construction specifications for all construction in the vicinity of creeks.

Pipeline construction would typically require a minimum of one lane of traffic and the adjacent shoulder and/or bike lane (if they exist), resulting in a construction corridor approximately 20 to 30 feet wide. It is expected that open trench construction within paved roadways would proceed at the rate of 200 to 300 feet per day for two crews (or 150 feet per day per crew). Given the rate of construction, pipeline installation would occur for a relatively brief period of time (at most a few days) at any one location along the pipeline alignment. Excavated trench materials would be sidecast within approved work areas and reused as appropriate for backfill. After pipeline construction and installation is complete, the pavement would be restored to preconstruction conditions.

Trenchless Pipeline Construction

Trenchless construction methods would be used for selected roadway, railroad, and creek crossings. Trenchless construction methods minimize the area of surface disruption required for pipeline installation and include: jack and bore, micro-tunneling, and HDD. Hanging pipes on existing bridge structures is another potential trenchless

[5] SBWR is a collaboration of various agencies including the City of San Jose, Santa Clara and Milpitas, five sanitation districts, the U.S. Bureau of Reclamation, Environmental Protection Agency, California Department of Water Resources, Department of Health Services, Regional Water Quality Control Board, Santa Clara County Health Department, and Santa Clara Valley Water District. SBWR provides a reliable, sustainable and drought-proof supply of recycled water to the South Bay area.

approach. Crossings where trenchless construction techniques would be implemented are shown in **Table 2-3** and described below. Trenchless pipeline installation methods are described following a discussion of the crossings.

Table 2-3: Trenchless Creek and Road Crossings

Location	Crossing
Adobe Creek	US 101
	East Meadow Drive
	Middlefield Road[1]
Barron Creek	Cowper Street
	Miranda Avenue[1]
Matadero Creek	Cowper Street
	Hillview Avenue
Page Mill Road	Railroad crossing between Alma Street and Park Boulevard
	El Camino Real
Hillview Avenue	SFPUC easement at intersection of Foothill Expressway
	Foothill Expressway

[1] Lateral pipeline

Three creeks would be crossed by the proposed alignment, alignment options, and laterals: Adobe Creek, Barron Creek, and Matadero Creek. The creek crossings would be constructed as follows:

- **Adobe Creek.** There are three proposed Adobe Creek crossings. The first crossing is associated with the proposed alignment on East Meadow Drive, west of US 101. The pipeline would be attached to the existing East Meadow Drive Bridge on the south side of the bridge or installed in the roadway on the bridge. The second crossing is associated with the Option 1 alignment, where the existing Adobe Creek crosses under US 101. The pipeline would be hung on the south side of the existing bridge. The third crossing is associated with a lateral pipeline on Middlefield Rd, which would require crossing Adobe Creek using trenchless techniques at the Middlefield Road bridge.
- **Barron Creek.** The alignment crosses Barron Creek, which flows in a concrete channel, on the Cowper Street Bridge. The pipeline would either be attached to the downstream side of the bridge or installed in the roadway on the bridge. A lateral pipeline would be constructed at Miranda Avenue using trenchless techniques.
- **Matadero Creek.** There are two Matadero Creek crossings. At the Cowper Street crossing, a bridge crosses Matadero Creek, which flows in a concrete channel. The pipeline would either be attached to the downstream side of the bridge or installed in the roadway on the bridge. At the Hillview Avenue crossing, Matadero Creek flows through a 12-foot wide box culvert below the roadway. The pipeline would be

installed in the roadway, above the culvert. Trenchless construction may also be needed on Arastradero Road south of Georgia Avenue.

In addition to the creek crossings, a trenchless railroad crossing would occur on Page Mill Road between Alma Street and Park Boulevard. Another trenchless crossing may occur on Hillview Avenue at the intersection of Foothill Expressway to cross a SFPUC ROW. Trenchless construction may also be used to cross busy intersections, at Page Mill Road and El Camino Real, and Hillview Avenue and Foothill Expressway.

Bore and Jack Construction

Bore and jack is a trenchless pipeline installation method that is often used for major roadway intersections and railroad crossings. Boring and jacking would involve the use of a hydraulic jack and auger stem (situated in a pit located at one end of the crossing) to simultaneously push a casing through the hole under the crossing while removing spoil from within the jacked casing. The pipeline is then installed in the casing. The jacking pit is excavated (and shored) with typical dimensions of 8 to 12 feet wide and 15 to 20 feet long. The depth would depend on the feature to be avoided (e.g., creek, railroad, road) as well as the presence of any existing utilities underground. The typical depths of construction for this and other trenchless methods are shown in **Table 2-4** below.

Shoring, appropriate to the pit depth, would be used to secure the walls. In addition, the back wall of the receiving pit would need to be constructed so as to withstand the reactive forces from the jacking frame. An additional area of up to 2,000 square feet may be needed around the pit for temporary storage of pipe sections and for loading material removed from the bore. The receiving pit at the other end of the crossing would be smaller, encompassing approximately 100 square feet. Pits and work areas would be located within existing ROW and along streets, where appropriate. It would take an average of approximately one month to complete pipeline installation at a 40-foot concrete-lined creek crossing, such as Adobe Creek at US 101, using the boring and jacking technique. After pipeline construction and installation is complete, the work area would be restored to preconstruction conditions.

Microtunneling

Microtunneling is a remotely-controlled pipejacking process that provides continuous positive control of earth and groundwater pressures at the face of the excavation. Jacking pipes are pushed by a microtunneling boring machine (MTBM) into the ground from a jacking pit to a receiving pit on opposite sides of the crossing. The carrier or product pipe[6] may be jacked directly or installed inside an oversized casing in a separate operation.

A cutterwheel[7] excavates material at the face as the machine is jacked forward. The excavated material is mixed with clean slurry[8] and pumped to the surface for separation and muck removal. Microtunneling machines have a closed face, thus limiting the size of rock or other object that can be ingested. Most machines are only capable of handling cobbles and boulders less than or equal to 20 to 30 percent of the outside diameter of the shield. In addition, large quantities of smaller cobbles can stall a MTBM by clogging the crushing chamber with rocks before they can be crushed and ingested. Therefore, microtunneling is not a preferred method when large quantities of cobbles and boulders or other objects are anticipated.

[6] The carrier or product pipe is the pipe that is being installed, in this case a recycled water pipeline.
[7] Cutter wheels or cutting wheels enable excavation of the drill head or end of the microtunneling machine through the ground.
[8] Slurry is used as a lubricant to reduce friction while drilling and provide support in the gaps between the edge of the drilling machine and the ground.

Table 2-4: Typical Depths of Construction

Location	Range of Construction Depth (feet)
Connection Point on East Bayshore Rd.	4 – 6
Highway 101 Crossing (trenchless)	25 – 30
East Meadow Drive at Adobe Creek	15 – 17
Middlefield Rd at Adobe Creek	15 – 17
Cowper St at Barron Creek	12 – 14
Cowper St at Matadero Creek	8 – 10
Page Mill Road (railroad crossing)	4 – 20
Page Mill Road (El Camino Real crossing)	8 – 10
Page Mill Road	6 – 8
Hillview Ave. and Arastradero Rd.	4 – 8
Hillview Ave. at Matadero Creek	20 – 24
Hillview Ave. (Foothill Expressway Crossing)	25
Miranda Ave. at Barron Creek	15 – 17
All other open cut segments, including laterals	4 – 8

Note: as described in the Trenchless Pipeline Construction discussion above, a variety of methods could be used for creek crossings, including hanging from bridges, which would not require excavation to the depths shown. However, these depths are provided in the event trenchless techniques are selected.

Slurry pressure and mechanical face pressure are used to support the face of the excavation when ground conditions are loose or soft. In high groundwater conditions the slurry excavation system prevents inflow of water into the pipeline. Microtunneling is typically used in a wide variety of soil types, including rock and stable soils to loose, flowing, or otherwise unstable soils.

Microtunneling provides continuous control of line and grade by use of a guidance system and steering jacks. The guidance system usually consists of a reference laser mounted in the jacking shaft that transmits its beam onto a target mounted inside the articulated section of the MTBM. This information and other operational performance information are transmitted through wire cables to the MTBM control cabin at the surface where the MTBM is remotely controlled.

Jacking pits for microtunneling are typically 12 to 16 feet wide by 24 to 32 feet long (typical maximum approximately 500 square feet). Receiving pits are typically 12 to 16 feet square. Pit depths would vary depending on the feature being avoided as well as the presence of any existing utilities underground. The range of depths associated with construction is shown in **Table 2-4** above. A work area (including the area of the pits) of up to 10,000 to 20,000 square feet is required at the jacking pit. Work area at the receiving pit can be smaller, but is typically a minimum of 8,000 square feet. Off-site staging areas can be used to reduce work areas at each shaft. Pits

and work areas would be located within existing ROW and along streets, where appropriate. Pipeline installation at a 40-foot concrete-lined creek crossing using the microtunneling technique would take an average of approximately two months to complete. After pipeline construction and installation is complete, the work area would be restored to preconstruction conditions.

Horizontal Directional Drilling (HDD)

HDD is a trenchless pipeline installation method that can be used for crossing major roadway intersections, creeks, and as an alternative to open-cut construction. HDD crossings are installed by using a drill rig tilted at the top at an angle of up to ten degrees from horizontal. The bore entry holes are drilled from the starting point to the destination point. In preparing the hole, a small diameter (3-inch wide) pilot hole is first drilled from the entry pit in a gentle arc from the drill rig to the completion hole on the other side of the area to be crossed. Alternatively, the pilot hole is drilled along a pre-determined horizontal and vertical alignment from the entry site to the exit site. This pilot hole can be guided using magnetic readings transmitted from the drill bit back to the drill rig.

After the initial hole is drilled, the final bore entry pit, approximately 10 – 40 feet square by approximately 8 feet deep, is constructed and is used as the collection point for Bentonite drilling mud and drill spoil. The pilot hole is then enlarged by pulling larger reamers, or reaming heads[9], from the pilot exit pit back towards the drilling rig. The pipeline is then pulled into place behind the last reamer head.

During the directional drill procedure, drilling mud is injected into the drill and recovered from the entry hole until the drill bit surfaces at the exit pit. Once the drill bit surfaces, the drilling mud is recovered at both the entry and exit hole, pumped into tanks and transported back to the rig location for cleaning and eventual reuse. The drilling equipment and materials require a work area of approximately 2,500 square feet. An additional area of approximately 2,000 square feet is needed for loading materials removed from the bore. Pits and work areas would be located within existing ROW and along streets, where appropriate. Pipeline installation at a 40-foot concrete-lined creek crossing using HDD would take an average of three weeks to complete.

If HDD is used for the installation of the entire pipeline, then pits would be located throughout the pipeline alignment. The frequency of construction pits would vary depending on pipe size, existing underlying utilities, and other environmental conditions. Typically, for an 18-inch pipe, the construction pits would be located approximately every 500 to 1,000 feet due to the increased force necessary to install large pipes. Smaller pipe sizes would require less frequent pit locations because they can be installed in longer segments. Pipes would be installed at variable depths depending on existing underlying utilities, soil types, environmental constraints, entry and exit constraints, and bend radius of the installed product and drill pipe. Other pit depths would vary depending on the feature being avoided as well as the presence of any existing utilities underground. The range of depths associated with construction is shown in **Table 2-4** above.

Installation of pipeline using HDD would proceed at the rate of approximately 100 feet per day for 18-inch pipe, and at greater rates for smaller pipe segments. Some pipeline installation would require construction in existing roadways.

Hanging on Existing Structures

Hanging pipes from existing structures is a potential method for installing pipelines over creeks where existing bridges can provide structural support for the pipeline. No excavation would be required for placement of the hanging pipeline crossings, and no disruption of the creek bed would be required. The pipeline would be installed externally on the side or under the bridge. There would be no construction equipment within the wetted limits of the creek channels. Pipeline would be installed from the bridge where feasible; however, equipment may be on the

[9] Reamers are tools used to create accurate sized holes.

banks of the channel or adjacent land in order to secure the pipeline to the bridge, but would not have to enter the wetted perimeter of the creeks. **Figure 2-8** shows an example of a recycled water pipeline hung from a bridge.

Figure 2-8: Example of a Recycled Water Pipeline Hung from Bridge

US 101 Crossing

As described above, the two options to cross underneath US 101 are using a trenchless construction technique under the proposed alignment and hanging from an existing bridge. The precise option and the locations would be determined during design. If trenchless construction is employed, the pits could be located within any open area shown in the polygon shown on **Figure 2-2** (e.g., on existing parking lots). Depending on the location, landscaped trees may be trimmed and/or removed to accommodate the pits and other activities in the work area. Existing parking spaces would be temporarily eliminated. Construction would require the City to work with the land owner to accommodate temporary loss of parking and disruption. If the pipeline is hung from the existing bridge on the south side of Adobe Creek, then construction would likely occur during the non-rainy season (April 15 through October 15), when the Adobe Creek Pedestrian Path is open. However, installation of the proposed pipeline would require temporary closure of the existing path for several days to a week.

Connection to the Existing 24-inch Recycled Water Pipeline (Mountain View Project)

The proposed pipeline would be connected to the existing 24-inch pipeline along East Bayshore Road through an existing stub out (connection point) on East Bayshore Road at the intersection with Corporation Way. Depending on the precise location of the Highway 101 crossing, a short connection pipeline may need to be constructed; this connection pipeline would be constructed via open cut construction. **Figure 2-2** shows that the maximum length of the connection pipeline (in purple) to the existing stub out assuming the pipeline is hung from the bridge. Because of this stub out, a system shutdown is not required when the proposed pipeline is connected to the existing pipeline.

Pump Station Construction

The booster pump station at Mayfield Soccer fields would require cutting the pavement, excavation and shoring, placement of the structure underground, and refinishing the pavement, and surrounding sidewalks/curb, as applicable. After the structure has been constructed, electrical equipment (e.g., machinery control consoles, panels, switchboards, lighting) would be installed and other site preparation (installing conduits and cables) would occur. Approximately five crew members would be needed for construction. The maximum depth of construction would be approximately 25 feet.

The pump station proposed at the RWQCP either would be installed within existing structures or located outside, adjacent to the existing, empty contact tank. Regardless of the location, it would be constructed entirely within existing City property. If located outside of existing structures, construction would involve excavation, installation of the pump station, electrical equipment, and erection of an enclosure if necessary. If the structure is located within an existing structure, then work would consist of installation of the pump. Relocation of the existing marsh pump may be necessary if the proposed pump is installed within the basement of the administration building. The connection pipeline segment along Embarcadero Road would be installed via open trench construction. The maximum depth of construction would be approximately eight feet.

Construction of each pump station is estimated to take approximately six months.

2.5.2 Workers, Equipment, and Staging

It is assumed that two crews of up to 10 workers would be working at the Project site at any one time. The installation of the pipeline and pump stations would require, but is not limited to, the following equipment: excavator, backhoe, front-end loaders, pavement saw, dump trucks, diesel generator, water tank, water truck, flat-bed truck, drill rig, crane, compactors, double transfer trucks for soil hauling, concrete trucks, and paving equipment. Equipment and vehicle staging would be accommodated along the pipeline alignments, and at selected locations, including adjacent to the proposed pump station at the Mayfield Soccer Fields and the RWQCP.

2.5.3 Excavation Volumes and Truck Trips

Spoil (soil and rock) that is excavated during construction activities would be reused on site for backfilling or disposed of properly. Spoil would be characterized to confirm that hazardous materials are not present before the spoil could be used as backfill. Any material that would not be reused as backfill would be stored temporarily at the construction staging area until characterized and then hauled away to a permitted disposal site.

The amount of spoil generated would depend on the construction methods selected and summarized in **Table 2-5**.

Table 2-5: Excavation Volume and Truck Trips

Type of Construction	Soil Generation (CY)	Truck Trips (round trips)	Average Truck Trips per day (round trips)
Open Trench	32,120	3,212	13.5
Microtunneling	4,360	436	1.8

For the open-trench pipeline segments, assuming a pipeline length of approximately 51,760 feet (total length of the backbone, lateral, and connection pipelines, minus crossings), and an open-trench width of about 2.5 to 4.5 feet (depending on the sizes of the pipelines) and depth of up to 8 feet (smaller pipelines require a depth of 5 feet), a total of approximately 32,120 cubic yards (CY) of soil would be generated[10]. Assuming all 11 crossings would be installed via the microtunneling technique[11], which would result in the largest tunnels and pit excavations, another

[10] The amount of soil excavated for open trench construction assumes trenching depths of 4 feet cover plus the internal diameter of the pipeline plus 6 inches below for all pipes sizes except the two largest diameter pipelines which assumes 12 inches below the pipeline instead of 6 inches.
[11] It is highly unlikely that microtunneling would be applied to every crossing, but for the purposes of conservatively estimating truck trips, this assumption has been used.

4,360 CY of soil would be generated[12]. For the purposes of providing a conservative analysis of truck trips, it is assumed that 100 percent of the material[13] would be exported in 10-CY haul trucks. Thus, the estimated number of truck trips over the life of the Project would be approximately 3,650 (round trips). Assuming construction would be spread out over a year (240 working days), then the daily truck trips generated would be about 15 truck trips per day, round trip[14]. The number of truck trips is assumed to be about 16 (round trips) per day if material and equipment delivery is included.

If the City were to select the HDD method for the entire alignment, the total soils generated would be approximately 4,840 CY[15]. If 100 percent of the material is exported for the purposes of a conservative truck trip analysis, then the estimated truck trips generated would be approximately 485 for the entire Project. This is equivalent to 2 daily truck trips. The number of truck trips is assumed to be about 3 per day if material and equipment delivery is included.

In addition to the truck haul trips, up to 20 workers would be accessing each site daily. Assuming each individual drives separately and half of the workers travel for lunch, 30 worker trips (round trips) would be generated per day.

The total truck trips generated per day would be 46 trips per day assuming open trench construction. While all of the trips associated with workers traveling to and from work would occur during the peak hours (20 trips each in the morning and afternoon), the majority of the truck trips would be spread throughout the day. Construction of the proposed Project would occur from 8 a.m. to 6 p.m. (9 a.m. to 4 p.m. only on arterial and collector streets). Assuming 16 truck trips are evenly spread throughout the 10 hour workday (Monday – Friday), about 2 truck trips would occur per hour. According to the Santa Clara Valley Transportation Agency's Congestion Management Program, the morning and evening peak periods occur from 5 to 9 a.m. and 3 to 7 p.m. Construction would overlap four hours of the peak traffic periods. Assuming 2 truck trips per hour, the total vehicle trips during the peak morning period would be approximately 22 (2 truck trips and 20 passenger trips); the total vehicle trips during the peak afternoon period would be 26 (6 truck trips and 20 passenger trips).

Operation of the Project would generate minimal truck trips associated with operations and maintenance (O&M) activities, which would already be conducted as part of regular inspection of other existing infrastructure.

2.5.4 Schedule

Construction would occur between the hours of 9 am and 4 pm Monday through Friday on arterial and collector streets in order to maintain compliance with the City's Traffic Control Requirements. Construction other than on arterial and collector streets would occur between the hours of 8 am and 6 pm Monday through Friday. Construction would occur between 9 am and 6 pm on Saturday for all construction areas. Construction of the proposed facilities would be expected to begin in 2018 pending availability of funding and be complete in approximately one year.

[12] The amount of soil excavated assumes tunnel diameter 50 percent larger than pipe and pit areas of approximately 500 square feet. The volume is calculated by multiplying the area of the tunnel cross-section by the length of the tunnel, plus the volume of the pits. The volume of the pits is assumed to be the maximum square footage (530 square feet) and depth (15 feet).

[13] For most projects, a portion of the soil is reused, and not 100 percent of the soil is disposed of at local landfills. The City of Palo Alto community has a goal of zero waste, meaning no waste to landfills by 2021, and thus the City would strive to reduce its construction waste. But for the purpose of this EIR and to provide a conservative analysis of potential truck trips and air quality pollutant emissions, it is assumed that 100 percent of the soil would be discarded at local landfills.

[14] The actual number of truck trips exporting/importing soil on a given day is typically about 10 trips, to account for the reuse of trucks and the time to load, unload and drive to and from the work sites.

[15] The amount of soil excavated assumes tunnel diameter 50 percent larger than pipe. For this method, it is assumed that one pit is needed every 750 feet in addition to the 22 pits needed at the 11 creek/road/railroad crossings. The total volume of soil is calculated by multiplying the area of the tunnel cross-section by the length of the tunnel, plus the volume of the pits.

2.5.5 Standard Project Requirements

The City is committed to implementing the following environmental protection measures as part of the Project. These measures are standard Project requirements based on federal, state, or local regulations, or best practices that are implemented by the City. These requirements, including dust control, protection of cultural resources, compliance with all the storage, handling, use, and disposal of hazardous materials, preparation and implementation of relevant hazardous materials-related plans, implementation of best management practices, compliance with California Code of Regulation Title 22 and local legislation, public outreach and education, compliance with the Tree Technical Manual, compliance with local noise ordinance, preparation and implementation of a traffic control plan and emergency access strategies, are described further below.

BAAQMD Dust Control Measures

The following basic construction measures are identified by BAAQMD and shall be incorporated into contract specifications and implemented by the contractor.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day;
- All haul trucks transporting soils, sand, or other loose material off-site shall be covered;
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited;
- All vehicle speeds on unpaved roads shall be limited to 15 mph;
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator;
- A publicly visible sign with telephone number and person to contact at the lead agency regarding dust complaints shall be posted. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

The following additional construction mitigation measures identified by BAAQMD shall be incorporated into contract specifications and implemented by the contractor, to supplement the proposed standard project requirement.

- All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe;
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph;
- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum50 percent air porosity;
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established;

- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time;
- All trucks and equipment, including their tires, shall be washed off prior to leaving the site;
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch or gravel;
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent;
- Idling time of diesel powered construction equipment shall be minimized to two minutes;
- The project shall develop a plan demonstrating that off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction and 45 percent PM reduction compared to the most recent California Air Resources Board (CARB) fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available;
- Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings);
- All construction equipment, diesel trucks and generators shall be equipped with Best Available Control Technology for emission reductions of NOx and PM; and
- All contractors shall use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

Protection of Cultural Resources

Should any previously undiscovered historic or prehistoric archaeological deposits be discovered during construction, work shall stop within 50 feet of the discovery, until such time that the discovery can be evaluated by a qualified archaeologist and appropriate mitigative action taken as determined necessary in consultation with the lead Federal agency for NHPA Section 106 compliance, in accordance with 36 CFR Part 800.13, and the City. Measures might include preserving in situ the archaeological resource or an archaeological monitoring or data recovery program. Prehistoric archaeological site indicators include chipped chert and obsidian tools, and tool manufacturing waste flakes, grinding implements such as mortars and pestles, and darkened soil that contains dietary debris such as bone fragments and shellfish remains. Historic site indicators include, but are not limited to, ceramics, glass, wood, bone, and metal remains.

Section 7050.5(b) of the California Health and Safety code will be implemented in the event that human remains, or possible human remains, are located during Project-related construction excavation. Section 7050.5(b) states:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code.

The County Coroner, upon recognizing the remains as being of Native American origin, is responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The Commission has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant. Sections 5097.98 and 5097.99 of the Public Resources Code also call for protection from inadvertent destruction. To achieve this goal, the construction personnel on the Project would be instructed as to the potential for discovery of cultural or human remains, the need for proper and timely reporting of such finds, and the consequences of failure thereof.

Protection of Paleontological Resources

If paleontological resources are discovered during earthmoving activities, the construction crew would immediately cease work near the find. In accordance with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 2010), a qualified paleontologist would assess the nature and importance of the find and recommend appropriate salvage, treatment, and future monitoring and mitigation.

Storage, Handling, and Use of Hazardous Materials in Accordance with Applicable Laws

The City shall ensure that all construction-related hazardous materials and hazardous wastes are stored, handled, and used in a manner consistent with applicable federal, state, and local laws, as well as the City of Palo Alto's Pollution Prevention plan sheet. In addition, construction-related hazardous materials and hazardous wastes shall be staged and stored away from stream channels and steep banks to keep these materials a safe distance from near-by residents and prevent them from entering surface waters in the event of an accidental release.

Proper Disposal of Contaminated Soil and/or Groundwater

If contaminated soil and/or groundwater is encountered or if suspected contamination is encountered during Project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. A contingency plan to dispose of any contaminated soil or groundwater will be developed through consultation with appropriate regulatory agencies and consistent with the requirements of the City of Palo Alto's Pollution Prevention plan sheet and RWQCP's permit requirements for discharge of exceptional wastewater to the sanitary sewer.

