Draft

PHOENIX – BON TEMPE CONNECTION PROJECT

Initial Study/Mitigated Negative Declaration

Prepared for
Marin Municipal Water District

March 2024

ESA

Draft

PHOENIX – BON TEMPE CONNECTION PROJECT

Initial Study/Mitigated Negative Declaration

Prepared for
Marin Municipal Water District

March 2024

180 Grand Avenue
Suite 1050
Oakland, CA 94612
510.839.5066
esassoc.com

ESA

Atlanta	Palm Beach County	San Diego
Bend	Pasadena	San Francisco
Irvine	Pensacola	San Jose
Los Angeles	Petaluma	Sarasota
Mobile	Portland	Seattle
Oakland	Rancho Cucamonga	Tampa
Orlando	Sacramento	Thousand Oaks

OUR COMMITMENT TO SUSTAINABILITY | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

CONTENTS

Initial Study/Mitigated Negative Declaration

Figures

Tables

Appendices

Acronyms and Other Abbreviations

Acronym or Abbreviation	Definition
ADT	average daily traffic
AF	acre feet
BAAQMD	Bay Area Air Quality Management District
AFY	acre feet per year
BPMP	Bicycle and Pedestrian Master Plan
BMPs	best management practices
CAAQS	California ambient air quality standards
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry and Fire Protection
CalGEM	California Geologic Energy Management Division
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGS	California Geological Survey
CH_4	methane
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CY	cubic yards
dB	decibels
dBA	A-weighted decibels
DPM	diesel particulate matter
DTSC	California Department of Toxic Substances Control
EFZ	Earthquake Fault Zone
EPA	U.S. Environmental Protection Agency

Acronym or Abbreviation	Definition
FTA	Federal Transit Administration
GHG	greenhouse gas
HMBP	Hazardous Materials Business Plan
HP	horsepower
IS/MND	Initial Study/Mitigated Negative Declaration
LUST	leaking underground storage tank
Marin Water	Marin Municipal Water District
MCSTOPPP	Marin County Stormwater Pollution Prevention Program
mgd	million gallons per day
MRZs	mineral resource zones
MT	metric tons
MTZ Plan	Mt. Tamalpais Mutual Threat Zone Plan
NAAQS	national ambient air quality standards
NO_2	nitrogen dioxide
N_2O	nitrous oxide
NOx	nitrogen oxides
NSO	northern spotted owl
NPDES	National Pollutant Discharge and Elimination System
NRCS	Natural Resources Conservation Service
OPR	Governor's Office of Planning and Research
PG&E	Pacific Gas and Electric
PM	particulate matter
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
PM_{10}	particulate matter 10 microns or less in diameter
PPV	peak particle velocity
ROG	reactive organic gases
RMS	root mean square (amplitude)
SFBAAB	San Francisco Bay Area Air Basin
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures Plan
SVP	Society of Vertebrate Paleontology
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
SWSA	Strategic Water Supply Assessment

Acronym or Abbreviation	Definition
TACs	toxic air contaminants
UCMP	University of California Museum of Paleontology
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	Decibel notation
VMT	vehicle miles traveled
WTP	water treatment plant

CHAPTER 1
Introduction

1.1 Purpose of the Initial Study

The Marin Municipal Water District (Marin Water), as the California Environmental Quality Act (CEQA) Lead Agency, has prepared this Initial Study (IS) for the Phoenix – Bon Tempe Connection Project (Project) in compliance with CEQA, the CEQA Guidelines (California Code of Regulations [CCR] Section 15000 et. seq.) and the regulations and policies of Marin Water.

Marin Water proposes to create a connection between Phoenix Lake and Bon Tempe Reservoir to improve operational efficiency and allow for more frequent use of Phoenix Lake water without the existing required intensive system modifications. The proposed Project is described in Chapter 2, Project Description.

1.1.1 Public Review Period

Publication of this IS marks the beginning of a 30-day public review and comment period. During this period, the IS will be available to local, state, and federal agencies and to interested organizations and individuals for review. Written comments concerning the environmental review contained in this IS during the 30-day public review period should be sent to:

Elysha Irish, Engineering Manager
Marin Water
220 Nellen Ave.
Corte Madera, CA 94925
415.945.1572
eirish@marinwater.org

1.1.2 Consideration of the Initial Study and Project

Following the conclusion of the public review period, the Marin Water Board of Directors (Board) will consider the adoption of the Initial Study/Mitigated Negative Declaration (IS/MND) for the Project at a regularly scheduled meeting. The Board shall consider the IS/MND together with any comments received during the public review process. Upon adoption of the MND, Marin Water may proceed with Project approval actions.

This page intentionally left blank

CHAPTER 2
Project Description

This chapter summarizes relevant background information and describes Marin Municipal Water District's (Marin Water) Phoenix-Bon Tempe Connection Project (Project), including Project need and objectives, location, Project components, construction process, and operations and maintenance.

2.1 Project Background and Need

2.1.1 Background

2.1.1.1 Service Area

Marin Water supplies water to over 196,000 customers in southern and eastern Marin County through about 61,700 active service connections.

2.1.1.2 Water Supply

Water supplies for Marin Water come from a mixture of local surface water (accounting for approximately 75 percent of supply), imported water from Sonoma Water, and recycled water. Supplies from Marin Water's local watersheds are generally sufficient in most years and of high quality. The local watersheds are expected to continue to be productive in the future, but year-to-year variability is likely to increase. Historically, Marin Water has successfully met demands during periods of extreme drought with a combination of rationing, conservation, and increased Sonoma Water supplies. However, recent drought conditions in 2021 severely threatened water supply reliability and prompted Marin Water to explore various water supply options to enhance resiliency for its customers. Marin Water recently completed a Strategic Water Supply Assessment (SWSA; Marin Water 2023a). The SWSA includes an assessment of current and future hydrological conditions, performance of the Marin Water system under these conditions, consideration of alternatives and strategies, and roadmap to a more resilient water supply future. The Phoenix-Bon Tempe Connection is one of the near-term projects identified in the SWSA to improve the resilience of Marin Water's system.

2.1.1.3 Overview of Existing Water System

Reservoirs

Rainfall on Mount Tamalpais is the source of most of the water supplied to Marin Water's customers. Marin Water reservoirs are Alpine Lake, Bon Tempe Reservoir, Kent Lake, Lake Lagunitas, and Phoenix Lake on the north slope of Mount Tamalpais and the Nicasio and Soulajule reservoirs in West Marin. Alpine, Bon Tempe, Kent, and Lagunitas are in the

headwaters of the Lagunitas Creek watershed and Phoenix Lake is part of the Corte Madera Creek watershed. The annual runoff to Marin Water reservoirs averages approximately 83,000 acre feet (AF), although it can range from as low as 4,000 AF (occurring in 1977) to over 211,000 AF (occurring in 2017). The current surface water storage for the total system is estimated to be 79,566 AF.

Phoenix Lake and Bon Tempe Reservoir

The proposed Project involves Phoenix Lake and Bon Tempe Reservoir. Constructed in 1905, Phoenix Lake is one of the smallest reservoirs in the Marin Water system and the only one that lies in Corte Madera Creek watershed, on the east side of the main watershed divide. Bon Tempe Reservoir was constructed in 1948. Water from the Bon Tempe Reservoir is treated at the Bon Tempe water treatment plant (WTP). **Table 2-1** presents capacity and average inflow information for the two reservoirs.

TABLE 2-1
CAPACITY AND AVERAGE INFLOW INFORMATION FOR PHOENIX LAKE AND BON TEMPE RESERVOIR

Reservoir	Capacity (AF)	Average Inflow (AFY)	Storage Capacity as a Percent of Average Inflow
Phoenix Lake	411	3,665	11%
Bon Tempe Reservoir	4,017	2,305	174%

NOTES:
AF = acre feet
AFY = acre feet per year
SOURCE: Marin Water, *Strategic Water Supply Assessment*, May 2023.

Water Treatment Plants

Marin Water treats water at the Bon Tempe WTP near Ross, the San Geronimo WTP in Woodacre, and the Ignacio Water Quality Improvement Station in Novato. The Bon Tempe and San Geronimo WTPs treat water from Marin Water's reservoirs; the Ignacio Water Quality Improvement Station polishes water purchased from Sonoma Water. In combination, these treatment facilities have a design capacity of 71 million gallons per day (mgd).

Distribution

Marin Water's potable and raw water distribution system includes approximately 908 miles of water pipelines, 97 pump stations, and 130 treated water storage tanks (Marin Water, 2023b).

2.1.2 Need for the Project

Currently, on rare occasions Marin Water pumps some water from Phoenix Lake to the Bon Tempe WTP but only in dry conditions due to the complexities of operations. Use of water from Phoenix Lake requires conversion of existing potable water infrastructure to raw water infrastructure and back again once Phoenix Lake water has been conveyed. This conversion results in a loss of critical potable water infrastructure that is needed during the fire season; consequently, the conversion can only be performed outside of the fire season. Additionally,

extensive treatment is required at Bon Tempe WTP due to Phoenix Lake's water quality characteristics.

2.2 Project Purpose and Objectives

The purpose of the proposed Project is to improve operational efficiency and flexibility and allow for more frequent use of Phoenix Lake water without the intensive system modifications that are required under current conditions. The improved connection between Phoenix Lake and Bon Tempe Reservoir would allow Marin Water to capture some of the excess inflows to Phoenix Lake.

The objectives of the proposed Project are:

- To convey water efficiently from Phoenix Lake to Bon Tempe Reservoir through dedicated raw water transmission and pumping facilities, which will:
  - Optimize and improve the efficiency of existing water storage for the Marin Water system; and
  - Improve the reliability of dry year supplies.

2.3 Project Location

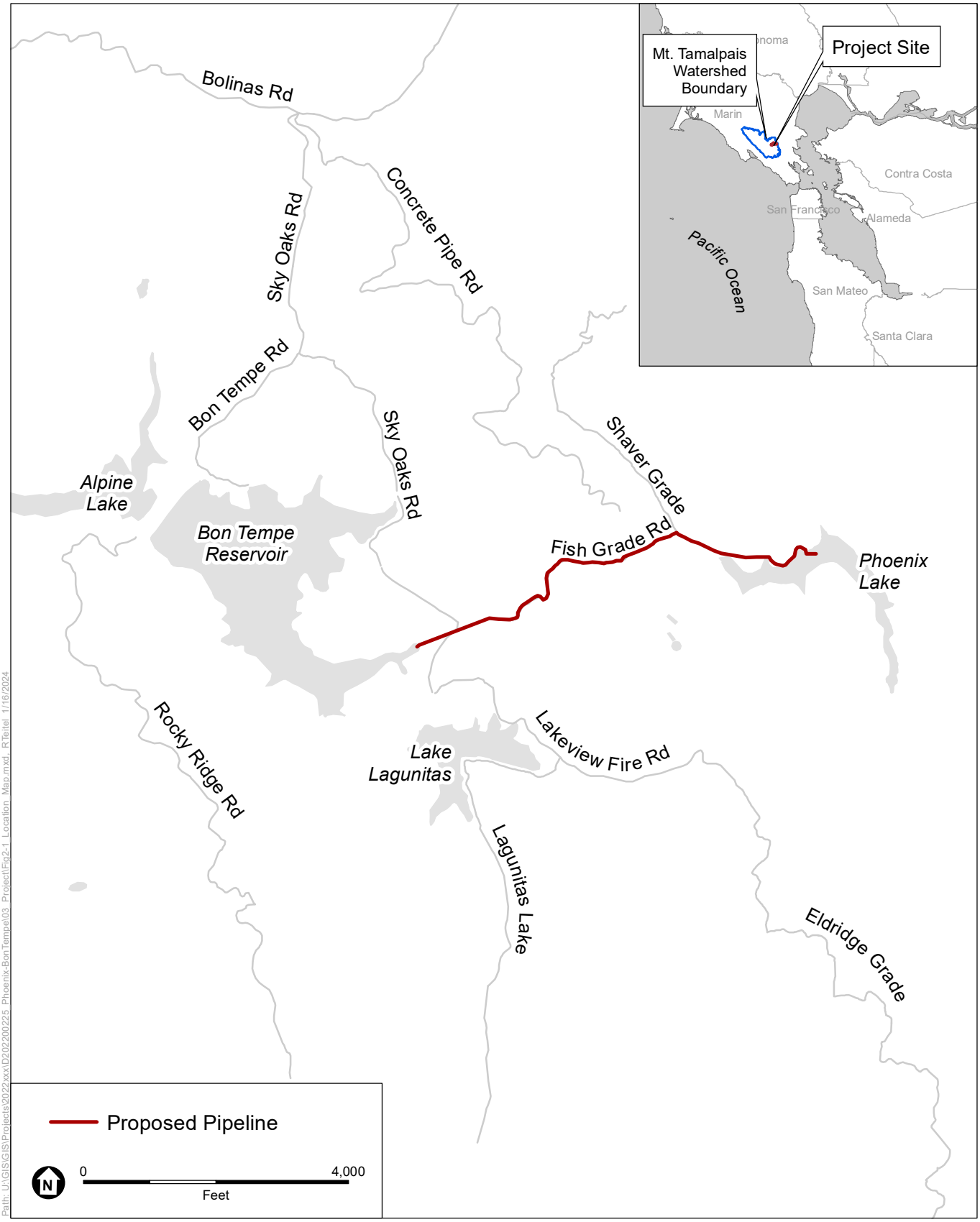
The Project site is located southwest of the Town of Ross in unincorporated Marin County, California, within Marin Water's Mt. Tamalpais watershed lands on land owned by Marin Water (see **Figure 2-1**). The proposed Project connection would convey water from the Phoenix Lake/Corte Madera Creek watershed to the Bon Tempe Reservoir/Lagunitas Creek watershed (see **Figure 2-2**). For purposes of clarity in this document, the pipeline has been divided into six segments identified by letters A through F, shown on **Figure 2-2** and **Table 2-2**.

2.4 Project Components

This section describes the proposed facilities, processes, and other features associated with the Project.

2.4.1 Phoenix – Bon Tempe Pipeline

The Project would construct a dedicated 18-inch diameter raw water pipeline between the barge pump (Pump 1) in Phoenix Lake and the Bon Tempe Reservoir shoreline. As indicated in **Table 2-2**, for segment B Marin Water would rely on an existing pipeline. The pipeline alignment would mostly follow existing trails and fire roads. Where the pipeline would deviate from existing trails, the corridor would be reseeded after construction in conformance with Marin Water's standard procedures for reseeding with native, local ecotype, site-appropriate, fire-resistant vegetation. At Bon Tempe Reservoir, the pipeline would be installed alongside existing pipes and water would enter the reservoir from the Bon Tempe shoreline. No new inlets or outlets would be required for Phoenix Lake.

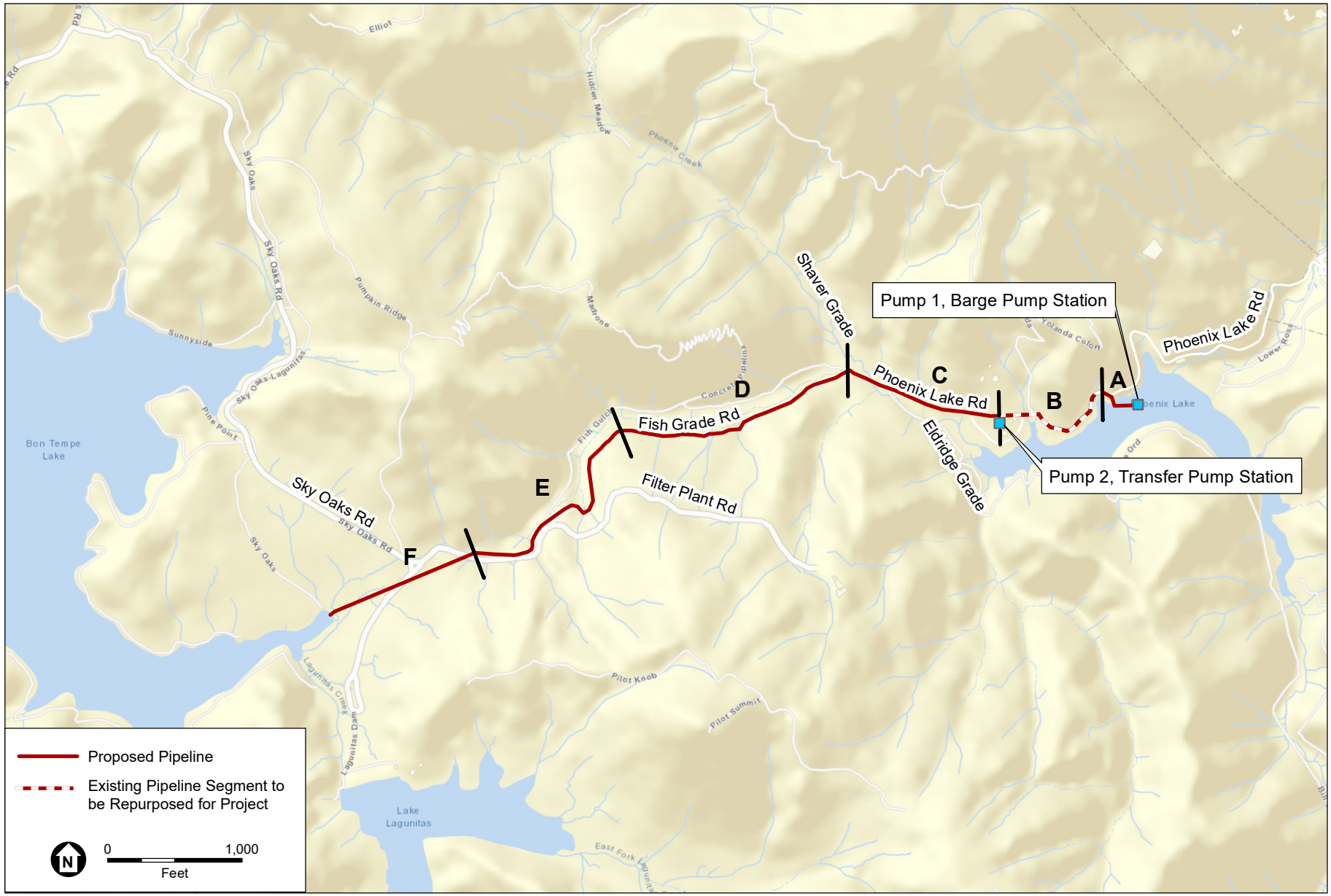


SOURCE: ESRI, 2023; ESA, 2023

MMWD Phoenix-Bon Tempe Project

Figure 2-1
Regional Location

ESA



Path: U:\GIS\GIS\Projects\2022xxx\D202200225_Phoenix-BonTempe\03_Project\Fig2-2_Project Components.mxd, RTeitel 1/19/2024

SOURCE: ESA, 2023; ESRI Imagery, 2023

MMWD Phoenix-Bon Tempe Project

Figure 2-2
Project Components

ESA

TABLE 2-2
PIPELINE AND PUMP STATION CONSTRUCTION DETAILS

	Segment[a]	From	To	Construction Details	Approximate Length (linear feet)	Construction Phase[b]	Estimated Duration
Pipeline	A	Pump 1, Barge Pump Station	Phoenix Lake Road	Replace existing pipeline in lake (reservoir would remain in operations) and along shoreline	290	2	3 weeks
	B	Phoenix Lake Road Shoreline	Pump 2, Transfer Pump Station	Use of an existing pipeline; no new pipeline construction	990	1	0 weeks
	C	Pump 2, Transfer Pump Station	Fish Grade Road/Shaver Grade intersection	Open trench for new pipeline	1,190	1	2 weeks
	D	Fish Grade Road/Shaver Grade intersection	Fish Grade Road	Open trench for new pipeline	1,850	2	3 weeks
	E	Fish Grade Road	Filter Plant Road	Open trench for new pipeline	1,790	2	1 weeks
	F	Filter Plant Road	Bon Tempe Reservoir shoreline	Replace existing pipeline in tunnel; terminate at shoreline with outflow over shoreline surface	1,190	1	8 weeks
	Total Approximate Pipeline Length[c]				**7,300**		
	Total Approximate New Pipeline Construction[c]				**6,310**		
Pump Stations	Pump 1, Phoenix Lake Pump Station			Upsize existing pump in Phoenix Lake	N/A	2	2 weeks
	Pump 2, Transfer Pump Station			New building pad, new pump station building, new pump	N/A	2	8 weeks

NOTES:

a. See Figure 2-2 for depiction of segments by letter.
b. As indicated in Table 2-4, Phase 1 is anticipated to occur from August 1, 2024 to January 31, 2025 and Phase 2 is anticipated to occur from August 1, 2025 to January 31, 2026.
c. Numbers may not match total due to rounding

2.4.2 Pumps and Pump Stations

Two pumps would be required to convey the water over the 500-foot elevation change between the two lakes (see **Figure 2-2**). Pump 1, the Barge Pump station, is an existing pump within Phoenix Lake that would be upsized to accommodate the capacity needed for the Project (see **Figure 2-3**). Pump 2 would be installed in a new building adjacent to the existing Phoenix Transfer Pump station (see **Figure 2-4**). This pump station building would be approximately 20 feet long, 15 feet wide and 15 feet tall and would include a new 450 hp pump and associated electrical equipment. The new building would include noise attenuation measures such as louvers or venting that is oriented away from trail users and recreationists. **Table 2-3** outlines the existing pump capacity and future requirements.

SOURCE: ESA, 2023.

MMWD Phoenix-Bon Tempe Project

Figure 2-3
Pump 1, Barge Pump Station

SOURCE: ESA, 2023.

MMWD Phoenix-Bon Tempe Project

Figure 2-4
Pump 2, Existing Transfer Pump Station

TABLE 2-3
EXISTING AND FUTURE PUMP STATION POWER REQUIREMENTS

Number/Name	Existing Power	Total Required Power for Project
1. Barge Pump Station	100 HP	125 HP
2. Transfer Pump Station	250 HP	450 HP

NOTE:
HP = horsepower

2.5 Construction

2.5.1 Construction Schedule, Hours, and Work Force

2.5.1.1 Construction Schedule

Construction is expected to occur between mid-2024 and early-2026.

Table 2-4 shows the anticipated construction schedule including the approximate duration of activities for each construction phase. Construction could occur over two or three seasons to avoid impacts to the Northern spotted owl, which is documented in the Project vicinity. No construction activities would occur during the February 1 to July 31 nesting season. For purposes of this environmental analysis, construction is assumed to occur over two seasons to avoid understating impacts related to traffic, air quality and noise.

TABLE 2-4
ANTICIPATED CONSTRUCTION SCHEDULE

Project Phase	Anticipated Start	Anticipated Finish
Phase 1	August 1, 2024	January 31, 2025
Phase 2	August 1, 2025	January 31, 2026

2.5.1.2 Construction Hours

Standard daytime shifts for construction activities would be 7:00 a.m. to 4:30 p.m. Monday through Friday. No nighttime or weekend construction is anticipated. Although short segments of the publicly accessible trails at/near the Project sites would be closed for short durations during weekdays, construction crews would backfill or plate trenches at the end of each workday to allow public use of select trails after 5 p.m. on weekdays and throughout the weekends.

2.5.1.3 Construction Workforce and Equipment

There would be approximately eight workers on any given day during Project construction. **Table 2-5** identifies the anticipated construction equipment for the Project.

TABLE 2-5
ANTICIPATED CONSTRUCTION EQUIPMENT

Construction Equipment	Number
Flatbed Truck	3
Front-end loader	2
Backhoe loader	1
Bulldozer	1
Excavator	2
Dump truck	2
Water truck	1
Off-highway truck	1
Grader	2
Bore/drill rig	1
Cement/mortar mixer	12
Crane	1
Portable pump and generator if dewatering is needed	1, 1
Roller compactor	1
Skid Steer	1

SOURCE: Marin Water 2023c

2.5.1.4 Staging and Laydown Areas

Construction staging, laydown, and worker parking would take place at existing parking/staging areas at Phoenix Lake and Bon Tempe Reservoir, shown on **Figure 2-5** and **Figure 2-6.** Staging at Phoenix Lake would be on an existing parking/staging area adjacent to the ranger house, which is located near the spillway. Staging at Bon Tempe Reservoir would be in the existing parking/staging area adjacent to Filter Plant Road. Staging also would be located adjacent to the transfer pump station, which is currently used for parking, and near the tunnel entrance which is currently used for material storage. No clearing would be required for any staging area. Staging would occur on previously developed land and would not necessitate vegetation removal.

This page intentionally left blank

Phoenix - Bon Tempe Connection Project
Phoenix Staging Location

2022/D2022002025.00 - MMWD Strategic Supplemental Water Supply/05 Graphics-GIS-Modeling-USE AZURE/Illustrator

SOURCE: Marin Water, 2023

MMWD Phoenix-Bon Tempe Project

Figure 2-5
Phoenix Lake Staging Area

ESA

Phoenix-Bon Tempe Connection Project
Bon Tempe Staging Location

N

Sky Oaks Rd

Pine Point Trl

Pumpkin Ridge Trl

Fish Gulch Trl

Fish Grade

Temporary Materials Storage Area

Filter Plant Rd

Cone Yard Rd

Sky Oaks Trl

Bon Tempe Channel Rd

Temporary Parking and Materials Storage Area

Pine Point Trl

Bon Tempe Reservoir

Shadyside Trl

Pilot Knob Trl

Lakeview Rd

0 200
Feet

2022/D2022002S.00 - MMWD Strategic Supplemental Water Supply/05 Graphics-GIS-Modeling-USE AZURE/Illustrator

SOURCE: Marin Water, 2023

MMWD Phoenix-Bon Tempe Project

Figure 2-6
Bon Tempe Reservoir Staging Area

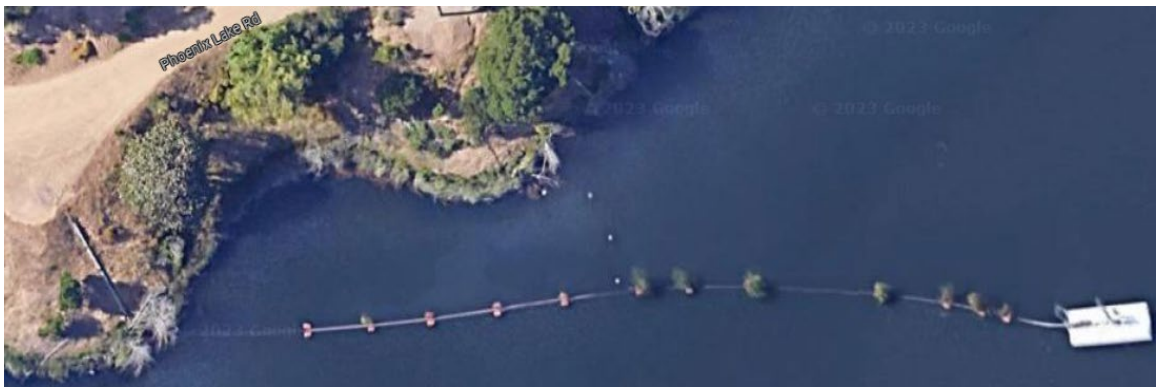
ESA

2.5.2 Construction Activities

Installation of the pipeline and new pump station would include the following construction techniques and activities (described from east to west):

- ***Segment A: Pump 1 Barge Pump Station in Phoenix Lake to Shoreline***. The 18-inch diameter pipeline would replace approximately 290 linear feet of existing pipeline in this segment. Like the existing pipeline (shown in **Figure 2-7**), the proposed pipeline would be suspended with floats within the reservoir, placed upon the shoreline, and undergrounded near the top of the reservoir shoreline. Pipeline installation within the reservoir would occur with the reservoir remaining in operation during installation.
- ***Segment B***: Marin Water would repurpose an existing pipeline in this segment of the alignment, so construction would be limited to connecting to segments A and C; no other work would occur within this segment.
- ***Segments C through E***: As indicated in **Table 2-2**, most of the pipeline would be installed using open-trench construction. For open-trench construction, the construction corridor (to accommodate the trench, materials, construction equipment and vehicles) would be approximately 12 feet wide in existing roadways; no roadways would be widened to accommodate project construction. The contractor would remove vegetation (described below), excavate a 2.5-foot wide by 4.5-foot-deep trench, install pipe bedding (sand), install the pipe, and backfill the trench with suitable excavated material or imported clean fill. The pipeline would be connected to Pump 2 at the location shown on **Figure 2-2**.
- ***Segment F:*** This segment of the alignment would be within an existing tunnel. The contractor would place a new pipeline next to the existing pipeline.

Construction at the Pump 2 site would include excavation, grading, paving, and construction of the pump station and appurtenant features. Some excavated materials may need to be hauled offsite.



SOURCE: ESA, 2023.

MMWD Phoenix-Bon Tempe Project

Figure 2-7
Replacement of Existing Pipeline Segment in Phoenix Lake

2.5.2.1 Site Preparation

During site preparation, trucks would deliver construction equipment and miscellaneous materials to the Project area and field offices would be set up.

2.5.2.2 Excavation and Soils

The Project would include excavation to construct Pump 2 and to install the new pipeline. Approximately 2,508 cubic yards (CY) of material are anticipated to be excavated during Project construction. Excavated material that would be reused on-site as backfill would be stored at the staging areas adjacent to Phoenix Lake and Bon Tempe Reservoir (see **Figure 2-5** and **Figure 2-6**). Excavated material that is contaminated or in excess would be disposed of at Redwood Landfill in Novato.

The pipeline would require approximately 1,000 CY of imported material in the trench to provide about 3 inches of sand along the pipeline.

2.5.2.3 Vegetation Removal

Construction could require the removal of approximately one tree as well as other existing vegetation along the pipeline route, depending on conditions once construction commences. The construction contractor would remove the tree or trim back vegetation as needed, in accordance with Marin Water's vegetation removal policies. As indicated above, no vegetation removal is anticipated to prepare the construction staging areas.

2.5.2.4 Dewatering and Water Use

Excavation would be required for Pump 2 and to install the pipeline. Dewatering may be necessary depending on the depth and time of year in which the excavation is conducted. Dewatering would involve the use of a portable pump and generator. Water from the trench (or Pump 2 construction site) would be returned to Phoenix Lake through Marin Water's standard procedures.

Approximately 30,000 gallons of water are anticipated to be used in construction activities. However, this is a conservative estimate since the amount of water needed for dust control would depend on weather, site conditions, and the contractor's schedule, means, and methods. The water would be supplied from off-site raw water hydrants and transported to the site via water truck, if needed.

2.5.3 Construction Traffic Routing

The primary entrance and exit route for construction traffic to Phoenix Lake would be via Sir Francis Drake Boulevard to Lagunitas Road through Natalie Coffin Greene Park. The primary entrance and exit route for construction traffic to Bon Tempe Reservoir would be via Sir Francis Drake Boulevard to Bolinas Road to Sky Oaks Road.

2.5.4 Standard Environmental Protection Measures

Marin Water has adopted a list of standard environmental protection measures that contractors must follow during construction (see **Appendix A**). These measures would help to minimize impacts to biological and cultural resources, reduce wildfire risks, and reduce the likelihood of an uncontrolled release of hazardous materials into the watershed. The environmental analysis assumes these measures would be implemented.

2.6 Operations and Maintenance

Phoenix Lake water would be moved to Bon Tempe Reservoir during dry years and up to three times a year during normal years. Pumping would occur continuously to convey up to 3 mgd of raw water for a total of up to 260 AF. For purposes of the environmental analysis, pumping is assumed to occur for approximately 28 days and would occur twice in one year (for a total of about 56 days), given the uncertainties of future dry year conditions. The water would only be conveyed during late fall to early winter and/or early to late spring but would not be conveyed during the summer or early fall when Phoenix Lake would not be able refill before the dry season.

Maintenance would include bi-annual testing of the pumps, which would require one to two workers traveling to the sites in a small passenger truck.

For information regarding anticipated changes in flows in Ross Creek under future with-project conditions, refer to Section 3.10, *Hydrology and Water Quality*.

2.7 Other Marin Water Projects

Under a separate project, Marin Water is maintaining and improving its internal roadway and trail network. To that end, Marin Water has been implementing a culvert maintenance program on Fish Grade Road since 2020, which physically overlaps with the proposed Phoenix-Bon Tempe Connection Project alignment. As of the writing of this document most of the culverts on Fish Grade Road have already been upgraded; however, several have yet to be improved. Although both projects would temporarily affect culverts on Fish Grade Road, the Phoenix-Bon Tempe Connection Project is independent of the roadway and trails management project.

2.8 Required Actions and Approvals

The Marin Water Board of Directors would be required to adopt the Mitigated Negative Declaration pursuant to CEQA prior to approving the Project. In addition, Marin Water would seek federal and state permits prior to construction as outlined in **Table 2-6**. After adopting the Mitigated Negative Declaration pursuant to CEQA, construction can occur on project components that do not require regulatory permits.

TABLE 2-6
REQUIRED PERMITS

Permit	Permitting Authority
Federal Permits	
Clean Water Act Section 404	U.S. Army Corps of Engineers
Section 106 National Historic Preservation Act	State Historic Preservation Officer
Section 7 Federal Endangered Species Act Consultation	U.S. Fish & Wildlife Service
State Permits	
Clean Water Act Section 401 Water Quality Certification	San Francisco Bay Regional Water Quality Control Board
Section 1601 et seq. Streambed Alteration Agreement	California Department of Fish and Wildlife

2.9 References

Marin Water. 2023a. Strategic Water Supply Assessment. Final Draft Report. Available at: https://www.marinwater.org/sites/default/files/2023-06/MMWD_SWSA_Final%20Draft%20Report.pdf. Accessed on May 2023.

_____. 2023b. "About Our Water System: Our Distribution System." Accessed online at: About Our Water System | Marin Water. Available at: https://www.marinwater.org/OurSystem. Accessed on October 9.

_____. 2023c. Personal communication between Marin Water and ESA re: estimated construction equipment. October 4.

CHAPTER 3
Initial Study

1.	**Project Title:**	Phoenix - Bon Tempe Connection
2.	**Lead Agency Name and Address:**	Marin Municipal Water District 220 Nellen Ave, Corte Madera, CA 94925
3.	**Contact Person and Phone Number:**	Elysha Irish
4.	**Project Location:**	Unincorporated Marin County
5.	**Project Sponsor's Name and Address:**	Marin Municipal Water District 220 Nellen Ave, Corte Madera, CA 94925
6.	**General Plan Designation(s):**	Open Space, and Agricultural and Conservation
7.	**Zoning:**	Open Area (OA)

8. Description of Project:

Marin Water proposes to convey water from Phoenix Lake to Bon Tempe Reservoir through dedicated raw water transmission and pumping facilities on Marin Water's watershed property. See Chapter 2.

9. Surrounding Land Uses and Setting:

The Project site is within the Mount Tamalpais Watershed owned by Marin Water and managed primarily for water collection and storage.

10. Oher public agencies whose approval is required:

California Department of Fish and Wildlife; San Francisco Regional Water Quality Control Board; U.S. Army Corps of Engineers; State Historic Preservation Officer; U.S. Fish & Wildlife Service

11. Have California Native American Tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

Marin Water contacted Graton Rancheria on October 12, 2023, to see if the Tribe wanted to consult on the Project. On October 30, 2023, the Tribe initiated consultation. Marin Water sent Project and site information on November 9, 2023. After multiple communications, Marin Water closed tribal consultation on January 29, 2024. However, Marin Water will coordinate with the Tribe if there are any inadvertent discoveries during construction.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

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

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

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

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

Signature

03/11/2024
Date

Environmental Checklist

3.1 Aesthetics

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☒

3.1.1 Discussion

Following construction, the pipeline would largely be buried or would otherwise not be visible to the public. Permanent above-ground facilities are limited to Pump Station 2, which would be constructed adjacent to the existing Phoenix Transfer Pump Station (see **Figure 2-4** in Chapter 2). Public views of the Project area would not be affected since vegetation removal would be limited.

a) **Less-than-Significant Impact.** The Marin Countywide Plan identifies Ridge and Greenbelt areas as sensitive and includes several design strategies within goal DES-4 to protect visually prominent ridgelines and identifies Ridge and Upland Green Areas (Marin County, 2007) but does not identify individual scenic vistas. The Project area is within view of a prominent ridgeline; however, due to the nature of the Project site and immediate area, it is not within a scenic vista. The Project site is visible near Phoenix Lake at Bill Williams Road to the east, Worn Spring Road to the north, and Eldridge Grade to the west, and visible near Bon Tempe Reservoir at Sky Oaks Road, Fish Grade Road to the east and Bon Tempe Dam Road to the north. All roads in the Project vicinity are publicly accessible. Due to the density of trees and the steep topography surrounding the site, the Project would not be seen within the context of a scenic vista. Further, while the Project includes the construction of a new pipeline, the alignment would mostly follow existing trails and fire roads. Thus, the Project would not substantially affect views from scenic vistas as designated by Marin County. This impact would be less than significant.

b) **No Impact.** In Marin County, Caltrans-designated State Scenic and Eligible State Scenic Highways include portions of US Highway 101 and State Route 37 in the vicinity of the city of Novato. None of these highways are visible in the vicinity of the Project site. There would be no impact under this criterion.

c) **Less-than-Significant Impact.** The Project is within a non-urbanized area (managed watershed land) and located adjacent to trails, reservoirs, ridges, and hillsides primarily along Fish Grade Road, which is available to the public for use as a non-motorized trail. Any views of the Project area from Bill Williams Road, Worn Spring Road, Eldridge Grade, Sky Oaks Road, and Bon Tempe Dam Road would be obstructed due to intervening vegetation and topography. The existing site is largely within an undeveloped forest, set within watershed lands crossed by trails and with water infrastructure in place. During the two 6-month construction phases, construction activities would be visible by trail users passing the site and would be seen as contrasting with the surrounding forested lands. However, once trail users move past the immediate site, the Project would recede from view. Although the Project area is in a natural setting, the relatively limited public viewing opportunities and view duration would not create substantial visual contrast with the surrounding areas. The visual character or quality of the site or its surroundings would not be substantially degraded with the presence of this Project. This impact would be less than significant.

d) **No Impact.** There are minimal sources of existing light in the Project vicinity, due to the undeveloped nature of the area. The proposed Project would not include temporary or permanent lighting. Therefore, there would be no light or glare impacts.

3.1.1.1 References

Marin County. 2007. Marin Countywide Plan. Marin County Community Development Agency. November 6, 2007. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update.pdf. Accessed November 27, 2023.

3.2 Agriculture and Forestry Resources

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

3.2.1 Discussion

a) **No Impact.** The Project site is not zoned for agricultural use and does not include Prime Farmland, Unique Farmland, or Farmland of Statewide (or Local) Importance. The Project does not propose to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. The Project site would be constructed just outside of the town of Ross in unincorporated Marin County and is designated as Other Land and Water Area by the California Department of Conservation (DOC, 2022). No Project components or staging areas would occur on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance and there would be no conversion to non-agriculture use. Therefore, there would be no impact.

b) **No Impact.** The Project site is not located on any land used for agriculture or zoned for agricultural use. The site and surrounding areas are zoned as Open Area and no agricultural lands conserved under the Williamson Act are present (Marin County, 2022). Project construction and staging also would not be located in or near existing zoning for agricultural use; therefore, the Project would not conflict with existing zoning for agricultural use or an active Williamson Contract and there would be no impact.

c) **No Impact.** The Project site is steep and is surrounded by existing woodland. The Project area is managed watershed land and is not used for timber production. The woodland is not zoned for forestland, timberland, or zoned Timberland Production, therefore; there would be no impact (Marin County, 2022).

d) **No Impact.** Project construction would require limited vegetation removal on site. After the completion of the Project, vegetation would grow back and would restore the site largely to pre-construction conditions. As discussed in item c), the Project site is not zoned for forestland and would remain in the current land use of managed watershed lands; therefore, the Project would not convert forestland to non-forest use and there would be no impact.

e) **No Impact.** As discussed above, the Project site and the surrounding areas would not be designated or zoned for any type of farmland or forestland. The Project would not involve any other changes in the existing environment that could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. For these reasons, the Project would have no impact.

3.2.1.1 References

California Department of Conservation (DOC). 2022. California Important Farmland Finder. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed October 30, 2023.

DOC. 1997. California Agricultural Land Evaluation and Site Assessment Model. Available at: https://www.conservation.ca.gov/dlrp/Documents/lesamodl.pdf. Accessed December 22, 2023.

Marin County. 2022. MarinMap Map Viewer. Available at: https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer. Accessed October 30, 2023.

3.3 Air Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) 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?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

3.3.1 Environmental Setting

The Project site is in Marin County and is within the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). Development projects can contribute to a region's adverse air quality impacts on a cumulative basis, so the BAAQMD considers the emission levels for which a project's individual emissions would be cumulatively considerable when developing thresholds of significance for air pollutants. The significance thresholds used for the Project's construction and operational impact analyses are based on thresholds set in the BAAQMD's CEQA Guidelines (BAAQMD, 2023).

Criteria Air Pollutants

Criteria air pollutants are a group of common air pollutants for which the U.S. Environmental Protection Agency (EPA) has set national ambient air quality standards (NAAQS). These pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) that is 10 microns or less in diameter (PM_{10}), PM that is 2.5 microns or less in diameter ($PM_{2.5}$), and lead. Most of the criteria pollutants are emitted as primary pollutants. Ground level ozone, however, is a secondary pollutant that is formed in the atmosphere by chemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROG) in sunlight. In addition to the criteria air pollutants identified by the EPA, California has added four state criteria air pollutants (visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride) to the California ambient air quality standards (CAAQS). The SFBAAB is designated as a non-attainment area with respect to the state and federal 8-hour ozone standards, the state 1-hour ozone standard, the state 24-hour PM_{10} standard, the state annual PM_{10} standard, the federal 24-hour $PM_{2.5}$ standard, and the state annual $PM_{2.5}$ standard. The SFBAAB is designated as an attainment area, or unclassified, relative to all the other criteria pollutant standards.

Toxic Air Contaminants

Toxic air contaminants (TACs) are state-designated, airborne substances that cause short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations, as well as heavy-duty trucks and heavy equipment. The current California list of TACs includes nearly 200 compounds, including diesel particulate matter (DPM) exhaust emissions from diesel-fueled engines (California Air Resources Board [CARB], 2023).

Sensitive Receptors

For the purposes of this air quality analysis, sensitive receptors are defined as facilities and land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these types of land uses include schools, hospitals, and daycare centers. Residential areas are also considered sensitive for poor air quality because these sensitive individuals could be present there, and people usually stay home for extended periods of time, so there is greater exposure to potentially harmful air quality. There is a ranger residence approximately 400 feet northeast of the Pump 2 location.

In the most recent CEQA Guidelines, BAAQMD recognizes offsite workers as receptors that need to be considered in the analysis of health risks (BAAQMD, 2023). There are no worker receptors within 1,000 feet of the Project site. The nearest offsite worker receptors are located approximately 0.65 mile northeast of the Project site.

3.3.1.1 Discussion

a) **Less-than-Significant Impact.** The 2017 Clean Air Plan (BAAQMD, 2017) is the current air quality plan for the SFBAAB. The primary goal of the 2017 Clean Air Plan is to protect public health by achieving attainment of air quality standards. The plan includes a wide range of control measures, which consist of actions to reduce non-attainment pollutants and achieve state and federal ambient air quality standards for ozone and PM. BAAQMD guidance states that "if approval of a Project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the Project would be considered to be consistent with the Clean Air Plan" (BAAQMD, 2023).

Construction activity measures in the 2017 Clean Air Plan include measures TR 19 (Medium and Heavy Duty Trucks), and TR 22 (Construction, Freight, and Farming Equipment). TR 19 requires BAAQMD to provide and encourage other organizations to provide incentives for the purchase of new lower-emission trucks, while TR 22 requires BAAQMD to provide incentives for the deployment of Tier 3 and Tier 4 off-road engines used for construction. Implementation of these measures is the responsibility of the BAAQMD and, therefore, is not applicable to the Project.

Measures in the 2017 Clean Air Plan that would be applicable to local planning actions would only apply to Project operations; however, operation of the Project would only require bi-annual maintenance trips in a passenger truck and is anticipated to generate nominal criteria pollutant emissions.

As discussed in Impact b) below, the Project would result in a net increase in emissions of criteria pollutants that would not exceed the significance thresholds for ROG, NOx, PM_{10}, and $PM_{2.5}$. Thus, criteria air pollutants emissions that would be generated from construction and operation of the Project would not conflict with the 2017 Clean Air Plan. Additionally, as discussed under Impact c), the Project would not generate a significant impact with regard to health risk for sensitive receptors or workers.

The Project would not generate emissions that would exceed the BAAQMD thresholds of significance for criteria air pollutants and would support the goals of the 2017 Clean Air Plan. Furthermore, the measures included in the 2017 Clean Air Plan fall under the responsibility of BAAQMD for implementation, and are otherwise not applicable to the Project, nor would the Project conflict with or hinder these measures. Therefore, the Project would be consistent with the 2017 Clean Air Plan and the impact would be less than significant.

Construction

b) **Less-than-significant Impact.** Criteria air pollutants from the construction phase of the Project would be generated primarily from the operation of heavy-duty equipment such as excavators, cranes, and forklifts as well as construction vehicles used to transport workers, equipment, and materials. Criteria air pollutant emissions from equipment and on-road vehicle exhaust were estimated using the California Emissions Estimator Model (CalEEMod; version 2022.1.1.20); modeling output files are included in **Appendix B**. Construction would take place over two 6-month periods. Project-specific data for construction schedule and phasing, construction equipment types and numbers, and volume of imported and exported material were provided by Marin Water and were used in the model to estimate emissions from construction. Model defaults were used where Project-specific data was unavailable, and the defaults are listed below:

- Number of days off-road equipment will be used in each phase
- Hours per day of equipment use
- Horsepower and engine tier for all off-road equipment
- Number of daily worker trips, vendor trips, and haul truck trips

The total emissions that would be generated over the duration of construction were divided by the number of construction days for each partial construction year to determine average daily emissions for each construction year. Consistent with BAAQMD guidance, only exhaust emissions from equipment and construction vehicles are presented in **Table 3-1**. As shown in the table, emissions of ozone precursors ROG and NOx as well as PM_{10} and $PM_{2.5}$ would all be below their respective significance

thresholds. Therefore, the Project's impact with respect to criteria pollutant emissions from construction would be less than significant.

TABLE 3-1
AVERAGE DAILY CONSTRUCTION-RELATED CRITERIA POLLUTANT EMISSIONS
(POUNDS PER DAY)

Project Average Daily Construction Emissions by Year	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
2024	6.2	52.1	2.2	2.0
2025	5.3	43.0	1.8	1.7
2026	5.5	40.0	1.8	1.8
BAAQMD Threshold for Significant Construction Impacts	54	54	82	54
Potential Significant Impact?	No	No	No	No

SOURCE: ESA (Appendix B)

Operations

c) **Less-than-significant Impact.** Once the pump station is operational, there would be associated recurring maintenance activities. Maintenance would include bi-annual testing of the pumps and would require one to two workers traveling to the sites in a small passenger truck. Vehicle trips would occur infrequently, and emissions generated would be negligible. Therefore, the Project's impact with respect to criteria pollutant emissions from operations would be less than significant.

d) **Less-than-Significant Impact.** Construction equipment and associated heavy-duty truck traffic generate DPM, a component of diesel exhaust identified as a TAC by the CARB. DPM emissions from construction may pose health risks to sensitive receptors. Although there is a full-time ranger residence adjacent to Pump 2, there are no other sensitive receptors near the Project site, which is zoned for open space uses. The nearest substantial sensitive receptor population is a residential community located approximately 0.75 mile southeast of the Project area, and the nearest worker receptor is located approximately 0.65 mile northeast of the Project Area; these are both outside the 1,000-feet zone the BAAQMD considers as the "zone of influence" for the evaluation of TAC impacts from sources. Pipeline construction would progress in a linear way away from the ranger residence and would not expose the adult receptor to emissions from the entirety of construction activities. Construction of Pump 2 station would occur over 8 weeks, and would consist of typical building construction such as framing, siding and interior finishing. Given the low levels of maximum annual PM_{10} exhaust emissions (2.2 pounds per day) and the general nature of construction, DPM concentrations and associated health risks to the nearest receptor from Project construction would be less than significant.

Given that there is only one sensitive receptor within 1,000 feet of the pump stations and transmission pipeline alignment and the low level of emissions associated with the intermittent nature of operational and maintenance activities, health risk impacts to sensitive receptors from Project operation would be less than significant.

e) **Less-than-Significant Impact.** Odors are generally regarded as an annoyance rather than a health hazard, and an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. People can have different reactions to the same odor. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, headache). The occurrence and severity of odor impacts depends on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

During construction, the use of diesel-powered vehicles and equipment could temporarily generate localized odors from combustion exhaust; however, these odors would be temporary and would cease upon completion of construction activities. Because there are no sensitive receptors in the vicinity of the Project site, the Project's odor impact during construction would be less than significant.

The BAAQMD CEQA Guidelines identify land uses that have potential to generate continuous odorous impacts and odor complaints during operation. These land uses include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants (BAAQMD, 2023). The Project would consist of a pump station and water transmission pipelines, and the Project would not include any of the land uses identified by the BAAQMD as common odor sources. Therefore, the Project's operational impact with respect to odors would be less than significant.

3.3.1.2 References

Bay Area Air Quality Management District (BAAQMD). 2017. *Final 2017 Clean Air Plan*. Available at: baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?rev=8c588738a4fb455b9cabb27360409529&sc_lang=en. Accessed November 2023.

BAAQMD. 2023. *BAAQMD CEQA Guidelines*. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-5-Project-air-quality-impacts_final-pdf.pdf?rev=de582fe349e545989239cbbc0d62c37a&sc_lang=en. Accessed November 2023.

California Air Resources Board (CARB). 2023. *CARB Identified Toxic Air Contaminants*. Available at: https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants. Accessed November 2023.

3.4 Biological Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4.1 Discussion

a) **Less-than-Significant Impact with Mitigation.** Database searches of the California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and U.S. Fish and Wildlife Service (USFWS) species lists were conducted within the San Rafael, Bolinas, San Geronimo and Novato USGS 7.5-minute quads surrounding the Project alignment to identify reported occurrences of special-status species (CDFW, 2023a; USFWS, 2023). ESA biologists conducted a reconnaissance-level site survey on October 25, 2023 and a follow-up survey on January 11, 2024, to characterize existing conditions and determine the potential for the occurrence of special-status species. **Table 3-2** summarizes the potential for special-status species to occur in the study area, which includes the pipeline alignment, the reservoirs, pump stations, and the downstream portion of Ross Creek influenced by Phoenix Lake overflow. No special-status species were observed during the site visits. Detailed below is a summary of findings and proposed mitigation measures to reduce potential significant impacts on special-status species to a less-than-significant level.