Health and Safety and Hazardous Materials Management and Spill Prevention Control Plans

The City shall require the contractor to prepare a Health and Safety Plan and Hazardous Materials Management and Spill Prevention and Control Plan prior to commencement of construction that includes a project-specific contingency plan for hazardous materials and waste operations. The Health and Safety Plan shall be applicable to all construction activities, and shall establish policies and procedures according to federal and California Occupational Safety and Health Administration (OSHA) regulations for hazardous materials Health and Safety Plans, and the City of Palo Alto's Pollution Prevention plan sheet.

Elements of the plan shall include, but not be limited to, the following:

- Discussion of hazardous materials management, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;
- Notification and documentation of procedures; and
- Spill control and countermeasures, including employee spill prevention/response training.

Best Management Practices – Storm Water Quality

The City shall require contractors to file a Notice of Intent with the Regional Water Quality Control Board (RWQCB) indicating compliance with the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit) and to

prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) outlining BMPs for construction/post-construction activities as specified by the City of Palo Alto's Pollution Prevention plan sheet, the California Stormwater Best Management Practices Handbook and/or the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures. The BMPs include measures guiding the management and operation of construction sites to control and minimize the potential contribution of pollutants to stormwater runoff from these areas. These measures address procedures for controlling erosion and sedimentation, and managing all aspects of the construction process to ensure control of potential water pollution sources. Erosion and sedimentation control practices typically include:

- Installation of silt fencing and/or straw wattle;
- Soil stabilization;
- Revegetation of graded and fill areas with a standard erosion control mix (approved by a native habitat restorationist);
- Runoff control to limit increases in sediment in stormwater runoff (e.g., straw bales, silt fences, drainage swales, geofabrics, check dams, and sand bag dikes);
- Equipment maintenance shall be performed at least 100 feet from all water bodies and wetlands, with measures in place to contain spills of diesel fuel, gasoline, or other petroleum products. Drainage from all work sites shall be directed away from any water bodies or wetlands where feasible;
- Prevent erosion of uplands and sedimentation of creeks, tributaries, and ponds;
- Minimize creek bank instability;
- Prevent flooding; and
- Return grades to preconstructed contours.

A SWPPP that complies with the statewide General Permit shall be developed and implemented to protect water quality of the creeks that lie in the study area. Appropriate erosion and sediment control and non-sediment pollution control (i.e., sources of pollution generated by construction equipment and material) BMPs shall be prescribed in the SWPPP, and erosion and sediment control material included in the SWPPP shall be certified as weed free. Dewatering operations are covered under the General Construction Permit as an authorized non-stormwater discharge. The discharge from dewatering operations would be evaluated and made part of the Project SWPPP. In addition, the Project shall comply with RWQCB regulations and standards to maintain and improve the quality of both surface water and groundwater resources.

Discharge of Exceptional Wastewater

Hydrostatic test water and water collected from dewatering activities (including contaminated water) are discharged to the sanitary sewer with an Exceptional Waste Discharge Permit from RWQCP. The permit requires chemical constituents to be sampled and identifies limits for these constituents. To minimize impacts to water quality, the City shall obtain an Exceptional Wastewater Permit prior to discharge of such waters into the sanitary sewer. .

Frac-Out Plan

Prior to constructing underground crossings of creeks or channels, a Frac-out Contingency Plan shall be developed. At minimum, the plan shall prescribe the measures to ensure protection of water quality and related biological resources (e.g., aquatic resources, and special-status plants and wildlife) including:

- Procedures to minimize the potential for a frac-out associated with horizontal directional drilling;
- Procedures for timely detection of frac-outs;
- Procedures for timely response and remediation in the event a frac-out; and

- Monitoring of drilling and frac-out response activities by a qualified biologist.

Compliance with Code of Regulations Title 22 and Local Legislation

The proposed Project shall be designed and operated in accordance with the applicable requirements of California Code of Regulations Title 22 and any other local legislation that is currently effective or may become effective as it pertains to recycled water. As proposed, the Project shall provide high quality recycled water to users. All landscape irrigation systems shall also be operated in accordance with the requirements of Title 22 of the Code of Regulations, any other local legislation that is currently effective or may become effective as it pertains to recycled water and any reclamation permits issued by the San Francisco RWQCB. Reclamation permits typically require that irrigation rates match the evapotranspiration rates of the plants being irrigated. Irrigation would not occur within 50 feet of any domestic supply wells.

Geologic Report for Potentially Affected Facilities

During the design phase for the Project, the City shall require preparation of a Geologic Report by a geologist registered in the State of California for facilities that could be affected by seismic-related hazards or unstable soils (e.g., liquefaction and expansive soils).

The Geologic Report shall include an engineering analysis of liquefaction and the potential for expansive soils at the pump stations. This assessment shall include a liquefaction assessment study in accordance with the California Geological Survey Special Publication 117 Guidelines. If this report finds unstable soils would present potential risks associated with liquefaction, engineering recommendations for surface and subsurface drainage specifications and detailed design for fill placement and excavation shall be provided.

Public Outreach and Education

Signs would be posted at parks irrigated with recycled water that notify people about the use of recycled water. The City would participate in public outreach and education efforts to inform local communities of the use of recycled water and the potential effects as well as benefits of recycled water.

Compliance with the Tree Technical Manual

The City of Palo Alto *Tree Technical Manual* (Dockter 2001) is a separately published document issued by the City Manager, through the Departments of Planning and Community Environment and Public Works to establish specific technical regulations, standards and specifications necessary to implement the Tree Ordinance (Chapter 8.10, Tree Preservation and Management Regulations), and to achieve the City's tree preservation goals and natural resource conservation goals.

Section 2.00 specifically addresses the protection of trees during construction; its objective is to reduce the negative impacts of construction on trees[16] to a less than significant level.

Construction projects within the tree protection zone (TPZ) of Regulated Trees[17] are required to implement protective practices prior to and during construction. The City would be required to retain a certified arborist to

[16] Typical negative impacts identified in the City's Tree Technical Manual include the following: 1) mechanical injury to roots, trunk or branches; 2) compaction of soil, which degrades the functioning roots and inhibits the development of new ones and restricts drainage, which desiccates roots and enables water mold fungi to develop; 3) changes in existing grade which can cut or suffocate roots; 4) alteration of the water table - either raising or lowering; 5) microclimate change, exposing sheltered trees to sun or wind; and 6) sterile soil conditions, associated with stripping off topsoil.

[17] Regulated Trees identified in the Tree Technical Manual include the following:

- Protected Trees: All coast live oak (*Quercus agrifolia)*, valley oak (*Quercus lobata)* trees that are 11.5-inches or greater in diameter (36-inches in circumference measured at 54-inches above natural grade) and coast redwood (*Sequoia sempervirens)* trees that are 18-inches or greater in diameter (57-inches in circumference measured at 54-inches above

prepare a Tree Protection and Preservation Plan if any activity is within the dripline of a Protected or Designated Tree. The Plan must include an assessment of impacts to trees, recommended mitigation to reduce impacts to a less than significant level, and identification of construction guidelines to be followed through all phases of a construction project.

Section 3.00 of the Tree Technical Manual outlines requirements associated with the removal and replacement of regulated trees. The standards and specifications for replacements of trees are dependent on the location where a Protected or Designated Tree would be replaced. If a tree is to be replaced on site, the replacement tree must be the same species unless the Director determines that another species would be more suitable for the location. The location of the replacement tree on site must be approved by the Director. If it is not possible to replace the tree on site, funding for the replacement of trees is calculated using a Tree Value Replacement Standard. The funding is then applied for planting of trees elsewhere.

Compliance with Local Noise Ordinance

According to the City of Palo Alto's Noise Ordinance (Palo Alto Municipal Code Chapter 9.10), for residential and non-residential property, construction, alteration and repair activities which are authorized by a valid city building permit shall be prohibited on Sundays and holidays and shall be prohibited except between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday, and 9:00 a.m. and 6:00 p.m. on Saturday, provided that the construction, demolition or repair activities during those hours meet the following standards[18]:

- No individual piece of equipment shall produce a noise level exceeding 110 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible.
- The noise level at any point outside of the property plane of the Project shall not exceed 110 dBA.
- The holder of a valid construction permit for a construction project in a non-residential zone shall post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, materialmen and all other persons at the construction site, of the basic requirements of this measure[19].
    - The sign(s) shall be posted at least five feet above ground level, and shall be of a white background, with black lettering, which lettering shall be a minimum of one and one-half inches in height.

natural grade) and Heritage Trees, individual trees of any size or species designated as such by City Council per the Palo Alto Municipal Code (PAMC) Section 8.10.

- Street Trees: All trees growing within the street right-of-way (publicly-owned), outside of private property. In some cases, property lines lie several feet behind the sidewalks. A permit from the Public Works Department is required prior to any work on or within the dripline of any 'street tree' per PAMC Section 8.04.
- Designated Trees: All trees, when associated with a development project, that are specifically designated by the City to be saved and protected on a public or private property which is subject to a discretionary development review per PAMC Section 18.76.

[18] Section 9.10.070 (Exception Permits) of the City's Noise Ordinance indicates that "If the applicant can show to the city manager or his designee that a diligent investigation of available noise abatement techniques indicates that immediate compliance with the requirements of this chapter would be impractical or unreasonable, a permit to allow exception from the provisions contained in all or a portion of this chapter may be issued, with appropriate conditions to minimize the public detriment caused by such exceptions. Any such permit shall be of as short duration as possible up to six months, but renewable upon a showing of good cause, and shall be conditioned by a schedule for compliance and details of methods therefor in appropriate cases. Any person aggrieved with the decision of the city manager or his designee may appeal to the city council pursuant to Section 16.40.080 of this code."

[19] This would be applicable at the pump station sites and not along the pipeline due to the nature of pipeline construction.

- The sign shall read as follows:

CONSTRUCTION HOURS

FOR RESIDENTIAL (OR NON-RESIDENTIAL) PROPERTY

(Includes Any and All Deliveries)

MONDAY - FRIDAY.....8:00 a.m. to 6:00 p.m.[20]

SATURDAY.....9:00 a.m. to 6:00 p.m.

SUNDAY/HOLIDAYS.....Construction prohibited.

Pump Station Design/Noise

For the pump station at the Mayfield Soccer Fields, a detailed analysis of the buildings' sound isolation would be conducted by a qualified acoustical consultant during the engineering design phase of the project for the site. A post-construction field sound measurement shall be conducted by an acoustical consultant to verify that the project operational noise standards are in compliance with relevant City noise standards.

Architectural Review and Site And Design Review

Architectural Review and/or Site and Design review will be required for all exterior modifications, including hanging pipes, pump stations, and landscaping. The individual components will require approval by the City's ARB for architectural review, and by the planning commission, ARB, and City Council for site and design review prior to project implementation.

Traffic Control Plan

The City's Transportation Section would require the contractor to have a full traffic control plan prepared by a registered traffic engineer. The traffic control plan shall be in accordance with the City's Traffic Control Requirements and would show specific methods for maintaining traffic flows to minimize construction impacts on traffic and parking. There are several schools in the vicinity of the Project. These areas would be evaluated more closely to determine whether the traffic control plan is appropriate or if additional measures are needed specific to school areas. Examples of traffic control measures to be considered include:

- Identify all roadway locations where special construction techniques (e.g., directional drilling) would be used to minimize impacts to traffic flow;
- Develop circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone;
- Schedule truck trips outside of peak morning and evening commute hours;
- Prohibit construction on collector and arterial streets during morning commute period before 9 a.m. and in the afternoon commute period after 4 p.m.;
- Use haul routes, minimizing truck traffic on local roadways to the extent possible;
- Consider detours for bicycles and pedestrians in all areas potentially affected by Project construction. Pedestrian and bicycle detours should not be required unless deemed necessary for safety reasons;

[20] Construction of the proposed Project would occur between the hours of 9 a.m. and 4 p.m. Monday through Friday on arterial and collector streets in compliance with City's Traffic Control Requirements. Thus, the sign would be modified accordingly, where relevant.

- Use flagmen to maintain alternating one-way traffic while working on one-half of the street;
- Use advance construction signs and other public notices to alert drivers of activity in the area;
- Use "positive guidance" detour signing on alternate access streets to minimize inconvenience to the driving public;
- Install traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones;
- Develop and implement access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, ask affected jurisdictions to identify detours, which would then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of lane closures;
- Store construction materials only in designated areas; and
- Coordinate with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary.
- Establish methods for minimizing for construction effects on parking (e.g., identifying designated areas for construction worker parking at staging areas).

Restoration of Roads to Pre-construction Condition

Following construction, the City shall ensure that road surfaces, bicycle routes, and bus stop facilities that are damaged during construction are returned to their pre-construction condition or better.

Emergency Access Strategies

In conjunction with the Traffic Control Plan for the Project, comprehensive strategies for maintaining emergency access shall be developed. Strategies shall include, but not be limited to, maintaining steel trench plates at the construction sites to restore access across open trenches and identification of alternate routing around construction zones. Also, police, fire, and other emergency service providers shall be notified of the timing, location, and duration of the construction activities and the location of detours and lane closures.

2.6 Potential Permits and Approvals Required

The proposed facilities would be located on leased land, within existing easements and through City and County lands (primarily streets). Portions of the pipeline may be within SCVWD, SFPUC, JPB, and Pacific Gas & Electric (PG&E) easements.

It is anticipated that permits / approvals would be required from the following agencies:

- City of Palo Alto: Encroachment and Street Work Permit, Conditional Use Permit, Site and Design Review, Exceptional Waste Discharge Permit, and Architectural Review; Recycled Water Permit for customers.
- SCVWD – permit for construction across creeks / flood control channels, easement to construct the pipeline in SCVWD ROW and a permit prior to construction or destruction of any new well, including monitoring wells;
- Caltrans – Encroachment Permit;
- JPB – Property Access Agreement for trenchless installation of pipeline below Caltrain railroad;
- Cal/OSHA – Underground Classification for tunnels;

- San Francisco Bay RWQCB - NOI to obtain coverage under General NPDES permit for construction activities and preparation of SWPPP;
- California Department of Fish and Wildlife – Streambed Alteration Agreement for trenchless crossings of stream channels (potential).
- Santa Clara Valley Transportation Authority (VTA) – Construction Access Permit if construction involved cutting through a VTA PCC bus stop pavement pad.
- SFPUC – Easement to cross SFPUC lands.

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Chapter 3 Environmental Setting, Impacts and Mitigation Measures

As described in *Chapter 1, Introduction and Project Background*, this EIR focuses on those issues of primary concern identified during the 30-day scoping comment period for the Draft EIR (i.e., effects of recycled water use on irrigation on landscaped areas, the groundwater basin, and on the urban forest). The remaining issue areas are discussed in **Appendix E, Environmental Checklist** of this EIR, which is the updated Initial Study for the Project.

3.1 Hydrology and Water Quality

3.1.1 Setting

This section describes the environmental setting for hydrology and water quality within the Project area.

Regional Hydrology

The City of Palo Alto is located within Santa Clara County, and is within the Santa Clara Basin Watershed as defined by the RWQCB Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) (RWQCB, 2011). The Santa Clara basin is defined as the San Francisco Bay south of the Dumbarton Bridge and the watersheds draining to that segment of the Bay. The hydrologic basin contains wetlands adjacent to South San Francisco Bay (particularly salt ponds that are currently being restored), a corridor of urban uses within the Bay Plain that define the southern portion of Silicon Valley and hillsides that are less urbanized at the fringe of the basin. Water courses that occur within the City of Palo Alto include Mayfield Slough near the RWQCP, San Francisquito Creek, Matadero Creek, Barron Creek, Adobe Creek, and a number of other channels.

Flooding

The proposed pipeline alignment lies within two different flood zones as defined by the Federal Emergency Management Agency (FEMA). These zones are described below.

- Zone AE. (Base Flood Elevations determined). Zone AE is the 100-year flood zone. The elevation of the base flood (i.e., 100-year flood level) has been determined by FEMA to be 8 feet above mean sea level.
- Zone X. Zone X is described as an area of moderate risk of flooding (roughly speaking, outside the 100-year flood but inside the 500-year flood limits). While some risk of flooding exists, structures within Zone X areas are not considered to be at substantial risk of flooding.

Most of the Project area is located within Zone X. The northeast part of the Project area between Middlefield Road and US 101 and the proposed pump station site at the RWQCP are located in Zone AE.

Surface Water Quality

Beneficial Uses

The purpose of the Basin Plan is to identify and protect the region's beneficial uses from water quality degradation. The Project area is located in the Santa Clara Basin. The Basin Plan designates the beneficial uses for San Francisco Bay South and the drainages within the proposed Project area, as shown in **Table 3-1** below.

Table 3-1: Beneficial Uses for Water Features in the Project Area

Beneficial Uses	Inland Surface Waters (HA No. 405.30)					Ground Waters (SubBasin No. 2-9.02)
	South San Francisco Bay	Mayfield Slough	Matadero Creek	Barron Creek	Adobe Creek	Santa Clara Valley Basin
Municipal and Domestic Supply (MUN)						E
Industrial Service Supply (IND)	E					E
Ocean, Commercial, and Sportfishing (COMM)	E					
Shellfish Harvesting (SHELL)	E					
Cold Freshwater Habitat (COLD)			E		E	
Estuarine Habitat (EST)	E	E				
Fish Migration (MIGR)	E	E	E			
Preservation of Rare and Endangered Species (RARE)	E	E	E			
Fish Spawning (SPWN)	E		E			
Warm Freshwater Habitat (WARM)			E	E	E	
Wildlife Habitat (WILD)	E	E	E	E	E	
Water Contact Recreation (REC-1)	E	E	E	E	E	
Non-contact Water Recreation (REC-2)	E	E	E	E	E	
Navigation (NAV)	E					
Industrial Process Water Supply (PROC)						E
Agricultural Water Supply (AGR)						E

Source: RWQCB, 2011.
E: Existing beneficial use:

The water quality objectives established in the Basin Plan are intended to protect San Francisco Bay from degradation so that it can continue to be used for the above beneficial uses.

Groundwater

Groundwater Basin

The City of Palo Alto overlies the Santa Clara Valley Basin, Santa Clara subbasin (Basin ID 2-9.02 according to the RWQCB Basin Plan[1]). **Table 3-1** above shows the beneficial uses designated for this subbasin.

According to the DWR's Bulletin 118, the Santa Clara Subbasin has a surface area of 153,600 acres (DWR, 2003). It extends from near the town of Morgan Hill to the northern border of Santa Clara County between the Diablo Ranges and the Santa Cruz Mountains.

The general hydrogeologic setting underlying the entire Project area is a broad system of coalescing alluvial fans that extend from the range fronts west of the Project area to the present shoreline of the Bay to the east. The sediments were deposited by streams flowing from surrounding mountains into the Santa Clara Valley and comprise the regional aquifers and aquitards (i.e., deposits through which water does not readily flow) within the basin. The basin fill is generally more fine-grained near the Bay, and the coarsest sediments are usually near the range front in abandoned stream channels or near the apex of an alluvial fan.

Groundwater occurs under both confined (under an aquitard that restricts percolation of water directly from the surface) and unconfined conditions (no aquitard over the groundwater) within the Project area. Groundwater movement is generally toward the Bay in both shallow and deep aquifers (i.e., water-bearing deposits). There is a downward vertical component of flow between adjacent coarse-grained deposits caused by regional groundwater pumping. Recharge of the aquifers occurs mainly along the mountain front where rainfall, streamflow, and deep percolation of applied water infiltrate the land surface.

The alluvial deposits beneath the Stanford area are 700 to more than 900 feet thick beneath the present channel of San Francisquito Creek, which runs near Stanford University to the southwest of the Project area. Sediments are characterized by lenticular beds of poorly sorted gravel, sand, silt, and clay that are variable in thickness and grain size. The local aquifers and aquitards do not appear to be continuous over short distances; however, regionally the discontinuous sand bodies interfinger to form a predominantly sandy zone that can be recognized throughout large areas.

Data suggest that there is a shallow aquifer near Stanford above approximately 150 feet below ground surface (bgs) and a deeper aquifer system below this depth. There are up to three fine-grained clay layers that impede vertical movement of groundwater at about 150, 200, and 300 feet bgs. The aquitards tend to thicken and become more laterally continuous toward the Bay. All of the production wells in the area draw most of their water from the deeper aquifer system, which is the zone below 300 ft bgs. The City of Palo Alto owns ten production wells, five of which have been abandoned. Stanford University owns four production wells, one of which has been abandoned. Stanford University, which is located near the Project area, is located near the apex of the San Francisquito Creek alluvial fan.

Groundwater Quality

The primary constituents of concern in the RWQCP's recycled water with regard to groundwater quality are inorganic salt ions, considered collectively as TDS. According to the SNMP, groundwater quality within the Santa Clara Subbasin is very good and is acceptable for all beneficial uses designated in the Basin Plan. TDS and nitrate (as NO_3) are used as representative salt and nutrient indicators for this SNMP. The volume-weighted average for the Santa Clara Subbasin is 425 mg/L. Average TDS and nitrate concentrations were compared with the recommended secondary drinking water standard of 500

[1] This subbasin is also known as Coyote Valley

mg/L and the primary drinking water standard of 45 mg/L, respectively. Average TDS and nitrate concentrations in all areas are well below their respective WQOs (SCVWD, 2014).

Seiche, Tsunami and Mudflows

Tsunamis are sea waves or tidal waves caused by offshore earthquakes, landslides, or volcanic eruptions. Seiches are waves in an enclosed or semi-enclosed body of water such as a lake, reservoir, or harbor resulting from seismic activity. Mud and debris flows are mass movements of dirt and debris that occur after intense rainfall, earthquakes, and severe wildfires. The area adjacent to the Bay, east of the plant (within the Bay lands) is considered a tsunami evacuation area (ABAG, 2014). No inland lakes are located in the Project area. ABAG provides maps that show debris flow source areas. The nearest debris flow source area is located west of the proposed backbone pipeline (west of Hillside Road). It is generally located on an open hillside between the following streets: Coyote Hill Road, Page Mill Road, Deer Creek Road, Arastradero Road, and Hillview Road.

Soil Characteristics

Table 3-2 and **Figure 3-1** show the soils that occur within the proposed Project area based on the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (USDA, 2014a and 2014b). The figure focuses on the areas where recycled water would be applied and thus does not include the RWQCP area. Soil types are important because they affect how effectively irrigation water can be used or managed on a given site.