TABLE 3-2
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PHOENIX – BON TEMPE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence on the Alignment
Invertebrates			
Western bumble bee (*Bombus occidentalis*)	--/SCE	Found in any area with sufficient flowers for nutrition, and underground burrows for nest for the queen.	**Low.** Forested areas have limited suitable habitat for this species.
Monarch butterfly (*Danaus plexippus plexippus*) (overwintering sites)	FC/--	Monarch butterfly breeding and larval habitat is on milkweed plants in open fields and meadows. During winter it stays in colonies in eucalyptus, Monterey cypress and other trees in California and at high altitudes in Mexico.	**Low.** Lack of suitable habitat for wintering monarchs.
California freshwater shrimp (*Syncaris pacifica*)	FE/SE	Shallow pools away from main streamflow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**Absent.** Stream and pool habitat not found on-site.
Fish			
Coho salmon *Oncorhynchus kisutch* Central California Coast ESU	FE/SE/--	CCC ESU includes populations south of Punta Gorda, California to and including Aptos Creek, as well as San Francisco Bay. Larger rivers serve as migration pathways for adults; juveniles rear in smaller tributaries. Require beds of loose, coarse gravel for spawning plus cover, cool water with sufficient dissolved oxygen.	**Not Present.** Extant spawning run in Lagunitas Creek below dam. Not present in Ross Creek or in any Marin Water reservoir.
Steelhead *Oncorhynchus (=Salmo) mykiss irideus* Central California Coast DPS	FT/--	Spawns and rears in coastal streams between the Russian River in Sonoma County and Soquel Creek in Santa Cruz County, as well as in drainages tributary to San Francisco Bay where gravelly substrate and shaded riparian habitat occurs.	**Low.** Extant spawning run in Lagunitas Creek and occasionally found in Ross Creek (CDFW 2023).
Amphibians			
California giant salamander (*Dicamptodon ensatus*)	--/SSC	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically, adults use mammal burrows.	**Moderate**. Nearby records in watershed, and suitable woodland habitat along creeks.
California red-legged frog (*Rana draytonii*)	FT/SSC	Streams, freshwater pools, and ponds with overhanging vegetation. Also found in woods adjacent to streams. Requires permanent or ephemeral water sources such as reservoirs and slow-moving streams and pools of >0.5 m depth for breeding.	**Low**. Nearest records in Lagunitas Creek watershed approximately 5 miles from alignment.
Foothill yellow-legged frog (*Rana boylii*)	--/SSC	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats; requires at least some cobble-sized substrate for egg-laying.	**Moderate**. Recent occurrence in San Anselmo Creek headwaters. Potential to be found in perennial aquatic habitats on alignment, though areas subject to disturbance.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence on the Alignment
Reptiles			
Northwestern pond turtle (*Actinemys marmorata marmorata*)	FPT/SSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation <6,000' in elevation. Require basking area and upland habitat for egg laying (sandy banks and open, grassy fields).	**High**. Present in Phoenix and Bon Tempe reservoirs, with potential to disperse into nearby streams.
Birds			
Northern spotted owl (*Strix occidentalis caurina*)	FT/ST	In Marin County, northern spotted owls nest in secondary-growth redwood and fir forests, featuring dense canopy closure of mature trees, abundant logs, standing snags, and live trees with broken tops.	**Present.** Northern spotted owl activity centers throughout watershed, including along Concrete Pipe Rd. and Eldridge Grade Rd. near alignment.
Burrowing owl (*Athene cunicularia*)	--/SSC	Nests and forages in low-growing grasslands with burrowing mammals.	**Low**. Project route is too forested and steep to provide suitable habitat for this species.
Northern harrier (*Circus cyaneus*)	--/SSC	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**Low.** Marsh vegetation not found on-site.
White-tailed kite (*Elanus leucurus*)	--/CFP	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	**Low.** Project site is forested, but species may nest or forage in vicinity.
American peregrine falcon (*Falco peregrinus anatum*)	BCC/CFP	Nest consists of a scrape or a depression on rock, cliff or building ledge over an open site.	**Low.** Suitable foraging habitat on-site, but nesting habitat is not present.
Black swift (*Cypseloides niger)*	BCC/SSC	Occur in wide range of habitats, but nest in specialized sites, in forested areas near rivers, often behind waterfalls or on damp cliffs.	**Low.** Species may fly over site but no nesting habitat is present.
California black rail (*Laterallus jamaicensis*)	BCC/ST/CFP	Found in salt, brackish and freshwater marsh with dense vegetation for nesting habitat.	**Absent.** Marsh vegetation not found on-site.
California Ridgway's rail (*Rallus obsoletus obsoletus)*	FE/SE/CFP	Found in salt and brackish marsh with well-defined tidal channels and dense growth of pickleweed; feeds on invertebrates in mud-bottomed sloughs.	**Absent.** Marsh vegetation not found on-site.
Western snowy plover (*Charadrius alexandrines nivosus*)	FT/SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Absent.** Sandy, gravelly soil habitat not found on-site.
Salt-marsh common yellowthroat (*Geothylpis thrichas sinuosa*)	--/SSC	In brackish and saline tidal marsh habitat around San Francisco Bay, associated with a high percent cover of rushes (*Scirpus* spp.), Peppergrass (*Leipidium latifolium*), and *Juncus spp.*	**Absent.** Marsh vegetation not found on-site.
Bank swallow (*Riparia riparia*)	--/ST	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**Absent.** Suitable bank habitat not found on-site.
San Pablo song sparrow (*Melospiza melodia samuelis*)	BCC/SSC	Inhabits tidal sloughs in the *Salicornia* marshes; nests in *Grindelia* bordering slough channels.	**Absent.** Marsh vegetation not found on-site.
California least tern (*Sternula antillarum browni*)	FE/SE	Nest on beaches, mudflats, and sand dunes, usually near shallow estuaries and lagoons with access to open ocean.	**Absent.** Suitable beach and dune habitat is not present on-site.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence on the Alignment
Mammals			
Pallid bat (*Antrozous pallidus*)	--/SSC/ WBWG High	Grasslands, shrublands, woodlands, and forests. Common in arid regions with rocky outcroppings, particularly near water. Roosts in rock crevices, buildings, and under bridges; may also roost in trees. Very sensitive to disturbance.	**Moderate**. May forage over site, but suitable roost habitat is limited. Nearby occurrences in watershed.
Hoary bat (*Lasiurus cinereus*)	--/--/ WBWG Medium	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths.	**Moderate**. Suitable tree roosting habitat present on-site and in the vicinity. Nearby occurrences in watershed.
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/SSC/ WBWG High	Montane forests, herbaceous, shrub, and open stages of most habitats with dry, friable soils. Roosts in caves and cave-like settings; sensitive to disturbance.	**Moderate (foraging only)**. May forage over site but suitable roost habitat not present.
Salt marsh harvest mouse (*Reithrodontomys raviventris*)	FE/SE/CFP	Pickleweed is primary habitat but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow, builds loosely organized nests. Requires higher areas for flood escape.	**Absent.** No marsh vegetation on-site.
American badger (*Taxidea taxus*)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**Low.** Grassland has suitable habitat for badger burrows but is close to busy trails. No suitable burrows seen during surveys.
Point Reyes mountain beaver (*Aplodontia rufa phaea*)	--/SSC	Burrows in cool, moist, north-facing slopes in moderately dense coastal scrub in Point Reyes.	**Absent.** Project site outside of subspecies' known range.
Plants			
Napa false indigo (*Amorpha californica* var. *napensis*)	--/--/1B.2	Broad-leafed upland forest, chaparral, or cismontane woodland. Blooms April - July. Elevation up to 2000 meters.	**High.** Nearby occurrences in evergreen forest habitat.
Bent-flowered fiddleneck (*Amsinckia lunaris*)	--/--/1B.2	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub. Blooms March – June. Elevation up to 500 meters.	**Moderate.** Nearby occurrences in watershed; Project site contains suitable montane woodland habitat.
Mt. Tamalpais manzanita (*Arctostaphylos montana* subsp. *montana*)	--/--/1B.3	Serpentine chaparral. Blooms February - April. Elevation ranges from 250 – 800 meters.	**Low.** Nearby occurrences in watershed, but serpentine habitat not present.
Marin manzanita (*Arctostaphylos virgata*)	--/--/1B.2	Sandstone, granite outcrops in chaparral, and conifer forests. Blooms December - March. Elevation up to 500 meters.	**Low.** Site lacks suitable chaparral habitat.
Coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*)	--/--/1B.2	Coastal marshes, seeps, and adjacent sand. Blooms June – September. Elevation up to 150 meters.	**Absent.** Site lacks marsh habitat and is outside species' known distribution.
Thurber's reed grass (*Calamagrostis crassiglumis*)	--/--/2B.1	Mesic coastal scrub, freshwater marshes and swamps. Blooms May - August. Elevation ranges from 10 – 60 meters.	**Absent.** No marsh habitat on-site.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence on the Alignment
Seaside bittercress *Cardamine angulate*	--/--/2B.1	Wetland-riparian areas in mixed evergreen forest	**Low.** No wetland or riparian habitat on-site.
Lyngbye's sedge *Carex lyngbye*	--/--/1B.1	Found in coastal salt marsh habitat. Blooms April – August.	**Absent.** No marsh habitat on-site.
Tiburon paintbrush (*Castilleja affinis* var. *neglecta*)	FE/ST/1B.2	Open serpentine grassland slopes. Blooms April – June. Elevation ranges from 60 – 400 meters.	**Low.** Site lacks serpentine grassland habitat.
Nicasio ceanothus (*Ceanothus decornutus*)	--/--/1B.2	Open, rocky serpentine slopes and ridges Blooms March – May. Elevation ranges from 235 - 290 meters.	**Low.** Site lacks serpentine slopes and ridges.
Mason's cceanothus Ceanothus masonii	--/--/1B.2	Chaparral (openings, rocky, serpentinite). Elevation 230-500 meters. Blooms March – April.	**Low.** Site lacks serpentine chaparral.
Point Reyes bird's-beak (*Chloropyron maritimum* subsp. *palustre*)	--/--/1B.2	Coastal salt marsh. Blooms May – October. Elevation up to 10 meters.	**Absent.** No marsh habitat on-site.
San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*)	--/--/1B.2	Sand. Blooms April – July. Elevation up to 300 meters.	**Absent.** No sand habitat on-site.
Mt. Tamalpais thistle (*Cirsium hydrophilum* var. *vaseyi*)	--/--/1B.2	Serpentine seeps. Blooms June – September. Elevation ranges from 300 – 450 meters.	**Low.** Site is dry and lacks serpentine.
Round-headed Chinese houses (*Collinsia corymbosa*)	--/--/1B.2	Coastal sand dunes. Blooms April – June. Elevation up to 20 meters.	**Absent.** No sand dunes present on-site.
Western leatherwood (*Dirca occidentalis*)	--/--/1B.2	North or northeastern facing slopes, mixed-evergreen forest to chaparral, generally in fog belt. Blooms November to March. Elevation ranges from 50 – 400 meters.	**Moderate.** Suitable forest edge habitat present. Nearby occurrences in watershed.
Tiburon buckwheat *(Eriogonum luteolum* var. *caninum*)	--/--/1B.2	Serpentine. Blooms May - September. Elevation up to 700 meters.	**Low.** Nearby occurrence from 1975; no serpentine habitat on-site.
Minute pocket moss (*Fissidens pauperculus*)	--/--/1B.2	Damp coastal soil within conifer forests. Elevation ranges from 10 - 1024 meters.	**Low.** No suitable soil present on-site
Fragrant fritillary (*Fritillaria liliacea*)	--/--/1B.2	Heavy soils on open hills and fields near the coast. Blooms from February - April. Elevation up to 400 meters.	**Low.** No suitable open coastal habitat present on-site.
Marin checker lily (*Fritillaria lanceolata* var. *tristulis*)	--/--/1B.1	Coastal scrub, prairie and woodland. Blooms February – May. Elevation ranges from 15-150 meters.	**Low.** Forest and non-native grassland on-site provide marginally suitable habitat.
Diablo helianthella (*Helianthella castanea*)	--/--/1B.2	Open, grassy areas. Blooms April – June. Elevation ranges from 60 – 1,300 meters.	**Low.** No suitable open habitat present on-site.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence on the Alignment
Congested-headed hayfield tarplant (*Hemizonia congesta* subsp. *congesta*)	--/--/1B.2	Grassy sites and marsh edges. Blooms April – November. Elevation up to 560 meters.	**Moderate.** Suitable grassy habitat along alignment.
Marin western flax (*Hesperolinon congestum*)	FT/ST/1B.1	Serpentine grassland. Blooms April – August. Elevation up to 200 meters.	**Low.** Site lacks serpentine soil habitat.
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/SE/1B.1	Clay soils in grassy areas. Blooms June – November. Elevation up to 200 meters.	**Low.** Site lacks clay soil habitat.
Thin-lobed horkelia (*Horkelia tenuiloba*)	--/--/1B.2	Sandy soils within open chaparral. Blooms April – July. Elevation ranges from 50 – 500 meters.	**Low.** Site lacks sandy soil habitat.
Blue coast gilia (*Gilia capitata subsp. chamissonis*)	--/--/1B.1	Coastal sand hills. Blooms April – June. Elevation up to 185 meters.	**Absent.** No sand dune habitat on-site.
Woolly-headed gilia *Gilia capitata ssp. tomentosa*	--/--/1B.1	Coastal bluff scrub, valley and foothill grassland, rocky outcrops, serpentinite. Elevation 10 - 220 meters. Blooms May – July.	**Low.** Site lack scrub or grassland habitat.
Dark-eyed gilia (*Gilia millefoliata*)	--/--/1B.2	Stabilized coastal dunes. Blooms March – July. Elevation up to 10 meters.	**Absent.** No sand dune habitat on-site.
Small groundcone (*Kopsiopsis hookeri*)	--/--/2B.3	Open woodland or mixed conifers, generally on *Gaultheria shallon*, and occasionally on either *Arbutus menziesii* or *Arctostaphylos uva-ursi*. Blooms April – August. Elevation ranges from 120 – 1,435 meters.	**Low.** Host plant species not present on-site.
Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*)	--/--/1B.2	Thin, gravelly soils of serpentine outcrops and roadcuts. Blooms July – October. Elevation from 60 – 305 meters.	**Moderate.** Roadcut habitat present on alignment. Nearby occurrences in watershed.
Marsh microseris (*Microseris paludosa*)	--/--/1B.2	Moist grassland and open woodland. Blooms April – June. Elevation up to 300 meters.	**Low.** Moist grassland habitat not present on-site.
Marin County navarretia (*Navarretia rosulata*)	--/--/1B.2	Rocky serpentine areas. Blooms May – July. Elevation from 200 – 600 meters.	**Low.** Serpentine habitat not present on-site.
White-rayed pentachaeta (*Pentachaeta bellidiflora*)	FE/SE/1B.1	Valley grasslands. Blooms March – May. Elevation up to 620 meters.	**Low.** Site lacks suitable grassland habitat.
Hairless popcornflower (*Plagiobothrys glaber*)	--/--/1A	Wet, saline to alkaline soils in valleys and coastal marshes. Blooms March – May. Elevation up to 100 meters.	**Absent.** Presumed extinct in California.
North Coast semaphore grass (*Pleuropogon hooverianus*)	--/ST/1B.1	Wet grassy areas. Blooms March – June. Elevation up to 1,300 meters.	**Moderate.** Suitable wet grassy habitat along reservoirs. Nearby occurrences in watershed.
Marin knotweed (*Polygonum marinense*)	--/--/3.1	Coastal salt and brackish marshes, swamps. Blooms April – August. Elevation up to 10 meters.	**Absent.** No marsh habitat on-site.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence on the Alignment
Tamalpais oak (*Quercus parvula* var. *tamalpaisensis*)	--/--/1B.3	Understory of conifer woodlands. Blooms March – April. Elevation from 100 – 750 meters.	**Moderate.** Nearby occurrences in watershed.
Point Reyes checkerbloom (*Sidalcea calycosa* subsp. *rhizomata*)	--/--/1B.2	Freshwater marshes. Blooms May – July. Elevation up to 30 meters.	**Low.** No marsh habitat on-site. Nearby occurrence from "San Anselmo Canyon" dated 1922.
Marin checkerbloom (*Sidalcea hickmanii* subsp. *viridis*)	--/--/1B.1	Dry ridges near coast in serpentine areas. Blooms May – June. Elevation ranges from 50 – 430 meters.	**Low.** No serpentine habitat present on-site
Santa Cruz microseris (*Stebbinsoseris decipiens*)	--/--/1B.2	Open, sandy, shale, or serpentine areas. Blooms April – May. Elevation ranges from 10 – 500 meters.	**Low.** No serpentine habitat present on-site.
Mt. Tamalpais jewelflower (*Streptanthus batrachopus*)	--/--/1B.3	Serpentine barrens and chaparral. Blooms April – July. Elevation ranges from 335 – 670 meters.	**Low.** No serpentine habitat present on-site.
Mt. Tamalpais bristly jewelflower (*Streptanthus glandulosus ssp. pulchellus*)	--/--/1B.2	Dry, open grassland, chaparral, open conifer/oak woodland; occasionally serpentine. Blooms May – August. Elevation ranges from 125 – 670 meters.	**Low.** Recent nearby occurrence, but no serpentine grassland habitat on-site.
Two-fork clover (*Trifolium amoenum*)	FE/--/1B.1	Moist, heavy soils in disturbed areas, coastal bluff scrub, and grassland. Blooms April – June. Elevation ranges from 5 – 415 meters.	**Moderate.** Recorded in Phoenix Lake area.

NOTES:

Status Codes:
USFWS (U.S. Fish and Wildlife Service)
- FE = Listed as Endangered by the Federal Government
- FT = Listed as Threatened by the Federal Government.
- FC = Listed as Candidate
- FPT = Federal Proposed Threatened

CDFW (California Department of Fish and Wildlife)
- SE = State Listed as Endangered in California
- ST = State Listed as Threatened in California
- SCE = State Candidate Endangered in California
- CFP = California Fully Protected species
- SSC = Species of Special Concern
- WBWG = Western Bat Working Group High/Medium Priority Species

California Native Plant Society:
List 1A=Plants presumed extinct in California
List 1B=Plants rare, Threatened, or Endangered in California and elsewhere
List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere
List 3= Plants about which more information is needed
List 4= Plants of limited distribution

An extension reflecting the level of threat to each species is appended to each rarity category as follows:
- .1 – Seriously endangered in California
- .2 – Fairly endangered in California
- .3 – Not very endangered in California

Potential to Occur Categories:
- Absent = The Project and/or immediate vicinity does not support suitable habitat for a particular species. Project site may be outside of the species' known range.
- Low Potential = The Project and/or immediate vicinity only provides limited habitat. In addition, the species' known range may be outside of the Project site.
- Moderate Potential = The Project and/or immediate vicinity provides suitable habitat.
- High Potential = The Project and/or immediate vicinity provides ideal habitat conditions or the species has been observed.
- Present = Species has been recorded within the Project Site or immediate vicinity.

Sources: California Department of Fish and Wildlife (CDFW), California Natural Diversity Data Base, 2023, San Rafael, Bolinas, San Geronimo and Novato USGS 7.5 minute quads. Available online at http://dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp; California Native Plant Society, Inventory or Rare, Threatened and Endangered Plants of California, 2023. Available online at http://www.rareplants.cnps.org/; U.S. Fish and Wildlife Service (USFWS), iPac Information for Planning and Conservation. Online database powered by ECOS Environmental Conservation Online System, 2023. Available online at https://ecos.fws.gov/ipac/.

Impacts on Special-Status Plant Species

Numerous special-status plant species have been documented within 3 miles of the study area (**Figure 3-1**). Eight special-status plant species described in **Table 3-1** have a moderate or higher potential to occur in the study area: Napa false indigo (*Amorpha californica* var. *napensis*), bent-flowered fiddleneck (*Amsinckia lunaris*), western leatherwood (*Dirca occidentalis*), congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*), Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*), North Coast semaphore grass (*Pleuropogon hooverianus*), Tamalpais oak (*Quercus parvula* var. *tamalpaisensis)* and two-fork clover (*Trifolium amoenum*). Of these, two-fork clover is listed as federally endangered, North Coast semaphore grass is listed as state threatened, and the remaining six plants are California Rare Plant Rank 1B species (rare, threatened, or endangered in California and elsewhere). These species occur within habitats including conifer or mixed evergreen forest, wet grassland, and disturbed road cuts, all of which are found along the proposed pipeline alignment, and all have nearby occurrences in the CNDDB (CDFW, 2023a).

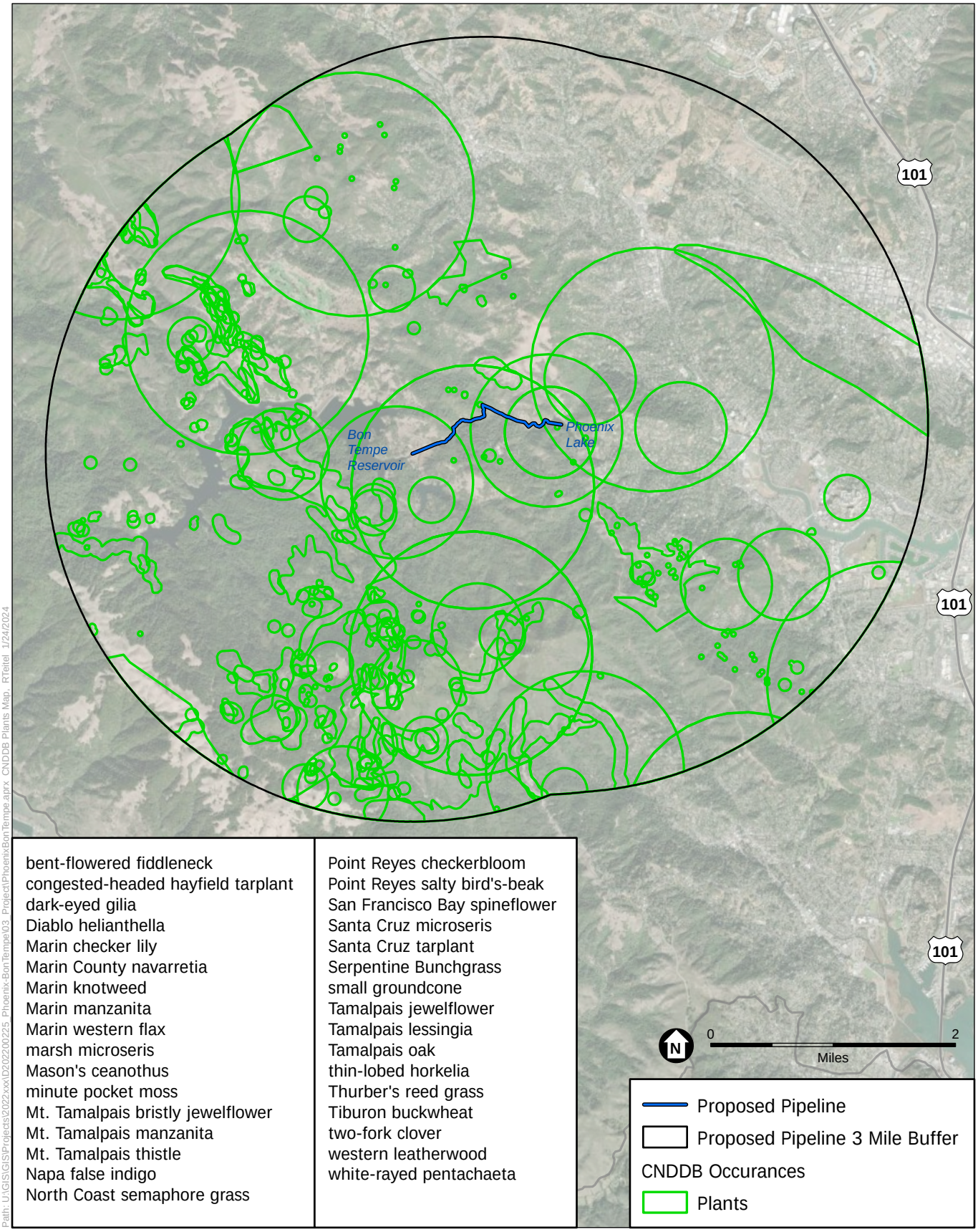
While there are no currently known or reported rare plant populations within the study area, ground disturbance during Project construction could result in the loss of, damage to, or removal of these special-status plants, if present. Due to high levels of existing use and disturbance, the staging areas do not have potential to host special-status plants.

Damage or removal of two-fork clover, Napa false indigo, or other special-status plants due to construction would represent a potentially significant impact. The implementation of **Mitigation Measure BIO-1, Protection of Rare Plants** would ensure that potential impacts on special-status plants would be reduced to a less-than-significant level.

Mitigation Measure BIO-1: Protection of Rare Plants.