Table 3-2: Soil Units and Characteristics in the Project Area

Map Unit Name and number	Slope (%)	Relevant Properties and Qualities	General Location
Aquic Xerorthents, bay mud substratum (120)	0 to 2	Natural drainage class: poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)	RWQCP and location of proposed connecting pipeline from RWQCP to the existing 24-inch Recycled Water pipeline (no irrigation proposed in this area)
Urbanland-Campbell complex (165)	0 to 2	Natural drainage class: moderately well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)	Location of proposed connecting pipeline from RWQCP to the existing 24-inch Recycled Water pipeline (no irrigation proposed in this area)
Urbanland-Embarcadero complex, drained (150)	0 to 2	Natural drainage class: very poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)	Location of proposed connecting pipeline from US 101 connection to stub out on East Bayshore Road (at Corporation Way); proposed backbone pipeline on Fabian
Urbanland-Hangerone complex, drained (145)	0 to 2	Natural drainage class: poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)	Proposed backbone pipeline on East Meadow, Cowper, and El Dorado, and lateral on Middlefield Road

Map Unit Name and number	Slope (%)	Relevant Properties and Qualities	General Location
Urbanland-Clear Lake complex (160)	0 to 2	Natural drainage class: Poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)	Proposed backbone pipeline on El Dorado and Page Mill Road
Urbanland-Cropley complex, (317)	0 to 2	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)	Portions of proposed backbone pipeline on Page Mill Road, El Camino Real, Hanson Way Hanover Street, and Hillview Drive; portions of the lateral pipeline alignment on Hanover Street
Urbanland – Stevenscreek complex (135)	2 to 9	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)	Portion of the lateral pipeline alignment west of Page Mill Road (on private property), and Hillview Drive; portions of proposed lateral pipeline on Foothill
Urban land – Botella complex (176)	2 to 9	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)	Portions of proposed backbone pipeline alignment on Page Mill Road; portions of proposed lateral alignment on Hanover Street
Literr-Urbanland-Merbeth complex (327)	9 to 15	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)	Portions of proposed backbone pipeline alignment on Page Mill Road and Hillview Drive; portions of proposed lateral pipeline on Foothill, Hillview Drive, Arastradero Road, and Deer Creek Road
Urban land-Flaskan complex (141)	2 to 9	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)	Portions of proposed backbone pipeline alignment on Page Mill Road and Porter Drive; portions of proposed lateral pipeline on Foothill
Urbanland-Botella complex (175)	0 to 2	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)	Portions of proposed backbone pipeline alignment on Porter Drive and Hillview Avenue
Urban land-Stevenscreek complex (136)	2 to 9	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)	Portions of proposed backbone pipeline alignment on Hillview Avenue; portions of proposed lateral pipeline on Foothill
Urbanland – Flaskan complex (140)	2 to 9	Natural drainage class: well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)	Portions of proposed lateral pipeline on Foothill

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Figure 3-1
Soil Units within the Project Area

Soil Types

Soil Map Unit Number

Pipeline Alignment

Proposed Alignment

Pipe Lateral

Alignment Options

Option 1

Option 2

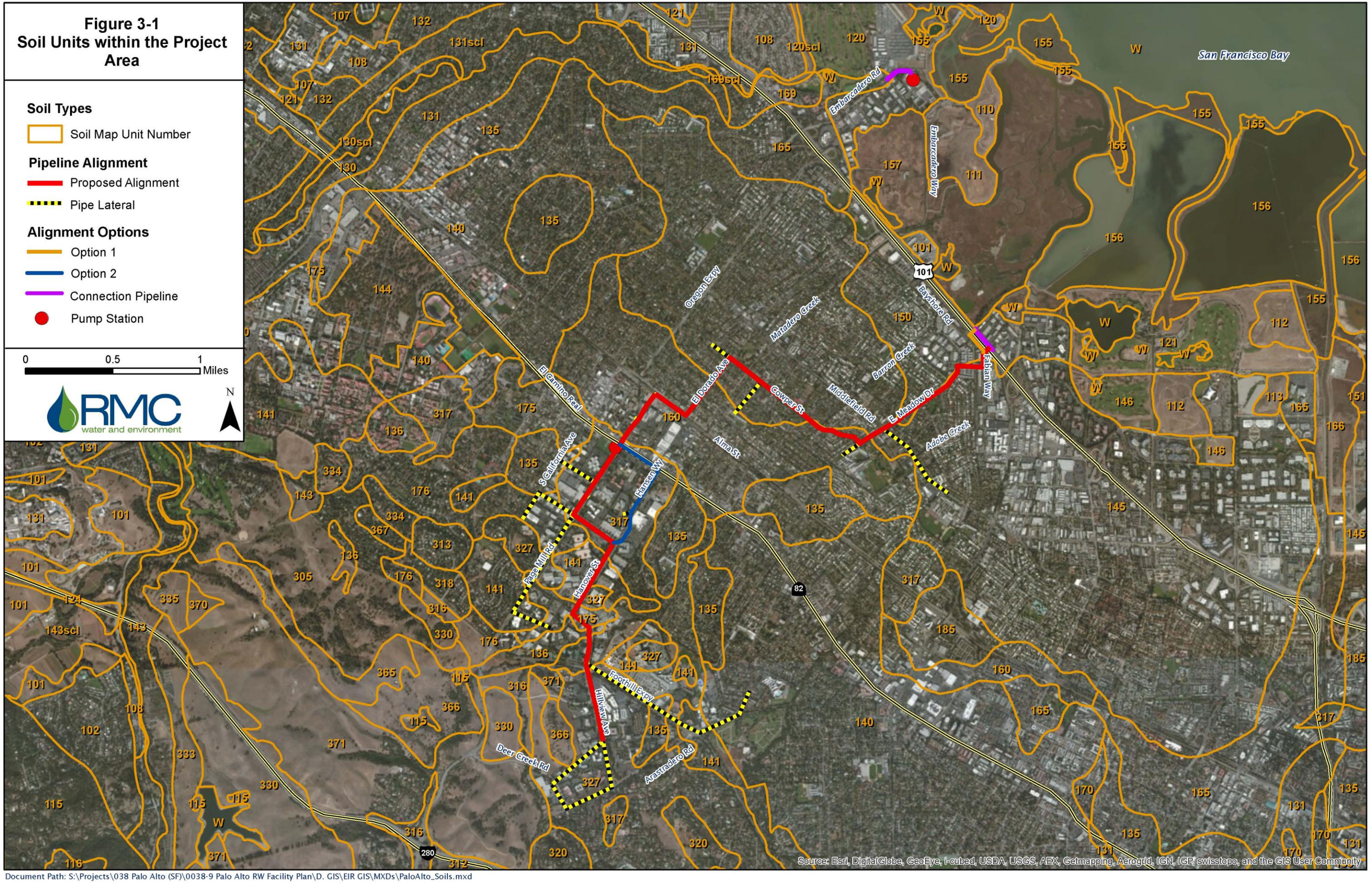
Connection Pipeline

Pump Station

0 0.5 1 Miles

N

RMC water and environment



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Soils vary based on location. As shown in **Figure 3-1** and **Table 3-2**, the proposed Project contains a variety of soil units[2], which range from poorly drained to well drained, with hydraulic conductivities (Ksat)[3] that range from moderately low to moderately high. In general, poorly drained soils are located closer to the Bay, while soils closer to the upland area tend to be well drained. Where soils are well drained, it is expected that recycled water use at the improved water quality level (lower TDS) would not cause harm to existing landscape plants, including low salt-tolerant vegetation if managed properly, as described herein. For poorly drained soils, proper management of irrigation is critical, irrespective of the water source.

3.1.2 Regulatory Framework

Federal

Clean Water Act

The federal Clean Water Act (CWA) is the primary surface water protection legislation throughout the country. By employing a variety of regulatory and nonregulatory tools, including establishing water quality standards, issuing permits, monitoring discharges, and managing polluted runoff, the CWA aims to restore and maintain the chemical, physical, and biological integrity of surface waters to support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." The CWA regulates both the pollutant content of point-source discharges and addresses polluted runoff (EPA 2003a).

The proposed Project is subject to regulations governing discharge from point sources and "wet-weather point sources," such as urban storm sewer systems and construction sites, as defined in Sections 1311–1330 of the CWA (Title 33, Chapter 26, Subchapter III of the United States Code [USC]). In conjunction, the proposed Project may be subject to a number of permit requirements, including Construction Activities Storm Water permits, and Sections 401/404 permit(s). Any necessary permits must be obtained prior to implementation of the proposed Project.

Section 401

Section 401 of the CWA requires that state water quality standards be met and that construction, dredging, and disposal activities not cause concentrations of chemicals in the water column that exceed state standards. Section 401 requires a water quality certification from a RWQCB for issuance of a 404 permit (typically if construction affects a wetland or water of the U.S.). If a Section 404 permit is required for the proposed Project/Action, then a 401 certification from the RWQCB would also be required.

Section 402

Section 402 of the CWA states that discharge of pollutants to "waters of the U.S." is unlawful unless the discharge is authorized and in compliance with an NPDES permit. The USEPA has granted the State primacy in administering and enforcing the provisions of the Clean Water Act and the NPDES permit program. The NPDES permit program is the primary federal program that regulates point-source and non-point-source discharges to the waters of the United States. Section 402 would apply to non-point discharges that could occur during construction.

Section 404

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or excavation within "waters of the U.S." The U.S. Army Corps of Engineers (USACE) is given the principal authority to regulate discharges of dredged or fill material, under oversight by the U.S. EPA.

[2] The soil units provided in **Table 3-2** do not use the same names as those used in HortScience's report.
[3] Saturated hydraulic conductivity, K_{sat}, describes water movement through saturated media.

"Waters of the U.S." are defined by the CWA as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined by the CWA as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." Under Section 404, USACE is responsible for issuing permits (typically called Section 404 permits) authorizing the placement of dredged or fill materials into jurisdictional waters, which would be required if construction affected a wetland or water of the U.S.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, also referred to as the 'Porter-Cologne Act', is contained in the California Water Code, Division 7, §13000 et seq. It is the principal law governing water quality (surface and groundwater) regulation in California. It is the policy of the state, as set forth in Porter-Cologne, that the quality of all the waters of the state shall be protected, that all activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason, and that the state must be prepared to exercise its full power and jurisdiction to protect the quality of water in the state from degradation. Porter-Cologne directs the SWRCB to formulate and adopt state policies for controlling water quality and designates the SWRCB as the state water pollution control agency for all purposes stated in the CWA. Porter-Cologne establishes the policies that are to be implemented and authorities that are to be used in achieving the goals of the CWA.

State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB)

The SWRCB and RWQCBs are responsible for preserving, enhancing, and restoring "the quality of California's water resources and ensuring their proper allocation and efficient use for the benefit of present and future generations". The SWRCB develops statewide regulations governing water use and point-source and nonpoint-source pollutant discharge, while the RWQCBs work in smaller regions throughout the state to implement SWRCB policies and regulations. RWQCBs also establish additional region- and area-specific regulations and policies to achieve water quality goals under the CWA and Porter-Cologne Water Quality Control Act.

Water Quality Control Plan (Basin Plan)

The Project area lies in the jurisdiction of the San Francisco Bay RWQCB. The Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan:

- Designates beneficial uses for surface and ground waters;
- Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy;
- Describes implementation programs to protect the beneficial uses of all waters in the Region; and
- Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code Sections 13240 thru 13244, Section 13050(j)].

The Basin Plan is used as the regulatory authority for water quality standards established in local NPDES permits and other RWQCB decisions.

General Permit for Discharges of Storm Water Associated with Construction Activity

In California, the SWRCB administers regulations promulgated by the U.S. EPA (55 CFR 47990) requiring the permitting of stormwater-generated discharges under the NPDES. Dischargers whose projects disturb one or more acres of soil are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction

General Permit) (Order 2012-0006-DWQ, which amends the original Order 2009-0009-DWQ as amended by 2010-0014-DWQ). Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the submittal of a Notice of Intent and the development and implementation of a SWPPP. The SWPPP should contain a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. It is anticipated that over one acre of land would be disturbed as a result of project construction, this requiring coverage under the Construction General Permit.

Recycled Water Policy

The Statewide Recycled Water Policy was originally approved on May 14, 2009. An amendment to the Policy was approved on April 25, 2013. The Policy specifies the following goals for California regarding recycled water:

- Increase the use of recycled water over 2002 levels by at least one million acre-feet per year (AFY) by 2020 and by at least two million AFY by 2030.
- Increase the use of stormwater over use in 2007 by at least 500,000 AFY by 2020 and by at least one million AFY by 2030.
- Increase the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20 percent by 2020.
- Included in these goals is the substitution of as much recycled water for potable water as possible by 2030.

In the Policy, the SWRCB acknowledges the potential for salts and nitrogen compounds to be of concern relative to the use of recycled water and its potential impacts on groundwater quality because high levels of salts and nutrients can make groundwater unsuitable for drinking. The policy therefore calls for the preparation of SNMPs to aid in management of these compounds relative to groundwater quality when evaluating and approving recycled water projects. The Policy also acknowledges concerns regarding constituents of emerging concern (CECs)[4]. In response, it requires regular monitoring for CECs consistent with recommendations by CDPH and the 'blue-ribbon' advisory panel that was convened by the SWRCB to guide future actions relating to CECs. CECs are a concern for groundwater recharge project, but not for recycled water irrigation projects.

California Code of Regulations Water Recycling Criteria

Title 22 of the California Code of Regulations, Division 4, Environmental Health, Chapters 1 through 3 outline California's health laws related to recycled water. The intent of these regulations is to ensure protection of public health associated with the use of recycled water. The regulations establish acceptable levels of constituents in recycled water for a range of uses and assurance of reliability in the production of recycled water. The SWRCB has jurisdiction over the distribution of recycled wastewater and the enforcement of Title 22 regulations.

[4] CECs are not presently regulated at the federal, state or local level, although their environmental fate, transport, and health effects are the subject of on-going research.

The existing Title 22 Water Recycling Criteria address treatment requirements for three types of recycled water uses: Landscape Irrigation, Recreational Impoundments, and Industrial Uses. The treatment requirements are intended to protect public health based on the expected degree of human contact with recycled water under each type of use. Treatment requirements are expressed as treatment process requirements (e.g., bio-oxidation, coagulation) as well as performance standards (e.g., disinfection standards and contaminant reduction).

Under Title 22, the RWQCP's tertiary recycled water qualifies for "unrestricted reuse", which allows the highest allowable uses, including landscape irrigation, use in recreational impoundments, and cooling towers. To be used as a source supply for this designation, the recycled water shall be at all times adequately oxidized, coagulated, clarified, filtered, and disinfected water. To be considered adequately disinfected, the median number of coliform organisms in the recycled water may not exceed a Most Probable Number (MPN) of 2.2 per 100 milliliters over a seven-day period.

Specifically, Chapter 3, Article 3 of Title 22 indicates that disinfected tertiary recycled water can be used for surface irrigation of food crops (including edible root crops, where the recycled water comes into contact with the edible portion of the crop), parks and playgrounds, school yards, residential landscaping, and unrestricted-access golf courses must meet certain turbidity requirements (California Code of Regulations Section 60304). Orchards and vineyards where the recycled water does not come into contact with the edible portion of the crop must be treated at least to undisinfected secondary level for surface irrigation (California Code of Regulations Section 60304).

In addition to uses of recycled water, Chapter 3 of Title 22 also specifies use area requirements. A regulation applicable to the project includes limitations on irrigation in the vicinity of water supply wells. The regulations state that within 50 feet of any domestic water supply well, irrigation with disinfected tertiary recycled water cannot take place unless five criteria are met, including but not limited to demonstration in a geological investigation that an aquitard exists at the well between the uppermost aquifer being draw from and the ground surface, and that the ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well (California Code of Regulations Section 60310[a]).

Other requirements related to use areas that are applicable to the proposed Project include:

- Posting signs to inform the public in areas where recycled water is in use;
- Confining recycled water to authorized use areas;
- Restricting irrigation of disinfected tertiary recycled water within 50 feet of any domestic water supply well;
- Use of purple recycled water distribution and transmission system piping to indicate that it contains recycled water;
- Prohibition of the over-application or any direct runoff of applied recycled water (recycled water would be applied to landscaped areas at agronomic rates to meet the evapotranspiration requirements, which minimizes surface runoff); and
- Other requirements designed to ensure that recycled water use does not adversely affect public health.

Local

Chapter 5 of the City of Palo Alto Comprehensive Plan provides policies relevant to hydrology and water quality, as follows (City of Palo Alto, 2007):

GOAL N-1: A Citywide Open Space System that Protects and Conserves Palo Alto's Natural Resources and Provides a Source of Beauty and Enjoyment for Palo Alto Residents.

Policy N-8: Preserve and protect the Bay, marshlands, salt ponds, sloughs, creeks, and other natural water or wetland areas as open space.

GOAL N-2: Conservation of Creeks and Riparian Areas as Open Space Amenities, Natural Habitat Areas, and Elements of Community Design.

Policy N-9: Avoid fencing, piping, and channelization of creeks when flood control and public safety can be achieved through measures that preserve the natural environment and habitat of the creek.

Policy N-11: Preserve the integrity of riparian corridors.

Policy N-13: Discourage creek bank instability, erosion, downstream sedimentation, and flooding by minimizing site disturbance and vegetation removal on or near creeks and carefully reviewing grading and drainage plans for development near creeks and elsewhere in the watersheds of creeks.

GOAL N-4: Water Resources that are Prudently Managed to Sustain Plant and Animal Life, Support Urban Activities, and Protect Public Health and Safety.

Policy N-18: Protect Palo Alto's groundwater from the adverse impacts of urban uses.

Policy N-20: Maximize the conservation and efficient use of water in new and existing residences, businesses and industries.

Policy N-21: Reduce non-point source pollution in urban runoff from residential, commercial, industrial, municipal, and transportation land uses and activities.

Policy N-22: Limit the amount of impervious surface in new development or public improvement projects to reduce urban runoff into storm drains, creeks, and San Francisco Bay.

3.1.3 Impacts and Mitigation Measures

Methodology for Analysis

This section discusses potential impacts to hydrologic resources that could result from implementation of the proposed Project, with a focus on the effects of using recycled water for irrigation of plants and landscaped areas. Specifically this analysis evaluates anticipated changes in the physical environment resulting from the proposed Project against the thresholds of significance identified below, to determine if direct and indirect changes from existing conditions would constitute potentially significant effects. Project changes are described and potential impacts, if any, are identified under each impact discussion. Where impacts would be considered potentially significant after standard project requirements are implemented, mitigation measures are identified to reduce impacts to a less-than-significant level.

Threshold of Significance

Hydrology- and water quality-related impacts associated with the proposed Project were analyzed in accordance with the CEQA Guidelines. For the purposes of this analysis, an impact to hydrology and water quality would be significant if the Project would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involve flooding, including flooding as a result of the failure of a levee or dam or being located within a 100-year flood hazard area;
- Inundation by seiche, tsunami, or mudflow;
- Result in stream bank instability; or
- Result in the substantial decline in health of the City's urban forest associated with the use of recycled water.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *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:* The City of Palo Alto receives potable drinking water from the SFPUC regional system. Use of tertiary recycled water would reduce dependence on SFPUC water. The proposed Project consists of delivering recycled water to customers for irrigation of landscaped areas. It would not require the extraction of groundwater or involve substantial construction of impermeable surfaces such that groundwater recharge would be reduced. The proposed Project would not cause a net deficit in the aquifer volume or a lowering of the local groundwater table level. As such, no impact would occur and no further evaluation is required.
- *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 which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site:* The proposed Project would not directly or indirectly alter the existing drainage patterns of any creeks or waterways (as they would be crossed using trenchless methods via hanging from a bridge or tunneling under creeks) or increase the rate or amount of surface runoff such that flooding would result. All pipelines (other than those that would be hung from bridges) would be buried underground and the proposed pump stations would be located on currently impervious surfaces and the placement of the pump stations would not generate any excess runoff. As such, no impact would occur and no further evaluation is required.
- *Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff:* The proposed pipelines would be buried underground within road rights of way and would not create or contribute runoff. The proposed pump stations would be placed on existing impervious surfaces and thus would not create additional runoff. Thus, the proposed Project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater

drainage systems. As the above-ground facilities are pump stations that would generate minimal runoff associated with maintenance activities (e.g., visits by City staff to inspect the site), they would not provide substantial additional sources of polluted runoff. Thus, no impact would occur and no further evaluation is required.

- *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:* The proposed Project would not involve construction of residential housing, and therefore would not place new housing within a flood hazard area or areas that could be exposed to sea level rise. No further evaluation is required.
- *Place within a 100-year flood hazard area structures which would impede or redirect flood flows:* Portions of the pipeline and the pump station at the RWQCB would be located within a 100-year flood hazard zone. Pipelines would be buried and would not affect flood flows. The pump station at the RWQCB could be located either within an existing structure or outdoors near the existing, empty chlorine contact tank. If the pump station is located in an existing structure, it would not impede or redirect flood flows. If it is located outside of an existing structure, the area would include site grading and repaving so as not to impede or redirect flood flows as part of standard design. All onsite stormwater would be collected and treated at the RWQCP. Thus, the proposed Project would not impede or redirect flood flows in areas of 100-year flood hazards, and no further evaluation is required.
- *Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam:* The proposed Project would include very limited above ground structures and would not appreciably impact flood flows or runoff volumes. The proposed Project would have no impact on any levees or dams and would not increase the risk of failure of any levee or dam. The proposed Project would redirect treated effluent of the RWQCP from the San Francisco Bay to existing customers for landscape irrigation. Thus, the proposed Project would not expose people or structures to a risk of loss, injury or death involving flooding. No impacts would occur and no further evaluation is required.
- *Inundation by seiche, tsunami or mudflow:* The Project area is not located in an area susceptible to seiche or mudflow. Due to the proposed Project's distance from inland water bodies, inundation by seiche is not a concern within the City. While a debris flow source area is identified in the vicinity of the westernmost portion of the proposed pipeline segments, because the proposed pipelines would be buried underground within a flat area, inundation by mudflow is not expected to damage the proposed infrastructure. The tsunami inundation area is located east of the RWQCP; as such, it is unlikely that in the event of a tsunami, people or structures within the RWQCP would be exposed to a significant risk of loss, injury, or death due to flooding. Thus, no further evaluation is required.
- *Result in stream bank instability.* The proposed facilities would not be constructed within a stream bank. All channels would be crossed using trenchless methods, including hanging the proposed pipeline from the bridge or boring under the channel. Substantial erosion that could lead to stream bank instability is considered unlikely because of the relatively small scale of earthmoving activities necessary for Project implementation and the geography of the area, which generally consists of level terrain. As such, the proposed pipeline would not directly or indirectly result in any stream bank instability. No further evaluation is required.

Impact Statements and Mitigation Discussions

Impact HYD-1 Potential violation of water quality standards and/or waste discharge requirements or otherwise substantially degrade water quality. Less than significant with Standard Project Requirements and Mitigation.

The construction of the proposed Project would expose areas of bare soil to erosive forces during construction. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, dewatering and grading activities could result in increased erosion and sedimentation to surface waters. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff (nonpoint source pollution), a contributor to the degradation of water quality. In addition, hazardous materials associated with construction equipment could adversely affect surface and groundwater quality if spilled or stored improperly. In accordance with the Construction General Permit and in compliance with standard project requirements proposed as part of the Project, a SWPPP would be developed for the proposed Project that would detail BMPs for all Project construction activities including excavation, dewatering, and stockpiling. Preparation and subsequent implementation of the SWPPP would reduce the potential for water quality impacts on nearby waterways.

During construction of the proposed Project, dewatering may be needed to remove excess groundwater from excavations created for installation of the pipeline. Dewatering operations are covered under the General Construction Permit as an authorized non-stormwater discharge. Thus, the discharge from dewatering operations would be evaluated and made part of the Project SWPPP. Dewatering would also need to be approved by the City under its Street Work Permit and may require additional permitting (Exceptional Waste Discharge Permit) if water is found to be contaminated.

All pipelines would be constructed either by hanging from a bridge or using trenchless construction beneath the channel to avoid effects on the creeks. The crossing of Adobe Creek in the Option 1 segment would be accomplished by hanging the pipeline from the bridge; work would occur within the Adobe Creek Pedestrian Path at Adobe Creek. Trenchless construction can be accomplished without surface disturbance of the channels; however, trenchless construction must be performed carefully to avoid the highly unlikely risk of an uncontrolled release of drilling fluids from construction of the pipeline under the stream, which is called "frac-out". The City would implement a Frac-Out Plan to protect against frac-out (see standard project requirements).

During construction, standard erosion control techniques (BMPs) would be implemented as required by the proposed Project (standard project requirements) and in accordance with the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity. The Project sponsor must submit a Notice of Intent to the San Francisco RWQCB prior to construction. Also, the General Construction Permit requires the preparation and implementation of a formal SWPPP which must be prepared before construction begins. The SWPPP includes specifications for BMPs implemented during Project construction to control sedimentation or pollution concentration in storm water runoff, and defines conditions for complying with the SWRCB NPDES permit requirements. Implementation of the SWPPP starts with the commencement of construction and continues through Project completion. Upon completion of the Project, the sponsor must submit a Notice of Termination to the RWQCB to indicate that construction is complete. Once the pipeline is constructed, hydrostatic testing would need to be conducted to confirm the pipeline integrity, and water from the testing would also need to be discharged. Water from testing would be discharged in accordance with the SWRCB General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality.

The Construction General Permit and RWQCP's Discharge of Exceptional Water Permit are established regulatory processes that effectively limit threats to water quality from construction activities such as those that would be conducted as part of the proposed Project. Impacts to water quality during construction would be potentially significant, but with implementation of standard project requirements, potential impacts would be reduced to less than significant.

Water Quality effects on Public Health associated with direct exposure to recycled water

Operation of the Project would be conducted in accordance with all applicable state requirements. Use of recycled water is governed by Title 22 of the California Code of Regulations. Compliance with Title 22

and the Recycled Water General Permit would ensure that operation of the proposed Project would meet water quality standards. The RWQCB has responsibility for reviewing proposed recycled water projects, and for issuing water recycling requirements through the RWQCB's permitting process.

SCVWD conducted a recycled water irrigation and groundwater study for the Santa Clara and Llagas Groundwater subbasins in 2011 (SCVWD, 2011) [5]. The purpose of the study was to compile and obtain information for SCVWD that can be used to apply recycled water for irrigation in a manner that maintains protection of groundwater resources. The study involved conducting a literature review, computer model, bench test, and a pilot study with the purpose of evaluating how expanded use of recycled water for irrigation may affect groundwater quality. The study area encompasses both the Santa Clara and Llagas Groundwater Subbasins in Santa Clara County.

The overall findings and major conclusions of the study are as follows:

> "Overall, the findings from the study have indicated that within the Santa Clara and Llagas Subbasins, recycled water can be used as an irrigation source in a manner that protects the groundwater quality. However, the implementation of recycled water for irrigation should proceed with some considerations in order to minimize the potential groundwater degradation. The study has shown from the literature review, bench test, and the pilot study that there are numerous constituents found in recycled water, many of which have different fate and transport characteristics. Some constituents were observed in the study to not pose an impact to groundwater while others, such as perfluorochemicals (PFCs) and NDMA, prompt some concern due to their detection in shallow groundwater during the pilot study. It was determined from the soil aquifer treatment (SAT) capacity and groundwater degradation potential (GWDP) maps of the Santa Clara and Llagas Subbasins that the most ideal areas for recycled water irrigation are generally in the areas with a confining layer and deep groundwater. These areas are found in the northern section of the confined areas in the Santa Clara Subbasin and in the southern section of the confined areas in the Llagas Subbasin."

As part of the data analysis, the study identifies the constituents that have been detected in recycled water sources[6] and categorizes them into four categories based on their potential to negatively impact the beneficial uses of water, with Category A as Significant Potential for Impact[7]. The constituents that fall within this category that are likely to negatively impact groundwater resources include ions (e.g., magnesium, calcium, sodium, sulfate, chloride), dissolved organic carbon, total organic carbon, TDS, and perchlorate.

The study also provided rankings for several parameters: 1) SAT capacity on a scale from 1 to 10 to determine the ability of the vadose zone soil to naturally treat contaminants with 1 representing areas with physical characteristics that are most ideal for the application of recycled water and protection of groundwater quality and 10 representing the least ideal areas; and 2) groundwater degradation potential associated with the use of recycled water in irrigation on a scale of 1 to 100, with 1 representing ideal locations for irrigation with recycled water with regard to groundwater protection based on the area's physical characteristics and the quality of the local recycled water source. The study also developed proposed recycled water irrigation screening levels (PRWISLs) for irrigation, in conjunction with BMPs and ongoing monitoring recommendations to protect water quality. PRWISLs are defined as the maximum concentration of a recycled water constituent for irrigation at which minimal groundwater

[5] Palo Alto overlies the Santa Clara Groundwater Subbasin. However, the study does not explicitly cover this area.
[6] The study evaluated the overall quality of recycled water using data from four producers, including the RWQCP.
[7] Category B are those constituents that are important to monitor as they provide insight to how other constituents in recycled water will behave through soil. Other categories include: Category C, Inconclusive; Category D, Constituents that are not expected to impact groundwater resources; and Category E, Insufficient Information.

degradation potential can be achieved. They are based on the soil aquifer capacity of a given area, the representative groundwater quality, and the constituent's potential threat level. BMPs are recommendations to maintain optimal use of recycled water for irrigation while protecting groundwater. They include the following: improving recycled water quality; reducing fertilizer application; careful site selection of sites for recycled water application; optimization of irrigation system; developing the salt and nutrient plan; and application of gypsum. The study also recommended ongoing monitoring of the potential long term impacts to groundwater from use of recycled water for irrigation in the two subbasins.

The eastern portion of Project area overlies the northwestern edge of the Santa Clara Groundwater Subbasin. The majority of the Project area overlies the confined aquifer, where a protective aquitard prevents direct percolation from the surface to ground. Only a very small portion of the area overlies the unconfined aquifer (a small linear segment across Page Mill Road between Hanover Street and about 550 feet north of Hansen Way. According to the SAT analysis, the confined area is ranked 1 to 2, with high aquifer capacity. The sliver of unconfined aquifer underlying the Project area is ranked 3 to 4, or good aquifer capacity. Groundwater degradation potential of the confined aquifer underlying the Project area is ranked 1 to 20 with the lowest groundwater degradation potential. The sliver of unconfined aquifer underlying the Project area is ranked 21 to 40, which indicates low potential for groundwater degradation. The average concentrations of constituents in recycled water produced by the RWQCP are currently below the recommended PRWISLs where information is available for the parameter, as shown in **Table 3-3**[8]. Given the majority of the Project occurs above the confined aquifer or outside of the groundwater basin, the high SAT, low potential for groundwater degradation, and the average of the RWQCP water constituents would be below the PRWSLs, the potential for groundwater impacts from recycled water irrigation under the proposed Project is expected to be minimal.

As described in the Statewide Recycled Water Policy, salts and nutrients are a potential concern because recycled water could conceivably add measurable quantities of salts and/or nutrients and cause a drinking water quality objective to be exceeded if assimilative capacity[9] did not otherwise exist. The SNMP, prepared by SCVWD, addresses the effects of using recycled water for landscape irrigation on groundwater quality with respect to these constituents. The SNMP acknowledges that all sources of groundwater recharge add salt and nutrient load to the subbasin, and that the major current sources of

Table 3-3: RWQCP Recycled Water Quality vs. PRWISL

Parameter	Units	SAT[1] zone: 1-2	SAT[1] zone: 3-4	Recycled Water Quality[2]	Above / Below PRWISL[3]?
Coliforms, Total	%	66.67%	66.67%	< 1.6	n/a
E. Coli	%	20.00%	20.00%	n/a	
Fecal Coliforms	%	20.00%	20.00%	n/a	
Boron	µg/L	505.00	505.00	0.34	Below
Bromide	mg/L	0.38	0.38	n/a	n/a
Calcium	mg/L	69.20	69.20	49.24	Below
Chloride	mg/L	320.00	320.00	310.80	Below
Magnesium	mg/L	42.20	42.20	34.35	Below
Nitrate as NO3	mg/L	122.00	122.00	23.59	Below
Nitrite as NO2	mg/L	5.59	5.59	n/a	n/a

[8] Data for some constituents are not available.
[9] Assimilative capacity is the difference between the ambient groundwater quality and the Basin Plan water quality objectives.

Parameter	Units	SAT[1] zone: 1-2	SAT[1] zone: 3-4	Recycled Water Quality[2]	Above / Below PRWISL[3]?
Phosphate	mg/L	14.13	14.13	12.51	Below
Potassium	mg/L	32.00	32.00	16.75	Below
Sodium	mg/L	230.00	230.00	200.82	Below
Sulfate	mg/L	247.00	247.00	94.29	Below
N-Nitroso Dimethylamine (NDMA)	ng/L	490.00	11.51		Below
Perfluorochemicals (PFBA)	ng/L	12.00	12.00	n/a	n/a
Perfluorochemicals (PFOS)	ng/L	87.00	87.00	n/a	n/a
Perfluorochemicals (PFOA)	ng/L	109.00	109.00	n/a	n/a
HAA5	µg/L	263.00	75.48	n/a	n/a
Bromochloroacetic Acid	µg/L	36.90	6.94	n/a	n/a
Total THMs	µg/L	366.00	366.00	n/a	n/a
Dissolved Organic Carbon	mg/L	9.00	9.00	n/a	n/a
Total Organic Carbon (TOC)	mg/L	9.62	9.62	n/a	n/a
Cyanide	mg/L	0.06	0.06	n/a	Below
Ethylenediaminetetraacetic acid (EDTA) µg/L	µg/L	305.00	305.00	n/a	n/a
NTA	µg/L	0.00	0.00	n/a	n/a
Perchlorate	µg/L	0.00	0.00	n/a	n/a
Surfactants (MBAS)	mg/L	0.36	0.36	n/a	n/a
Terbuthylazine	µg/L	0.10	0.10	n/a	n/a

Source: Santa Clara Valley Water District, 2011.

[1] SAT is defined as soil aquifer treatment
[2]Recycled Water Quality is based on the City's recycled water data from September 2009 through October 2013.
[3]PRWISLs are defined as Proposed Recycled Water Irrigation Screening Levels

TDS loading to the Santa Clara Plain (where the proposed Project is located) include landscape irrigation, and minor sources of TDS loading including recycled water. The primary sources of nitrate include but are not limited to landscape irrigation with potable and recycled water. SCVWD quantified the loading and removal of salts and nutrients to compare against the water quality objectives (WQOs) and evaluate available assimilative capacity. The loading calculations included projected concentrations from the City's Recycled Water Project. The SNMP concludes that "the current and planned recycled water use by 2035 cause only minor water quality changes to the subbasin with respect to salts and nutrients. Accordingly, recycled water project(s) are consistent with the maximum benefit of the people of the State and can be increased while still protecting groundwater quality for beneficial uses." Thus, operation of the proposed Project would not be expected to degrade groundwater quality.

Current treatment methods (including physical, chemical and biological processes) at the RWQCP remove some pharmaceutical compounds and micropollutants from the wastewater. These compounds may be present in the recycled water with concentrations measured in nanograms per liter, or one part per trillion. The presence of trace amounts of these compounds in the recycled water would not adversely affect landscape irrigation or any other proposed uses of the recycled water within the Project area. Natural processes, such as biological and photo-degradation at or below the ground surface would further break down residual contamination. Because the majority of the Project overlies a confined aquifer and

only a small portion occurs over the unconfined aquifer, it is unlikely that the minute quantities of these compounds, if present, could migrate through the soil and into groundwater. If this migration were to occur, the concentrations would be extremely low, if even detectable. Residual traces of chemicals, if any, would not adversely affect groundwater quality.

Heavy metals are not absorbed by the vegetation or broken down in the subsurface and thus can accumulate in the soil and may potentially leach into the groundwater during the wet season or in case of over-irrigation. However, metals are present in recycled water in such minute quantities that, if this migration were to occur, the concentrations would be extremely low, if even detectable, and would not adversely affect groundwater quality from a public health standpoint, because the concentrations are far below public health standards.

Adherence of the proposed Project to all appropriate Title 22 requirements would ensure that potential impacts to public health or groundwater quality would be less than significant. Thus, No mitigation measures are required.

Standard Project Requirements

Best Management Practices – Storm Water Quality

The City shall require contractors to file a Notice of Intent with the Regional Water Quality Control Board (RWQCB) indicating compliance with the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit) and to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) outlining BMPs for construction/post-construction activities as specified by the City of Palo Alto's Pollution Prevention plan sheet, the California Stormwater Best Management Practices Handbook and/or the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures. The BMPs include measures guiding the management and operation of construction sites to control and minimize the potential contribution of pollutants to stormwater runoff from these areas. These measures address procedures for controlling erosion and sedimentation, and managing all aspects of the construction process to ensure control of potential water pollution sources. Erosion and sedimentation control practices typically include:

- Installation of silt fencing and/or straw wattle;
- Soil stabilization;
- Revegetation of graded and fill areas with a standard erosion control mix (approved by a native habitat restorationist);
- Runoff control to limit increases in sediment in stormwater runoff (e.g., straw bales, silt fences, drainage swales, geofabrics, check dams, and sand bag dikes);
- Performing equipment maintenance at least 100 feet from all water bodies and wetlands, with measures in place to contain spills of diesel fuel, gasoline, or other petroleum products.
- Directing drainage from all work sites away from any water bodies or wetlands where feasible;
- Preventing erosion of uplands and sedimentation of creeks, tributaries, and ponds;
- Minimizing creek bank instability;
- Preventing flooding; and
- Returning grades to preconstruction contours.

A SWPPP that complies with the statewide General Permit shall be developed and implemented to protect water quality of the creeks that lie in the study area. Appropriate erosion and sediment control and non-sediment pollution control (i.e., sources of pollution generated by construction equipment and material) BMPs shall be prescribed in the SWPPP, and erosion and sediment control material included in the SWPPP shall be certified as weed free. Dewatering operations are covered under the General Construction Permit as an authorized non-stormwater discharge. The discharge from dewatering operations would be evaluated and made part of the Project SWPPP. In addition, the Project shall comply with RWQCB regulations and standards to maintain and improve the quality of both surface water and groundwater resources.

Frac-Out Plan

Prior to constructing underground crossings of creeks or channels, a Frac-out Contingency Plan shall be developed. At minimum, the plan shall prescribe the measures to ensure protection of water quality and related biological resources (e.g., aquatic resources, and special-status plants and wildlife) including:

- Procedures to minimize the potential for a frac-out associated with horizontal directional drilling;
- Procedures for timely detection of frac-outs;
- Procedures for timely response and remediation in the event a frac-out; and
- Monitoring of drilling and frac-out response activities by a qualified biologist.

Discharge of Exceptional Wastewater

Hydrostatic test water and water collected from dewatering activities (including contaminated water) are discharged to the sanitary sewer with an Exceptional Waste Discharge Permit from RWQCP. The permit requires chemical constituents to be sampled and identifies limits for these constituents. To minimize impacts to water quality, the City shall obtain an Exceptional Wastewater Permit prior to discharge of such waters into the sanitary sewer.

Mitigation Measure

No additional measures required

Impact HYD-2 Potential to 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 which would result in substantial erosion or siltation on- or off-site. Less than Significant with Standard Project Requirements and Mitigation.

The proposed Project would not alter the course of a stream or river. Construction activities involving soil disturbance, such as excavation, stockpiling, and grading could temporarily alter the existing drainage pattern of a site in a manner that could result in increased erosion, sedimentation and siltation to surface waters. Earthmoving activities could contribute to soil erosion that would subsequently degrade water quality as described in **Impact HYD-1** above. Implementation of standard erosion control techniques during Project construction activities and the completion of the SWPPP proposed as part of the Project (see standard project requirements), in accordance with the NPDES permit, would ensure potential water quality impacts are less than significant with mitigation.

Standard Project Requirements

See standard project requirements listed under **Impact HYD-1** above.

Mitigation Measure

No additional measures required.

Impact HYD-3 Potential to result in the substantial decline in health of the redwood trees and other salt-sensitive plant species. Less than Significant with Mitigation Measures.

One of the primary issues raised in comments about the Project is the concern that salts in recycled water could adversely affect salt-sensitive plants in the Project area. As discussed in *Chapter 2, Project Description*, TDS concentrations of effluent have substantially declined since the 1980s. The TDS concentration was approximately 920 mg/L between 2009 and 2012 and 780 mg/L as a result of implementation of early projects in 2013. Salinity reductions due to planned projects are expected to result in a cumulative reduction to below 650 mg/L[10] within the next several years, before the Project is completed. **Figure 2-7** in *Chapter 2* shows the TDS trends since February 2011. The City continues to strive to meet the goals of the Salinity Reduction Policy (see *Chapter 1, Introduction and Project Background*), and has been working with the RWQCP Partners to identify the sources of elevated TDS groundwater and to plan and implement projects that reduce infiltration of TDS into its wastewater and recycled water product. The City and RWQCP Partners have already completed projects that have substantially reduced TDS, and will continue to plan and implement projects that will further reduce TDS levels to make progress toward the City's goal of 600 mg/L TDS. The 600 mg/L goal was based upon the engineering feasibility of making changes that would keep saline groundwater out of the sewer system. To demonstrate the collective commitment to reducing salinity, the key RWQCP Partners have adopted salinity reduction resolutions to reduce the salinity of recycled water. The projects that have been completed, are in progress, or are planned for the next several years that would further reduce TDS concentrations are described in **Table 2-2** in *Chapter 2, Project Description*. Several of the completed projects have substantially reduced TDS. Other projects have been implemented but the reductions were more difficult to quantify given existing fluctuation in TDS levels. Other projects have yet to be implemented, but they are anticipated to be completed in advance of the operation of the proposed recycled water delivery system (2019). Therefore, it is estimated that TDS levels would be below 650 mg/L by the time this Project is completed and water is delivered. To ensure that TDS levels continue to decline toward the salinity goal, and thereby avoid effects on salt sensitive plants, the City shall continue to line and repair existing sewers to minimize saline groundwater infiltration, and shall immediately begin monitoring and surveillance of salinity (and related constituents) of the recycled water to track success and identify other potential sources of salt that could be eliminated or reduced (see **Mitigation Measures HYD-3a** and **HYD-3b)**.

A variety of factors contribute to the response of a landscape to recycled water, including the water quality of the irrigation water, soil characteristics (chemical characteristics, texture of the soil, soil profile, soil drainage, and soil structure), salt-tolerance of landscaped plants, and irrigation method and frequency. The 2011 study conducted by HortScience for the proposed Project, *Evaluation of Use of Recycled Water for Landscape Irrigation* (included in **Appendix G**) provides a detailed discussion of how each factor affects the response of landscapes to recycled water. The study also describes the constituents of concern in recycled water that could affect landscapes, including the following:

- Salinity (total salts as expressed in TDS and electrical conductivity [Ec_w[11]]) which can accumulate in the soil if not properly leached through the soil through rainfall or irrigation and could stunt growth and cause yellowing of the foliage;

[10] One commenter on the Project (Stanford University's Real Estate Office) believes that there will be no salinity impact on Redwood trees or similar salt sensitive species at TDS levels below 650 mg/L, but that there could be impacts above that level.

[11] Electrical conductivity (EC) is a measurement of the ability of a solution to conduct electricity and is directly related to the concentration of dissolved salts. EC_w is the electrical conductivity of the water.

- Specific ion concentration (chloride, sodium and boron) which can cause leaf chlorosis[12] and marginal burning as well as necrosis[13]
- Sodium adsorption ratio (SAR)[14] that is high reflects soil permeability problems.
- Bicarbonate can cause interveinal chlorsis[15] (tissue between leaf veins is yellow)
- Nutrients (e.g., nitrogen, phosphorus and sulfur) are beneficial, but at high levels could result in alga and other aquatic weed problems if recycled water were ponded for extended periods (days).

Recycled water is characteristically higher in alkaline salts than typical irrigation water derived from potable supplies and may cause declines in the health of low-salt tolerant tree species (e.g., redwood trees) under certain conditions. Additionally, salt buildup in poorly drained soil may create a long-term inability of the soil to absorb and provide water availability to the tree roots if proper site management practices are not implemented.

No federal or state standards have yet been established for boron, sodium, chloride, and salts in irrigation water or redwood tissues to determine the level of acceptable concentrations for irrigation of landscaped areas. This is due in part to the fact that recycled water can be applied in various environments without damage to soils and/or plants, and other sources of water (e.g., groundwater or certain imported water) could affect tree health depending on site specific conditions.

A number of studies have been conducted evaluating the effects of recycled water on low salt-tolerant redwood trees and on soils (see **Appendix D** for a summary of these studies). Referencing some of these studies, Stanford University has expressed concerns regarding the effects of irrigating Stanford Research Park landscapes with high-TDS recycled water.

Based on the 2011 study conducted by HortScience for the proposed Project, recycled water with TDS levels in the range of 870 to 1,000 mg/L could be used on certain types of landscaped plants, although some effects on low- and moderate salt tolerant plants could occur. The study also indicated that the salinity hazard would be eliminated if TDS levels were maintained below 650 mg/L, Ec_w below 1,000 µmoh/cm, chloride below 100 mg/L, sodium below 70 mg/L, and specific ranges for the combination of SAR and EC_w (HortScience, 2011). This high level of water quality (Category 1 water as defined by HortScience), is appropriate for use for all soil types and salt-sensitive plants[16]. Because TDS of the RWQCP recycled water would improve toward, and is projected to reach, the 600 mg/L goal by the time the Project is implemented in 2019, it is expected that the salinity hazard from recycled water would be eliminated and it could be used for landscape irrigation without any substantial issues. It should be noted that as TDS levels decrease, chloride and sodium will also reduce commensurately. Reduction in both

[12] Chlorosis is a condition in which leaves produce insufficient chlorophyll.
[13] Necrosis is the degeneration or death a living organism's cells or tissues. Necrosis causes leaves, stems, and other parts to darken and wilt.
[14] SAR is a water quality measurement and is a value calculated from sodium, calcium, and magnesium concentrations. It is calculated to determine the potential sodium hazard to soils, as sodium can affect directly soil structure by causing dispersion of soil aggregates, decreasing soil permeability to water and air, which may affect plant health. Adjusted SAR is an alternate measure of potential problems in irrigation water and is calculated from the salinity, bicarbonate, calcium, sodium and magnesium concentrations of the water.
[15] Interveinal chlorosis is the yellowing of the areas between the veins.
[16] HortScience prepared Recycled Water Guidelines for Stanford University which included a discussion of four categories of water quality based on the tolerance of the plant materials to salts in the water source and degree to which soil is expected to become degraded. Category 1 is defined as good water quality with no restrictions on site use. The TDS, chloride and sodium concentrations for a Category 1 source water are <650 mg/L, 100 mg/L and 70 mg/L, respectively, and specific ranges for the combination of SAR and EC_w are met, similar to the recommendation provided in the 2011 HortScience report (see **Appendix C** for the HortScience Guidelines include in the Stanford comment letter).

chloride and sodium levels have already been noted as a result of the Infiltration/Inflow and sewer improvement projects described in *Chapter 2, Project Description* (see **Table 2-2**) and will continue to decline with improving TDS levels. Thus, with the projected reductions in salinity of RWQCP recycled water, low- and moderate salt tolerant trees, whether or not protected by the City of Palo Alto, are not expected to decline in health from the use of recycled water.

It is possible for the health of any tree to decline under certain unfavorable circumstances, regardless of whether recycled water is used or not. For example, certain soil conditions in the Palo Alto area are not suitable for many tree species. (e.g., redwood trees typically occur in riparian areas with well-drained soil and ample water supply). Landscaped trees may currently be growing in suboptimal conditions. When such trees are exposed to increased stress by an environmental change (e.g., prolonged drought, pathogens or disease), they may exhibit signs of decline. The City cannot control the pre-existing conditions of trees not in prime health under current soil regimes that are not amenable to the growth of certain landscape trees, hydrological and climatic conditions, or diseases. Contributions by these sources to the decline of health cannot be attributed to the City's recycled water. If these conditions are coupled with other existing problems including poor site management (e.g., using sprinklers to irrigate trees with recycled water and not keeping the soil moist), then even if the salinity hazard of recycled water is eliminated, it is possible for tree health to be affected. Despite the potential for a combination of unfavorable conditions where some trees may decline in health and/or appearance, or die (which could occur even if other water sources are used), it is not expected that such fate would occur en masse for substantial numbers of landscaped trees, including protected trees. Nevertheless, to provide a conservative analysis, and because there is the possibility that trees could be affected under a combination of factors that involve, but are not necessarily caused by recycled water use (and to distinguish the contribution would be difficult), the potential for the urban forest to be affected (in terms of biological health, appearance, or mortality) is considered to be potentially significant. Implementation of **Mitigation Measure HYD-3c**, which includes site management BMPs, would be required to reduce unfavorable site conditions. These measures require site managers of individual properties using recycled water to implement appropriate management actions that would improve soils and drainage. Implementation of this measure would reduce potential impacts to redwood trees and other salt-sensitive species to less than significant.

While TDS and other related parameters in recycled water are expected to achieve the desired concentrations by the time the Project is operated, in the unlikely event that they are not achieved by the time of Project operation, there is potentially a greater risk that certain salt-sensitive plants could be adversely affected by recycled water use. While TDS greater than 650 mg/L can be safely used on many landscaped areas, some salt-sensitive trees, such as redwood trees, could be affected, particularly under the combination of factors that are independent of recycled water quality. The City is sensitive to concerns of landowners whose properties may be dominated by salt-sensitive tree species, and thus has identified actions that would mitigate the potential for damage to those trees. Specifically, the City would consider other options prior to Project operation if anticipated recycled water quality is not achieved by the time of Project operation, and would select the best strategy moving forward. These actions would include an amendment to the City's existing Recycled Water Ordinance to allow for an exemption from use of recycled water on redwood trees (and other salt-sensitive trees) such that an individual site would have dual plumbing to allow potable water to be used on salt-sensitive species (if desired by the individual landowner), blending of the recycled water, or additional treatment of recycled water, based on available technology at the time (see **Mitigation Measure HYD-3d**). However, there may be a limited period at the beginning of Project operations when recycled water quality is not at the optimal level. In such an event, there is a potential for adverse effects similar to those described above for the use of any source water, particularly for salt-sensitive species. Given the expected short duration of recycled water use with less optimal recycled water quality, any effects on vegetation would occur for a limited time, and long-term damage to salt-sensitive species is not expected. Recycled water with higher TDS levels can be used on certain landscapes with minimal effect, and with proper site management (as required in

Mitigation Measure HYD-3c), and the implementation of options to reduce TDS (**Mitigation Measure HYD-3d**), impacts would be less than significant.