Prior to ground disturbance, a qualified botanist shall conduct a focused survey where ground disturbance in suitable habitat for the rare plant species with potential to be present during their blooming period. The blooming period for rare plants with a moderate or higher potential to occur is as follows:

- Napa false indigo (Amorpha californica var. napensis): April – July
- Bent-flowered fiddleneck (Amsinckia lunaris): March – June
- western leatherwood (Dirca occidentalis): November – March
- congested-headed hayfield tarplant (Hemizonia congesta ssp. congesta): April – November
- Tamalpais lessingia (Lessingia micradenia var. micradenia): July – October
- North Coast semaphore grass (Pleuropogon hooverianus): March – June
- Tamalpais oak (Quercus parvula var. tamalpaisensis): March – April
- two-fork clover (Trifolium amoenum): April – June



bent-flowered fiddleneck
congested-headed hayfield tarplant
dark-eyed gilia
Diablo helianthella
Marin checker lily
Marin County navarretia
Marin knotweed
Marin manzanita
Marin western flax
marsh microseris
Mason's ceanothus
minute pocket moss
Mt. Tamalpais bristly jewelflower
Mt. Tamalpais manzanita
Mt. Tamalpais thistle
Napa false indigo
North Coast semaphore grass
Point Reyes checkerbloom
Point Reyes salty bird's-beak
San Francisco Bay spineflower
Santa Cruz microseris
Santa Cruz tarplant
Serpentine Bunchgrass
small groundcone
Tamalpais jewelflower
Tamalpais lessingia
Tamalpais oak
thin-lobed horkelia
Thurber's reed grass
Tiburon buckwheat
two-fork clover
western leatherwood
white-rayed pentachaeta

SOURCE: Maxar 2022, CDFW, 2023, ESA, 2022

D202200225.15 - MMWD Phoenix-Bon Tempe

Figure 3-1
CNDDB 3 Mile Buffer

ESA

If no special-status plants are observed, no further action shall be required. If any special-status plant species, including two-fork clover, Napa false indigo or North Coast semaphore grass, are observed, the plants will be avoided with a non-disturbance buffer of 25 feet or other suitable buffer distance determined in coordination with the California Department of Fish and Wildlife and/or U.S. Fish and Wildlife Service as appropriate by species. The buffer zone shall be clearly demarcated onsite using exclusion fencing. If establishing an avoidance buffer is not feasible, individual plants shall be transplanted to an area with suitable physical and biological conditions outside of the work area, according to a Rare Plant Relocation Plan to be prepared by Marin Water or its contractor and reviewed and approved by the California Department of Fish and Wildlife and/or U.S. Fish and Wildlife Service, as applicable. The relocation plan shall include regular monitoring for a period of 5 years, as well as adaptive management actions, such as additional monitoring, weed control, irrigation, or replanting, if success criteria of 75 percent survival are not met after the 5-year monitoring period.

Special-Status Wildlife Species

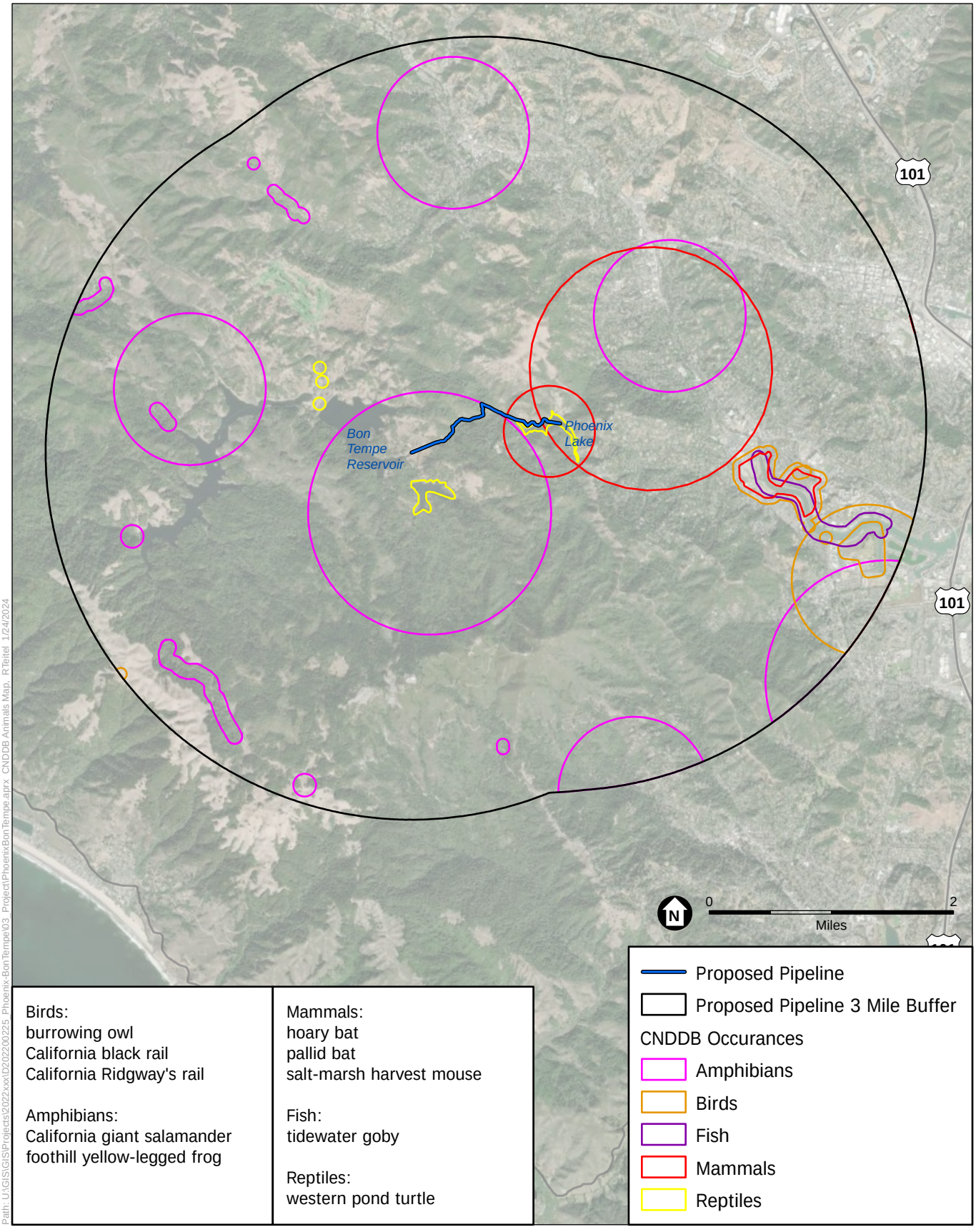
Special-status wildlife species recorded within 3 miles of the study area are shown in **Figure 3-2**.

Impacts on Fish

There are no special-status fish species in Phoenix Lake or Bon Tempe Reservoirs, due to the presence of the dams. The Project's changes to the frequency, duration, or magnitude of water overflow from Phoenix Lake into Ross Creek could have a significant impact on fish, including the federally threatened central California coast (CCC) steelhead (*Onchorhynchus mykiss irideus*). Depending on the season, impacts to steelhead could include impairments to late-fall and winter upstream passage conditions for adults, reductions in the quality and availability of winter spawning habitat, impairments to winter and spring juvenile rearing and outmigration conditions, and reductions in the quality and availability of summer rearing habitat. These impacts could extend downstream to Corte Madera Creek if reductions in overflow were of substantial volume.

At present, Ross Creek supports a small steelhead run in years where sufficient precipitation can maintain a wetted channel during the winter and spring (Rich, 2000; Leidy et al., 2005). As is the case with many tributaries to San Francisco Bay, Ross Creek becomes intermittent in late spring or early summer, drying into small, disconnected pools. The Project's alterations in the overflow regime from Phoenix Lake could result in reductions in baseflow during the spring months, and lead to a more rapid increase in water temperatures as instream pools become disconnected.

However, as shown in **Appendix C** (**Figure 2-6 and 3**), Project implementation is not expected to result in substantial changes in overflow from Phoenix Lake into Ross Creek. Since Phoenix Lake is a small reservoir, minor amounts of precipitation can cause the reservoir to fill and spill into Ross Creek (see **Appendix C**). Modeled overflow under existing and future with-Project conditions indicates that there would continue to be a similar pattern in timing, duration, and magnitude of events. Thus, impacts to steelhead within Ross Creek from any changes in overflow from Phoenix Lake would be less than significant, with no mitigation required.



SOURCE: Maxar 2022, CDFW, 2023, ESA, 2022

D202200225.15 - MMWD Phoenix-Bon Tempe

Figure 3-2
CNDDB 3 Mile Buffer

ESA

Impacts on Reptiles and Amphibians

The pipeline alignment crosses two intermittent streams, Fish Creek and Phoenix Creek, and as many as ten ephemeral streams. The perennial streams have moderate potential to host special-status amphibians or reptiles, including foothill yellow-legged frog (*Rana boylii*), California giant salamander (*Dicamptodon ensatus*), and western pond turtle (*Emys marmorata*). The turtle is a federal candidate species and has been recorded in both reservoirs. The Project would replace pipe within Phoenix Lake, pump water and deliver it to Bon Tempe Reservoir. The pipe replacement would be in the same location as the current pipe, and would not affect turtle habitat along the banks.

Phoenix Creek is presently culverted beneath Shaver Grade, where the alignment would pass. If the pipeline can be placed without disturbing the culvert, impacts would also be avoided at this location. However, if Project construction disturbs forest or riparian habitat in wetted areas near the ephemeral channels or along Phoenix Lake (where western pond turtle is known to occur), these reptile and amphibian species could be harmed, which would be a potentially significant impact. The implementation of **Mitigation Measure BIO-2, Protection of Reptiles and Amphibians** would ensure that potential impacts on special-status reptiles and amphibians would be reduced to a less-than-significant level.

> **Mitigation Measure BIO-2: Protection of Reptiles and Amphibians.**
>
> Marin Water and/or its construction contractor shall install temporary exclusion fencing around work areas within 200 feet of suitable aquatic habitat for western pond turtle or amphibian species. The fence shall be to a minimum aboveground height of 30 inches, and the bottom shall be buried to a depth of at least 6 inches. The fence shall be installed prior to ground disturbing activities and monitored by a qualified biologist, who will check the fence alignment before vegetation clearing and fence installation to ensure no special-status species are present.
>
> Where riparian habitat cannot be avoided and Marin Water proposes vegetation removal, the construction contractor shall use hand tools or another method approved by the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife to remove vegetation from the ground disturbance work area plus a 10-foot buffer around the riparian area. No vegetation in this area shall be removed using heavy equipment, such as an excavator. Vegetation height within the buffer zone shall be maintained at or below 5 inches above ground. Vegetation removal in riparian habitat shall be conducted under the supervision of a qualified biologist(s).

Impacts on Northern Spotted Owl and Other Migratory Birds

Federally threatened Northern spotted owl (*Strix occidentalis caurina*) is present throughout the watershed surrounding the Project alignment. One active pair of spotted owls is nesting near Concrete Pipe Road near the Project alignment, and another pair is nesting south of the alignment near Eldridge Grade Road. Spotted owls will nest in different trees from year to year within their territories, known as activity centers. Construction activities performed during nesting season (February 1 to July 31), especially those that involve the use of mechanized equipment (e.g., grading and excavation), could disturb spotted owl nesting within 0.25-mile (1,320 feet). The loss or

failure of any active nest by direct actions (e.g., removing vegetation containing a nest) or indirect actions (e.g., nest abandonment caused by construction disturbance) would be a significant impact. As stated in Section 2.5.1, *Construction Schedule, Hours, and Work Force*, construction season would occur from August through January to avoid Northern spotted owl nesting season. Thus, impacts to this species would be less than significant.

Numerous other migratory birds also have potential to nest on or near the Project alignment in trees, shrubs, and grassland. The federal Migratory Bird Treaty Act protects nesting birds from direct take, and California Fish and Game Code Sections 3503 and 3503.5 protect migratory birds and their eggs and nests from both direct and incidental take. These protections apply to special-status birds identified in **Table 3-1**, as well as other birds that may occur at the Project site.

Migratory birds are likely to nest in trees, shrubs, or tall grasses along the Project alignment. Because construction would occur outside of the nesting bird season, impacts would be less than significant.

Impacts on Bat Species

Three special-status bat species have moderate potential to occur on or near the Project site (**Table 3-1**): pallid bat (*Antrozous pallidus*), hoary bat (*Lasiurus cinereus*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Pallid bat and hoary bat have been recorded within 2 miles of the alignment. These bats inhabit woodlands and forests and may roost in nearby buildings, mines, caves, crevices, tunnels, or beneath tree bark. Townsend's big-eared bats are known in Marin County and may forage along the Project alignment; however, cave-like roosting habitat is not present.

Bats are nocturnal feeders on insects in flight, generally in the vicinity of water. Large oak trees or redwood trees near the Project site may provide roosting habitat for these special-status and other, more common bat species. Tree-roosting bat species may be present in tree foliage, under exfoliating bark, or in tree cavities. The Project alignment is unlikely to host hibernation or maternity roosting sites but may contain night roosts for special-status bats and other bat species.

Removal of large trees needed to complete the Project could result in injury or disturbance to protected roosting bats, or destroy occupied roosting habitat, which would be a significant impact. Implementation of **Mitigation Measure BIO-3, Bat-Safe Tree Removal** would reduce these impacts to a less-than-significant level.

> **Mitigation Measure BIO-3: Bat-Safe Tree Removal.**
>
> A qualified biologist shall conduct a pre-construction survey for special-status bats in advance of tree trimming or removal to characterize potential bat habitat and identify active roost sites. Should potential roosting habitat or active bat roosts be found in trees to be disturbed, the following measures shall be implemented:
>
> - Trimming or removal of trees with potential to house maternity or winter roosting colonies shall occur outside of the bat maternity roosting season

(approximately April 15 to August 15) and outside of months of winter torpor (approximately October 15 to February 28).

- Trimming or removal of trees containing night roost sites or potential bat roosting habitat shall be removed using the following two-day phased removal method under supervision of a qualified biologist. Branches and limbs not containing cavities or fissures in which bats could roost shall be cut on the first day, only using chainsaws. Branches or limbs containing roost sites shall be trimmed on the following day, under the supervision of the qualified biologist, also using chainsaws.

b) **Less-than-Significant Impact with Mitigation.** Vegetation communities and habitat types in the Project site are discussed below. Of these, the coastal redwood forest and riparian woodland are the only California Department of Fish and Wildlife−regulated sensitive natural communities.

Annual grassland is located on the hill that the alignment crosses between Phoenix Lake Road and Shaver Grade and on the bank of Phoenix Lake where the pipeline would be laid. The annual grasslands are dominated by non-native grasses and forbs. Common grass species in this community may include soft chess brome (*Bromus hordeaceus*), and ripgut brome (*Bromus diandrus*). Common non-native forbs may include summer mustard (*Hirschfeldia incana*) and Italian thistle (*Carduus pycnocephalus*). A small group of coast live oak trees (*Quercus agrifolia*) is present in the grassland off Phoenix Lake Road but would be avoided by the pipeline trench. Annual grassland is not considered a sensitive community.

Douglas-fir forest mixed with coast redwood forest occurs on the hillside along Fish Grade Road. This community is dominated by Douglas-fir (*Pseudotsuga menziesii*). Other species in the canopy include oaks (*Quercus* spp.), California bay laurel (*Umbellularia californica*), and madrone (*Arbutus menziesii*). The understory of the Douglas-fir forest includes species such as California blackberry (*Rubus ursinus*), sword fern (*Polystichum munitum*), and wood fern (*Dryopteris arguta*). Douglas-fir forest is not considered a sensitive community.

Coast redwood forest occurs along Fish Grade Road and in the canyon surrounding Fish Creek. This community is dominated by coast redwood (*Sequoia sempervirens*). Associated tree species include California bay laurel and Douglas-fir. The understory is sparse but includes native shrubs and forbs such as toyon (*Heteromeles arbutifolia*), redwood sorrel (*Oxalis oregana*), sword fern, and Pacific starflower (*Lysimachia latifolia*). The redwood forest and woodland community is considered a sensitive natural community by the California Department of Fish and Wildlife (2023b).

Developed/disturbed areas include roads, paths, and previously disturbed areas used for pump stations and staging areas. These areas generally lack vegetation, but may have some ruderal roadside weeds, or landscape shrubs and trees. The developed/disturbed areas provide very little habitat for wildlife, but wildlife from surrounding natural communities may pass through such areas.

Riparian Habitat. Riparian woodland, a sensitive community located along the alignment is limited to the area surrounding Phoenix Creek, which is densely vegetated with ferns, bigleaf maples (*Acer macrophyllum*), and other vegetation. Coast redwood and Douglas-fir communities may also be classified as riparian by the California Department of Fish and Wildlife if they shade ephemeral creek channels. Temporary or permanent removal of riparian trees or other sensitive woodland habitat would be a significant impact. Potential impacts to sensitive woodland habitats would be mitigated by implementation of **Mitigation Measure BIO-4, Habitat Restoration and Monitoring**.

Mitigation Measure BIO-4: Habitat Restoration and Monitoring.

Marin Water or its contractor shall avoid or minimize impacts on sensitive natural communities and potentially jurisdictional aquatic habitat; Project design shall minimize the extent of temporary and permanent loss of such areas. Prior to construction, Marin Water or its contractor shall prepare a Habitat Restoration and Monitoring Plan to restore temporary or mitigate for permanent impacts to sensitive habitats or aquatic resources within the Project site. The plan shall describe how impacts on riparian or other sensitive natural communities, and of jurisdictional waters, would be offset through the replacement, restoration or enhancement of a comparable amount of stream habitat area (i.e., a minimum 1:1 ratio based) at an inter-agency-approved location. Ephemeral channels or sensitive habitats temporarily impacted by construction-related activity shall be restored, under guidance from a qualified biologist.

The Habitat Restoration and Monitoring Plan shall include protocols for replanting or re-seeding of native vegetation removed prior to or during construction, and management and monitoring of the plants for a 5-year period to ensure replanting success. The plan shall specify monitoring and performance criteria for the species planted, monitoring frequency, reporting requirements, as well as the best time of year for seeding or planting to occur, pursuant to requirements of permits granted for the Project. Appropriate performance standards may include but are not limited to: a 75 percent survival rate of restoration plantings after five years; and a viable, self-sustaining creek or wetland system at the end of the 5-year monitoring period. The plan shall include adaptive management strategies if success criteria are not being met. The Habitat Restoration and Monitoring Plan would include interim thresholds for replanting success and alternative management approaches, and may include weed control, supplementary watering, or additional replanting to undertake if performance thresholds are not met.

d) **Less-than-Significant Impact with Mitigation.** Two reservoirs, Phoenix and Bon Tempe hold water year-round from Phoenix and Lagunitas Creeks, respectively. Project construction would involve placing new pipe in Phoenix Lake but would largely avoid impacts to the water. Project operation would involve transferring water from Phoenix Lake to Bon Tempe Reservoir, as shown in **Figure 2** in **Appendix C**, but is not expected to result in substantial changes in overflow from Phoenix Lake into Ross Creek.

Phoenix Creek is an intermittent stream that flows northwest along Shaver Grade fire road and is presently culverted under Shaver Grade. Fish Creek is also an intermittent stream running in the ravine off Fish Grade Road. The Project plans to avoid impacts to

waters by trenching beneath Fish Grade Road, and by placing the pipeline over an existing culvert through which Phoenix Creek passes under Shaver Grade.

Additional intermittent and ephemeral streams are present along the Project alignment. Numerous small ephemeral streams, which only carry water during and after rainstorms but which do not have a regular flow of water, flow down the hillside beneath Fish Grade Road and are often culverted beneath the road.

Although these ephemeral channels would not be considered waters of the United States, they may be considered jurisdictional by the state and, as such, would be subject to permitting from the Regional Water Quality Control Board, and by the California Department of Fish and Wildlife as a streambed. For any of these channels which would be temporarily or permanently impacted by installation of the pipeline, all required permits would be obtained by Marin Water. This impact to potential waters of the state would be significant. The implementation of **Mitigation Measure BIO-4, Habitat Restoration and Monitoring,** would ensure that potential impacts on jurisdictional waters would be reduced to a less-than-significant level.

d) **Less-than-Significant Level.** The Project alignment crosses natural areas between Phoenix Lake and Bon Tempe Reservoir across a mostly undeveloped landscape. When the Project is complete, the pipeline would be buried; however, during construction, active work areas would be temporarily unavailable to wildlife during the daytime due to the presence of heavy equipment, noise, and human disturbance. There would be no barriers to movement of terrestrial wildlife such as black-tailed deer (*Odocoileus hemionus columbianus*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), and other species, which would continue to cross the Project area during construction. This impact would be less-than-significant because it is transitory; following construction, the Project would not affect the movement of these and other wildlife overland. The Project may cross ephemeral streams and an intermittent stream (Phoenix Creek); however, no terrestrial or aquatic wildlife nursery sites are present along the alignment. Impacts to wildlife corridors and wildlife nursery sites would be less than significant.

e) **Less-than-Significant Impact with Mitigation.** Marin County Code (Section 22.62.040, the Native Tree Protection and Preservation ordinance) defines protected trees as native trees larger than 6- or 10-inches in diameter at breast height (dbh) depending on the species, and heritage trees as trees greater than 18- or 30-inches dbh, also depending on the species. Species covered by the Native Tree Protection and Preservation ordinance include black oak (*Quercus kelloggii*), coast live oak (*Quercus agrifolia)*, madrone, coast redwood, California bay laurel, and other native species (Marin County, undated).

The Project site contains mature black oak, coast live oak, redwood, and bay trees. If any mature trees that meet Marin County's definition of protected trees need to be removed, this would be a significant impact.

Although the Project is exempt from the Native Tree Protection and Preservation ordinance pursuant to California Water Code Section 53091, Marin Water strives to be consistent with the performance standards embodied in the ordinance wherever feasible.

Pursuant to Marin Water's Standard Environmental Protection Measures (see **Appendix A**), contractors would be prohibited from harming trees outside the work area limits and would be required to protect trees that area near the limits of the construction work area (e.g., no ropes, cables or guys can be attached to any protected trees).

In addition, the Marin Countywide Plan includes protections for native habitats and biodiversity, including protection of wetlands and riparian zones, sensitive natural communities, wildlife corridors and nursery areas, woodlands and forests. It also promotes control of invasive exotic plants, protection of ecotones (natural transitions between habitat types), stream channels, bird nesting habitat, and coordination with federal and state agencies. Policy 3.1 Protects wetland areas and establishes Wetland Conservation Area setbacks; the Project would not impact any identified wetland area. Countywide Plan Policy 4.1 requires a development setback on each side of the top of each streambank in Stream Conservation Areas, which cover land within 100 feet of streams (Marin County 2007). The Project would not place development near a protected stream; thus, there would be no impact to Stream Conservation Areas.

Under the Project design one tree is proposed for removal. If any trees proposed for removal qualify as protected or heritage trees pursuant to the County tree ordinance, Marin Water would make a good-faith effort to meet County standards, including tree replacement, sheltering existing trees within the watershed to meet the tree protection guidance, payment of an in-lieu fee to the County, or a combination of these strategies, according to **Mitigation Measure BIO-5, Minimize Impacts on Protected Trees** below.

In addition, tree trimming may be required and numerous tree roots may be exposed during trenching operations for the Project. Trimming of branches or roots may weaken trees and make them more prone to death from toppling or disease, particularly if more than 30 percent of roots are impacted. Project best management practices (BMPs) (see **Appendix A**) require limiting root cutting during excavation and trenching, wrapping the roots in burlap for protection when exposed, and using tree seal to limit harm to the roots. With implementation of these measures, impacts to retained trees would be less than significant.

Adherence to County code tree removal/replacement performance standards wherever feasible as provided in **Mitigation Measure BIO-5** would reduce the impact of tree removal to a less-than-significant level.

Mitigation Measure BIO-5: Minimize Impacts on Protected Trees.

Prior to construction, Marin Water shall determine whether any heritage or protected trees are to be removed and will minimize impacts on retained heritage or protected trees. For removed heritage or protected trees within the Project area, tree

replacement shall be provided through one or more of the following options, consistent with the Marin County Native Tree Protection and Preservation ordinance:

- Heritage trees shall be replaced at an alternative site within the watershed on a 3:1 basis using 15-gallon trees (i.e., three 15-gallon trees will be planted for every tree removed). Heritage trees shall be replaced with a tree of the same species wherever possible. Alternative species to the tree removed may be planted if more appropriate to the environmental conditions at the identified mitigation site.

- Plantings shall receive forage protection using a rigid tree tube, receive regular (i.e., bi-annual) weeding, be given a weed mat/and or appropriate mulching, and may be subject to supplemental watering during an initial 2-year establishment period. Regular (e.g., biannual) monitoring shall be performed to review the vigor of plantings and provide maintenance as needed.

- As an alternative to planting trees, Marin Water may "shelter" native volunteer tree seedlings within the watershed on a 3:1 basis, with preference given to species and areas where the recruitment of young trees is problematic (e.g., some oak species) due to grazing or other factors. Plantings shall receive protection, maintenance, and watering as described above for heritage tree replacement plantings.

- Alternatively, to compensate for some or all removed heritage or protected trees, Marin Water may contribute to an in-lieu payment program in the amount of $500.00 per replacement tree to the Tree Preservation Fund managed by the Marin County Parks and Open Space Department for planting, maintenance, and management of trees and other vegetation.

- If replacement trees do not thrive 5 years following planting or sheltering, Marin Water may either replace unsuccessful trees using the methods described above, or contribute funds to the Tree Preservation Fund to meet the initial tree protection standard (i.e., 3:1).

Retained heritage or protected trees on the Project site shall be identified as preserved on site plans and shall be clearly delineated by construction netting, which will remain in place for the duration of all work. To the extent possible, if site work must encroach upon the dripline of a preserved tree, excavation will be performed in a manner that causes only minimal root damage. The following will not occur within the dripline of any protected retained tree: parking; storage of vehicles, equipment, machinery, stockpiles of excavated soils, or construction materials; or dumping of oils or chemicals.

f) **No Impact.** There are no adopted Habitat Conservation Plans, Natural Conservation Community Plans, or other approved local, regional, or state habitat conservation plans that apply to the Project site. Therefore, no impact would occur.