The provision of a sustainable water supply to landscaped areas and appropriate site management have the benefit of reducing the added stress that droughts could impose on the existing trees, including protected and non-protected trees, and trees of all salt tolerance. The City's UWMP describes the City's Water Shortage Contingency Planning, which is broken up into four water supply shortage stages, with up to 50 percent supply reduction under the worst case shortage scenario. Typically, landscape customers are the first casualty when mandatory water cutbacks are imposed. Recycled water provides a more stable source than potable water for landscape irrigation because of use limitations. Potable water may be scarcer as drought reduces potable water supply, and demand for drinking water grows with population expansion. Trees and landscape plants become less tolerant of change as they age, where water availability is a critical factor influencing continued tree/plant health, condition, and longevity. Ensuring a reliable supply of water for landscape irrigation is therefore of paramount importance for the function of the urban forest as a whole over the long-term.

The ability of trees and landscape plants to tolerate higher salinity levels of recycled water is partially reliant upon species as identified in the EIR, but also related to adaptation to site specific conditions including recurring/historic maintenance. In other words, potential impacts are related both to nature and nurture. Mitigation measures such as use exemption for salt sensitive species, soil analysis, improved leaching, addition of gypsum, and monitoring are described. These best practices can be augmented with design of new landscapes that thrive with recycled water, improvements to soil volume and structure (during construction of projects), modifications to site specific storm water drainage through landscape areas, and irrigation system upgrades which allow customized application of either recycled or potable water (to encourage leaching as needed). Adaptation plans with schedules should be developed on a site specific scale. Recycled water is a drought-proof, sustainable supply that would offset effects that could otherwise occur after prolonged droughts (as long as proper site management such as leaching is conducted). Thus, the proposed Project would benefit protected trees, non-protected trees and other vegetation present in existing landscapes that contribute to the greenery of the City.

Mitigation Measure

Mitigation Measure HYD-3a. Source Control of Saline Groundwater. The City shall continue to line and repair existing sewers to minimize saline groundwater Infiltration.

Mitigation Measure HYD-3b. Monitoring. The City shall immediately begin quarterly monitoring of the salinity (and related constituents) of the recycled water and shall report the rolling 12-month average for comparison to the Palo Alto City Council goal of 600 mg/l TDS. The City shall monitor soil salinity and SAR through semi-annual soil analyses, preferably taken early and late in the irrigation season (approximately April and October).

Mitigation Measure HYD-3c: Site Management. As a condition of recycled water use, the City shall require the site owners to: 1) Continue to irrigate with recycled water, even during droughts, (because recycled water is a drought-proof supply), to meet the water demand of the subject plants and trees; and 2) conduct appropriate best management practices/management actions specified below in the event that protected, low-salt-tolerant trees irrigated with recycled water show signs of decline.

- To avoid plant damage to salt sensitive landscape plants, implement a leaching program to maintain soil salinity within the root zone below 2.0 dS/m[17] and SAR below 6.0. For

[17] ds/m is decisiemen/meter. A dS/m is a measure of electrical conductivity, and approximates to 640 mg/L TDS.

moderately salt-tolerant plants, maintain soil salinity below 4.0 dS/m. Where subsoils do not drain adequately, installation of subsurface drainage systems may be recommended. Rainfall will satisfy a portion of the leaching requirement, depending on the rate, volume, and distribution through the season. The frequency with which leaching applications should be made depends on several variables, and is triggered by approaching soil salinity thresholds defined above.

- Apply gypsum prior to leaching when indicated by soil analysis. Gypsum is a soil amendment that, when combined with leaching, helps lower soil sodium concentrations. Gypsum application shall be considered when soil analyses reveal one or more of the following conditions: SAR exceeds 6.0, SAR increases 2 units or more (e.g., 2.3 to 4.3), and/or sodium concentration exceeds 5 meq/l (115 mg/L). The amount of gypsum needed and the frequency of application depend on site-specific soil and water characteristics, and shall be determined by laboratory analysis.

Mitigation Measure HYD-3d: Other Options to Protect Salt-Sensitive Plants. In the event that monitoring results (see Mitigation Measure HYD-3b) show that optimal concentrations of TDS and related parameters will not be achieved prior to operation of the Project (i.e., recycled water application), the City will consider other actions to improve TDS levels, as follows:

- The City shall amend its existing Recycled Water Ordinance to include an exemption for redwood trees (and/or other salt sensitive species) from use of recycled water and allow for the use of dual systems so the exempted trees could be irrigated separately using potable water, if desired by individual landowners;
- The City shall blend recycled water and potable water prior to application; or
- The City shall treat recycled water to reduced TDS prior to application.

Significance after Standard Project Requirements and/or Mitigation

Less than significant

3.2 Aesthetics

3.2.1 Setting

This section describes the environmental setting for visual resources within the Project area.

There are no scenic highways within the Project area. The nearest eligible scenic highway[18] is Highway 280, which is located approximately 2.5 miles from the proposed pump station at the Mayfield Soccer Fields.

According to the City of Palo Alto Comprehensive Plan, the City's backdrop of forested hills to the southwest and San Francisco Bay to the northeast is a character-defining element of the City. The City of Palo Alto Comprehensive Plan identifies a number of scenic routes and corridors. These resources located within the Project area are listed below:

- Arastradero Road, west of Foothill Expressway
- Embarcadero Road from Harbor Road to El Camino Road
- Oregon Expressway / Page Mill Road between Bayshore Freeway to Interstate 280
- Foothill Expressway

[18] Eligible state scenic highways are not yet officially designated.

The Comprehensive Plan also identifies primary gateways to the City. The gateway at Page Mill Road and El Camino Real is located within the Project area.

3.2.2 Regulatory Environment

Federal

There are no federal regulations associated with visual resources that are relevant to this Project/Action.

State

There are no state regulations associated with visual resources that are relevant to this Project/Action.

Local

City of Palo Alto Comprehensive Plan

Chapter 5 of the City of Palo Alto Comprehensive Plan provides policies relevant to visual resources, as follows (City of Palo Alto, 2007):

GOAL L-1: A Well-designed, Compact City, Providing Residents and Visitors with Attractive Neighborhoods, Work Places, Shopping Districts, Public Facilities, and Open Spaces.

Policy L-5: Maintain the scale and character of the City. Avoid land uses that are overwhelming and unacceptable due to their size and scale.

Policy L-69: Preserve the scenic qualities of Palo Alto roads and trails for motorists, cyclists, pedestrians, and equestrians.

Policy L-70: Enhance the appearance of streets and other public spaces by expanding and maintaining Palo Alto's street tree system.

Policy L-79: Design public infrastructure, including paving, signs, utility structures, parking garages and parking lots to meet high quality urban design standards. Look for opportunities to use art and artists in the design of public infrastructure. Remove or mitigate elements of existing infrastructure that are unsightly or visually disruptive.

GOAL N-3: A Thriving "Urban Forest[19]" That Provides Ecological, Economic, and Aesthetic Benefits for Palo Alto.

Policy N-17: Preserve and protect heritage trees, including native oaks and other significant trees, on public and private property.

City of Palo Alto Zoning Ordinance

Chapter 18.28 of the Zoning Ordinance provides the site development standards for Public Facility uses. Minimum setbacks, site coverage, height restrictions are specified for development within Public Facility areas.

[19] The "urban forest" is comprised of the street tree system, trees on parks and other public lands, and trees on private properties and in yards throughout the City. It functions as an extension of the woodland and grassland plant communities in the foothills and provides a "bridge" for wildlife between the foothills and the Bay. The urban forest is most established in the older parts of the City, where mature street trees provide a dense canopy. In addition to its biological benefits, the investment in Palo Alto's urban forest has provided a significant return by creating appealing streets and resulting higher property values. There are more than 300 different species of trees on Palo Alto's streets. However, a limited number of species make up almost 50 percent of the total trees planted. These are Southern Magnolia, American Sweetgum, London Plane, Modesto Ash, Camphor, Chinese Elm, and Holly Oak.

The City's Architectural Review Board (ARB) is charged with design review of all new construction and changes and additions to commercial, industrial and multiple family projects. Approval by the ARB is necessary prior to implementation of a project.

Site and Design review is also required for all work within a Site and Design Review Combining District (D)[20]. The Site and Design Review Combining District regulations are provided in Chapter 18.30(G) of the Zoning Code. The intent of this district is to provide a process for review and approval of development in environmentally and ecologically sensitive areas, including established community areas that may be sensitive to negative aesthetic factors, excess noise, increased traffic or other disruptions, to assure that use and development will be harmonious with other uses in the general vicinity, will be compatible with environmental and ecological objectives, and will be in accord with the Palo Alto Comprehensive Plan. Site and design approval must be secured prior to issuance of any permit or other approval for the construction of any building or establishment of any use on any site within the site and design reviewing combining district. Findings are made at successive levels for approval by the Planning Commission, ARB, and the City Council.

Architectural review and site and design review will be needed for certain exterior modifications, such as hanging pipes, pump stations, and landscaping.

3.2.3 Impacts and Mitigation Measures

Methodology for Analysis

This analysis evaluates anticipated changes in the physical environment resulting from the proposed Project against the thresholds of significance identified below, to determine if direct and indirect changes from existing conditions would constitute potentially significant effects. Project changes are described and potential impacts, if any, are identified under each impact discussion. Where impacts would be considered potentially significant after standard project requirements are implemented, mitigation measures are identified to reduce impacts to a less-than-significant level.

Thresholds of Significance

Aesthetic impacts and effects associated with the proposed Project were analyzed in accordance with the CEQA Guidelines. For the purposes of this analysis, an impact to visual quality would be significant if the Project would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Have a substantial adverse effect on a public view or view corridor;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Violate existing Comprehensive Plan policies regarding visual resources;
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area; and
- Substantially shadow public open space (other than public streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21.

Criteria Requiring No Further Evaluation

- *Substantially damage to scenic resources within a state scenic highway.* The proposed Project is not located near or within a state scenic highway; US 101 is not designated as a Scenic Highway in the vicinity of the Project area. Therefore, the proposed Project would not damage scenic

[20] The RWQCP is located within a Site and Design Review Combining District.

resources, including but not limited to rock outcroppings, and historic buildings within a state scenic highway. No impact would occur and no further discussion is required.

- *Substantially shadow public open space between 9:00 a.m. and 3:00 p.m. from September 21 to March 21. T*he proposed Project would be constructed within existing roadways and/or utility corridors within commercial, industrial, and residential areas. Pipelines and the pump station at Mayfield Soccer Fields would be buried underground, with some appurtenant structures located above ground may cast a short shadow in the adjacent parking space. The pump station at the RWQCP would be located on City owned land that is not within a public open space area and thus any shadows created would not be considered an impact. As such, the proposed Project would not result in any adverse effects and no further discussion is required.

Impact Analysis

Impact AES-1 Substantial degradation of the existing visual character or quality of the site and its surroundings or on a public view or view corridor. Less than significant with Standard Project Requirements and Mitigation Measures.

The Project area includes a City-designated scenic route and view corridor in both directions along Page Mill Road (for the proposed alignment and pipe lateral), a scenic route along Foothill Expressway (for the pipe lateral), major view corridors (looking south) along East Meadow Drive (proposed alignment), and other areas with extensive landscaping. There are no scenic vistas in the proposed Project area. The Project proposes the construction of a recycled water pipeline and associated facilities to provide an alternative water supply for non-potable uses. During construction, the Project would alter the visual environment in and around the construction area due to the presence of equipment, material (e.g., pipes and spoil) and excavation sites (i.e., open trenches or pits). Existing landscaped vegetation and trees could also be damaged and/or removed during Project construction. However, construction would be temporary and the affected areas (with the exception of the pipeline crossings on bridges, pump station sites, and areas where trees may be removed) would be restored to preconstruction conditions or re-vegetated upon completion of work activities to ensure that short-term construction-related impacts would not become long-term aesthetic problems (see **Mitigation Measure AES-1**). Implementation of this mitigation measure would reduce potential impacts to less than significant.

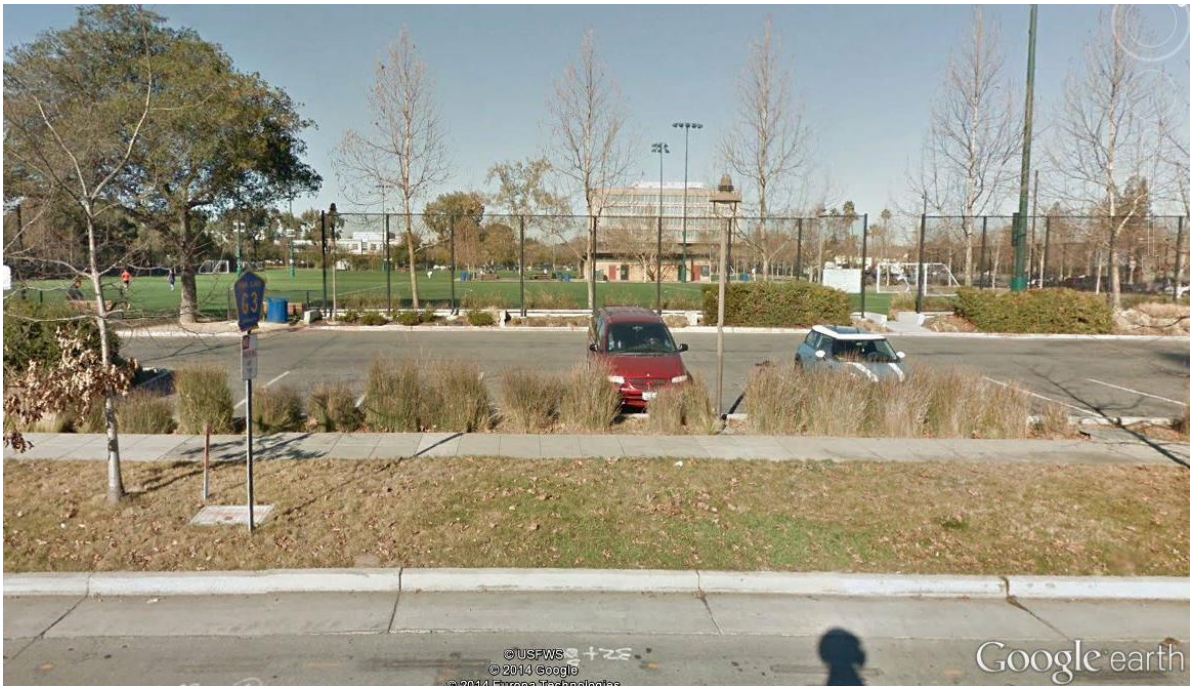
Trees could be trimmed or removed during construction activities; for example, crossing of the highway may require pits associated with trenchless construction that could require either trimming or removal of trees in a parking lot or along East Bayshore Boulevard. Tree removal would comply with the City's Municipal Code to ensure that protected trees would remain on the Project site and any designated trees removed would be replaced according to the Tree Canopy Replacement Formula, Tree Technical Manual, Section 3.30. Street trees would be replaced with species determined by Public Works Operations (see standard project requirements below). The City would comply with the Tree Technical Manual regarding the avoidance, removal, and replacement of trees. Compliance with the Manual's practices would ensure that potential visual related impacts associated with tree removal would be less than significant.

The City has a practice of imposing a 5-year moratorium on cutting newly paved streets, with appropriate exceptions. Although not established for this reason, the moratorium indirectly limits visual impacts that could occur from continuous construction activities along any one roadway segment. The Project is expected to be constructed in 2018. No trench work would occur on streets that have been paved within the 5 years prior to construction unless an exception is needed and an agreement can be reached to allow for that exception. Where exceptions to the 5-year moratorium would be granted, impacts on public views from multiple construction activities along roadway segments would be considered less than significant due to the temporary and continuously-moving nature of construction activities.

Two pump stations are proposed as part of the Project. One would be located at Mayfield Soccer Fields, within the existing parking area. The other pump station would be located at the RWQCP.

The proposed pump station site at Mayfield Soccer Fields is located adjacent to Page Mill Road, within an existing parking area. This road is a multi-lane roadway with bicycle lanes on either side of the street. Within the proposed pump station site, a sidewalk adjacent to a grassy patch of land divides the road from the parking strip. Small grasses are planted adjacent to the sidewalk and trees are planted intermittently between the parking spaces. Behind the parking lot are a row of deciduous trees and a high fence surrounding the soccer fields. When the trees are bare, the structure in between the two soccer fields is visible from Page Mill Road, as is a tall building in the background (see **Figure 3-2**). The proposed pump station site is visible from the surrounding parking area, soccer fields, and along Page Mill Road.

Figure 3-2: View of the Mayfield Soccer Fields looking north from Page Mill Road



The pump station at Mayfield Soccer Fields would be buried underground with an access hatch and ventilation located above the buried structure, on the parking surface. The access hatch and the vent would be located flush to the ground. A transformer (to step down the voltage) would be located on a pad up to 8 by 8 feet. The actual size of the transformer would need to be determined during design, but could be up to 8 by 8 by 6 feet (width, length and height). Transformers are typically located within metal boxes that would be painted green or other suitable color that integrate with the surrounding environment as approved during design review. Concrete bollards would be needed at 2 feet off of the pad edges in any direction with vehicle traffic to prevent cars from accidentally driving into or over these components; the bollards would be spaced at 4 feet apart from one another at a height of approximately 3 feet. No features or facilities can be located within 4 feet of the transformer to meet safety guidelines. A communication system (e.g., SCADA) may also be needed to monitor pump station operations. This would require an antenna to be installed at the site, which could vary in height, but would be well below the height of street lamps. Due to the space needed to accommodate these features, it is expected that up to four parking spaces would be removed and replaced by these above-ground components of varying height. It is possible some of the features could be accommodated within the grassy area adjacent to the pump station

site. The pump station and appurtenances have not yet been designed, so the precise configuration has not been determined.

Construction and operation of the proposed facilities would result in a permanent visual change at the site and surrounding. Because above-ground features would be located at a site along the designated scenic corridor, any change could be considered a potentially significant effect. However, given its location within a parking lot in front of a soccer field with a high fence, and because there is a structure in the middle of the soccer fields, it is expected that the proposed above-ground facilities could be designed to integrate with the surrounding environment. As such, special design (treatment to blend the proposed facilities into the background) would be needed. These treatments could include limiting the size of the transformer to as small as feasible, and painting the transformer green or a suitable color to match the grassy fields / structure in the background. All components of the Project that are seen from public views and create a permanent physical change (pipelines that would not be buried, new structures, or landscape changes) require Architectural Design Review by the City. The purpose of the design review is to promote visual environments that are of high aesthetic quality and variety and which, at the same time, are considerate of each other. Implementation of this standard City requirement would ensure that the Project's potential visual impacts, particularly on a scenic corridor, would be less-than-significant level.

Permanent changes to the visual condition of the RWQCP would result if the pump station is located outside of existing structures. However, the pump station would be industrial in nature, integrated in appearance with surrounding buildings and existing conditions at the plant. Electric poles, paved roads, dirt roads, and existing facilities at the RWQCP are part of the scenic environment. The pump station would be shielded from public view by the existing vegetation, approximately 50 to 75 feet tall growing along the perimeter of the fenced RWQCP property. The pump station would be located within the developed RWQCP site. The pump station would comply with the requirements of both the Baylands Master Plan and Santa Clara County's Airport Master Plan for the Palo Alto Airport. The pump station would be required to go through a Site and Design Review during the design phase of the Project to ensure compliance with the City's regulations. For this reason, the proposed pump station at the RWQCP would result in a less-than-significant impact.

As discussed in **Impact HYD-3** above, potential impacts on the City's protected trees are not anticipated to occur because the salinity of the RWQCP recycled water would be reduced to a level below the previously identified thresholds by the time the proposed Project is constructed and operated in 2019. The City would continue to pursue projects that reduce salinity concentrations and would monitor salinity levels (and related constituents) to track success (see Mitigation Measures **HYD-3a** and **HYD-3b**). Some landscaped areas could be affected under a narrow subset of conditions, and as a result, this impact was determined to be potentially significant but mitigable with implementation of **Mitigation Measure HYD-3c**. Proper site management would support the health of the landscape such that the visual environment would be maintained.

In the event that the combination of factors described in **Impact HYD-3** occur or in the unlikely event that recycled water quality does not achieve the desired concentrations by the time the Project is implemented (before additional actions are executed as specified in **Mitigation Measures HYD-3d**), some salt-sensitive plants could react poorly to recycled water (e.g., some salt-sensitive plants may show browning of leaves). Under this circumstance, the Project is not anticipated to result in a substantial change in the visual quality of the Project area from declines in the health of redwood trees and other salt-sensitive species. Any visual changes would likely occur gradually, over time, and with the site management actions described in **Mitigation Measure HYD-3c**, site managers would be able to monitor the appearance of trees and the quality of the soil and make necessary adjustments to maintain the health of its landscaped areas. Also, damage, if any, would unlikely occur in multiple locations simultaneously, due to the variations in site specific conditions of the tree, soil, and site management regime. Potential exposure of salt-sensitive plants to less optimal recycled water quality would be expected to be

temporary. Also, recycled water with higher TDS levels could be used on a variety of landscapes with minimal effect, and with proper site management (as required in **Mitigation Measure HYD-3c**), even if some plants were to be affected, such visible effects would be scattered and unlikely to occur en masse. Because options (**Mitigation Measure HYD-3d**) are available to improve irrigation water quality, impacts to the visual environment would be less than significant. As discussed in the City's Draft UFMP, the future composition of Palo Alto's urban forest will be influenced by an emphasis on drought tolerant and recycled water tolerant species. Thus, any alterations in the visual environment associated with the conversion of the existing landscape to that containing more drought-tolerant regime should not be attributed to potential effects by the proposed Project. The choice to convert is an independent decision by each landowner.

The provision of a sustainable water supply to landscaped areas along with appropriate site management has the benefit of reducing the anticipated visual quality degradation that droughts could impose on the landscape. The City's UWMP describes the City's Water Shortage Contingency Planning, which is broken up into four water supply shortage stages, with up to 50 percent supply reduction under the worst case shortage scenario. Typically, landscape customers are the first casualty when mandatory water cutbacks are imposed. Recycled water is a drought-proof, sustainable supply that would offset effects that could otherwise occur after prolonged droughts (e.g., damaged/dying turf, shrubs, and trees). Thus, the proposed Project would provide aesthetic benefits for the entire City.

Based on the analysis above, with the standard project requirements and mitigation measures described, the proposed Project would result in less-than-significant visual quality impacts.

Standard Project Requirements

Compliance with the Tree Technical Manual

The City of Palo Alto Tree Technical Manual (Dockter 2001) is a separately published document issued by the City Manager, through the Departments of Planning and Community Environment and Public Works to establish specific technical regulations, standards and specifications necessary to implement the Tree Ordinance (Chapter 8.10, Tree Preservation and Management Regulations), and to achieve the City's tree preservation goals and natural resource conservation goals.

Section 2.00 specifically addresses the protection of trees during construction; its objective is to reduce the negative impacts of construction on trees to a less than significant level.

Construction projects within the tree protection zone (TPZ) of Regulated Trees are required to implement protective practices prior to and during construction. The City would be required to retain a certified arborist to prepare a Tree Protection and Preservation Plan if any activity is within the dripline of a Protected or Designated Tree. The Plan must include an assessment of impacts to trees, recommended mitigation to reduce impacts to a less than significant level, and identification of construction guidelines to be followed through all phases of a construction project.

Section 3.00 of the Tree Technical Manual outlines requirements associated with the removal and replacement of regulated trees. The standards and specifications for replacements of trees are dependent on the location where a Protected or Designated Tree would be replaced. If a tree is to be replaced on site, the replacement tree must be the same species unless the Director determines that another species would be more suitable for the location. The location of the replacement tree on site must be approved by the Director. If it is not possible to replace the tree on site, funding for the replacement of trees is calculated using a Tree Value Replacement Standard. The funding is then applied for planting of trees elsewhere.

Architectural Review and Site and Design Review

Architectural Review and/or Site and Design review will be required for all exterior modifications, including hanging pipes, pump stations, and landscaping. The individual components will require approval by the City's Architectural Review Board (ARB) for architectural review, and by the planning commission, ARB, and City Council for site and design review prior to project implementation.

Mitigation Measures

Mitigation Measure AES-1: Restoration to Pre-construction Conditions. The City shall require its contractors to restore disturbed areas to their pre-construction conditions, to the extent consistent with pipeline operations, so that short-term construction disturbance does not result in long-term visual impacts.

Significance after Standard Project Requirements and/or Mitigation

Mitigation

Less than significant

Impact AES-2 Violation of the existing Comprehensive Plan policies regarding visual resources. Less than significant.

The proposed Project would not violate any existing Comprehensive Plan policies regarding visual resources. The proposed Project would involve constructing and operating a recycled water system that consists of buried pipelines and new pump stations. Proposed facilities would be located within existing roadways and/or utility corridors within commercial, industrial, and residential areas, or public lands owned by or leased to the City. The aboveground facilities would be designed to integrate with existing visual quality of the proposed sites and in accordance with the requirements of the Architectural Design Board. Thus, above-ground features would not affect the scale or character of the City, the scenic qualities of Palo Alto roads, or the City's street trees or the urban forest. Additionally, the pump station at the RWQCP, which is located in an area defined collectively as the Palo Alto Baylands Nature Reserve, would comply with the requirements of both the Baylands Master Plan (City of Palo Alto, 2008) and Palo Alto Airport Master Plan (City of Palo Alto, 2006). Thus, the proposed Project would not violate any relevant Comprehensive Plan policies regarding visual resources. Impacts are considered less than significant.

Mitigation Measures

None required

Impact AES-3 Creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area. Less than significant.

The proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Nighttime construction activities are not anticipated. As described in the Project Description, construction would occur between the hours of 9 a.m. and 4 p.m. Monday through Friday on arterial and collector streets in order to maintain compliance with the City's Traffic Control Requirements. Construction other than on arterial and collector streets would occur

between the hours of 8 a.m. and 6 p.m. Monday through Friday. Construction would occur between 9 a.m. and 6 p.m. on Saturday for all construction areas.

The Mayfield Soccer Fields pump station would be located underground. Proposed above-ground facilities (transformer, concrete pad, bollards, and antenna) would not require substantial lighting. All aboveground facilities constructed as part of the Project would go through Architectural Design and Site and Design Review during the design phase of the project and would satisfy the requirements of the City and the Architectural Review Board. Lighting conditions would not change at the RWQCP as a result of the proposed Project. Thus, the impact would be less than significant.

Mitigation Measures

None Required

3.3 Environmental Justice

3.3.1 Setting

Environmental justice is defined 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 economic groups should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies." (USEPA 2012).

Economic Development

The median household income (MHI) for the City of Palo Alto was estimated as $122,482 in 2012 (US Census 2012). The Palo Alto Comprehensive Plan includes a Business and Economics chapter that shows the city has experienced strong economic growth in the mid-1990s, and that jobs had been projected to increase through 2010 (City of Palo Alto 2007). However, the Plan was written prior to the economic recession, and regionally, jobs declined between 2007 and 2010, though growth is again anticipated (ABAG 2012). Palo Alto is projected to experience 33 percent job growth from 2010 to 2040, for a total of an additional 29,650 jobs (ABAG 2012).

Minority and Low Income (Disadvantaged) Communities

According to CEQA and USEPA guidelines, a minority population is present in a study area if the minority population of the affected area exceeds 50 percent, or if the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (USEPA 1998). Under the same guidelines, a low-income population exists if the project study area is composed of 50 percent or more people living below the poverty threshold, as defined by the U.S. Census Bureau, or if the percentage of people living below the poverty threshold in the study area is substantially greater than the poverty percentage of the general population or other appropriate unit of geographic analysis.

Per the 2010 U.S. Census, the City of Palo Alto found that the population was 64.2 percent White (alone), and 35.8 percent non-White or multiracial (U.S. Census 2010). A review of demographic data for the City of Palo Alto shows that most of the Project Area is not identified as a minority community, although the proposed pipeline crosses through one minority community that is bounded by Alma Street, El Camino Real, South Rengstorff Ave., and Oregon Expressway (see **Figure 3-3**) (U.S. Census 2013b). The proposed pump station at the Mayfield Soccer fields is also located adjacent to this area.

MHI for the City of Palo Alto is generally high, as described above. Detailed demographic information was analyzed using data from the U.S. Census Bureau's American Community Survey (ACS), which

provides estimates of demographic information based on annual surveys. Data from ACS is available on a Census-tract level, and this finer scale is more accurate for project analyses. The most recent set of ACS data available at the Census-tract level for the City of Palo Alto is the 2008-2012 data, which correlates the data to 2012 Census tracts. Mapping these data shows that there are no tracts within the Study area that have more than 20 percent of families and people below the poverty line. Within the Project Area less than 6.1 percent of the population is considered to be below the poverty line (see **Figure 3-4**) (U.S. Census 2013a).

2008-2012 ACS data estimate Statewide MHI at $61,400. Disadvantaged Communities (DACs) are defined through the state's Integrated Regional Water Management Program as those communities with an MHI 80 percent or less than statewide MHI. This means that communities with an MHI of $49,120 or less qualify as a DAC. Mapping using 2008-2012 ACS data for the Study Area shows one grouping of DACs within the Study Area, located along El Camino Real, northwest of, but not-adjacent-to, the proposed pipeline (see **Figure 3-5**) (U.S. Census 2013a).This grouping of DAC overlies an area that includes 11-20 percent of the population below the poverty line, as well as areas where 0-2.7 percent of the population is below the poverty line. This area primarily includes Stanford University and Medical Center. The low MHI in this area is likely related to the high number of students in the vicinity rather than a population that is considered low-income.

3.3.2 Regulatory Setting

Federal

Executive Order (EO) 12989 prohibits discrimination against or exclusion of individuals and populations during the conduct of federal activities. It requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs and activities on minority and low-income populations.

State

There are no state regulations related to environmental justice that are relevant to this Project.

Local

There are no local regulations related to environmental justice that are relevant to this Project/Action.

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Figure 3-3
Minority Populations

Percent Minority

- 0-25
- 25-50
- 50-75
- 75-100
- Proposed Alignment
- Pipe Lateral

Alignment Options

- Option 1
- Option 2
- Connection Pipeline
- Water Courses
- Pump Station

0 0.10.2 0.4 0.6 0.8 Miles

N

RMC water and environment

San Francisco Bay

Regional Water Quality Control Plant (RWQCP)

Mayfield Soccer Fields

101

82

Oregon Expy

Matadero Creek

Bayshore Rd

Fabian Way

El Camino Real

El Dorado Ave

Cowper St

Middlefield Rd

Barron Creek

E. Meadow Dr

Adobe Creek

Alma St

S California Ave

Hansen Wy

Page Mill Rd

Hanover St

Foothill Expy

Hillview Ave

Arastradero Rd

SAN FRANCISCO

OAKLAND

PLEASANTON

HAYWARD

LIVERMORE

FREMONT

SAN MATEO

PALO ALTO

PROJECT LOCATION

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USD

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Figure 3-4
Poverty Levels

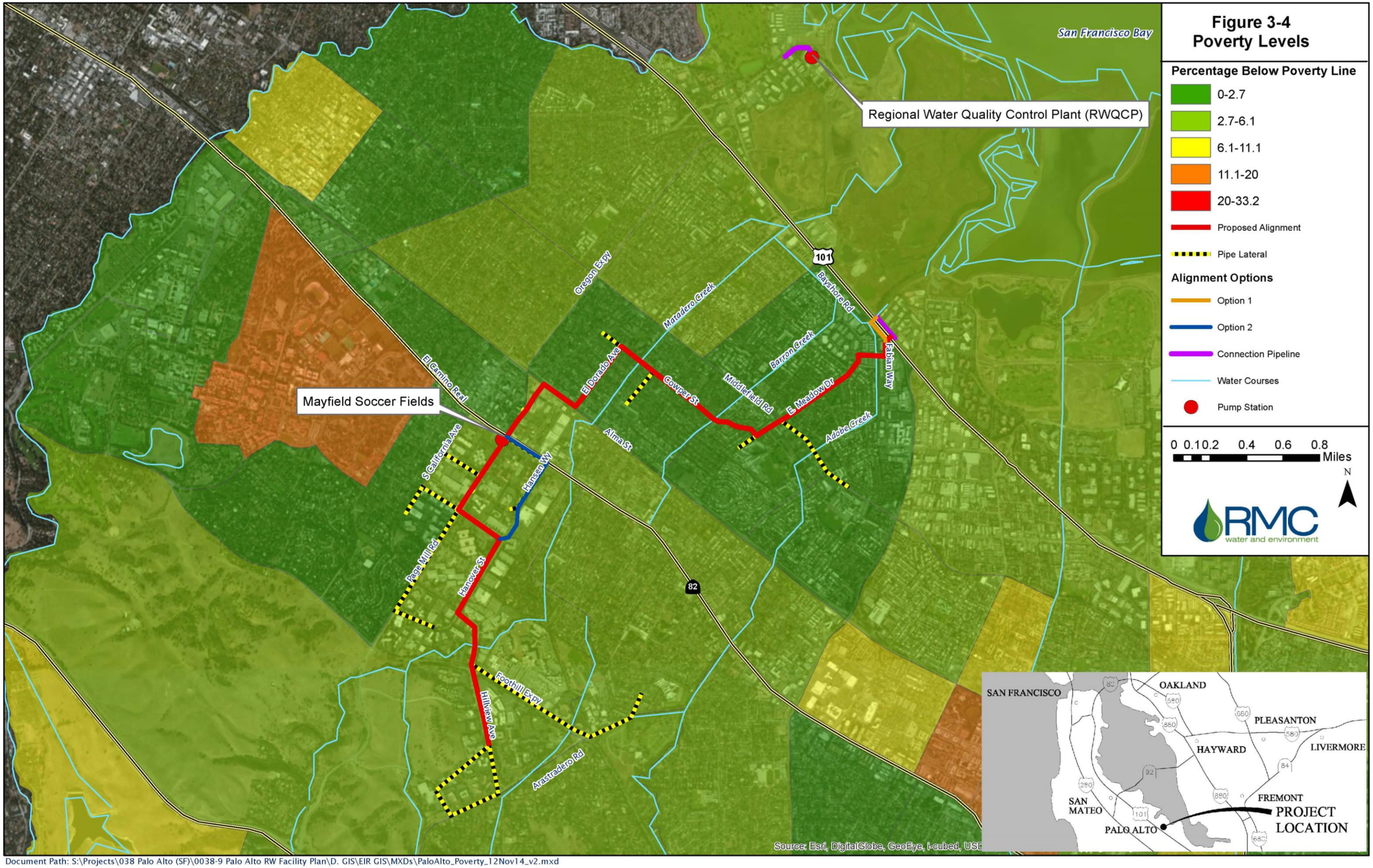

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Figure 3-5
Disadvantaged Communities

Regional Water Quality Control Plant (RWQCP)

Mayfield Soccer Fields

San Francisco Bay

Disadvantaged Community

Proposed Alignment

Pipe Lateral

Alignment Options

Option 1

Option 2

Connection Pipeline

Water Courses

Pump Station

0 0.10.2 0.4 0.6 0.8 Miles

N

RMC water and environment

SAN FRANCISCO
OAKLAND
PLEASANTON
HAYWARD
LIVERMORE
SAN MATEO
FREMONT
PALO ALTO
PROJECT LOCATION

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USD

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3.3.3 Impacts and Mitigation Measures

Threshold of Significance

To determine if a Project could disproportionately affect a high-minority or low-income population, it must also be determined how the Project would affect other segments of the population. For example, if there are more high-income populations affected by a project than low-income populations, then the potential for disproportionate impacts to the low-income population, and thus the potential for environmental justice impacts, is low. If the proportion of low-income and high-minority populations impacted by a project is greater than either the middle or high-income populations or the middle- or low-minority populations, then there is more potential for an environmental justice impact.

Environmental justice impacts and effects associated with the proposed Project were analyzed in accordance with NEPA Guidelines. For the purposes of this analysis, an impact related to environmental justice would be significant if the Project would:

- Cause impacts to minority or low-income populations that are disproportionately high and adverse, either directly, indirectly, or cumulatively.

Impacts Analysis

As described in Chapter 2, Project Description, the proposed Project Action would install pipelines and two pump stations in Palo Alto. The placement of the proposed pipelines is strategic, intentionally located to provide recycled water to existing landscape irrigation customers, including schools, parks, and businesses.

Mapping of demographic and economic data shows that the proposed pipeline alignment and its laterals would not be constructed within a community defined as containing greater than 50 percent low income populations. The pipeline and laterals would run along roadway ROWs within communities that are generally above the poverty line (where only 0 to 6.1 percent of the population would be below the poverty line).

The proposed pipeline would be constructed in areas with a primarily white population, as shown in **Figure 3-3**, although in one small portion of the pipeline alignment along Page Mill Road, minorities comprise 50 to 75 percent of the population. Because this area also coincides with an area where 0 to 2.7 percent of the population is defined as low-income and is not considered a DAC, the population in this area is not considered disadvantaged when paired with other economic characteristics.

As there are no low-income populations in the area and the minority population is not considered disadvantaged, the proposed Project would not cause any impacts to minority or low-income populations. The Project would not disproportionately affect any minority or low-income populations and no environmental justice impacts would occur

Mitigation Measures

No mitigation is required

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Chapter 4 Other CEQA/NEPA Considerations

4.1 Introduction

CEQA contains statutory requirements that require the City of Palo Alto to consider the growth-inducing impacts of a project (CEQA Guidelines 15126.2(d)); the cumulative impacts of the Palo Alto Recycled Water Project (CEQA Guidelines 15130); the significant irreversible environmental changes resulting from the Project (CEQA Guidelines 15126.2(c)); and significant environmental effects which cannot be avoided if the Project is implemented (CEQA Guidelines 15126.2(b)).

4.2 Growth-Inducing Impacts

4.2.1 Approach to Growth-Inducing Analysis

CEQA Guidelines require that an EIR evaluate the growth-inducing impact of a proposed action. Section 15126.2(d) defines growth-inducing impacts as follows:

> [T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects….It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Based on the CEQA definition above, assessing the growth-inducing potential of the proposed Project involves answering the question: will construction and/or operation of planned facility improvements proposed as part of the Project directly or indirectly support more economic or population growth or residential construction. Implementation of the proposed Project provide recycled water for non-potable uses (e.g., irrigation of landscapes), thus conserving existing water supplies for potable uses (e.g., to meet future, approved growth).

4.2.2 Growth-Inducing Analysis

As described in *Chapter 2, Project Description*, the proposed Project would provide recycled water to customers for use in irrigation of landscapes, which would offset the use of potable water supplies.

The environmental effects of a proposed project's induced growth are considered secondary or indirect impacts of the Project. Growth can result in significant increased demand on community and public service infrastructure, increased traffic, noise, degradation of air and water quality, and conversion of agricultural land to urban uses.

Projects are considered to have growth-inducing implications when economic, housing, or population growth would be stimulated, either directly or indirectly. Local land use plans (e.g., general plans and specific plans) provide for development patterns and growth policies that allow for the planned and orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service, and solid waste service. A project that would induce growth could indirectly cause adverse environmental impacts not previously envisioned. Thus, to assess whether a project has the potential to induce growth and result in adverse secondary effects beyond what is anticipated by local jurisdictions, it is important to assess the degree to which the growth associated with a project would or would not be consistent with applicable land use plans.

Construction of the proposed Project would not directly induce population growth, as no new residential or commercial development project would be constructed. However, the Phase I Project could indirectly induce growth by removing or reducing the barriers to growth through the provision of non-potable water supplies to existing potable water users in the City. By delivering recycled water to potential users within the City's service area, the City's existing potable water supplies could be stretched further, thereby indirectly accommodating more development within the City. However, water supply is not currently limiting growth within the City, so freeing up potable supplies is not expected to result in additional development proposals that would not otherwise have occurred.

The proposed Project would provide approximately 900 AFY of non-potable water demands. Growth inducement may result in adverse impacts if the growth is not consistent with the land use and growth management policies for the affected area (i.e., City of Palo Alto). However, the proposed Project would provide recycled water for landscape irrigation to existing water users; therefore, it would not increase the capacity of or otherwise expand the potable water distribution system in direct support of new population or economic expansion. Given that the City's projected future water supply in 2030 is 15,949 AFY; the proposed Project would contribute only 5 percent of the City's total future supply (City of Palo Alto, 2011)..

Through the CEQA and development approval process, the City of Palo Alto and other local agencies with discretionary land use authority impose mitigation requirements on development projects to address the secondary effects of growth and identify measures to be implemented by other agencies, such as RWQCB and Caltrans, among others. The City of Palo Alto will impose, on a project-by-project basis, appropriate mitigation measures to manage such growth. In addition, mitigation of the secondary effects of growth is also within the authority and jurisdiction of other public agencies and the City will look to those agencies to implement such measures as appropriate and consistent with their authorities. In this context, given that the availability of potable water afforded by the proposed Project would not in and of itself spur growth because potable water supplies are not currently limiting within the City, the proposed Project would not be expected to accommodate additional growth. As such, potential indirect growth-inducing effects facilitated by the proposed Project would be less than significant and no mitigation is required.

4.3 Cumulative Effects

4.3.1 CEQA Analysis Requirements

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

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not be as detailed as it is for the effects attributable to the project alone.

- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is described in each subsection that follows.

4.3.2 Approach to Cumulative Analysis

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

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

Similar Environmental Impacts

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

Geographic Scope and Location

The geographic scope of cumulative projects is dependent on the resource area affected and is specifically described under each topical section below. In general, the geographic scope includes the areas within and adjacent to the Project site. However, for some resource topics, the geographic scope can extend farther such as the regional air basin.

Timing and Duration of Implementation

Construction of the proposed project would begin in 2018 and be completed within a year. Cumulative effects could occur if the construction of other projects overlapped with the construction of the proposed Project.

4.3.3 List of Relevant Projects

Table 4-1 lists the past, present, and reasonably foreseeable projects and activities within 0.25 miles of the proposed Project area and provides a brief description of the projects and their status. The table also identifies the areas of potential cumulative effects associated with each of the cumulative projects. This table, compiled based on information published on the City's Planning & Community Environment website, focuses on commercial and industrial projects due to their scale. While there are other single-family residential projects (e.g., renovations), or other small projects (modification of signs, sidewalk/landscape improvement projects, facade changes to buildings, removal of trees, bridge to connect two buildings, installation of antennas, and single-residence renovations/construction) within 0.25 mile of the proposed Project alignments throughout the City, they are not included in the project due to their numbers and relatively small scale. However, it is possible they would contribute cumulative impacts, albeit on a localized level.

The cumulative projects listed in **Table 4-1** below include mixed used development and construction of new offices. Based on the type and scale of these development projects, it is expected that they would be similar to the proposed Project in terms of construction related effects, including generation of construction traffic, criteria air pollutant emissions, noise, and hazards. Cumulative projects would also result in permanent changes in the visual quality of the site and surrounding area. In addition, cumulative projects could affect sensitive biological and cultural resources located in and around the Project area.

4.3.4 Cumulative Impacts Analysis

Aesthetics

The geographic scope of potential aesthetic impacts encompasses the Project site and immediate vicinity. Cumulative projects would consist of demolition, new construction, or expansion of large structures that would change the visual quality of the surrounding area, including the Stanford Research Park and the vicinity of the Mayfield Soccer Fields where the proposed pump station would be located[1]. While all of these cumulative projects would include installation of new structures, they would be subject to the requirements of the City's architectural review to ensure consistency with zoning regulations and in consideration of the overall visual quality of the site and their surroundings. Despite the requirements, due to the number of and scale of the cumulative projects, particularly in and around the Stanford Research Park area, combined aesthetic impacts of other projects are considered potentially significant.

The majority of proposed Project facilities are pipelines that would be buried and therefore would not be visible after the completion of construction. Above-ground facilities (e.g., concrete pad, transformer, bollards, and antenna) are the only elements of the proposed Project that have potential long-term cumulative, visual impacts within the Project area. Above-ground facilities include the pump station at the RWQCP and associated facilities at the Mayfield Soccer Field. Impacts of the proposed Project would be less than significant with the standard project requirements identified in *Chapter 2, Project Description* and mitigation measure identified in *Section 3.2, Aesthetics* in *Chapter 3, Environmental Setting, Impacts and Mitigation Measures* and the implementation of all requirements specified during the City's architectural review process. Because of the standard project requirements and proposed

[1] Because cumulative projects would not have aesthetic impacts associated with effects of irrigation on landscapes, this issue is not discussed under this section.

Table 4-1: Cumulative Commercial and Industrial Projects within 0.25 Miles of the Project Components

No.	Project Name	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
1	3445 Alma Street	Alma Plaza Shopping Center (to be renamed Alma Village), which includes 20,000 square foot (sf) grocery store, 6,000 sf commercial space, and 14 below-market rate (BMR) units above the grocery store. Also includes 37 single family homes..	Located along proposed backbone alignment. *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Completed in 2013
2	1451 – 1601 California Avenue	180 unit housing development on ~17 acres in an area zoned RP(AS2) zoning district.	Located along proposed lateral alignment. *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction began in Nov. 2014, anticipated to end by the end of 2017
3	600 East Meadow Drive	Construction of the Magical Bridge playground area and replacement of the bridge over Adobe Creek, located at the southern end of Mitchell Park	Located along proposed backbone alignment. *Construction period traffic, air and noise; potential impacts to biological resources.*	Playground currently under construction
4	2755 El Camino Real (VTA site)	Demolition of the existing VTA parking lot and construction of a four story commercial building with three levels of below grade parking	Located ~0.15 mile from proposed backbone alignment. *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment, potential impacts to biological and cultural resources.*	Currently planning. Construction timing unknown
5	2515 - 2595 El Camino Real	New 3-story mixed use building	Located ~0.15 mile from proposed backbone alignment. *Construction period traffic, air, noise; hazards, and water quality; Long-term change in visual environment; potential impacts to biological and cultural resources.*	Currently planning. Construction timing unknown
6	2755 El Camino Real (VTA Siste)	Demolition of the existing VTA parking lot and construction of a four story commercial building with three levels of below grade parking	Located along proposed backbone alignment. *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	2016
7	3159 El Camino Real	Four parcels: Construction of a new four-story, 55 foot tall, mixed use building totaling 74,122 sf of floor area.	Located along proposed Option 2 alignment. *Construction period traffic, air, noise; hazards, and water quality; Long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction likely to begin in early 2015

No.	Project Name	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
8	1875 Embarcadero Road	Reconfiguration of the Palo Alto Municipal Golf Course and expansion of the Baylands Athletic Center	Located across from RWQCP *Construction period traffic, air, noise; hazards, and water quality; Long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction of the golf course anticipated in 2016. The athletic center has not been funded
9	911 Hansen Way	4,734 sf one-story addition to an existing 143,142 sf manufacturing building for Varian on a 13.7 acre lot. Demolition of ~1,920 sf of floor area within the RP zoning district.	Located along proposed Option 2 alignment. *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction completed
10	3421-3431 Hillview (VMware Phase 4)	Phase 4 of the VMware Campus project including demolition and reconstruction of 85,000 sf of office space, modifications to the previously approved CSG building including addition of a 10,000 sf fitness center, and reconstruction of the entrance drop off area in the RP-5 zoning district	Located along proposed backbone alignment. *Construction period traffic, air, noise; hazards, and water quality; Long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction anticipated in 2015
11	195 Page Mill Road (Park Plaza)	82 residential rental units in 104,174 sf on the 2nd and 3rd floors of a new 3-story mixed use building (Park Plaza) with 47,917 sf of ground floor commercial use (primarily for research and development) but inclusive of 2,40 sf of ground floor retail use in a three story building	Located along proposed backbone alignment *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Waiting for building permit. Construction not known.
12	441 Page Mill Road	3 story mixed use building	Located along proposed backbone and Option 2 alignments *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction likely to begin in mid-2015
13	1050 Page Mill Road	Demolition of existing structures and construction of approximately 287,000 sf of research and development (R&D)/office in four buildings in the RP zoning district	Located along proposed backbone alignment *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction expected summer/fall 2015
14	1400 Page Mill Road	Demolition of the existing two commercial buildings and rebuilding of one two-story building containing the same amount of floor space (86,925 sf)	Located along proposed Project alignments *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Currently under construction

No.	Project Name	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
15	1701 Page Mill Road	Demolition of 67,000 sf of existing commercial development floor area and construction of 116,000 sf of new floor area for a two story R&D building on a 8.5 acre site.	Located along proposed Project alignments *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction nearly complete; ready for occupancy
16	2555 Park Blvd	Construction of a new three story 24,466 square foot office building in the Community Commercial zone district	Located within 0.15 mile of the proposed Project alignments *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction likely to begin mid to late 2015
17	2747 and 2785 Park Blvd	Demolition of existing one story structures and construction of a new three (3) story office building.	Located along proposed backbone alignment *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Anticipate construction in 2016
18	3045 Park Blvd	Demolition of an existing auto dealership/repair shop and construction of a new two (2) story office building	Located within 0.12 mile of the proposed Project alignments *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Anticipate construction in 2016
19	385 Sherman Ave.	One new 3-story mixed use building	Located ~0.15 mile of proposed backbone alignments *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment; potential impacts to biological and cultural resources.*	Construction like to begin early to mid 2015
20	Mitchell Park Library & Community Center	A new two-story library and a single story community center	Located adjacent to proposed Project alignments *Construction period traffic, air, noise; hazards, and water quality.*	Construction completed.
22	Other Utilities and Infrastructural Projects	Other projects that occur annually include replacement / rehabilitation of the City's water and wastewater distribution systems, and replacement of gas mains throughout the City.	Located adjacent to or in the vicinity of proposed backbone and lateral alignments *Construction period traffic, air, noise; hazards, and water quality; potential impacts to biological and cultural resources.*	Varies and could overlap with proposed project.
23	2500 EL Camino Real	Request by Stanford Real Estate for Architectural Review of a proposed four-story mixed use project with 70 residential units (one, two and three bedroom units) of below market rate rental housing and approximately 7,300 square feet of commercial space	Located ~0.15 mile from proposed backbone alignment. *Construction period traffic, air, noise; hazards, and water quality; long-term change in visual environment. potential impacts to biological and cultural resources.*	Building permits have been issued, Construction timing unknown.