3.4.1.1 References

California Department of Fish and Wildlife (CDFW). 2023a. California Natural Diversity Data Base (CNDDB). Available at: https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed on November 1, 2023.

CDFW. 2023b. California Sensitive Natural Communities List. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609. Accessed on November 1, 2023.

California Native Plant Society (CNPS). 2023. Inventory or Rare, Threatened and Endangered Plants of California. Available at: http://www.rareplants.cnps.org/. Accessed on November 1, 2023.

Marin County, undated. Tree Removal Permit Fact Sheet. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/factsheets/treeremoval_fs.pdf. Accessed on November 1, 2023.

Marin County, 2007. Countywide Plan. https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update_r.pdf

U.S. Fish and Wildlife Service (USFWS). 2023. Information for Planning and Conservation. USFWS Official Species List. Available at: https://ecos.fws.gov/ipac/. Accessed on November 1, 2023.

3.5 Cultural Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

3.5.1 Discussion

To determine the cultural resources sensitivity of the proposed Project site, ESA cultural resources staff conducted a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) on August 31, 2023 (File No. 23-0287). The records search included a review of previously recorded cultural resources in the Project site and within a 0.5-mile radius, as well as a review of architectural resources within and immediately adjacent to the Project site.

The results of the background research indicate that no archaeological resources or historic-age architectural resources have been previously recorded in the Project site.

The Project site and general vicinity has been subject to several previous cultural resource studies. These studies did not identify any archaeological resources in the Project site or immediate vicinity. The nearest known Native American cultural resource is over 2 miles to the south of the Project site. The geology and environment indicate that archaeological sites in this area would be identifiable on the surface and would not be buried by natural alluvial processes.

The nearest known historic-age cultural resource to the Project site is the log cabin for the Hippolyte Ranch Complex, next to Pump 2 (Marin Water, 2020). This resource consists of a group of buildings and structures including a two-story log building constructed in the early 1890s that is considered the only remaining log structure of its type in Marin County. The log building would not be directly affected by the Project. Vibratory impacts are also not anticipated (see Section 3.13, *Noise and Vibration*).

Archaeological Resources

An ESA archaeologist completed surface surveys of the Project site on October 25 and December 4, 2023. All areas of proposed ground disturbance (including access and staging areas) were either walked in narrow (less than 10 meter) transects to provide an overall assessment of existing conditions and/or viewed from accessible nearby vantage points if the area was steep or otherwise difficult to access. Ground visibility was generally good along the entire alignment. The surface

was examined for cultural materials such as obsidian or chert flakes, midden soil, or other indications of pre-contact use or occupation. The surface was also examined for any historic-era artifact concentrations or features such as foundations or footings. No cultural materials or features were identified during the survey effort.

Architectural Resources

An ESA architectural historian completed a pedestrian survey of the Project site on December 4, 2023. The purpose of this survey was to document all accessible historic-age (pre-1978) built resources within the Project site. Three resources—including Phoenix Lake, Bon Tempe Reservoir, and the pipeline and ancillary infrastructure connecting the two—were surveyed and documented as part of the evaluation.

Phoenix Lake

Phoenix Lake and Dam were built by Marin Water & Power Company in 1905. Phoenix Lake is a 25-acre reservoir located on Ross Creek on the west side of the Town of Ross in southern Marin County. Per California Department of Dam Safety records, Phoenix Lake Dam is an earth-fill dam constructed in 1907 (other records indicate 1905), measuring approximately 90 feet high and 320 feet long (DSOD, 2023). The crest width measures approximately 22 feet wide, with 1.5:1 to 3:1 slopes. The dam was modified in the late 1960s to improve seismic safety, and the spillway was retrofitted in 1985 (Daily Independent Journal, 4/27/1964; Miller Pacific Engineering Group, 2010). Marin Water has both widened the spillway by 5 to 6 feet and has lowered the spillway by 6 feet (Town of San Anselmo, 2015).

Archival review does not indicate that there are any significant associations between Phoenix Lake and important events or patterns in history (Criterion 1/A). While Phoenix Lake is associated with Marin Water's history of water storage infrastructure, it functions as a backup water supply for the region, and it does not appear to rise above typical associations with this organization or associated events. Phoenix Lake was one of multiple reservoirs constructed by water companies in the region in the early twentieth century in response to the region's growing water needs. The earliest regional reservoir was Lagunitas Reservoir, which was constructed in 1872, and the region has a long history of the development of water infrastructure. Phoenix Lake does not appear to reflect significant associations with twentieth century regional water infrastructure. For these reasons, Phoenix Lake does not appear eligible for either the California Register of Historical Resources or the National Register of Historic Places under Criterion 1/A.

Archival review also does not indicate that there are any significant associations between Phoenix Lake and significant persons (Criterion 2/B). Research does not indicate that Phoenix Lake is significantly associated with the productive life of any significant person, and it therefore does not appear to meet Criterion 2/B for the California or National registers.

Phoenix Lake is not significant for its design or engineering (Criterion 3). The reservoir and associated structures were designed by Marin Water & Power Company in 1905. Its dam is a utilitarian earthen structure without architectural or engineering distinction. Archival research did not reveal any information about a specific engineer or architect associated with Phoenix Lake. Additionally, as noted above, it is one of many typical earthen water storage structures that were

built at the time. Therefore, it does not appear to meet Criterion 3/C for the California or National registers.

Lastly, Phoenix Lake does not appear to have the potential to yield more information and therefore does not appear eligible for the California or National registers under Criterion 4/D.

As Phoenix Lake does not meet any of the National Register or California Register criteria and it is ineligible for listing under national or state criteria, Phoenix Lake is not considered a historical resource for the purposes of CEQA.

Bon Tempe Reservoir

Bon Tempe Reservoir was built by Marin Water in 1948. The name is an Americanization of the family name Bautunpi. Three Bautunpi brothers ran a ranch and dairy that was removed to make way for Bon Tempe and Alpine reservoirs (Marin Independent Journal, 04/24/2012). Per California Department of Dam Safety records, Bon Tempe Reservoir is a 140-acre reservoir on Lagunitas Creek located 3 miles west of Fairfax in southern Marin County. Bon Tempe Dam is an earth-fill dam constructed in 1949 (other records indicate 1948), measuring approximately 96 feet high and 1,150 feet long with a crest width approximately 23 feet wide (DSOD, 2023).

Archival review does not indicate that there are any significant associations between the Bon Tempe Reservoir and important events or patterns in history (Criterion 1/A). While Bon Tempe Reservoir is associated with Marin Water's water infrastructure, and it functions as a primary water supply for the region, it does not appear to rise above typical associations with this organization or associated events. Bon Tempe was one of multiple reservoirs constructed by Marin Water in the mid-twentieth century in response to the region's growing water needs. The earliest regional reservoir was Lagunitas Reservoir in 1872, and Marin Water and the region have a long history of the development of water infrastructure. The Bon Tempe Reservoir does not appear to reflect significant associations with twentieth century regional water infrastructure. For these reasons, the Bon Tempe Reservoir does not appear eligible for listing under the California or National registers under Criterion 1/A.

Archival review also does not indicate that there are any significant associations between the Bon Tempe Reservoir and significant persons (Criterion 2/B). Research does not indicate that the Bon Tempe Reservoir is significantly associated with the productive life of any significant person, and it therefore does not appear to meet Criterion 2/B for the California or National registers.

The Bon Tempe Reservoir is not significant for its design or engineering (Criterion 3). The reservoir and associated structures were designed by Marin Water in 1948. The dam is a utilitarian structure without architectural or engineering distinction. Archival research did not reveal any information about a specific engineer or architect associated with Bon Tempe Reservoir and Marin Water. Additionally, as noted above it is one of many typical earthen water storage structures that was built by Marin Water at the time. Therefore, it does not appear to meet Criterion 3/C for the California or National registers.

Lastly, the Bon Tempe Reservoir does not appear to have the potential to yield more information and therefore does not appear eligible for the California or National registers under Criterion 4/D.

As the Bon Tempe Reservoir does not meet any of the National Register or California Register criteria and it is ineligible for listing under national or state criteria. Bon Tempe Reservoir is not considered a historical resource for the purposes of CEQA.

Pipeline and Ancillary Infrastructure

Subsurface and surficial welded steel pipelines are located throughout the Project area; these connect various sources of water (both treated and raw), through a collection of pump houses and existing potable water infrastructure. The 1,200-foot Bon Tempe Headworks tunnel also serves as a portion of the alignment near Bon Tempe Reservoir. Historic Marin Water design drawings show area pipelines in plans dating as early as 1928 through 1976. The pipes near the Bon Tempe Headworks tunnel are imprinted with a stamp dating to 1957. The current alignment was established with the construction of Bon Tempe Reservoir in 1948. Pipe sizes vary on historic drawings between 12-24 inches in diameter.

Archival review does not indicate that there are any significant associations between the pipelines and ancillary infrastructure connecting Bon Tempe Reservoir and Phoenix Lake, and important events or patterns in history (Criterion 1/A). While the pipelines and tunnel are associated with Marin Water's history of water storage infrastructure, they do not appear to rise above typical associations with this organization or associated events. Marin Water and its predecessors constructed numerous miles of pipeline infrastructure connecting reservoirs to each other and to the surrounding communities. This construction throughout the twentieth century was in response to the region's growing water needs. The pipelines and tunnel do not appear to reflect significant associations with twentieth century regional water infrastructure. For these reasons, the pipelines and tunnel connecting Bon Tempe Reservoir and Phoenix Lake do not appear eligible for the California or National registers under Criterion 1/A.

Archival review also does not indicate that there are any significant associations between the pipelines and tunnel and significant persons (Criterion 2/B). Research does not indicate that pipelines and tunnel are significantly associated with the productive life of any significant person, and therefore do not appear to meet Criterion 2/B for the California or National registers.

The pipelines and tunnel are not significant for their design or engineering (Criterion 3). The pipeline and tunnel appear on design drawings by Marin Water in 1949, and visible date stamps on the surficial pipes by the Bon Tempe Headworks tunnel say 1957. Both the pipelines and tunnel are utilitarian infrastructure without architectural or engineering distinction. Archival research did not reveal any information about a specific engineer or architect associated with their construction. Therefore, they do not appear to meet Criterion 3/C for the California or National registers.

Lastly, the pipelines and tunnel do not appear to have the potential to yield more information and therefore do not appear eligible for the California or National registers under Criterion 4/D.

As the pipelines and tunnel do not meet any of the National Register or California Register criteria and are ineligible for listing under national or state criteria, the pipelines and tunnel are not considered historical resources for the purposes of CEQA.

a) **No Impact.** CEQA Guidelines Section 15064.5 requires the lead agency to consider the effects of a project on historical resources. A historical resource is defined as any building, structure, site, or object listed in or determined to be eligible for listing in the California Register, or determined by a lead agency to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural annals of California. Archaeological resources, including those that are potentially historical resources according to CEQA Guidelines Section 15064.5, are addressed below under issue b).

As a result of the records search, background research, survey effort, and evaluations, it was determined that no historical resources are present within the Project site. As such, there are no architectural or structural resources on the Project site that qualify as historical resources, as defined in CEQA Guidelines Section 15064.5, and there would be no impact on historical resources.

b) **Less-than-Significant Impact with Mitigation.** CEQA Guidelines Section 15064.5 requires the lead agency to consider the effects of a project on archaeological resources. A significant impact would occur if a project would cause a substantial adverse change to an archaeological resource through physical demolition, destruction, relocation, or alteration of the resource.

As a result of the records search, background research, and survey effort, it was determined that no known archaeological resources are present within the Project site. Based on the survey results and environmental context, there is a low potential that unknown archaeological resources could be discovered during Project implementation.

In the unlikely event that a previously unrecorded archaeological resource is identified during Project ground-disturbing activities and found to qualify as a historical resource or a unique archaeological resource, any impacts on the resource resulting from the Project could be potentially significant.

Implementation of **Mitigation Measure CUL-1: Cultural Resources Awareness Training and Inadvertent Discovery of Archaeological Resources or Tribal Cultural Resources** would reduce potentially significant impacts to less than significant. In the event of an inadvertent discovery of an archaeological or tribal cultural resource, this mitigation would ensure that work is halted in the vicinity until a qualified archaeologist can make an assessment and provide additional recommendations if necessary, including contacting Native American Tribes.

> **Mitigation Measure CUL-1: Cultural Resources Awareness Training and Inadvertent Discovery of Archaeological Resources or Tribal Cultural Resources.**
>
> Prior to authorization to proceed, a qualified archaeologist, defined as an archaeologist meeting the U.S. Secretary of the Interior's Professional Qualification Standards for Archeology, will conduct a training program for all construction and field workers involved in site disturbance. On-site personnel shall attend a

mandatory pre-Project training that will outline the general archaeological sensitivity of the area and the procedures to follow in the event an archaeological resource and/or human remains are inadvertently discovered.

If pre-contact or historic-era archaeological resources are encountered during Project implementation, all construction activities within 100 feet shall halt, and a qualified archaeologist shall inspect the find within 24 hours of discovery and notify Marin Water of the initial assessment. Pre-contact archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls, and deposits of metal, glass, and/or ceramic refuse.

If Marin Water determines, based on recommendations from a qualified archaeologist and a Native American representative (if the resource is pre-contact indigenous related), that the resource may qualify as a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5) or a tribal cultural resource (as defined in Public Resources Code [PRC] Section 21080.3), the resource shall be avoided if feasible. Consistent with Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource, or incorporating the resource within open space, capping and covering the resource.

If avoidance is not feasible, Marin Water shall consult with appropriate Native American Tribes (if the resource is pre-contact indigenous related), and other appropriate interested parties to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3).

c) **Less-than-Significant Impact with Mitigation.** The records search and background research determined that no human remains are known to exist within the Project site. Therefore, the Project is not anticipated to impact human remains, including those interred outside of formal cemeteries.

While unlikely, if any previously unknown human remains were encountered during ground-disturbing activities, impacts on the human remains resulting from the Project could be potentially significant.

Implementation of **Mitigation Measure CUL-2: Inadvertent Discovery of Human Remains** would reduce potentially significant impacts to less than significant. This measure shall comply with applicable state laws, including Section 7050.5 of the Health and Safety Code. This would require work to halt in the vicinity of a find and the immediate notification of the County coroner. If the coroner determines that the human remains are Native American, they will notify the California Native American Heritage

Commission (NAHC), who shall appoint a Most Likely Descendant (PRC Section 5097.98).

Mitigation Measure CUL-2: Inadvertent Discovery of Human Remains.

If potential human remains are encountered, all work will halt within 100 feet of the find and Marin Water will be contacted by on-site construction crews. Marin Water will contact the Marin County coroner in accordance with PRC Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner will contact the Native American Heritage Commission. As provided in PRC Section 5097.98, the Native American Heritage Commission will identify the person or persons believed to be the Most Likely Descendant. The Most Likely Descendent will make recommendations for the means of treating, with appropriate dignity, the human remains and any associated grave goods, as provided in PRC Section 5097.98.

3.5.1.1 References

DSOD. 2023. Jurisdictional Dams listed by County. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/DAMS-WITHIN-JURISDICTION-OF-THE-STATE-OF-CALIFORNIA-LISTED-ALPHABETICALLY-BY-COUNTY-SEPTEMBER-2023.pdf. Accessed December 2023.

Daily Independent Journal. 1964. “Phoenix Dam Is Found Unsafe” by Phil Fradkin.

Marin Independent Journal. April 24, 2012. "Marin Municipal Water District celebrates 100 years Wednesday". Available at: https://www.marinij.com/2012/04/24/marin-municipal-water-district-celebrates-100-years-wednesday. Accessed December 2023.

Marin Water. 1928. New Pipe Line and Connections from Baffle Chamber on Fish Grade to Phoenix Gate House. May 1928

Marin Water. 1976. Phoenix Lake Submersible Pump. April 1976.

Marin Water. 1964. Phoenix Gatehouse Pump Station Plan and Elevations. December 1964.

Marin Water. 2020. Historical Highlights. Available at: https://www.marinwater.org/sites/default/files/2020-11/Historical%20Highlights%202020.pdf. Accessed February 2024.

Miller Pacific Engineering Group. 2010. Preliminary Geotechnical Evaluation DB5 – Phoenix.

Lake Dam & Reservoir Watershed Flood Damage Reduction & Creek Management Study Marin County, California.

Town of San Anselmo. 2015. Local Hazard Mitigation and Climate Adaptation Plan Update. Available at: https://sananselmo-ca.granicus.com/DocumentViewer.php?file=sananselmo-ca_2956d0836d4dfcadf957357910bdaeab.pdf. July 2015. Accessed December 2023.

3.6 Energy

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

3.6.1 Discussion

a) **Less-than-Significant Impact.** Project construction would involve both direct and indirect use of energy, primarily in the form of fossil fuels (diesel and gasoline) and electricity.

Diesel fuel would be used in the construction equipment and the heavy-duty trucks used to transport materials and equipment, while gasoline would primarily be used in the vehicles of construction workers travelling to and from the construction site. The use of electricity in construction equipment, if any, would be very minimal in comparison to the quantities of diesel and gasoline used.

The volume of diesel and gasoline fuels that would be consumed during construction was calculated based on the estimated carbon dioxide (CO_2) emissions for Project construction and the gasoline and diesel CO_2 emission factors from The Climate Registry (TCR, 2023). Project construction is estimated to consume a total of approximately 1,120 gallons of gasoline and 136,502 gallons of diesel fuel over the construction period. Fuel use during construction would represent approximately 0.001 percent of gasoline and less than 3 percent of diesel sold in Marin County in 2022 (CEC, 2023a). Overall, the fuel use during construction would be minimal in comparison to the overall fuel use within Marin County.

Project construction would comply with state and local regulations such as 13 CCR Sections 2485 and 2449, which require equipment and commercial vehicle operators to limit idling to no more than 5 minutes; this would ensure that fuel energy consumed in the construction phase would not be wasted through unnecessary idling. In addition, all vehicles used during construction and operation would be required to comply with Corporate Average Fuel Economy (CAFE) standards. Therefore, energy use would not be wasteful, inefficient, or unnecessary during the construction or operation of the Project and the impact would be less than significant.

Project operation and maintenance would require the use of gasoline fuel for vehicle trips to conduct intermittent maintenance of the pumps. Vehicles used by operation and

maintenance workers would be required to comply with the CAFE standards, which would increase fuel consumption efficiency. In addition, energy in the form of electricity would be used to power pumps at the pump stations, which are anticipated to operate for two cycles of approximately 28 days a year (for a total of about 56 days). There would be no generators or permanent on-site lighting required as part of the Project. Electricity to the pump stations would be supplied by PG&E.

Electricity use associated with the extraction and conveyance efforts of the pumps (pump operations) was conservatively quantified using local water energy intensity factors and the maximum water capacity of Phoenix Lake. The water energy intensity factor in the San Francisco Bay hydrologic region is 233 kilowatt hours (kWh) per AF for extraction and conveyance (CAPCOA, 2021); this factor was used to quantify maximum annual energy consumption that would be required for Project operation. Phoenix Lake has a capacity of 411 AF of water, which would take a maximum of 95,763 kWh of electricity per year to pump to Bon Tempe Reservoir.[1] This would be approximately 0.01 percent of the total kWh of electricity consumed in Marin County in 2022 (CEC, 2023b). Local distribution of water improves energy efficiency as the water does not require conveyance and distribution over long distances of potentially steep and difficult topography (CAPCOA, 2021). Therefore, the Project would not result in inefficient consumption of energy and would have a less-than-significant impact.

b) **Less-than-Significant Impact.** As discussed above, Project construction would require the use of off-road construction equipment and on-road trucks. Construction activities would comply with state and local requirements designed to minimize idling and associated emissions, which would also minimize the use of fuel. Specifically, pursuant to 13 CCR Sections 2485 and 2449, idling of commercial vehicles over 10,000 pounds and off-road equipment over 25 horsepower would be limited to a maximum of 5 minutes. Fuel use for Project construction would be consistent with typical construction and manufacturing practices as well as with energy standards such as the Energy Policy Acts of 1975 and 2005, which promote strategic planning and building standards that reduce consumption of fossil fuels, increase use of renewable resources, and enhance energy efficiency.

Once operational, the Project's primary energy use would be the operation of the pump station for two cycles of approximately 28 days a year (for a total of 56 days). Energy used for operational vehicle trips would be negligible. Electricity needs of the Project would be provided by PG&E, which would be subject to SB 100 and the California's Renewable Portfolio Standard Program. Signed into law by Governor Jerry Brown, SB 100 increased California's Renewable Portfolio Standard target to 60 percent of total electric retail sales by 2030 and requires 100 percent of electric retail sales to come from eligible renewable or carbon-free resources by 2045. PG&E, as the utility provider, is subject to these requirements. In addition, Marin Water participates in the Deep Green energy program to supply up to 100 percent of its electricity from clean, renewable

[1] This is a conservative estimate because the Project would never draw down the entire capacity of Phoenix Lake.

sources (MCE 2024). There are no aspects of the Project that would conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and the impact would be less than significant.

3.6.1.1 References

California Air Pollution Control Officers Association (CAPCOA). 2021. Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity. Available at: https://www.caleemod.com/documents/handbook/full_handbook.pdf. Accessed December 2023.

California Energy Commission (CEC). 2023a. *California Annual Retail Fuel Outlet Report Results (CEC-A15)*. Available at: https://www.energy.ca.gov/media/3874. Accessed November 2023.

CEC. 2023b. *Electricity Consumption by County*. Available at: http://www.ecdms.energy.ca.gov/elecbycounty.aspx. Accessed November 2023.

The Climate Registry (TCR). 2023. *2023 Default Emission Factors*. Available at: https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf. Accessed November 2023.

MCE. 2024. "Opt Up to 100% Renewable Energy." Available at: https://mcecleanenergy.org/opt-up. Accessed February 19, 2024.

3.7 Geology and Soils

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on 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?	☐	☐	☒	☐
d) Be located on expansive soil[2] creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) 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?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

3.7.1 Discussion

a.i) **No Impact.** The state Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) prohibits the development of structures for human occupancy across active fault traces. Under this act, the California Geological Survey (CGS) has established "Zones of Required Investigation" on either side of an active fault that delimits areas susceptible to surface fault rupture. The zones are referred to as Earthquake Fault Zones (EFZs) and are shown on official maps published by the CGS (CGS 2022). Surface rupture occurs when the ground surface is broken due to a fault movement during an earthquake; typically, these types of hazards occur within 50 feet of an active fault.

[2] The CBC, based on the International Building Code and the now defunct Uniform Building Code, no longer includes a Table 18-1-B. Instead, Section 1803.5.3 of the CBC describes the criteria for analyzing expansive soils.

The Project site does not lie within any mapped EFZs according to the available data (CGS 2022). Although the area could be affected by earthquakes or seismic ground shaking, there is no current data available indicating the presence of active faults within the Project site. The nearest EFZ is the San Andreas fault zone, approximately 5.2 miles to the southwest of the Project site. The Project does not include any habitable structures and would not expose people or structures to potential substantial adverse effects associated with rupture of a known earthquake fault. There would be no impact related to fault rupture.

a.ii) **Less-than-Significant Impact.** The Project site is in a historically seismically active region of California. The 2014 Working Group on California Earthquake Probabilities[3] (WGCEP) concluded that there is a 72 percent probability that a magnitude (MW) 6.7 earthquake or higher will strike the San Francisco Bay Area before the year 2045 (Field et al. 2015). As discussed above, there are no known faults that intersect the Project site (CGS 2022); however, there are three significant fault systems in the region: the San Andreas, Hayward, and Rogers Creek fault zones (CGS 2022). The closest of these fault systems is the San Andreas fault zone, approximately 5.2 miles southwest of the Project site. According to the WGCEP, there is a 7 percent probability that an earthquake of magnitude 6.7 or greater could occur over the next 30 years in the northern section of the San Andreas fault zone nearest the Project site; as modeled by the United States Geological Survey (USGS) ShakeMap (USGS 2016), during such an event violent to severe ground shaking would be expected at the Project site.

The Project site may be subject to potentially violent to severe seismic ground shaking due to the Project site's proximity to the San Andreas fault zone. Strong seismic ground shaking could result in potential damage to the proposed Project and potential adverse effects to the surrounding residences.

However, the Project would be subject to the seismic design criteria of the California Building Code (CBC), which requires that all buildings and structures be constructed to withstand anticipated ground shaking from regional fault sources. Implementing the regulatory requirements in the CBC and applicable local ordinances and ensuring that all buildings and structures are constructed in compliance with the law is the responsibility of the Project engineers and building officials. Marin Water would be required to retain a licensed geotechnical engineer to design the Project components to withstand probable seismically induced ground shaking. All construction on-site would adhere to the specifications and procedures contained in the final design-level geotechnical report, which is required to be fully compliant with the seismic recommendations of a California-registered, professional geotechnical engineer in accordance with the CBC. Adherence to the applicable CBC requirements would reduce potential impacts of the Project associated with directly or indirectly causing substantial adverse effects, including the

[3] Also referred to as WGCEP 2014, this is a working group comprised of seismologists from the U.S. Geological Survey (USGS), California Geological Survey (CGS), Southern California Earthquake Center (SCEC), and California Earthquake Authority (CEA).

risk of loss, injury, or death involving strong seismic ground shaking. Therefore, the impacts would be less than significant.

a.iii) **Less-than-Significant Impact.** Liquefaction is a phenomenon in which unconsolidated, water-saturated sediments become unstable because of strong seismic shaking. During an earthquake, these sediments can behave like a liquid, potentially causing severe damage to overlying structures. Lateral spreading is a variety of minor landslide that occurs when unconsolidated liquefiable material breaks and spreads because of gravity, usually down gentle slopes. Liquefaction-induced lateral spreading is defined as the finite, lateral displacement of gently sloping ground because of pore-pressure buildup or liquefaction in a shallow underlying deposit during an earthquake. The occurrence of this phenomenon depends on many complex factors, including the intensity and duration of ground shaking, particle-size distribution, and density of the soil.

Geologic mapping by Blake Jr. et al. indicates that the deposits underlying the Project site are composed entirely of mélange[4] from the Franciscan Complex (Blake Jr. et al. 2000a). The mélange described by Blake Jr. et al. consists of a mixture of shale and sandstone containing inclusions of greenstone, chert, graywacke (a variety of sandstone), serpentinite, and other metamorphic rocks (Blake Jr. et al. 2000b). As liquefaction-prone soils are typically loose and sandy soils, the deposits underlying the Project site are not likely to be subject to earthquake-induced liquefaction. Additionally, the liquefaction susceptibility map compiled by Witter et al., although small in scale (showing less detail), indicates that the Project site is within an area of low liquefaction susceptibility (Witter et al. 2006).

As noted above, Marin Water is required to design the Project in accordance with applicable CBC seismic design standards as recommended by a California-registered professional geotechnical engineer in the site-specific geotechnical review. As part of the final design-level geotechnical report identified in Impact a.ii, consistent with CBC seismic design standards, the licensed geotechnical engineer would be required to consider potential liquefaction in the final design plans. While liquefaction hazards have not been mapped at the site, if identified by the geotechnical engineer, liquefaction hazards can generally be addressed through site preparation measures or foundation design measures, such as removal and replacement of liquefiable soils, densification of these soils, or specific foundation design recommendations. Implementation of these measures in accordance with CBC requirements can effectively reduce the hazard to minimize any potential for substantive damage.

Compliance with CBC requirements, including implementation of recommendations provided in the final design-level geotechnical report, and local agency enforcement would reduce or avoid impacts related to ground failure, including liquefaction. Project

[4] A mélange is a mappable body of rock characterized both by the lack of internal continuity of contacts or strata and by the inclusion of fragments and blocks of all sizes, both exotic and native, embedded in a fragmented matrix of finer-grained material (Raymond, 2019).

construction would not directly or indirectly result in adverse effects related to ground failure, including liquefaction, and the impact would be less than significant.

a.iv) **Less-than-Significant Impact.** Landslides are one of the various types of downslope movements in which rock, soil, and other debris are displaced because of gravity. The potential for material to detach and move downslope depends on multiple factors, including the type of material, water content, and steepness of terrain.

The deposits underlying the Project site are mapped as mélange from the Franciscan Complex, which is generally considered to be an unstable soil type and prone to slope failure (Wakabayashi 2008). Geologic mapping supports this conclusion, as there are several historical landslides mapped in the region within similar mélange deposits (Blake Jr. et al. 2000a). Project construction would include grading and excavation activities, and would require vegetation removal within the Project site. It is well documented that vegetation removal exacerbates the landslide potential of a given area (Runyan & D'Ordirico 2014; Cimini et al. 2016). Therefore, the Project is in an area with elevated landslide risk.

The Project would mostly follow existing roads and trails, and where the pipeline alignment deviates from these areas, areas of ground disturbance would be reseeded with local ecotype, site appropriate, native vegetation. As stated in Impact a.ii, the final design-level geotechnical report would include design requirements that would inform the structural and geotechnical engineering of the Project, as required by the CBC. Implementation of these measures in accordance with CBC requirements would reduce any potential hazard associated with earthquake-induced landslides.

Compliance with CBC requirements, including implementation of recommendations provided in the final design-level geotechnical report would reduce or avoid impacts related to landslides. Project construction would not directly or indirectly result in adverse effects related to landslides, and the impact would be less than significant.

b) **Less-than-Significant Impact with Mitigation Incorporated.** During Project construction ground-disturbing activities could increase the risk of erosion or sediment transport, if not managed appropriately. As described in Section 2.5, *Project Construction*, construction activities would only occur from August through January to avoid conflicts with the Northern spotted owl nesting season. This scheduling means that construction activities would coincide with the Bay Area rainy season, which could potentially exacerbate soil erosion and sedimentation at the site.

Because the Project would disturb more than 1 acre of land, a Storm Water Pollution Prevention Plan (SWPPP) would be required for the Project in accordance with the National Pollutant Discharge and Elimination System (NPDES) General Permit for Stormwater Discharge Associated with Construction and Land Disturbance Activities (Construction General Permit). This SWPPP must include site-specific BMPs designed to control and reduce soil erosion. The BMPs may include dewatering procedures, storm

water runoff quality control measures, watering for dust control, and the construction of silt fences, as needed.

As described in Chapter 2, *Project Description*, Marin Water would require the implementation of standard construction practices and BMPs by the contractor selected to construct the Project. As noted in Marin Water Standards for Environmental Protection (see **Appendix A**), an environmental protection plan would also be required. Additional measures would be implemented consistent with Marin Water Standards for Erosion and Sediment Transport and Control.

To further ensure that erosion and sedimentation is controlled at the Project site during construction in the rainy season, **Mitigation Measure HYD-1**: **Water Control, Drainage, and Discharge Plan** would be implemented. As discussed in Section 3.10, *Hydrology and Water Quality*, Mitigation Measure HYD-1 would include measures to prevent erosion, scouring of bank, nuisance, contamination, and otherwise limit excess sedimentation (see Section 3.10, *Hydrology and Water Quality* for detailed description).

Compliance with Mitigation Measure HYD-1, the SWPPP, and implementation of the soil and erosion control measures would reduce or avoid erosion and soil loss, and related impacts would be less than significant.

c) **Less-than-Significant Impact.** As discussed in Impact a.iii, the Project site is in an area of low liquefaction susceptibility; this conclusion is supported by an understanding of the underlying geology and the liquefaction susceptibility map for the Bay Area. However, as discussed in Impact a.iv, the Project site is in an area that is susceptible to landslides; this conclusion is supported by research that indicates mélange from the Franciscan Complex is susceptible to landslides, coupled with the activities associated with Project construction, including vegetation removal from the Project site.

Impacts a.iii and a.iv conclude that compliance with the engineering designs included in the final design-level geotechnical report and the requirements of the CBC would reduce any potential hazards associated with liquefaction, landslides, and other hazards associated with unstable soils; therefore, this impact would be less than significant.

d) **Less-than-Significant Impact.** Expansive soils are soils that possess a "shrink-swell" characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying; the volume change is reported as a percent change for the whole soil. This property is measured using the coefficient of linear extensibility (COLE) (NRCS 2017). The Natural Resources Conservation Service (NRCS) relies on linear extensibility measurements to determine the shrink-swell potential of soils. If the linear extensibility percent is more than 3 percent (COLE = 0.03), shrinking and swelling may cause damage to buildings, roads, and other structures (NRCS 2017). NRCS Web Soil Survey data indicates the soil underlying the Project site has a 1.5 percent linear extensibility rating, which is considered a low linear extensibility rating (NRCS 2020).

Based on the available data from the Web Soil Survey, the risk of encountering expansive soils at the Project site is low and would likely not affect Project construction. Although Web Soil Survey data suggests that expansive soils at the Project site would not be an issue, CBC would still require the preparation of a final, design-level geotechnical report, which would include soil testing. If these investigations find expansive soil at the Project site, the report would include recommendations to ensure that any structural impacts resulting from expansive soil on-site would be avoided, removed, or engineered to be suitable. Adherence to the requirements of the CBC and geotechnical investigation would avoid impacts resulting from potentially expansive soils on the Project site. The Project would not create substantial direct or indirect risks to life or property related to expansive soils, and impacts would be less than significant.

e) **No Impact.** The Project would not include the use of septic tanks or alternative wastewater disposal system, and therefore would not require the use of soils that are adequate for supporting such systems. There would be no impact associated with the Project having adequate soil for septic tanks or alternative wastewater disposal systems.

f) **Less-than-Significant Impact.** Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones; mammals, birds, fish, etc.), invertebrates (animals without backbones; starfish, clams, coral, etc.), and microscopic plants and animals (microfossils), and can include mineralized body parts, body impressions, or footprints and burrows. They are valuable, non-renewable, scientific resources used to document the existence of extinct life forms and to reconstruct the environments in which they lived. A significant impact would occur if a project destroyed a unique paleontological resource or site, or a unique geologic feature.

In its "Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources," the Society of Vertebrate Paleontology (SVP) defines four categories of paleontological potential for rock units: high, low, undetermined, and no potential: **High Potential**, rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources; **Low Potential**, rock units that are poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule; **Undetermined Potential**, rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment; and **No Potential**, rock units like high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites) that will not preserve fossil resources (SVP 2010).

The Project site is mapped entirely within late Jurassic to early Cretaceous-age mélange of the Franciscan Complex (Blake Jr. et al. 2000a). Fossils in the Franciscan Complex are rare, but key microfossils, trace fossils, and occasional macrofossils (late Jurassic-age marine reptiles) have been discovered and found to be scientifically significant (Sub Terra Consulting 2017).

The University of California Museum of Paleontology (UCMP) online fossil locality database contains records of three invertebrate fossil localities in Marin County (UCMP 2023). One such fossil locality is recorded from the town of Corte Madera,[5] approximately 5 miles southeast of the Project site (UCMP 2023). While microfossils and trace fossils have contributed to scientific study, these types of fossils are relatively common and have been studied extensively and would not be considered significant in this context. Furthermore, although vertebrate fossils are considered to be significant paleontological resources, their presence in the Franciscan Complex is exceedingly rare. Taking this into consideration, the deposits underlying the Project site are considered to have a low potential to contain significant paleontological resources and impacts on significant paleontological resources and/or unique geological formations would be less than significant.

3.7.1.1 References

Blake Jr., M.C., R.W. Graymer, and D.L. Jones (Blake Jr. et al.). 2000a. Geologic map and map database of parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California. United States Geological Survey. Miscellaneous Field Studies, MF-2337, Version 1.0. Map. Scale 1:75,000.

_____. 2000b. Geologic map and map database of parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California. United States Geological Survey. Pamphlet to accompany Miscellaneous Field Studies, MF-2337, Version 1.0.

California Geological Survey (CGS). 2022. Earthquake Zones of Required Investigation. Available at: https://maps.conservation.ca.gov/cgs/EQZApp/. Accessed on: November 13, 2023.

Cimini Dora, Portoghesi, L., Madonna, S., Grimaldi, S., Corona, P. (Cimini et al.). 2016. Multifactor empirical mapping of the protective function of forests against landslide occurrence: statistical approaches and a case study. *iForest Biosciences and Forestry*. Vol. 9, pp. 383-393. doi: 10.3832/ifor1740-008.

Field, E. H., Glenn P. Biasi, Peter Bird, Timothy E. Dawson, Karen R. Felzer, David D. Jackson, Kaj M. Johnson, Thomas H. Jordan, Christopher Madden, Andrew J. Michael, Kevin R. Milner, Morgan T. Page, Tom Parsons, Peter M. Powers, Bruce E. Shaw, Wayne R. Thatcher, Ray J. Weldon II, and Yuehua Zeng (Field et al.). 2015. Long-Term Time-Dependent Probabilities for the Third Uniform California Earthquake Rupture Forecast (UCERF3). Bulletin of the Seismological Society of America, Vol. 105, No. 2A. pp. 511-543. April 2015. doi: 10.1785/0120140093.

Natural Resources Conservation Service (NRCS). 2017. Title - National Soil Survey Handbook. Part 618 – Soil Properties and Qualities. Section 618.41, Linear Extensibility Percent.

_____. 2020 Web Soil Survey. Linear Extensibility—Marin County, California. Map. Scale 1:25,410.

[5] Exact locations of the fossil localities contained in the UCMP database are not available online, as this is considered confidential information.

Runyan, Christiane W., and Paolo D'Odririco (Runyan & D'Ordirico). 2014. Bistable dynamics between forest removal and landslide occurrence. American Geophysical Union (AGU) Publications. *Water Resources Research*. Vol. 50, pp. 1112-1130. doi:10.1002/2013WR014819.

Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee.

United State Geological Survey (USGS). 2016. ShakeMap – USGS Earthquake Hazards Program. Earthquake Planning Scenario. M 7.7 Scenario Earthquake - N. San Andreas; Offshore + North Coast. https://earthquake.usgs.gov/scenarios/eventpage/nclegacynpsanandreassaosanm7p7_se/executive#shakemap. Accessed on November 13, 2023.

University of California Museum of Paleontology (UCMP). 2023. UC Museum of Paleontology Localities database. Fossils from the Franciscan Complex throughout California.

Wakabayashi, John (Wakabayashi). 2008. Franciscan Complex, California: Problems in Recognition of Mélanges, and the Gap Between Research Knowledge and Professional Practice. American Rock Mechanics Association (ARMA). ARMA 08-357.

Witter, Robert C., Keith L. Knudsen, Janet M. Sowers, Carl M. Wentworth, Richard D. Koehler, and Carolyn E. Randolph (Witter et al.). 2006. Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California: Liquefaction Susceptibility. United States Geological Survey. Open-File Report 06-1037. Sheet 2 (of 2).

3.8 Greenhouse Gas Emissions

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

3.8.1 Discussion

a) **Less-than-Significant Impact.** The combustion of diesel and gasoline fuel to provide power for the operation of construction equipment and vehicles results in the generation of greenhouse gas (GHG) emissions. Construction GHG emissions associated with the Project were estimated using Project-specific information provided by Marin Water, such as construction phasing schedule, construction equipment types and amounts, and volume of imported and exported material. **Appendix B** contains the data and assumptions used to estimate the construction-phase GHG emissions that would be associated with the Project.

Projected carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions from off-road construction equipment and construction vehicle trips were also derived from the CalEEMod run to estimate criteria air pollutant emissions. N_2O and CH_4 emissions were multiplied by their respective Global Warming Potentials (GWPs) (25 and 298) and added to the CO_2 emissions to obtain carbon dioxide equivalent (CO_2e) emissions.

Project construction would generate an estimated annual maximum of 661 metric tons (MT) of CO_2e during the construction period. BAAQMD has not adopted quantitative significance thresholds for construction-related GHG emissions in its 2022 CEQA Guidelines (BAAQMD, 2023). However, it recommends that the Lead Agency quantify and disclose construction GHG emissions and incorporate best management practices to reduce GHG emissions during construction, as applicable. In the absence of applicable BAAQMD significance thresholds, this analysis applies the nearby Sacramento Metropolitan Air Quality Management District (SMAQMD) GHG significance thresholds included in the *SMAQMD Guide to Air Quality Assessment in Sacramento County* (SMAQMD, 2021). These thresholds of significance were updated in April 2020 in consideration of Senate Bill 32, including the statewide GHG reductions target of 40 percent below 1990 levels by the year 2030 and includes an annual maximum of 1,100 $MTCO_2e$ per year as the threshold for evaluation of construction GHG emissions.

Maximum annual GHG emissions associated with Project construction were estimated to be 661 $MTCO_2e$ in 2025. These emissions are well below the SMAQMD threshold,

therefore the Project's impact with respect to construction GHG emissions would be less than significant and no mitigation would be required.

Following construction, operation would generate GHG emissions from the bi-annual employee vehicle trips. The GHG emissions associated with these trips would be negligible and would be expected to be less than 1 $MTCO_2e$ per year. Maximum indirect GHG emissions from the increase in electricity use at the pump stations were calculated using intensity factors from PG&E and would be approximately 8.9 $MTCO_2e$ per year.

The BAAQMD's 2022 CEQA Guidelines include significance thresholds for the evaluation of operational GHG emissions. The thresholds are in the form of construction design standards for projects targeting reduction of operational GHG emissions from building energy use and transportation. These thresholds are therefore more applicable for the evaluation of land use development projects and not infrastructure development projects such as the proposed Project, which would consist of construction of pipelines and a pump station, and due to the nature of the Project, the SMAQMD operational GHG thresholds of significance are not directly applicable. For these reasons, operational GHG emissions associated with the Project would be less than significant.

b) **Less-than-Significant Impact.** In response to AB 32 GHG reduction goals, CARB adopted the Climate Change Scoping Plan, which outlined a framework for achieving the emission reduction goals set in the California Global Warming Solutions Act. The Scoping Plan was most recently updated in 2022 (2022 Scoping Plan; CARB, 2022) to address California's 2030 GHG target and identifies how the State can reach the 2030 climate target established by SB 32 while making substantial advancements to achieve carbon neutrality by 2045 toward the 2050 climate goal established by Executive Order S-3-05 (2005).

Marin County developed and adopted a climate action plan in 2020 to meet a county-wide 2030 GHG emissions target consistent with SB 32 and achieve reductions in line with the longer-term statewide goal to reduce emissions 80 percent below 1990 levels by 2050, as established by Executive Order B-30-15 (Marin County, 2020).

Strategies in the climate action plan that are applicable to the Project include:

WR-CR3 **Construction & Demolition Debris and Self-Haul Waste.** Require all loads of construction & demolition debris and self-haul waste to be processed for recovery of materials as feasible.

The Marin Countywide Plan (Marin County, 2007) also includes goals and recommended programs and policies to reduce GHG emissions generated within the County. Relevant policies and programs in the Countywide Plan include:

- AIR-4.1 **Reduce Greenhouse Gas Emissions**. Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emission technologies.

- AIR-4.h **Evaluate the Carbon Emissions Impacts of Proposed Developments**. Incorporate a carbon emissions assessment into land use plans and the environment impact report for projects.
- AIR-4.o **Implement Proposed State Programs to Reduce Greenhouse Gas Emissions**. Implement proposed State programs to reduce greenhouse gas emissions, including the Renewable Portfolio Standards, California Fuel Efficiency (CAFE) standards, and carbon cap and trade program.
- EN-3.1 **Initiate Green Building Initiatives**. Encourage and over time increasingly require sustainable resource use and construction with nontoxic materials.
- EN-3.c **Divert Construction Waste**. Continue to implement and improve the Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum of 50% of unused or leftover building materials.

GHG emissions would primarily be generated from construction activities. The 2022 Scoping Plan Update contains a measure that requires that 25 percent of energy demand from construction equipment will be electrified by 2030 and 75 percent will be electrified by 2045, which the Project would be consistent with as construction would be completed before 2030. The Project would be consistent with the policies and programs in the Marin Countywide Plan to reduce GHG emissions. Material excavated on site would mostly be reused as backfill on site, and all vehicles would be required to comply with CAFE standards as well as the Advanced Clean Cars Program and Mobile Source Strategy. Electricity would be supplied by PG&E, which is required to comply with SB 100 and the Renewable Portfolio Standard. SB 100 requires that the proportion of electricity from renewable sources be 60 percent by 2030 and 100 percent renewable power by 2045. Therefore, the Project would be consistent with all applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions. This impact would be less than significant.

3.8.1.1 References

Bay Area Air Quality Management District (BAAQMD). 2023. BAAQMD CEQA Guidelines. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-6-Project-climate-impacts_final-pdf.pdf?rev=ce3ba3fe9d39448f9c15bbabd8c36c7f&sc_lang=en. Accessed November 2023.

California Air Resources Board (CARB). 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. Accessed November 2023.

Marin County. 2007. Marin Countywide Plan, 2007. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update_r.pdf?la=en. Accessed November 2023.

Marin County. 2020. Marin County Unincorporated Area Climate Action Plan 2030. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/sustainability/climate-and-adaptation/cap-2030_12082020final.pdf. Accessed November 2023.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2020. Revised February 2021. SMAQMD Guide to Air Quality Assessment. Available at: https://www.airquality.org/LandUseTransportation/Documents/Ch6GHG2-26-2021.pdf. Accessed November 2023.

3.9 Hazards and Hazardous Materials

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☒	☐

3.9.1 Discussion

a, b) **Less-than-Significant.** During Project construction, equipment and materials would include fuel, oils, lubricants, hydraulic fluid, paints and thinners and cleaning solvents to maintain vehicles and motorized equipment, which are commonly used in the construction industry. Routine use of any of these substances could pose a hazard to people or the environment and would be considered potentially significant.

As discussed in greater detail in Section 3.7, *Geology and Soils*, item (b), Project construction would be subject to the Construction General Permit and its required SWPPP, which must include BMPs to control potential water quality pollutants, including hazardous materials, used for construction. Implementation of BMPs developed for the SWPPP would reduce the potential for release of hazardous materials during construction activities.

Project operation and maintenance would result in the transportation, storage, use or disposal of fewer hazardous materials compared to construction. During operation,

relatively limited quantities of the hazardous materials listed above would be stored onsite. In accordance with requirements contained in the Health and Safety Code and the California Code of Regulations, Marin Water would prepare a Hazardous Materials Business Plan/Spill Prevention, Control, and Countermeasures Plan (HMBP/SPCC). The HMBP would include BMPs for the transport, storage, use, and disposal of hazardous materials and waste. The HMBP would also include information regarding construction activities, worker training procedures, and hazardous materials inventory procedures. Prior to operation, Marin Water would update the HMBP (including the BMPs) with information about the types of hazardous materials that would be used during operation.

The Project would be maintained and operated according to all local, state, and federal regulations during construction and operation, and hazardous material storage would be detailed in the SPCC Plan. Refueling and general maintenance for equipment, such as changing fluids and lubricating parts, would also be subject to sufficient containment capabilities and according to measures outlined in the SPCC Plan.

Compliance with applicable federal, state, and local regulations and the applicable BMPs and HMBP would ensure that any potential impact would be less than significant during Project operation and maintenance.

Compliance with applicable federal, state, and local requirements, and related BMPs and plans would reduce the risk that the Project would create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials or potential upset and accident conditions involving the release of hazardous materials into the environment. Therefore, this impact would be less than significant.

c) **No Impact.** The Project site is not located within 0.25 mile of a school. The nearest school is The Branson School, approximately 1.9 miles northeast of Pump Station 1. The Project would not emit hazardous emissions or handle hazardous materials within 0.25 mile of a school; consequently, there would be no impact.

d) **No Impact.** The search for hazardous materials sites compiled pursuant to Government Code Section 65962.5 (referred to as the "Cortese List") is based on the results of regulatory agency database searches using the California State Water Resources Control Board (SWRCB) GeoTracker database and the California Department of Toxic Substances Control (DTSC) EnviroStor database, and other sources identified by the California Environmental Protection Agency. The GeoTracker database includes the following hazardous materials site lists: leaking underground storage tank (LUST) cleanup sites; spills, leaks, investigation, and cleanup (SLIC) sites; permitted underground storage tank (UST) facilities; land disposal sites; military cleanup sites; and other cleanup sites. The EnviroStor database includes federal Superfund, state response, voluntary cleanup, school cleanup, and hazardous waste corrective action. Nearby landfill facilities were identified by the database searches. The DTSC and SWRCB are also agencies that are responsible for updating the Hazardous Waste and Substances Site List (Cortese List). The list is a planning document used by state and local agencies and

developers to comply with CEQA requirements by providing location information for hazardous material release sites.

An independent review of the EnviroStor and GeoTracker hazardous materials databases confirms there are no active or closed hazardous materials sites within the Project site boundary (DTSC 2023; SWRCB 2023a). The closest hazardous materials site is a LUST Cleanup Site located at 153 Lagunitas Drive (Peacock Property), approximately 0.92 mile northeast of the Project site. The site was closed as of May 24, 1993 (SWRCB 2023b); any contamination associated with this site has been remediated and would not affect the Project. Therefore, the Project would not create a significant hazard to the public or the environment based on proximity to a known hazardous materials site and there would be **no impact** under this criterion.

e) **No Impact.** The Project site is not located within 2 miles of a public or public use airport. The nearest airport is the San Rafael Airport, approximately 5.1 miles northeast of the Project site. The Project would not result in a safety hazard or excessive noise for people residing or working in the area; there would be no impact.

f) **Less-than-Significant Impact.** The Marin County Fire Service created the Mt. Tamalpais Mutual Threat Zone Plan (MTZ Plan) for urban-wildland interface fires on and around Mt. Tamalpais. Included in the MTZ Plan are maps for areas that include Structural Protection Zones and evacuation routes. The Project site is included on the Ross Valley – South Area map, on which Bolinas Road and Dibblee Road, which turns into Lagunitas Road, are delineated as primary evacuation routes (Marin County 2022).

Section 2.5.3, *Construction Traffic Routing*, states that Sir Francis Drake Boulevard to Lagunitas Road through Natalie Coffin Greene Park would be used as the primary entrance and exit location for construction traffic to Phoenix Lake and Sir Francis Drake Boulevard to Bolinas Road to Sky Oaks Road would be used as the primary entrance and exit location for construction traffic to the Bon Tempe Reservoir.

While Sir Francis Drake Boulevard, Lagunitas Road, Bolinas Road, and Sky Oaks Road would be utilized by construction vehicles, the Project would not require any road closures, and traffic generated by the Project is not expected to cause congestion such that the Project would impair or physically interfere with the MTZ Plan. Impacts related to impairment or physical interference of an emergency response or evacuation plan would be less than significant.

g) **Less-than-Significant Impact.** Based on mapping by the California Department of Forestry and Fire Protection (CAL FIRE) Forest Resource Assessment Program, the Project site is mapped within a moderate Fire Hazard Severity Zone (CAL FIRE, 2007). The use of construction equipment and the possible temporary on-site storage of fuels and/or other flammable construction chemicals could pose an increased fire risk resulting in injury to workers or the public during construction. However, contractors would be required to comply with hazardous materials storage and fire protection regulations, as well as Marin Water's standard fire reduction measures (see **Appendix A**) which would

minimize potential for fire creation and ensure that the risk of wildland fires during construction would be less than significant.