Source: City of Palo Alto Commercial and Mixed Used Projects

mitigation measure and the small scale of above-ground facilities at Mayfield Soccer Fields, the proposed Project's contribution to significant cumulative impacts would be less-than-cumulatively considerable.

Agricultural and Forest Resources

Because the proposed Project would have no impact on agricultural and forest resources, there is no potential for the project to contribute to a cumulatively significant impact.

Air Quality

Potential impacts related to air quality are evaluated on a regional (air basin) basis. The BAAQMD has stringent numeric thresholds for criteria air pollutants. Exceedances of these thresholds would constitute a substantial contribution to a cumulative air quality impact. All projects that involve construction have the potential to exceed these thresholds, depending on the amount of excavation generated, the number of truck trips required, the type of equipment used, and the duration of activities. Cumulative projects in combination may result in a cumulative air quality impact by exceeding BAAQMD thresholds for criteria air pollutants. As discussed in *Section E.2, Air Quality* in **Appendix E**, construction and operations have the potential to exceed BAAQMD thresholds. However, with implementation of standard project requirements proposed as part of the Project and **Mitigation Measure AIR-1**, the proposed Project's contribution to cumulative air quality impacts would be less-than-cumulatively considerable.

Biological Resources

The geographic scope of potential cumulative impacts on biological resources encompasses the Project area and immediate vicinity. Many of the development projects would be located on developed parcels away from major water features. Depending on their location, cumulative projects could contribute to impacts on biological resources (e.g., impacts on protected trees through trimming or removal, or effects on nesting birds during the nesting season) and as such the potential for cumulative impacts when these projects are considered in combination is considered significant. As discussed in *Section E.3, Biological Resources* in **Appendix E**, the Project has the potential to affect resources in the Project area, including special-status wildlife. However, with implementation of standard Project requirements proposed as part of the Project and **Mitigation Measures BIO-1** through **BIO-10**, impacts of the proposed Project would be reduced to less than significant, and thus the Project's contribution to this potential cumulative impact would not be cumulatively considerable. Portions of the proposed Project would be located within the project plan area covered by the Stanford Habitat Conservation Plan (HCP). The mitigation measures would be consistent with the Stanford HCP and thus would not contribute to any cumulatively considerable impacts.

Cultural Resources

The geographic scope of potential cumulative impacts on cultural and paleontological resources encompasses the Project area and immediate vicinity. All cumulative projects involving excavation in the Project area has the potential to impact cultural resources, and as such this is considered a cumulative impact. As discussed in *Section E.4, Cultural Resources* in **Appendix E**, there is potential for the project to affect resources in the Project area. However, with implementation of the standard Project requirements proposed as part of the Project (procedures to protect cultural resources in case they're encountered) and **Mitigation Measure CR-1** (subsurface testing and appropriate actions), potential project impacts would be reduced to less than significant. As such, the proposed Project's contribution to potential cumulative impact would not be cumulatively considerable.

Geology, Soils, and Seismicity

The geographic scope of potential cumulative impacts related to geology, seismicity, and soils encompasses the project study area and immediate vicinity. Geologic and soils impacts are generally site-

specific and depend on local geologic and soil conditions. Although facilities would be located within a recognized seismic hazard zone and subject to strong seismic ground shaking and liquefaction, all development projects are required to conduct geotechnical evaluation and comply with stringent building requirements. For this reason, cumulative geology, soils, and seismicity effects are considered less than significant. Thus, no further discussion is required.

Greenhouse Gas Emissions (GHGs)

GHG emissions and their contribution to climate change is a global issue. The scope of this analysis includes lifecycle and global contributions to GHG emissions. Because GHG emissions affect global climate change, evaluation of cumulative impacts is not based on adding emissions of all reasonably foreseeable projects (which would not be feasible on a global basis). The BAAQMD CEQA Guidelines approach for cumulative GHG analysis establishes an individual project threshold (for operations) that addresses whether a project would result in cumulatively considerable emissions. If a project's GHG emissions exceed the threshold, the project is considered to result in a cumulatively considerable contribution of GHG emissions and have a cumulatively significant impact on global climate change. While cumulative projects may result in a cumulative impact related to GHG emissions, as noted in *Section E.6, Greenhouse Gas Emissions* in **Appendix E**, the proposed Project would not exceed the BAAQMD threshold during operation. Thus, the proposed Project would not result in a cumulatively significant contribution to potential cumulative GHG emissions resulting from the implementation of cumulative projects.

Hazards and Hazardous Materials

The geographic scope of potential cumulative impacts associated with hazards and hazardous materials encompasses the footprint of proposed Project facilities and immediate vicinity. With respect to the use of hazardous materials and hazardous materials in the environment, effects are generally limited to site-specific conditions. For cumulative effects on emergency response plans, the effects can extend to regional roadways that could be affected by construction-related traffic. All cumulative projects have the potential to contribute to hazards associated with use of hazardous materials during construction, and potential for disruption of contaminated sites during construction. However, the project's contribution to this impact would be less-than-cumulatively considerable with implementation of the standard Project requirements proposed as part of the Project associated with the storage, handling and use of hazardous materials, proper disposal of contaminated soil and groundwater, and the implementation of a health and safety and hazardous materials management and spill prevention control plan. In addition, the Project's contribution to the impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan would be reduced to less than cumulatively significant with the implementation of the traffic control plan that is proposed as part of the Project's standard project requirements. Thus, the proposed Project would not result in a cumulatively considerable contribution to cumulative effects associated with hazards and hazardous materials.

Hydrology and Water Quality

The geographic scope of potential cumulative hydrology and water quality impacts is the watershed covered by the Project area, including the creeks and flood control channels. Construction of cumulative projects could result in runoff that affects local water quality. The proposed Project includes an standard project requirements to implement best management practices to reduce water quality degradation. In addition, the proposed Project includes a standard project requirement to address the potential for frac-out and protect water quality. With implementation the standard project requirements, the proposed Project would not result in a cumulatively considerable contribution to cumulative effects.

Land Use and Planning

The geographic scope of potential cumulative land use impacts consists of the Project area. Implementation of the proposed Project, in conjunction with cumulative projects would not create long-term cumulative land use conflicts. The proposed Project facilities would either be buried underground or would be constructed in areas that would not conflict with existing uses.

Minerals Resources

Because the proposed Project would have no impact on mineral resources there is no potential for the project to contribute to a cumulatively significant impact.

Noise

For noise and vibration, the geographic scope of potential cumulative impacts is limited to the immediate project vicinity as well as areas adjacent to any routes designated for access and hauling. All cumulative development projects could contribute to cumulative impacts associated with short-term construction noise. The extent of the impact would depend on both the proximity of the cumulative projects to the elements of the proposed Project, and the possibility that the construction period would overlap. Given the uncertainty regarding construction schedules it is assumed that there is a potential for overlap in construction periods that could result in a significant short-term exposure of sensitive receptors to elevated noise and vibration levels during construction. The project's contribution to this short-term impact has the potential to be cumulatively considerable. However, construction noise would be minimized through implementation of the standard project requirements proposed as part of the project (compliance with the noise ordinance) and **Mitigation Measures NOI-1** and **NOI-2**. Operational noise impacts of the cumulative projects would generally be limited to ongoing noise from traffic and the new land use. The project's contribution to cumulative operational noise impacts would be reduced to less than significant with implementation of **Mitigation Measure NOI-3**. Thus, implementation of the standard project requirements and mitigation measures would reduce the proposed Project's contribution to cumulative impacts to less than cumulatively considerable.

Public Services

The geographic scope of potential cumulative impacts to public services is within the City of Palo Alto. As discussed in *Section E.12, Public Services* in **Appendix E**, the proposed Project would not require new or expanded fire protection, police, school or other public facilities. This impact would thus not be cumulatively considerable.

Recreation

The geographic scope of potential cumulative impacts to recreation is within the Project area. The cumulative projects would be located within specific parcels and thus would not result in impacts to specific recreational facilities. As such, no further discussion is needed.

Transportation and Traffic

The geographic scope of potential cumulative impacts related to transportation is the roadway network in the Project area, including U.S. 101 and East Meadow Drive, Cowper Street, El Dorado Avenue, Alma Street, Page Mill Road, Oregon Expressway, Hansen Way, Hanover Street, Hillview Avenue, amongst others. All of the cumulative projects could contribute traffic to these roadways during construction, and many would increase traffic once constructed, potentially resulting in unacceptable traffic delays at nearby intersections or increases in traffic on the regional freeway system. The proposed Project would have limited operational traffic impacts; the major impact would be the short-term disruption of traffic during construction of pipelines, which would require closures of traffic lanes. This temporary impact would be reduced to less-than-significant with implementation of the standard project requirements

proposed as part of the Project. This requirement would require that the City implement a traffic control plan, which would include identifying all roadway locations where special construction techniques would be used to minimize traffic impacts, developing circulation and detour plans, and would require implementation of a construction staging and traffic management plan. The contribution of the proposed Project to cumulative impacts is not expected to be cumulatively considerable.

Utilities and Service Systems

The geographic scope of potential cumulative impacts would be confined to the immediate vicinity of the proposed Project, where non-potable water would be used, utilities could be disrupted, and stormwater would be conveyed to existing storm drainage facilities. The proposed Project would be designed to meet all water quality requirements for use of recycled water, and would thus not contribute to a cumulatively significant impact regarding wastewater treatment requirements. In addition, the proposed Project would not exceed capacity of existing stormwater systems, and thus would not contribute to a cumulatively significant impact.

4.4 Alternatives Evaluation

4.4.1 Alternatives Evaluation

Methodology

The CEQA Guidelines Section 15126.6 requires EIRs to evaluate a range of reasonable alternatives to a project, or to the location of a project that would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The following criteria for selecting alternatives are set forth in the Guidelines:

- An EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The range of alternatives addressed in an EIR should be governed by a rule of reason. Not every conceivable alternative must be addressed, nor do infeasible alternatives need to be considered (CEQA Guidelines Section 15126.6(a)). When addressing feasibility, factors that may be taken into account may include site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, jurisdictional boundaries, and the proponent's ability to reasonably acquire, control, or otherwise have access to an alternative site (CEQA Guidelines Section 15126.6(f)(1)).
- Evaluation is to focus on those alternatives capable of either avoiding or substantially lessening any significant environmental effects of the project, even if the alternative would be more costly or would impede, to some degree, the attainment of the project objectives (which are identified in *Chapter 2, Project Description*).
- The EIR should identify alternatives that were considered by the lead agency but were rejected as infeasible and the reasons for the lead agency's determination (Section 15126.6(c))
- A "No Project" alternative must be evaluated and the EIR must also identify an environmentally superior alternative (Section 15126.6(e))

The discussion should not consider those alternatives whose implementation is remote or speculative, and the analysis need not be presented in the same level of detail as the assessment of the proposed project. Alternatives may take the form of no project, reduced project size, different project design, or suitable alternative project sites.

Based on the CEQA Guidelines, several factors should be considered in determining the range of alternatives to be analyzed in an EIR and the level of analytical detail that should be provided for each alternative. These factors include:

- The potential for the proposed project to result in significant impacts;
- The ability of alternatives to reduce or avoid the significant impacts associated with the proposed project;
- The ability of the alternatives to meet the objectives of the proposed project; and
- The feasibility of the alternatives.

The analysis in this EIR indicates the proposed Project would not result in any potentially significant and unavoidable impacts and thus none of the alternatives examined herein would avoid a significant impact associated with the proposed Project.

Recycled Water Planning Study Alternatives Development

The 2009 City of Palo Alto Recycled Water Facility Plan conducted an alternatives assessment to identify the proposed Project described in *Chapter 2, Project Description*. The purpose of the alternative analysis was to identify a backbone alignment that is cost-effective, serves the largest potential recycled water demand, and that has minimal utility, traffic, and constructability issues. Alternative alignments were considered with the aim of serving the largest concentration of users. Laterals to users located off the backbone alignment were added after the backbone alignment was identified.

Description of Alternatives to the Proposed Project

No Project Alternative

In accordance with CEQA Guidelines 15126.6, this EIR evaluates the No Project Alternative. The "project alternative" represents the projections of current conditions into the foreseeable future if the proposed Project were not approved, based on current plans and consistent with available infrastructure and community services, and provides an appropriate basis by which other alternatives are compared.

For the purposes of this project, the No Project Alternative would not implement any of the components described under the proposed Project in *Chapter 2, Project Description*. The City would continue to supply imported water from SFPUC to its customers for landscape irrigation, and treated wastewater would continue to be discharged into San Francisco Bay. The source of SFPUC's water supply is surface waters from the Tuolumne and Alameda watersheds. The No Project Alternative would not meet any of the objectives of the Project. That is, the proposed Project would not improve potable water supply reliability by conserving drinking water for potable purposes, would not provide a dependable, locally controlled non-potable water source, would not secure a non-potable water source that will be available even in droughts to serve irrigation and other non-potable uses, and would not reduce reliance on imported water. Under the No Project Alternative, shortages in potable water could require mandatory rationing, which would reduce the supply of water available for outdoor irrigation uses.

No Funding from U.S. Bureau of Reclamation (USBR) Alternative

Although not required, it is USBR's practice to include a "no action alternative" to provide an appropriate basis by which other alternatives are compared. For the purposes of this project, because USBR is providing funding for the project, this alternative would consist of USBR not funding the proposed Project. Without funding by USBR, it is expected that the City would still move forward with the proposed Project as described above, through other budgetary arrangements. As such, the No Funding from USBR Alternative would still meet all of the objectives of the proposed Project, in that it would maximize the use of local water supplies, reduce reliance on imported water from SFPUC, improve water supply reliability, and secure a non-potable water source that will be available in droughts.

The effects of the No Funding from USBR Alternative would be exactly the same as the proposed Project, and thus no further evaluation is necessary in this document. It should be noted that if the City obtains state funding through the State Revolving Fund Program, then SWRCB, instead of Reclamation, would be responsible for initiating consultation with SHPO for compliance with NHPA Section 106 to meet CEQA-Plus requirements.

No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative

This alternative is similar to the No Project Alternative in that the Recycled Water Project as proposed would not be built. In addition, in anticipation of the need to conserve the highest quality potable water supply over the long term (*i.e.*, because of anticipated future droughts or reduced supply from SFPUC), the City would enact an ordinance that would prohibit the use of high quality potable water for outdoor use (including landscape irrigation) by commercial and industrial uses (residential users would be exempt from the ordinance as they make up a smaller proportion of outdoor demand). The ordinance may also restrict the use of potable water for other non-potable uses (e.g., toilet flushing). The ordinance would affect not only the 900 AFY of demand that the proposed Project would have otherwise served, but would also affect all other commercial and industrial properties within the City where existing potable water is currently used for irrigation and other non-potable purposes.

The City would not be responsible for providing supplemental irrigation water to any customer except its own properties. As groundwater is designated for emergency use by the City, the City would have to truck in potable water for irrigation of its own properties. Individual landowners, and not the City, would be responsible for securing their own outdoor water supply.

To ensure a more complete analysis of this alternative in this EIR, the City considered what individual landowners may do to acquire an alternate water supply to meet water demand. The City considered whether individual landowners trucking in potable water for outdoor irrigation would be a viable option. The cost to purchase water to meet all of the City's commercial and industrial outdoor demand would be substantial, and would require a large number of truck trips. The actual number of truck trips generated would depend on the number of landowners who decide to purchase water from an outside vendor, rather than converting their landscape into a drought-tolerant landscape or hardscape to avoid completely the need to water. Truck trips would increase traffic on highways and local roadways causing congestion, and increase air pollutant and GHG emissions. For the reasons described above, this potential option was deemed to be infeasible. In addition, the environmental impacts of trucking water were determined to be substantially greater than the impacts of the proposed project, so this option would not achieve the goal of reducing impacts. The option of trucking water for nonpotable uses was thus eliminated from further consideration.

Other water supply options for individual landowners who cannot use the City's potable water supply could include the following:

- Option 1: Groundwater;
- Option 2: Recycled water from a satellite treatment plant (to meet Stanford Research Park demands); and
- Option 3: a combination of options 1 and 2.

Under the first option, individual landowners would use groundwater as a supplemental supply. SCVWD manages the groundwater basin underlying the City of Palo Alto, and approval would be required for development of any new groundwater wells[2]. For purposes of environmental analysis, it is assumed that

[2] SCVWD has in place well permitting requirements. Digging, boring, drilling, deepening, modifying, repairing or destroying a groundwater well that intersects the groundwater aquifers of the Santa Clara County is prohibited without a permit from SCVWD.

SCVWD would not grant permits for well development if additional wells would result in adverse impacts on the groundwater basin. If SCVWD were to grant permission for individual landowners to construct new wells, individual landowners would also have to construct supporting infrastructure, including pipelines and pump stations. The development of such infrastructure could be cost prohibitive, particularly for smaller landowners with relatively small demands. The exact locations of these wells and supporting infrastructure would depend on which landowners pursue this option and whether SCVWD would grant permission to drill new wells.

The second option would involve the use of recycled water treated at a satellite plant to meet customer needs of Stanford Research Park. Professors at Stanford University have developed a new treatment system which is currently being studied at the Codiga Resource Recovery Center (CR2C Facility) at Stanford University[3]. Wastewater would be treated at this decentralized, satellite treatment plant using a new treatment technology that relies on the activity of naturally occurring, beneficial microbes[4] (Stanford News, 2014). The system would treat flows generated at Stanford and the product recycled water would then be routed to the Stanford Research Park area through new pipelines. Solids would be conveyed to the RWQCP for treatment and disposal using existing infrastructure. The satellite system could treat up to 3 mgd, which is the current amount of wastewater produced by Stanford University. The treated flow would be conveyed from the CR2C Facility to the service area through newly defined pipelines to potential customers. The CR2C Facility is located on Bonair Siding Road, near Palo Alto Fire Station No. 6. A new pump station would be located at the site. The precise pipeline alignments from the satellite plant would need to be determined if this alternative were to be developed further, but would pass through campus and City streets (e.g., Bonair Siding Road, Campus Drive, Serra Street, El Camino Real). The remaining pipelines to potential customers at Stanford Research Park could be similar to the pipelines defined for the proposed Project in and around Stanford Research Park. No concentrated brine would be produced as part of this process. It is highly uncertain when a satellite treatment plant could be fully implemented.

While this alternative would improve potable water reliability by conserving drinking water and reducing reliance on imported water through the adoption of the ordinance prohibiting use of potable water for outdoor irrigation, it would not achieve the primary objective of maximizing recycled water as a supplemental water source (while the second and third options would use recycled water, they would not necessarily maximize its use given the limited geographic reach of the satellite system). Treated wastewater, not recycled, would continue to be discharged into San Francisco Bay.

Comparison of Alternatives

The alternatives determined to be reasonable and feasible must also be analyzed to determine if their significant impacts can be substantially reduced or avoided. This section provides an analysis of the environmental impacts of the alternatives to the proposed Project, as well as the impacts that would result from implementation of the No Project Alternative. **Table 4-2** compares the environmental effects of the alternatives to the proposed Project.

[3] The CR2C is a collaborative effort among university water-resource specialists and faculty researchers from the Department of Civil and Environmental Engineering, the Stanford Woods Institute for the Environment and the Stanford-led Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt). The study will include pilot testing of promising technologies for the recovery of resources (clean water, nutrients, energy, chemical feedstocks) from wastes. The facility will have 4 bays each capable of providing up to 30 liters per minute from any of 4 water sources (raw sewage, microscreened sewage, secondary effluent and non potable lake water) (see http://web.stanford.edu/group/cr2c/).

[4] The technology is called a staged anaerobic fluidized membrane bioreactor (SAF-MBR). Dr. Perry McCarty (Stanford University) and colleagues at Inha University in South Korea developed this technology that efficiently recovers clean water and energy from wastewater (Stanford University, 2014).

Table 4-2 reflects the level of significance after implementation of standard project requirements and/or mitigation. As shown, all potentially significant impacts of the proposed Project can be reduced to less than significant with standard project requirements and/or mitigation measures.

The No Project Alternative must be analyzed pursuant to Section 15126.6(e) of the CEQA Guidelines to allow decision makers to compare the impacts of approving the proposed Project with the impacts of not approving the proposed Project. As shown in **Table 4-2**, the No Project Alternative would not result in any of the construction-related impacts identified for the proposed Project, but could result in potentially significant, unavoidable impacts. **Table 4-2** also shows that the No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative has potentially significant, unavoidable impacts.

No Project Alternative

Although none of the potential construction-related impacts identified in this EIR would occur because there would be no changes to the environment, the benefits of expanding the recycled water system would also not be realized. Availability of imported water from SFPUC could diminish over time because of droughts, climate change effects, or regulatory actions, which could reduce potable supply for the City in the long term. In the short-term, emergencies such as an earthquake damaging the SFPUC water system could also affect the availability of water supplies for the City. The effects of a diminished supply would be more severe rationing during droughts, and an inability to accommodate future demands associated with approved growth. As indicated in the City's 2010 UWMP, "no decision has been made regarding whether or not to use groundwater as a supplemental supply in droughts, though the City is proceeding with the Emergency Water Supply and Storage project which will provide the City the flexibility to rely on groundwater during a drought if necessary" (City of Palo Alto, 2010). While the City's existing wells and storage could provide emergency supply from the groundwater basin, it would not be able to meet long-term demands without managed supplemental recharge of the basin. As such, severe cutbacks would be anticipated that would affect all customers, particularly landscape customers, as the health and visual quality of landscape areas degrade due to the lack of water. If the City were to choose to use groundwater as a supplemental supply in the drought, then the increased use of the groundwater basin to meet existing and future demands could reduce groundwater supplies and potentially lead to overdraft of the groundwater basin (if use exceeded recharge). In addition to reduction in overall supply, the increased use of groundwater could stress this resource and result in other unplanned, secondary environmental effects such as subsidence and water quality reduction. However, for purposes of environmental analysis, it is assumed that SCVWD would not grant permits for well development if additional wells would result in adverse impacts on the groundwater basin.