3.9.1.1 References

California Department of Forestry and Fire Protection (CAL FIRE). 2007. Marin County Fire Hazard Severity Zones in State Responsibility Areas (SRA). Adopted by CAL FIRE on November 7, 2007. Forest Resource Assessment Program. Map. Scale 1:100,000.

Department of Toxic Substances Control (DTSC). 2023. EnviroStor database. Hazardous materials sites in Marin County.

Marin County. 2022. Wildfire Evacuation Zones. Available at: https://www.marincounty.org/-/media/files/departments/fr/wildfire-evacuation-zones/mtz_kentfield.pdf. Accessed on November 9, 2023.

State Water Resources Control Board (SWRCB). 2023a. GeoTracker database. Hazardous materials sites in Marin County.

_____. 2023b. GeoTracker database. Record for Peacock Property. Available at: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0604100175. Accessed on November 21, 2023.

3.10 Hydrology and Water Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☒	☐	☐
iii) 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; or	☐	☒	☐	☐
iv) impede or redirect flood flows?	☐	☒	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐

3.10.1 Discussion

a) **Less-than-Significant Impact with Mitigation.**

Construction

The Project site would drain to Bon Tempe Reservoir or Phoenix Lake, which are waters under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), an agency tasked with implementing water quality requirements of the State of California. To prepare the site to install the new pipeline, approximately 2,508 CY of material would be excavated from the site. As described in Section 2.5.2, *Construction Activities,* excavated material that would be reused on-site as backfill would be stored at the staging areas adjacent to Phoenix Lake and Bon Tempe Reservoir. Excavated material that is contaminated or in excess would be disposed of at Redwood Landfill in Novato. Construction activities could result in pollutants being mobilized into the surrounding area through stormwater runoff (nonpoint-source pollution), potentially degrading the quality of receiving waters. Soil-disturbing activities, such as tree removal,

excavation, and site clearing, could result in soil erosion and the mobilization of debris and soil in the form of stormwater runoff to downstream water bodies and storm drains. If not properly managed, stockpiled spoils could migrate offsite during storm events and increase sedimentation in downstream receiving waters. Fuels, lubricants, and other hazardous materials associated with the Project's use of construction equipment could also adversely affect water quality if spilled or stored improperly.

Additionally, because the Project would disturb more than 1 acre of land, a SWPPP would be required for the Project in accordance with the NPDES Construction General Permit. This SWPPP must be prepared by a qualified SWPPP developer and include site-specific BMPs designed to control stormwater and reduce soil erosion. The BMPs would be determined by the qualified SWPPP developer and may include dewatering procedures, storm water runoff quality control measures, watering for dust control, and the installation of silt fences, as needed.

In addition, as described in Chapter 2, *Project Description*, Marin Water would require its contractor to implement standard construction practices and BMPs (refer to **Appendix A**). As noted in the Marin Water Standards for Environmental Protection, an environmental protection plan would be required to be prepared by the contractor selected to construct the Project. General Protection of Natural Resources (part 3.1), for example, stipulates that "natural resources within the project boundaries and outside the limits of permanent work … be preserved in their existing conditions or be restored to an equivalent or improved condition upon completion of work." Additional erosion control measures (guidance noted in **Appendix A**, Standard S18000, part 3.5) would be implemented to control construction runoff, consistent with Marin Water Standards for Erosion and Sediment Transport and Control (Marin Water, 2021).

The proposed construction schedule includes work within the wet season. As described in Section 3.4, *Biological Resources*, the Project alignment crosses two intermittent streams, Fish Creek and Phoenix Creek, and as many as ten ephemeral streams. If construction requires work within ephemeral streams during the wet season, the project could release excess sediment into the streams, a potentially significant water quality impact.

To reduce impacts and provide for the careful planning for water control, site drainage, and discharge during construction, implementation of **Mitigation Measure HYD-1, Water Control, Drainage, and Discharge Plan** would be required.

> **Mitigation Measure HYD-1: Water Control, Drainage, and Discharge Plan.**
>
> Prior to (or at the time of) final design, the contractor selected to construct the Project shall prepare and submit to Marin Water, Marin County, and the RWQCB (as applicable) a Water Control, Drainage, and Discharge Plan. The plan shall apply to all areas of ground disturbance and contain provisions for energy dissipation and describe measures to prevent erosion, scouring of banks, nuisance, and contamination, and otherwise limit the project's contribution of silt and sediment into receiving waters. An assessment of the downstream/down gradient drainage ("hydrological conditions assessment") shall be conducted to allow for appropriate

planning for rerouting existing site drainage to accommodate the proposed Project such that erosion is not allowed to occur in the vicinity of the Project on- or off-site.

A detailed plan for drainage control shall be prepared based on the results of the design-level geotechnical report and Project hydrological conditions assessment. Proposed measures shall conform with the requirements of all applicable discharge permits. Measures shall include, but not be limited to, the following:

- To the extent feasible, construction during moderate to heavy rain events shall cease;
- The use of heavy equipment at the site during all phases of the Project shall be limited during rain events, and the site shall be allowed to dry out prior to heavy equipment use upon sloping terrain or in ephemeral stream channels;
- Water used for dust control or other purposes during construction shall not be applied in a manner that results in ponding or runoff (on- or off-site);
- Straw wattles, sand bags, and other erosion control devices shall be installed, periodically checked, and maintained in a manner that allows for optimal functionality to prevent contamination of stormwater;
- Good housekeeping measures shall include covering spoils piles and removing trash from the site daily;
- Adaptive management shall be incorporated into drainage planning to ensure the adequacy or functionality of installed erosion control measures. In the event of redundant or overlapping erosion control measures or BMPs, the more effectual measures shall be utilized;
- Design for grading, drainage, and stormwater control to support proposed site structures shall conform to all applicable requirements of the California Building Code and Regional Water Quality Control Board stormwater and/or waste discharge requirements (as applicable);
- Site hydrology shall be considered with energy dissipation structures (or other measures) installed at strategic locations where stormwater is discharged into the natural drainages such that runoff and erosion are controlled on- and off-site;
- Concrete residues shall not be allowed to enter waterways or stormwater infrastructure. Measures to limit migration of residues may include the use of silt fencing or on-site containment, subject to review and approval by Marin Water;
- Bio-retention and/or measures for source control of silt, sediment, and other pollutants shall be incorporated into the drainage design, as appropriate;
- Revegetation of disturbed areas and downstream drainages, as appropriate, shall utilize plantings or reseeding with ecologically appropriate, local ecotype native plant materials;

- In the event that dewatering is required during construction, such activities shall be conducted in a manner that conforms to applicable Marin Water standards, waste discharge requirements, or general permit for dewatering provisions.

The Project's conformance with applicable water quality requirements, adherence to Marin Water standards, and implementation of **Mitigation Measure HYD-1, Water Control Drainage and Discharge Plan**, would reduce construction-related impacts to less-than-significant levels.

Operation and Maintenance

Currently, during dry conditions and when required, Marin Water can convey Phoenix Lake water directly to the Bon Tempe WTP after manually changing the existing pipes from treated to raw water. Phoenix Lake water has different water quality characteristics, which require additional treatment. The project would route Phoenix Lake water into Bon Tempe Reservoir over two cycles, each for approximately 28 days (for a total of about 56 days), instead of directly to Bon Tempe WTP. Water would be pumped from Phoenix Lake and discharged into Bon Tempe Lake at the upper shoreline edge.

Beneficial uses of Bon Tempe Reservoir are municipal supply, sport fishing, fish spawning, warm freshwater habitat, wildlife habitat, and recreation (RWQCB, San Francisco Bay Basin Water Quality Control Plan, 2023). Beneficial uses of Phoenix Lake are municipal supply, commercial and sport fishing, fish spawning, cold freshwater habitat, warm freshwater habitat, preservation of rare and endangered species (northwestern pond turtle), wildlife habitat, and recreation (RWQCB, San Francisco Bay Basin Water Quality Control Plan, 2023).

The water quality in Phoenix Lake and Bon Tempe Reservoir differs. Relative to Bon Tempe Reservoir, Phoenix Lake water is generally cooler, has lower dissolved oxygen levels, and has higher nutrient and metals concentrations. Bon Tempe Reservoir water is generally warmer, with relatively higher dissolved oxygen levels and lower nutrient and metals concentrations (Stillwater Sciences, 2023). Depending on the season, water quality in each lake can also differ depending on the depth in the water column. During warmer months, water in lakes can become stratified into warmer water near the surface and cooler water near the bottom (cooler water near the bottom is called the *hypolimnion*). Water at the bottom of the lake (in the hypolimnion) is not in contact with the atmosphere and becomes relatively depleted of oxygen, which can encourage the release of nutrients into the water.

Due to the differences in water quality between the two lakes, the transfer of water from Phoenix Lake directly into Bon Tempe Reservoir could alter the water quality in both lakes. The quality of water pumped from Phoenix Lake could differ depending on the season of water transfer. Transfers during summer or fall are likely to add water with higher concentrations of nutrients and low dissolved oxygen to Bon Tempe Reservoir, because the pump could draw water from the hypolimnion. However, water transfers are proposed to occur only in the late fall/early winter or late spring, with no transfers in the

summer or early fall when the reservoirs are at their lowest. Winter transfers are less likely to affect water quality in Bon Tempe Reservoir because the water column in Phoenix Lake is mixed.

The quality of water In Phoenix Lake would also change as water is pumped to Bon Tempe Reservoir. To minimize the occurrence of algal blooms, benthic algae mats would be placed in Bon Tempe Reservoir as is Marin Water's standard practice. However, water transfers during most of the year (winter/spring/summer) are likely to increase the water temperatures in Phoenix Lake, which could also increase the potential for algal blooms in Phoenix Lake and could impair use of the water for designated beneficial uses (such as warm freshwater habitat, wildlife habitat, and fish spawning). This would be a potentially significant water quality impact, which would be avoided with implementation of **Mitigation Measure HYD-2, Adaptive Water Quality Management Plan**. Mitigation Measure HYD-2 would avoid this impact by testing water in Phoenix Lake prior to transfers, and, if water quality criteria are not met, delay transfers.

Depending on the diameter of the pipeline opening, and the substrate underlying the area where the water is released, project operation could also cause new erosion and release additional sediment into Bon Tempe Reservoir. However, the Project's conformance with applicable water quality requirements, adherence to Marin Water standards, and implementation of **Mitigation Measure HYD-1, Water Control Drainage and Discharge Plan**, would reduce operation-related impacts to Bon Tempe Reservoir to less-than-significant levels.

Mitigation Measure HYD-2: Adaptive Water Quality Management Plan.

Marin Water shall develop and implement an adaptive water quality management plan applicable to water transfers between Phoenix Lake and Bon Tempe Reservoir. The purpose of the adaptive water quality management plan is to prevent the accumulation of biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses, and to maintain dissolved oxygen levels in Phoenix Lake above 5.0 mg/l. The plan shall include measurable water quality criteria applicable to Phoenix Lake that will establish whether a water transfer could promote aquatic growths such that beneficial uses are adversely affected or dissolved oxygen is reduced below minimum levels in Phoenix Lake. Marin Water shall measure water quality prior to transfers to ascertain whether Phoenix Lake exceeds the water quality criteria. If measured water quality indicates that the transfer could promote aquatic growths such that beneficial uses are adversely affected or could reduce dissolved oxygen below minimum levels in Phoenix Lake, then Marin Water will delay transfer. For up to five years after the first water transfer, Marin Water will monitor the dissolved oxygen concentrations in Phoenix Lake monthly. If monitoring establishes that, after 5 years, the median dissolved oxygen concentration for any three consecutive months was not less than 80 percent of the dissolved oxygen content at saturation, or not less than the baseline (2023−2024) seasonal minimum dissolved oxygen concentrations in Phoenix Lake, then monitoring can cease.

b) **Less-than-Significant Impact.** Water resources would likely be used for dust control and other purposes during construction, some of which may be sourced from groundwater. Marin Water proposes to increase the storage of water resources; however, the use of groundwater resources is not expected to increase following construction. In addition, the Project is not within a groundwater basin subject to conditions of critical overdraft, nor would the Project be constructed in a medium or high-priority groundwater basin defined by the California Department of Water Resources for purposes of the Sustainable Groundwater Management Act. The Project would not substantially increase impervious area. Moreover, the Project would not increase the demand for groundwater resources or otherwise deplete resources in the basin. Impacts on groundwater during the construction and operation of the Project are less than significant.

c.i) **Less-than-Significant Impact with Mitigation.**

Construction

The Project would use heavy equipment to prepare the site to support the pipeline and associated infrastructure and would therefore temporarily alter the terrain and drainage patterns of the existing slope. Grading and excavation would be required to prepare the Project site and install the pipeline, as described in Section 2.5.2, *Construction Activities*. Because the Project would include soil-disturbing activities, compliance with the Construction General Permit and SWPPP terms would be needed, as discussed in item a). The contractor selected to construct the Project would be responsible for preparing the SWPPP, which would outline procedures to ensure effective stormwater/non-stormwater management at the Project site.

As noted in Section 3.7, *Geology and Soils*, the Project would be subject to CBC design criteria, and all construction would be required to adhere to specifications and procedures within the final geotechnical report. However, due to the necessity of crossing up to ten ephemeral drainages during the rainy season, even with the implementation of design specifications and a SWPPP, construction of the Project could still result in substantial erosion and/or siltation of ephemeral waterways proximal to the site. **Mitigation Measure HYD-1 (Water Control, Drainage, and Discharge Plan)** would be implemented to reduce potential impacts and implement appropriate water control, drainage, and discharge measures within and from the site. Refer to question a) for the text of the mitigation measure.

Operation and Maintenance

The Project would release water into Bon Tempe Reservoir at a rate of 3 mgd (equivalent to about 4.6 cubic feet per second of flow) twice a year for approximately 28 days (for a total of about 56 days). The water would be released along the high water line of the reservoir and flow over land into the reservoir. The pipeline diameter was selected in part to avoid creating shear stress during discharge, which would reduce the potential for erosion. Implementation of **Mitigation Measure HYD-1** would require Marin Water to develop and implement a plan for energy dissipation and the prevention of erosion, scouring of banks and contamination, and otherwise limit the project's contribution of silt

and sediment into receiving waters. Additionally, **Mitigation Measure HYD-2** would require Marin Water to develop and implement an adaptive water quality management plan applicable to water transfers between Phoenix Lake and Bon Tempe Reservoir. This plan would include measures to prevent substantial erosion and/or siltation. Therefore, Project operation would not result in substantial erosion or siltation, a less-than-significant impact with mitigation.

c.ii-iv) **Less-than-Significant Impact with Mitigation.** Additional stormwater infrastructure must be incorporated into the Project's design to accommodate Project construction, as described in Chapter 2, *Project Description*. Because the Project's preliminary design is currently in development and has not yet been completed, a general description is provided in Chapter 2. Site design would be subject to modification per the pending results of the geotechnical evaluation, hydrology assessment, and hydraulics calculations required for overall site engineering. The final design of the Project stormwater infrastructure would be sized to accommodate the capacity needed to drain the site without generating erosion, would conform to Marin County requirements for stormwater pollution prevention (MCSTOPP), and would be constructed and maintained consistent with Marin County erosion control planning requirements (see Section 3.7, *Geology and Soils*).

As described in Section 3.4, *Biological Resources*, the Project alignment would cross two intermittent streams, Fish Creek and Phoenix Creek, and as many as ten ephemeral streams. Those ephemeral channels could be temporarily impacted by pipeline installation if they are flowing during construction, particularly in November or December. During construction, they could be culverted across the alignment or have rock riffles installed to slow flow downstream. However, as noted under question a), various measures, including a SWPPP and an Environmental Protection Plan (per Marin Water standards), would be implemented to reduce or otherwise control runoff (see **Appendix A**). Even with the implementation of these measures, given the alternation of the existing contours, the Project could exceed stormwater conveyance capacity, which has the potential to overrun the current system and generate secondary effects. This would be a significant impact.

To reduce these potential effects and ensure that ongoing stormwater capacity exceedances do not occur, **Mitigation Measures HYD-1, Water Control, Drainage, and Discharge Plan** (described above, under question a) and **BIO-5, Habitat Restoration and Monitoring** (see Section 3.4, *Biological Resources*) would be required.

With the implementation of Mitigation Measures HYD-1 and BIO-5, Project impacts would be less than significant.

d) **Less-than-Significant Impact.** The Project site is not located in an area subject to tsunami or seiche hazards, nor is the site in a special flood hazard area or other areas of flood hazard, as defined by the Federal Emergency Management Agency (FEMA, 2009,

2014). Therefore, Project construction would have no impact associated with these hazards.

Constructed in 1905, Phoenix Lake is one of the smallest reservoirs in the Marin Water system and the only one that lies in Corte Madera Creek watershed, on the east side of the main watershed divide. The capacity of Phoenix Lake is 411 acre-feet, which is about 11 percent of the average inflow into Phoenix Lake. Once the capacity of Phoenix Lake is reached, water overflows into Ross Creek. Downstream areas of Ross Creek, located in the Town of Ross near the confluence of Ross and San Anselmo creeks, are mapped within the FEMA special flood hazard area and floodway. The Project would remove water from Phoenix Lake during the wet season, potentially increasing available capacity in the lake for water storage. As presented in **Appendix C**, with the Project, overflow amounts from Phoenix Lake into Ross Creek are expected to be similar or reduced. Consequently, the Project would not exacerbate downstream flooding by impeding or redirecting flood flows.

The Project design features, in conjunction with the required erosion and sedimentation control measures, would reduce any potential impact related to runoff and drainage changes. Therefore, operation-related alteration of local drainage patterns would not result in flooding, and the impact would be less than significant.

e) **Less-than-Significant Impact with Mitigation.**

Construction

Activities involving soil disturbance during construction could result in soil erosion and siltation of waterways during excavation and grading. If precautions are not taken to contain contaminants, construction could contribute to water quality degradation, including through the generation of stormwater run-off, a form of nonpoint source pollution. In addition, because construction equipment would require the use of fuels, lubricants, and other hazardous materials, soil contamination and water quality violations could occur if these materials are stored improperly during Project construction. These effects would conflict with the Water Quality Control Plan (Basin Plan) requirements.

However, because the Project would disturb more than 1 acre, coverage under the General Construction Permit and development of a SWPPP would be required, as previously discussed. The requirements of the General Construction Permit are enhanced and made more specific by **Mitigation Measure HYD-1**, which would provide a site-specific drainage plan and control discharge. Such measures would be implemented to reduce impacts and protect the surface and groundwater quality; refer to question a) for the text of the mitigation measure. With the implementation of **Mitigation Measure HYD-1**, the Project would not conflict with or obstruct the implementation of a water quality control plan.

Operation

As discussed in Impact a), water transfers between Phoenix Lake and Bon Tempe Reservoir could degrade water quality, which would conflict with the San Francisco Bay Basin Plan. However, as discussed in Impact a), with implementation of **Mitigation Measure HYD-2, Adaptive Water Quality Management Plan**, water quality would not be degraded.

The Project site is not located in a defined groundwater basin. The Project would not create any new impervious surfaces or require the use of groundwater. There is no groundwater sustainability plan in the Project vicinity. Therefore, the Project would not conflict with or obstruct implementation of sustainable groundwater basin management.

Operational impacts would be less than significant with mitigation.

3.10.1.1 References

Federal Emergency Management Agency (FEMA), 2009. Flood Insurance Rate Map (FIRM) Number

06041C0453D, Effective Date May 4, 2009. Marin County 060173.

FEMA, 2014. FIRM Number 06041C0454E, Map Revised March 17, 2014. Marin County 060173, Town of Ross 060179, Town of San Anselmo 060180.

Marin Water, 2021. Construction Specifications and Standards Section 02200, Earthwork and Section 1800 Environmental Protection Measures.

San Francisco Bay Basin Regional Water Quality Control Board, Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), as amended through March 7, 2023.

Stillwater Sciences, 2023. Phoenix and Bon Tempe Lakes Limnology Review, Presented to Marin Municipal Water District, October 27, 2023.

3.11 Land Use and Planning

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.11.1 Discussion

a) **No Impact.** The nearest established community is the Town of Ross, located east of Phoenix Lake. The Project includes the construction of a new pump station adjacent to an existing one and a pipeline within Marin Water's Mount Tamalpais watershed lands; none of the Project components are proposed within the Town of Ross. Project construction, staging, and operation would not physically divide this established community. Therefore, there would be no impact.

b) **No Impact.** The Project site is classified as Open Area in the Marin Countywide Plan, and the Project as proposed would not substantially conflict with the Open Space land use designation because there would be no change in land use after Project construction (Marin County Code, 2007). Project consistency with specific County policies adopted for the purpose of avoiding or mitigating environmental effects are addressed in other sections of this Initial Study (e.g., Section 3.12, *Noise*, addresses Project consistency with Noise Ordinance policies). For these reasons, there would be no impact.

3.11.1.1 References

Marin County Code. 2023. Marin County Code – Title 22 Development Code. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/devcode2024/2023marin-county-development-code_title-22_final.pdf. Accessed October 30, 2023.

Marin County. 2007. Marin Countywide Plan. Marin County Community Development Agency. November 6, 2007. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update.pdf. Accessed November 27, 2023.

3.12 Mineral Resources

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

3.12.1 Discussion

a,b) **No Impact**. Multiple sources of information were consulted to determine the potential presence of mineral resources at the Project site, and whether Project activities would result in the loss of availability of any mineral resources.

The Mineral Resources Data System, administered by the USGS, provides data describing mineral resources, including deposit name, location, commodity, deposit description, production status, and references, and can be used to confirm the presence/absence of existing surface mines, closed mines, occurrences/prospects, and unknown/undefined mineral resources. According to the available Mineral Resources Data System data, there are no significant mineral resources at the Project site or in the area (USGS, 2023).

The CGS maps and regulates the locations of potential mineral resources in California consistent with the Surface Mining and Reclamation Act. To protect these potential mineral resources, the CGS has classified the regional significance of mineral resources into mineral resource zones (MRZs) and mapped them. The Project site is mapped in an area that is classified as MRZ-3, which indicates the area contains mineral occurrences of undetermined significance (Miller & Busch, 2013).

The California Geologic Energy Management Division (CalGEM) provides oversight of the oil, natural gas, and geothermal industries, and regulates the drilling, operation, and permanent closure of energy resource wells. CalGEM's online mapping application, Well Finder, was reviewed to determine the presence of any oil, gas, or geothermal resources in and around the Project site. Well Finder data indicates there are no significant resources at the Project site or vicinity (CalGEM, 2023).

Additionally, the Built Environment Element of the Marin Countywide Plan, which provides information about locally important, significant mineral resources within Marin County, does not indicate the presence of any significant mineral resources at or near the Project site (Marin County, 2007).

According to the review of available data from the USGS, CGS, CalGEM, and Marin County, there are no significant mineral resources at the Project site or in the area. Additionally, Project activities would not result in the loss of availability of any known mineral resources or locally important mineral resources. Therefore, there would be no impact on mineral resources.

3.12.1.1 References

California Geologic Energy Management Division (CalGEM). 2023. Well Finder online tool. Available at: https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx. Accessed on: November 27, 2023.

Marin County. 2007. Marin Countywide Plan. Built Environment Element. Marin County Community Development Agency. November 6, 2007.

Miller, Russell V. and Lawrence L. Busch, (Miller & Busch). 2013. Updated Mineral Land Classification Map for Class II Base-Grade Aggregate in the North San Francisco Bay Production-Consumption Region, Marin, Napa, Sonoma, and Southwestern Solano Counties, California. Special Report 205 – Place 1C. California Geological Survey. Map. Scale 1:150,000.

United States Geological Survey (USGS). 2023. Mineral Resources Data System (MRDS) database. Available at: https://mrdata.usgs.gov/mrds/map-graded.html. Accessed on November 27, 2023.

3.13 Noise

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

3.13.1 Noise Definitions and Concepts

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with 0 dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. Therefore, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead focusing on the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). All sound pressure levels and sound power levels reported below are A-weighted.

3.13.1.1 Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal and is typically expressed in units of inches per second (in/sec). The PPV is most frequently used to describe vibration impacts on buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to

compress the range of numbers required to describe vibration (Federal Transit Administration [FTA] 2018). Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

3.13.1.2 Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise sensitive.

The Project site is undeveloped and surrounded by woodland. Sensitive receptors in the vicinity include single-family residences located on Goodhill Road approximately 0.75 mile to the east of the Project site. The ranger residence adjacent to Pump 2, which houses a Marin Water employee, is not considered a sensitive receptor for purposes of this analysis.

3.13.1.3 Discussion

a) **Less-than-Significant Impact.** The Project would generate noise primarily during construction as discussed below. Once operational, the Project's pump station operation would largely remain the same as current operations and would include up to two workers traveling in a small passenger truck for bi-annual testing of the pumps.

As described in Section 2.5.1, *Construction Schedule, Hours, and Work Force*, Project construction would occur within two 6-month phases between mid-2024 and early 2026.