Droughts are inevitable in California; the only uncertainty is their frequency, length and severity, which could require limiting potable water for uses that do not require high quality drinking water such as landscape irrigation, toilet flushing, cooling towers, process uses and other uses for non-potable water. If the drought continues and other factors coalesce (e.g., the reliability of SFPUC water reduces), then it is possible that the City will opt to implement mandatory conservation measures for potable water so as to preserve high-quality drinking water for potable purposes in the future. If the City makes this decision, then the No Project Alternative may cause impacts similar to those describe for the No Potable Water Supply for Landscaping Irrigation or Other Non-Potable Uses Alternative below if there is insufficient potable water in the future for landscape irrigation and other non-potable water uses. These effects, including deterioration of plant health and changed quality of the visual environment (including impacts to redwood trees, etc.), could ultimately be significant and unavoidable if mandatory conservation measures were to be extended in time. There is also the possibility that it will not be up to the City to make the determination independently to prohibit uses of potable water for such uses listed above. The SWRCB could conceivably make a ruling requiring such restrictions in severe droughts. In 2014, the

Table 4-2: Summary of Alternatives

Impact Statement	Level of Significance After Mitigation[1]			
	Proposed Project	No Project Alternative	No Funding from U.S. Bureau of Reclamation (USBR) Alternative	No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative
Hydrology and Water Quality				
Impact HYD-1: Potential violation of water quality standards and/or waste discharge requirements or otherwise substantially degrade water quality.	LSM	NI	LSM	LSM
Impact HYD-2: Potential to 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 which would result in substantial erosion or siltation on- or off-site.	LSM	NI	LSM	LSM
Impact HYD-3: Potential to result in the substantial decline in health of redwood trees and other salt-sensitive plant species.	LSM	SU	LSM	SU
Aesthetics				
Impact AES-1: Substantial degradation of the existing visual character or quality of the site and its surroundings or on a public view or view corridor.	LSM	SU	LSM	SU
Impact AES-2: Violation of the existing Comprehensive Plan policies regarding visual resources.	LTS	NI	LTS	LTS
Impact AES-3: Creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	LTS	NI	LTS	LTS
Environmental Justice				
No impacts were identified.	NI	NI	NI	NI

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Impact Statement	Level of Significance After Mitigation[1]			
	Proposed Project	No Project Alternative	No Funding from U.S. Bureau of Reclamation (USBR) Alternative	No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative
Agricultural and Forestry Services				
No impacts were identified.	NI	NI	NI	NI
Air Quality				
a) Conflict with or obstruct with implementation of the applicable air quality plan (1982 Bay Area Air Quality Plan & 2000 Clean Air Plan.	LTS	NI	LTS	LTS
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.	LSM	NI	LSM	LSM
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).	LSM	NI	LSM	LSM
d) Expose sensitive receptors to substantial levels of toxic air contaminants.	LTS	NI	LTS	LTS
e) Create objectionable odors affecting a substantial number of people.	LTS	NI	LTS	LTS
f) Not implement all applicable construction emission control measures recommended in the *Bay Area Air Quality Management District CEQA Guidelines.*	NI	NI	NI	NI

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Impact Statement	Level of Significance After Mitigation[1]			
	Proposed Project	No Project Alternative	No Funding from U.S. Bureau of Reclamation (USBR) Alternative	No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative
Biological Resources				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	LSM	NI	LSM	LSM
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, including federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LSM	NI	LSM	LSM
c) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	LTS	NI	LTS	LTS
d) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10).	LSM	NI	LSM	LSM
e) Conflict with any applicable Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	LTS	NI	LTS	LTS

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	Proposed Project	No Project Alternative	No Funding from U.S. Bureau of Reclamation (USBR) Alternative	No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative
Cultural Resources				
a) Directly or indirectly destroy a local cultural resource that is recognized by City Council resolution.	LSM	NI	LSM	LSM
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5.	LSM	NI	LSM	LSM
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	LSM	NI	LSM	LSM
d) Disturb any human remains, including those interred outside of formal cemeteries.	LSM	NI	LSM	LSM
e) Adversely affect a historic resource listed or eligible for listing on the National and/or California Register, or listed on the City's Historic Inventory.	LSM	NI	LSM	LSM
f) Eliminate important examples of major periods of California history or prehistory.	LSM	NI	LSM	LSM
Geology, Soils, and Seismicity				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, groundshaking, liquefaction or landslides.	LSM	NI	LSM	LSM
b) Result in substantial soil erosion or the loss of topsoil.	LSM	NI	LSM	LSM
c) Result in substantial siltation.	LSM	NI	LSM	LSM

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d) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	LSM	NI	LSM	LSM
e) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.	LSM	NI	LSM	LSM
f) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.	NI	NI	NI	NI
g) Expose people or property to major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques.	NI	NI	NI	NI
Greenhouse Gas Emissions				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	LTS	NI	LTS	LTS
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	LTS	NI	LTS	LTS
Hazards and Hazardous Materials				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LSM	NI	LSM	LSM

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b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	LSM	NI	LSM	LSM
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	LSM	NI	LSM	LSM
d) Construct a school on a property that is subject to hazards from hazardous materials contamination, emissions or accidental release.	NI	NI	NI	NI
e) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.	LSM	NI	LSM	LSM
f) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.	LTS	NI	LTS	LTS
g) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working the project area.	NI	NI	NI	NI
h) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LSM	NI	LSM	LSM

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i) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	NI	NI	NI	NI
j) Create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination in excess of soil and ground water cleanup goals developed for the site.	NI	NI	NI	NI
Land Use and Planning				
a) Physically divide an established community.	LTS	NI	LTS	LTS
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.	NI	NI	NI	NI
c) Conflict with any applicable habitat conservation plan or natural community conservation plan.	LTS	NI	LTS	LTS
d) Substantially adversely change the type or intensity of existing or planned land use in the area.	NI	NI	NI	NI
e) Be incompatible with adjacent land uses or with the general character of the surrounding area, including density and building height.	NI	NI	NI	NI

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f) Conflict with established residential, recreational, educational, religious, or scientific uses of an area.	NI	NI	NI	NI
g) Convert prime farmland, unique farmland, or farmland of statewide importance (farmland) to non-agricultural use.	NI	NI	NI	NI
Mineral Resources				
No impacts were identified.	NI	NI	NI	NI
Noise				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LSM	NI	LSM	LSM
b) Exposure of persons to or generation of excessive ground borne vibrations or ground borne noise levels.	LTS	NI	LTS	LTS
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	LSM	NI	LSM	LSM
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	LSM	NI	LSM	LSM
e) For a project located within an airport land use plan or, where such a plan has not been adopted, would the project expose people residing or working in the project area to excessive noise levels.	LTS	NI	LTS	LTS
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.	NI	NI	NI	NI

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	Proposed Project	No Project Alternative	No Funding from U.S. Bureau of Reclamation (USBR) Alternative	No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative
g) Cause the average 24 hour noise level (Ldn) to increase by 5.0 decibels (dB) or more in an existing residential area, even if the Ldn would remain below 60 dB.	LSM	NI	LSM	LSM
h) Cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB.	LSM	NI	LSM	LSM
i) Cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.	LSM	NI	LSM	LSM
j) Result in indoor noise levels for residential development to exceed an Ldn of 45 dB.	LSM	NI	LSM	LSM
k) Result in instantaneous noise levels of greater than 50 dB in bedrooms or 55 dB in other rooms in areas with an exterior Ldn of 60 dB or greater.	LSM	NI	LSM	LSM
l) Generate construction noise exceeding the daytime background Leq at sensitive receptors by 10 dBA or more.	LSM	NI	LSM	LSM
Population and Housing				
No impacts were identified.	NI	NI	NI	NI
Public Services				
No impacts were identified.	NI	NI	NI	NI

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Recreation				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	NI	NI	NI	NI
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.	NI	NI	NI	NI
c) Does the project affect recreational facilities.	LTS	NI	LTS	LTS
Transportation and Traffic				
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.	LSM	NI	LSM	LSM
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.	LSM	NI	LSM	LSM

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c) Result in change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.	NI	NI	NI	NI
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	LSM	NI	LSM	LSM
e) Result in inadequate emergency access.	LSM	NI	LSM	LSM
f) Result in inadequate parking capacity that impacts traffic circulation and air quality.	LSM	NI	LSM	LSM
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., pedestrian, transit & bicycle facilities).	LSM	NI	LSM	LSM
h) Cause a local (City of Palo Alto) intersection to deteriorate below Level of Service (LOS) D and cause an increase in the average stopped delay for the critical movements by four seconds or more and the critical volume/capacity ratio (V/C) value to increase by 0.01 or more.	LTS	NI	LTS	LTS
i) Cause a local intersection already operating at LOS E or F to deteriorate in the average stopped delay for the critical movements by four seconds or more.	LTS	NI	LTS	LTS

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j) Cause a regional intersection to deteriorate from an LOS E or better to LOS F or cause critical movement delay at such an intersection already operating at LOS F to increase by four seconds or more and the critical V/C value to increase by 0.01 or more.	LTS	NI	LTS	LTS
k) Cause a freeway segment to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment already operating at LOS F.	LTS	NI	LTS	LTS
l) Cause any change in traffic that would increase the Traffic Infusion on Residential Environment (TIRE) index by 0.1 or more.	LTS	NI	LTS	LTS
m) Cause queuing impacts based on a comparative analysis between the design queue length and the available queue storage capacity? Queuing impacts include, but are not limited to, spillback queues at project access locations; queues at turn lanes at intersections that block through traffic; queues at lane drops; queues at one intersection that extend back to impact other intersections, and spillback queues on ramps.	LTS	NI	LTS	LTS
n) Impede the development or function of planned pedestrian or bicycle facilities.	LSM	NI	LSM	LSM
o) Impede the operation of a transit system as a result of congestion.	LSM	NI	LSM	LSM
p) Create an operational safety hazard	NI	NI	NI	NI

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Utilities and Service Systems				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	LTS	NI	LTS	LTS
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	NI	NI	NI	LSM
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	LTS	NI	LTS	LTS
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.	NI	SU	NI	SU
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	NI	NI	NI	NI
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.	LTS	NI	LTS	LTS
g) Comply with federal, state, and local statutes and regulations related to solid waste.	LTS	NI	LTS	LTS

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Impact Statement	Level of Significance After Mitigation[1]			
	Proposed Project	No Project Alternative	No Funding from U.S. Bureau of Reclamation (USBR) Alternative	No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative
h) Result in a substantial physical deterioration of a public facility due to increased use as a result of the project.	LTS	NI	LTS	LTS

SU = Significant and Unavoidable; NI = No Impact;
LTS = Less than Significant (no standard project requirements and/or mitigation measures required);
LSM = Significant but Mitigable (standard project requirements and / or mitigation measure would reduce potentially significant impacts to less than significant);

SWRCB mandated certain water use restrictions that the City adopted (see Staff Report 4973, Resolution 9449 and Staff Report 5051, Resolution 9460). On March 17, 2015, the SWRCB voted to update and extend emergency drought regulations[5]. On April 1, Governor Jerry Brown issued Executive Order B-29-15[6] to mandate substantial water reductions across the state. The Order contains four categories of provisions: 1) Save Water; 2) Increase Enforcement Against Waste; 3) Invest in New Technologies; and 4) Streamline Government Response. Directive 2 under the Save Water category directed SWRCB to "impose restrictions to achieve a statewide 25 percent reduction in potable urban water usage through February 28, 2016." Amongst other provisions, the Order also directed SWRCB to "impose strict restrictions to require that commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries immediately implement water efficiency measures to reduce potable water useage in an amount consistent with the reduction targets mandated by Directive 2 of this Executive Order," to "prohibit irrigation with potable water of ornamental turf on public street medians," and to "direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions." It is anticipated that SWRCB will adopt emergency rules that implement the directives in the Governor's executive order in May. The City will be required to adopt and enforce these regulations. If the current or future droughts are more severe, the SWRCB and the Governor may take additional actions to severely limit the use of potable water for irrigation and other uses that don't require potable water.

In summary, while none of the physical changes anticipated as part of the proposed Project would occur under this alternative, this alternative would also not meet any of the objectives of the proposed Project, which include improving potable water supply reliability by conserving drinking water, providing a dependable locally controlled non-potable water source that could be used during droughts, and reducing the reliance on imported water. In addition, the No Project Alternative could result in an inadequate supply to meet the City's customer needs, and may potentially lead to restricting potable water supply for high-quality drinking water purposes only. This restriction could impact the groundwater basin if groundwater were further developed in Palo Alto. In addition, a restriction on potable water for high-quality drinking water purposes could result in similar impacts described for the No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative below.

No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative

This alternative would involve the City adopting regulation (i.e., through an ordinance) that restricts the use of potable water for landscape irrigation and other non-potable uses for commercial and industrial

[5] SWRCB's action on March 17 includes the following: Continue the prohibitions on potable water use (first adopted in 2014). These include prohibiting Californians from: 1) washing down sidewalks and driveways; 2) watering outdoor landscapes in a manner that causes excess runoff; 3) washing a motor vehicle with a hose, unless the hose is fitted with a shut-off nozzle; 4) operating a fountain or decorative water feature, unless the water is part of a recirculating system; and 5) irrigation turf or ornamental landscapes during and 48 hours following measureable precipitation. In addition, SWRCB added new prohibitions for commercial businesses, including: 1) restricting restaurants and other food service establishments from serving water to customers only upon request; and 2) requiring operators of hotels and motels to provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option. Water agencies are also required to: 1) limit the number of days per week that customers can irrigation outdoors, 2) notify customers when they are aware of leaks that are within the customer's control; and expand monthly reporting to include the limit on days for outdoor irrigation and a description of compliance and enforcement efforts. Local agencies can fine property owners up to $500 a day for failure to implement conservation requirements and the SWRCB can issue cease and desist orders against water agencies that don't impose mandatory conservation measures upon their retail customers (SWRCB, 2017).

[6] The Executive Order is available for viewing at: http://gov.ca.gov/docs/4.1.15_Executive_Order.pdf

users. In the absence of water supply for outdoor irrigation, alternate water sources would have to be identified by individual landowners (not the City). For the purposes of a more complete analysis, this section describes the anticipated effects of not only enactment of the ordinance but also the effects that landowners would likely experience associated with the alternative supply options described below. The City would not be responsible for mitigating the effects of implementing the alternative water supply options.

- Option 1: Groundwater;
- Option 2: Recycled water from a satellite treatment plant (to meet Stanford Research Park demands); and
- Option 3: a combination of options 1 and 2.

The physical change that would be most visible resulting from the enactment of the ordinance, assuming that supplemental supply is only partially available or not available, is the change in the urban forest[7]. Prohibiting use of potable water for outdoor irrigation would present even greater restrictions on use of water than would rationing during drought periods, because the prohibition would occur even during hydrologically normal and wet years. Landscapes without any supplemental water supply would decline in appearance and health over time. Turf would be yellow and symptoms of tree stress would likely appear seasonally in normal hydrologic years in the absence of rain, until finally vegetation dies. Landowners may choose to convert to drought tolerant landscapes, which would still require water during the plant establishment periods, or convert to hardscape. Visual changes from the lack of water supply would be visible from local residential streets but more prominently along the City's visual corridors and from the hills. The urban forest as it currently exists would be expected to decline substantially in density, and such changes would be difficult to reverse if no other water source was available for landscapes besides seasonal rain. The anticipated effects on plants and the visual environment under such a scenario would be substantial and could be significant and unavoidable.

Option 1, the groundwater option, would increase the use of groundwater such that this non-sustainable resource would be reduced, affecting the City's emergency supply and the supply of others who rely on groundwater. Any reduction of groundwater elevations (without appropriate recharge) has the potential to result in other unplanned, secondary environmental effects such as subsidence and water quality reduction. The precise effects on groundwater cannot be determined without defining the amount of water that could be extracted under this alternative and without further study. However, it is expected that SCVWD would control the number of permits that it would issue to ensure that cumulative impacts on the groundwater basin would not occur.

Options 1 and 2 would involve a new network of pipes, pump stations and groundwater wells as well as a satellite treatment facility. Thus, these options would generate the same types of construction-related impacts as the proposed Project, and similar standard project requirements and mitigation measures would be required to reduce potential effects to less-than-significant levels. The scale and location of impact would depend on how many facilities would ultimately be built and their locations, which are currently unknown.

The options under this alternative would result in the application of water with lower TDS levels on the landscapes. However, as the proposed Project would provide high quality recycled water that is not expected to present an unacceptable salinity hazard, this alternative would not reduce any significant impacts of the Project.

[7] The UFMP specifies that "in concept the urban forest may be considered to encompass all the trees, plants and associated organisms that inhabit the shared ecosystem within Palo Alto."

It is still possible that if proper site management is not conducted and the narrow subset of conditions occur as described in *Section 3.1, Hydrology and Water Quality* for the proposed Project, landscaped areas could be affected, regardless of the type of water applied. Thus, **Mitigation Measure HYD-3c** described for the proposed Project would also apply to this alternative.

In summary, the options would generate significant unavoidable aesthetic effects if water supply to outdoor landscapes were reduced or eliminated entirely (for areas not served directly by groundwater, satellite recycled water, or both). All three options could also result in similar construction impacts as the proposed Project. TDS of water produced by this alternative could be lower but would not offset any significant impacts of the proposed Project. All the same types of impacts and mitigation measures related to construction identified for the proposed Project would also apply for all the options.

Environmentally Superior Alternative

CEQA requires that an EIR identify an environmentally superior alternative (Guidelines Section 15126.2). The proposed Project is the environmentally superior alternative. The No Potable Water Supply for Landscape Irrigation or Other Non-Potable Uses Alternative would not reduce any of the potentially significant impacts when compared to the proposed Project as described above. In fact, it would result in potentially significant, unavoidable impacts. This alternative could result in substantial plant and visual quality changes associated with the lack of water supply for the Urban Forest outside the rainy season if landowners do not choose to irrigate with an alternative water supply. The No Project Alternative could also result in significant unavoidable impacts if mandatory conservation measures were imposed during extended droughts, limiting the use of potable water supply for landscape irrigation. For that reason, the proposed Project (or the No Funding from the USBR, which differs only in that no funding would be provided by USBR) is clearly the Environmentally Superior Project Alternative.

4.5 Other Topics Required by CEQA and NEPA

4.5.1 Significant and Unavoidable Impacts of the Project

As described in *Chapter 3, Environmental Setting, Impacts and Mitigation Measures,* and **Appendix E, Environmental Checklist** there would be no significant and unavoidable impacts from the Palo Alto Recycled Water Project. As such, while the City would be required to adopt Findings as part of its approval of the EIR, it would not prepare a Statement of Overriding Considerations for unavoidable, adverse impacts. There would be a number of potential impacts resulting from the proposed Project; however, the standard project requirements and mitigation measures described in *Chapter 3, Environmental Setting, Impacts and Mitigation Measures,* and **Appendix E, Environmental Checklist** would reduce any potentially significant impacts to less than significant.

4.5.2 Significant Irreversible Environmental Changes

Implementation of the City of Palo Alto Recycled Water Project would require irreversible commitment of natural resources including construction materials; labor; and energy required for construction, operation, and maintenance. Commitment of non-renewable natural resources used in construction would include gravel, petroleum products, steel, and others. Commitment of energy resources for construction would include fuel oil, natural gas, and gasoline for heavy machinery.

Operation of the proposed Project would result in further commitment of energy resources, but the use of recycled water in place of imported, potable water supplies, would offset the energy requirements to deliver the same amount of water from outside sources.

4.5.3 Indian Trust Assets

Indian trust assets (ITAs) are legal interests in assets that are held in trust by the U.S. Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, Executive Order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. "Assets" are anything owned that holds monetary value. "Legal interests" are defined as a property interest for which there is a legal remedy, such as compensation or injunction, if there is improper interference. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something. Indian trust assets cannot be sold, leased or otherwise alienated without United States' approval. Trust assets may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, Indian trust assets may be located off trust land.

Reclamation shares Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain Indian Trust assets reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

The proposed action does not have a potential to affect Indian Trust Assets. The nearest ITA is a Public Domain Allotment approximately 38 miles north/northwest of the proposed Project (Rivera, 2010).

4.5.4 Compliance with Federal Statutes and Regulations

This section describes the status of compliance with relevant federal laws, executive orders, and policies, and the consultation that has occurred to date or will occur in the near future. The topics are based in part on the SWRCB's Clean Water State Revolving Fund Program Federal Cross-cutting Environmental Regulations Evaluation Form for Environmental Review and Federal Coordination and NEPA requirements for consultation and coordination.

Federal Endangered Species Act

Section 7 of the Federal Endangered Species Act (FESA) requires Federal agencies, in consultation with the Secretary of the Interior, to ensure that their actions do not jeopardize the continued existence of Federally-listed as threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat for these species. Under Section 7, a Federal action that may result in take of a listed species (or result in destruction or adverse modification of designated critical habitat) must consult with the United States Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service. Appendix J, *Biological Resources*, describes listed species that were observed or have the potential to occur in the action area. Where there is a potential for listed plants and animals to occur, the standard project requirements and **Mitigation Measures BIO-1** through **BIO-10** have been identified to reduce potential effects of the project. Therefore, the USFWS will be contacted and informal consultation requested for listed species for which take may occur or designated critical habitat may be destroyed or adversely modified.

National Historic Preservation Act, Section 106

The purpose of this act is to protect, preserve, rehabilitate, or restore significant historical, archeological, and cultural resources. Section 106 requires Federal agencies to take into account effects on historic properties. Once an undertaking has been established, the Section 106 review involves a step-by-step procedure described in detail in the implementing regulations (36 CFR Part 800). As described in *Section E.4*, Cultural Resources of **Appendix E**, a cultural resource assessment report compliant with Section 106 for the proposed Project was conducted (see **Appendix K**). Upon the City's completion of subsurface testing (if needed) as described in **Mitigation Measure CR-1**, Reclamation will submit this report to

SHPO for initiation of the consultation process. Completion of the cultural resources report and concurrence by SHPO would ensure compliance with the NHPA.

Clean Air Act

U.S. Congress adopted general conformity requirements as part of the Clean Air Act (CAA) Amendments in 1990 and the USEPA implemented those requirements in 1993 (Sec. 176 of the CAA (42 U.S.C. § 7506) and 40 CFR Part 93, Subpart B). General conformity requires that all federal actions "conform" with the State Implementation Plan (SIP) as approved or promulgated by USEPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain the national ambient air quality standards. Before a federal action is taken, it must be evaluated for conformity with the SIP. All "reasonably foreseeable" emissions predicted to result from the action are taken into consideration. These include direct and indirect emissions, and must be identified as to location and quantity. If it is found that the action would create emissions above de minimis threshold levels specified in USEPA regulations (40 CFR § 93.153(b)), or if the activity is considered "regionally significant" because its emissions exceed 10 percent of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the proposed Project into conformance. As described in *Section E.2, Air Quality* of **Appendix E**, the Project area lies within the BAAQMD. The results of the air quality modeling showed that pollutant emissions would not exceed Federal General Conformity significance thresholds. As such, the lead agency is in compliance with this Act.

Executive Order 11988 – Floodplain Management

EO 11988 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. As described in Section 3.1, Hydrology and Water Quality in *Chapter 3, Environmental Setting, Impacts, and Mitigation Measures*, most of the proposed Project facilities would lie outside the 100-year floodplain as designated by the FEMA. The proposed pump station at the RWQCP would be located within the 100-year flood zone, but as the site is already developed as a wastewater treatment plant, construction and operation of the pump station would not remove any floodplains. As such, the lead agency would be in compliance with this EO.

Federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Executive Order 13168

The Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act prohibit the take of migratory birds (or any part, nest, or eggs of any such bird) and the take and commerce of eagles. EO 13168 requires that any project with federal involvement address impacts of federal actions of migratory birds. As described in *Section E.3, Biological Resources* in **Appendix E**, the proposed Project would have a less-than-significant impact on nesting birds with the proposed **Mitigation Measure BIO-8** if construction cannot be avoided during the nesting season. Thus, the lead agency would be in compliance with this EO.

Executive Order 11990 – Protection of Wetlands

Under EO 11990, federal agencies must avoid affecting wetlands unless it is determines that no practicable alternative is available. As described in *Section E.3, Biological Resources* in **Appendix E**, the Project area does not support federally protected wetlands as defined by CWA Section 404 and therefore no impacts are anticipated. Three jurisdictional waters (i.e., Adobe Creek, Barron Creek, and Matadero Creek) are present within the proposed Project area. No direct impacts to these waters would occur because all pipelines would be constructed either by hanging from a bridge or using trenchless construction beneath the channel. To ensure impacts would be less than significant, standard project requirements proposed as part of the Project and **Mitigation Measure BIO-1**, protection of sensitive

habitats and jurisdictional features, would reduce potential effects. Thus, the lead agency would be in compliance with EO 11990.

Executive Order on Trails for America in the 21st Century

The EO on Trails for America requires federal agencies to protect, connect, promote, and assist trails of all types throughout the United States. The proposed Project would require short-term disruption of existing trails during construction. The existing pedestrian path along Adobe Creek under U.S. 101 would require temporary closure during construction activities and the connection pipeline north of the RWQCP could cross an existing trail. Potential impacts would be less than significant given the short duration of construction and the availability of alternate routes that cross U.S.101. Thus, no long-term adverse effects on trails would occur and the lead agency is in compliance with this EO.

Executive Order 13007 - Indian Sacred Sites

Sacred sites are defined in EO 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." The proposed Project would not be located on or impact any Federal lands and therefore would not affect any Indian sacred sites.

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Chapter 5 References and List of Preparers

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