Construction would involve the use of equipment that would generate substantial noise at and adjacent to construction areas. Noise impacts from construction would depend on the type of activity being undertaken and the distance to the receptor location. Construction noise impacts are most severe if construction activities take place during noise-sensitive hours (i.e., early morning, evening, or nighttime hours), in areas immediately adjoining noise-sensitive land uses, and/or when construction duration lasts over extended periods.

Table 3-3 shows typical noise levels produced by the types of construction equipment that are expected to be used for Project construction and their corresponding acoustical usage factor.

TABLE 3-3
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Type of Equipment	L_{max} at 50 feet, dBA	Acoustical Usage factor (%)
Auger Drill Rig	84	20
Backhoe	78	40
Bulldozer	82	40

Type of Equipment	L_{max} at 50 feet, dBA	Acoustical Usage factor (%)
Concrete Mixer Truck	79	40
Crane	81	16
Dump Truck	76	40
Excavator	81	40
Flatbed Truck	74	40
Front End Loader	79	40
Grader	85	40
Roller compactor	80	20
Skid Steer Loader	79	40

NOTES:

Lmax = The instantaneous maximum noise level measured during the period of interest.
Acoustical Usage factor is the percent of time during a construction noise operation that a piece of construction equipment is operating at maximum level.

SOURCE: FHWA 2017.

The operation of each piece of off-road equipment would not be constant throughout the day, as equipment would be turned off when not in use. This is accounted for in the acoustical usage factor for each equipment type, also shown in **Table 3-3**. Over a typical workday, equipment would operate at different locations on the Project site and would not always be operating concurrently. Though the County's municipal code allows for exceptions from construction hour restrictions for construction projects conducted by a public utility, such as the proposed Project, the Project's construction activities would generally be restricted to the less noise-sensitive daytime hours between 7 a.m. and 4:30 p.m., Monday through Friday. No work on weekends and holidays is anticipated.

To estimate daytime construction noise levels that the closest sensitive receptors would be exposed to, consistent with the methodology recommended by the FTA in its *Transit Noise and Vibration Assessment Manual*, the two noisiest pieces of equipment used for Project construction are assumed to be operating simultaneously at the center of the Project construction area, approximately 0.75 mile from the nearest residential receptors. Taking into account the acoustical usage factors, simultaneous operation of a bulldozer and a grader at the same location would generate a combined daytime noise level of approximately 45 dBA L_{eq} at the nearest sensitive receptors. These estimated noise levels do not account for the additional attenuation that would result due to woodland screening that would occur. There are no quantitative standards for construction noise specified by either the Marin Countywide Plan or the municipal code and construction projects of public agencies and utilities are exempt from construction hour restrictions specified by the code. The FTA's Transit Noise and Vibration Impact Assessment has identified a daytime 1-hour L_{eq} level of 90 dBA as a noise level where adverse community reaction could occur at residential land uses (FTA 2018). Construction noise generated by the Project would be well below this level. In addition, construction contractors would be required to comply with Marin Water's Environmental Standards for noise control during construction, which specifies maximum allowed noise levels for equipment used as well

as BMPs to manage noise impacts to neighboring receptors (see **Appendix A**). Therefore, noise impacts from Project construction would be less than significant.

In addition to construction equipment, noise would also be generated from construction vehicles transporting workers and materials to and from the Project site. Construction traffic trips to and from the Project site would occur during the less noise-sensitive, daytime hours of 7 a.m. to 4:30 p.m. on weekdays. Trucks would travel on U.S. Highway 101 to Sir Francis Drake Boulevard to Lagunitas Road through Natalie Coffin Greene Park to access the Project site at Phoenix Lake, and Sir Francis Drake Boulevard to Bolinas Road to Sky Oaks Road to access the Project site at Bon Tempe Reservoir. These roadways are well traveled routes in the area and the increase in noise from the addition of Project traffic would not be perceptible. The scattered residential receptors in the Project vicinity would experience a temporary increase in roadside noise level due to the addition of Project construction traffic. But this increase would not be substantial since Project construction would average eight trips per day. Given the absence of quantitative construction noise standards and the exemption allowed for public agencies and utilities, this impact would be less than significant.

Upon completion of Project construction, and after the pumps are commissioned and operational, Pump 1 would be upsized but operation would largely remain the same as current operation. Pump 2 would be enclosed in a new pump station building (see Section 2.4.2, *Pumps and Pump Stations*, and would include a new 400 horsepower (hp) pump. Pumps at these hp ratings can generate noise levels of 96 dBA at 3 feet (Hoover and Keith, 2000), which corresponds to a noise level of 78 dBA at 25 feet. However, Pump 2 would be located farther than approximately 0.4 mile from the nearest sensitive receptor population and would be enclosed within a structure with noise attenuation measures, and therefore would not be expected to have a perceptible noise impact. The Project would require minimal maintenance, which is expected to include bi-annual testing of the pumps and would require one to two workers traveling to the sites in a small passenger truck. The associated increase in vehicle noise would not be perceptible. Noise generated by Project operation and maintenance would therefore result in a less-than-significant impact.

The Project would not generate a substantial temporary or permanent increase in ambient noise levels in the Project vicinity exceeding standards established in the local general plan or noise ordinance. This impact would be less than significant.

b) **Less-than-Significant Impact.** Construction activity can result in varying degrees of groundborne vibration, depending on the type of soil, equipment, and methods employed. Operation of construction equipment can cause ground vibrations that spread through the ground and diminish in strength with distance. Buildings on the soil near the construction site respond to these vibrations with varying results, ranging from no perceptible effects at the lowest levels, low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels. While ground vibrations from construction

activities do not often reach the levels that can damage structures, fragile buildings must receive special consideration.

Equipment expected to be used for Project construction is shown in **Table 3-3**. Construction vibration may generate perceptible vibration when impact equipment or heavy earth moving equipment are used. There are structures of historical significance in the Project vicinity (refer to Section 3.5, *Cultural Resources* for additional details about historic resources). The nearest structure on Phoenix Lake Road is Pump House #2 (approximately 100 feet northeast of the Phoenix Lake Log Cabin) located 30 feet from the pipeline alignment, and the nearest historical structure is located 130 feet from the pipeline alignment (Phoenix Lake Log Cabin).

The FTA and Caltrans have adopted vibration standards that are used to evaluate potential impacts related to sensitive receiving land uses from vibration. The FTA identifies 0.2 in/sec PPV as the level at which potential damage could result to buildings of conventional construction. Caltrans identifies 0.24 in/sec PPV as the level at which vibration is distinctly perceivable to humans.

Of the equipment shown in **Table 3-3**, the roller compactor would be the highest vibration-generating equipment used for Project construction. Using groundborne vibration levels for standard types of construction equipment provided by the FTA, vibration levels from the operation of a roller compactor would attenuate to 0.160in/sec PPV at the nearest structure 30 feet from construction activities, and 0.018 in/sec PPV at the nearest historical structure from construction activities (FTA 2018). The attenuated vibration level at the nearest receptor would be well below the building damage and human annoyance vibration thresholds of 0.2 in/sec and 0.24 in/sec, respectively. Vibration impacts from other equipment used would be lower. Therefore, operation of construction equipment would result in less-than-significant vibration impacts at nearby structures and receptors.

Once operational, the Project would not include any new sources of substantial vibration. While pumps may generate some level of vibration, this would be monitored by the operators to ensure optimal longevity. Therefore, the Project would have no operational impacts resulting from groundborne noise and vibration.

c) **No Impact.** The Project site is not within 2 miles of a private airstrip or a public use airport. Therefore, the Project would not expose people working in the Project area to excessive noise levels from aircraft operations.

3.13.1.4 References

California Department of Transportation (Caltrans). 2009. *Technical Noise Supplement*, November 2009. Available at: https://www.gsweventcenter.com/Draft_SEIR_References/2013_0709_DOT_Technical_Noise_2009.pdf. Accessed December 2023. Accessed December 1, 2023.

———. 2013. *Transportation and Construction Vibration Guidance Manual*, September 2013.

Federal Highway Administration (FHWA). 2017. *Default Noise Emission Reference Levels and Usage Factors*, last updated August 24, 2017. Available at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. Accessed December 1, 2023.

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual*, September 2018. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed December 26, 2023.

Marin County. 2007. *Marin Countywide Plan: Chapter 3 – The Built Environment Element*, adopted November 6, 2007, reprinted October 2014. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update_r.pdf?la=en. Accessed December 2023.

Hoover and Keith, 2000. Noise Control for Buildings and Manufacturing Plants, Thirteenth

Printing, 2000. Available: https://www.co.monterey.ca.us/Home/ShowDocument?id=51070. Accessed December 26, 2023.

3.14 Population and Housing

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

3.14.1 Discussion

a) **No Impact.** Project construction and operation would not include any element that would directly result in new population growth like residences or businesses, or indirectly by the extension of roads and other growth-inducing infrastructure. There would be no impact.

b) **No Impact.** The Project location is on undeveloped land outside of the Town of Ross in unincorporated Marin County. While there are residences approximately 0.75 mile to the east of the Project site, the Project does not propose to displace any existing people or housing. For this reason, there would be no impact.

3.15 Public Services

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

Emergency fire protection and paramedic services in unincorporated Marin County are administered by the Marin County Fire Department in Woodacre, CA (Marin County LAFCo, 2023). The fire department consists of 220 firefighters (full time, seasonal, and volunteer), four-to-fourteen person Tamalpais Fire Crews, and a one-to-fourteen person Fuels Crew (MCFD, 2023). The department serves Woodacre, Nicasio, Lucas Valley, Forest Knolls, Lagunitas, and San Geronimo Valley, and provides mutual aid to the community of Fairfax (Marin County, 2022).

The Marin County Sheriff's Office provides law enforcement services to unincorporated communities in Marin County (MCSO, 2023). The office is divided into three bureaus: Administrative and Support Services, Detention Services, and Field Services, in addition to operating the countywide Major Crime Task Force. Overall, the sheriff's office supports 202 sworn deputies and 112 other law enforcement professionals.

The County of Marin has 17 school districts serving more than 30,000 pre K-12 students (MCOE, 2023a). The Marin County Office of Education collaborates with Marin County's 17 school districts to safeguard public funds by providing financial oversight and centralized services at economies of scale in the areas of business, technology, professional development, emergency services, maintenance, and operations (MCOE, 2023b).

Marin County Parks is responsible for managing 17,900 acres of parks and open space in the county. The county has 43 parks and facilities and 34 preserves (MCP, 2021a). Park property is governed by the Marin Municipal code, and open space preserves are regulated by Marin County Open Space District Code (MCP, 2021b).

3.15.1 Discussion

a.i) **No Impact.** Project construction would be temporary and intermittent, occurring within two 6-month phases over the course of one-and-a-half calendar years. Because of the presence of the Northern spotted owl, construction would only occur for six months per year, between August 1 and January 31 of the following year. There would be approximately eight workers on any given day during Project construction. Workers would be sourced from the local workforce and would not relocate to communities near the Project site for Project construction. Operations and maintenance would be conducted by existing staff. Because Project construction and operation would not increase the local population, the Project would not result in a need for altered or new governmental fire protection facilities. The Project is not anticipated to impact the County of Marin's ability to maintain acceptable service ratios, response times, and other fire-fighting performance objectives. Therefore, the Project would have no impact on fire services.

a.ii) **No Impact.** The Project would consist of eight construction workers on any given day during Project construction, and no new employees would be required for operations and maintenance. The Project is not anticipated to impact the Marin County Sheriff's Office's ability to maintain acceptable service ratios, response times, or other performance objectives. For this reason, the Project would not result in a need for new or altered governmental police protection facilities and the Project would have no impact on police services.

a.iii) **No impact.** The Project would not require any new school facilities or the altering of any existing school facilities. There would only be eight construction workers, who would be sourced locally, as stated in a.i, and no new operations and maintenance employees would be required. Therefore, the proposed Project would not result in a permanent increase in employees. For these reasons, the Project would have no impact on schools.

a.iv) **No impact.** The Project would not result in an increased population or the use of existing recreation facilities such that there would be demand for new or expanded park facilities. Project operations would be consistent with existing conditions. For this reason, the Project would have no impact on parks.

a.v) **No Impact.** The Project would not require the need for additional permanent employees and would not increase the use of other public facilities. For this reason, the Project would have no impact on other public facilities.

3.15.1.1 References

Marin County. 2022. Woodacre Fire Station/Headquarters - Fire Department - County of Marin Available at: https://www.marincounty.org/depts/fr/divisions/operations/stations/woodacre. Accessed October 31, 2023.

Marin County Fire Dept (MCFD). 2023. 2023 Marin County Unit Strategic Fire Plan & Community Wildfire Protection Plan. Available at: https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/osfm-website/what-we-do/community-

wildfire-preparedness-and-mitigation/fire-plan/2023/2023-marin-county-fire-plan.pdf?rev=580e74765420477fbc57f5198b785d48&hash=CAEF51144F405D7C8D041BA78AEA5306. November 28, 2023.

Marin County LAFCo. 2023. County Service Area in Unincorporated Marin. Available at: https://marinlafco.specialdistrict.org/county-service-area-31-fire-service-in-unincorporated-marin. Accessed October 31, 2023.

Marin County Office of Education (MCOE). 2023a. Marin County Office of Education Annual Report 2023 – 2024. Available at: https://www.marinschools.org/cms/lib/CA01001323/Centricity/Domain/2317/2023-2024%20Annual%20Report.pdf. Accessed October 31, 2023.

_____. 2023b. About MCOE - Marin County Office of Education. Available at: https://www.marinschools.org/domain/2317. Accessed October 31, 2023.

Marin County Sheriff's Office (MCSO). 2023. About Us - Marin County Sheriff's Office (marinsheriff.org). Available at: https://www.marinsheriff.org/about-us. Accessed October 31, 2023.

Marin County Parks (MCP). 2021a. Marin County Parks Annual Report 2021-2022. Available at: https://www.parks.marincounty.org/-/media/files/sites/marin-county-parks/about-us/measure-a/fy-21-22/mcp_fy202122_annualreportenglish.pdf?la=en. Accessed October 31, 2023.

_____. 2021b. Marin County Parks Overview and Organization. Available at: https://www.marincountyparks.org/about-us/organization. Accessed October 31, 2023.

3.16 Recreation

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

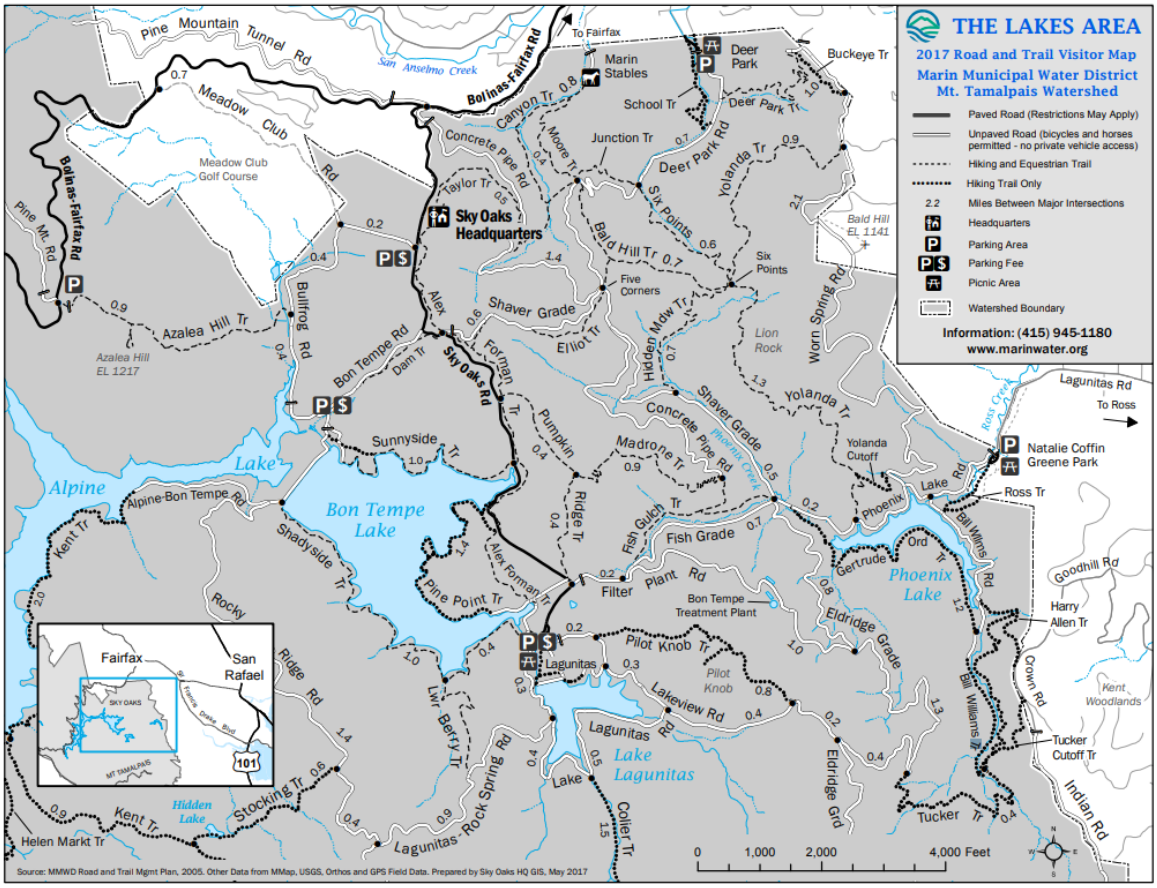
3.16.1 Discussion

a) **Less-than-Significant Impact.** The Project site is within the Mt. Tamalpais Watershed, which has over 150 miles of trails and unpaved roads for hiking and 90 miles of fire roads for cycling. Marin Water also allows horses on unpaved roads and designated trails in the watershed (Marin Water, 2023). Marin Water lands are open to the public for recreational use during daylight hours only, beginning 30 minutes before sunrise and ending 30 minutes after sunset.

Figure 3-3 depicts trails in the Project area. Publicly accessible roads used by recreationists that would be directly affected by the Project include Phoenix Lake Road, Fish Grade Road, Shaver Grade Road, Eldridge Grade, Filter Plant Road, Bon Tempe Channel Road North, Bon Tempe Channel Road South, and Sky Oaks Road. The Alex Forman Trail begins approximately 25 feet north of the Project site at Bon Tempe Channel Road South. The Phoenix Lake Trail begins at Dibblee Road and then becomes Phoenix Lake Road, approximately 0.6 mile east of the Project site. Segment B of the pipeline (shown in **Figure 2-2**), which is within the Phoenix Road portion of the Phoenix Lake trail, would involve reuse of an existing pipeline; consequently, no new pipeline construction would occur in Segment B (other than where the existing pipe would be connected to new pipe). The building for Pump 2 would be constructed adjacent to the Phoenix Lake Trail. The Yolanda Trail connects to the Phoenix Lake Trail at Phoenix Lake Road.

As described in Section 2.5.1, *Construction Schedule, Hours, and Work Force*, segments of publicly accessible trails would be temporarily closed during construction hours during the weekdays. Marin Water would limit recreational access to Phoenix Lake Road during construction hours. Construction crews would backfill trenches at the end of each workday to allow public use of select trails after 5 p.m. on weekdays and throughout the weekends. Consequently, recreationists may choose to use other trails, resulting in increased use of other trails. As shown on Figure 3-3, many other trails and roads are available to recreationists in the area. Given the number of trails as well as parks in the area and the duration of construction activities, this temporary shift of trail users would

not be sufficient to cause substantial physical deterioration of these trails to occur or be accelerated. Thus, this impact would be less than significant.



SOURCE: Marin Water, 2017

MMWD Phoenix-Bon Tempe Project

Figure 3-3
Trails in the Project Area

b) **No Impact.** The Project would not include recreational facilities or require the construction or expansion of recreational facilities, resulting in no impact on the environment.

3.16.1.1 References

Marin Water. 2023. Mt. Tam Watershed - Visitor Information. Available at: https://www.marinwater.org/visiting-mt-tam. Accessed October 31, 2023.

3.17 Transportation

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☒	☐

3.17.1 Discussion

The Project site is located west of the Town of Ross in unincorporated Marin County. The nearest highways to the Project site are US Highway 101, approximately 3.5 miles east of Phoenix Lake, and Highway 1, approximately 4 miles west of Bon Tempe Reservoir. Construction traffic travelling to and from Phoenix Lake would use Sir Francis Drake Boulevard (a major north-south arterial through San Anselmo and Ross), Lagunitas Road, and Diblee Road to Natalie Coffin Greene Park. Construction traffic travelling to and from Bon Tempe Reservoir would use Sir Francis Drake Boulevard, Bolinas Road to Sky Oaks Road. Additionally, internal watershed property roads would be used to move materials and equipment to and within the Project site.

Approximately 2,508 CY of material is anticipated to be excavated during construction. Some of the excavated material is anticipated to be re-used on site as backfill. Excavated material that is contaminated or in excess would be disposed of at Redwood Landfill in Novato. For purposes of this analysis, it was assumed that no more than 500 CY would be transported to Novato over the two construction phases (approximately 250 CY per year). With an average capacity of 16 CY per truck, this would equate to approximately 62 one-way truck trips, or 31 per construction phase, over each construction period. As each construction phase would have approximately 122 workdays, this would equate to approximately one truck trip every four workdays. In addition, approximately 1,000 CY of sand would be imported to place beneath the pipeline. This would equate to 124 one-way truck trips, or 62 per construction phase. Import of sand would require approximately one truck trip every two workdays.

a) **No Impact.**

Congestion Management Program

Congestion management programs (CMPs) established by congestion management agencies are intended to monitor and address long-term traffic conditions related to future development that generate permanent (on-going) traffic increases, and do not apply to

temporary impacts associated with construction projects. The 2021 CMP, prepared by the Transportation Authority of Marin, monitors and evaluates (among other considerations) changes to the designated CMP roadway system, system performance, and transportation demand management. The nearest CMP network roadway is Sir Francis Drake Boulevard from College Avenue to Toussin Avenue, approximately 1 mile east of Phoenix Lake.

The proposed Project does not involve new or modified land uses that would generate a substantial number of long-term vehicle trips or other features that may affect the local or regional circulation system. The number of vehicle trips associated with Project operations (up to two twice a year for facility maintenance) would not be a noticeable increase in vehicle trips. Consequently, the Project would not conflict with the CMP.

Public Transit, Bicycle, and Pedestrian Facilities

Adopted in 2018, the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan (BPMP) and Mt. Tamalpais Road and Trail Management Plan, adopted in 2005, primarily serve as coordinating and resource documents for Marin County, with a focus on developing a primary network of bikeways, pedestrian enhancement, and programs. There are no bikeways identified in the BPMP in the Project vicinity. The nearest recognized bikeway in the BPMP is Sir Francis Drake Boulevard, a Class III route (i.e., shared use with on-street motor vehicle traffic), approximately 1 mile east of Phoenix Lake. The Project would not directly or indirectly eliminate existing or planned alternative transportation corridors or facilities and would not conflict with policies or programs set forth in the BPMP. Furthermore, the Project would not conflict with policies set forth in the Marin Countywide Plan (Marin County, 2007) that supports active transportation.

The Marin Transit 2020–2029 Short Range Transit Plan outlines priorities and performances measurements to maintain and improve the rural bus transit system. There are no transit services in the Project vicinity. The nearest transit line is an east-west bus route, 228 Downtown San Rafael – Fairfax Manor, and a north-south bus route, 22 Downtown San Rafael – Marin City, both of which travel along Sir Francis Drake Boulevard, approximately 1 mile east of Phoenix Lake.

For reasons stated above, the Project would not conflict with a program, ordinance, or policy, including transit, roadway, bicycle, and pedestrian facilities, that would apply to the Project area's circulation system and there would be no impact.

b) **Less-than-Significant Impact.** In accordance with Senate Bill 743, CEQA Guidelines Section 15064.3(b) indicates that vehicle miles traveled (VMT) is the most appropriate measure for identifying transportation impacts. VMT is a measure of the total number of miles driven to or from a development. In December 2018, the Governor’s Office of Planning and Research (OPR) updated the technical advisory, *Technical Advisory on Evaluating Transportation Impacts in CEQA*, to provide guidance on evaluating transportation impacts under CEQA. The thresholds set forth in the updated technical advisory may be used if a lead agency has not yet adopted VMT screening criteria. In

particular, the technical advisory screening threshold for projects generating or attracting fewer than 110 one-way automobile trips per day may generally be assumed to cause a less-than-significant transportation impact (OPR, 2018). Marin Water has not yet adopted VMT screening criteria, therefore, statewide guidance would apply to the Project.

It is anticipated that there would be approximately eight workers on any given day during Project construction. In addition, excavated material that would be disposed of at Redwood Landfill in Novato would result in approximately one truck trip every four workdays. Also, imported sand would require approximately one truck trip every two workdays. As such, Project construction is anticipated to have approximately up to 22 one-way trips per day. The Project would not require the closure of any roadways and would not generate significant or noticeable delays.

As discussed above, Project operations, assumed to require up to two workers, would only require an additional eight one-way trips annually. In addition, the Project's land uses would essentially operate in the same manner that it operated prior to Project construction and the number of peak trips occurring on any one day would be significantly less than the number identified in the technical advisory's guidance.

Therefore, considering the information presented above, the Project would not conflict with or be inconsistent with CEQA Guidelines 15064.3 (b). VMT generated by the Project would be less than significant, and no mitigation would be required.

c) **No Impact.** During Project construction, temporary staging, laydown, and worker parking would be at existing parking/staging areas within Marin Water's watershed lands and would not be in public roadways, as described in Section 2.5.1 *Construction Schedule, Hours, and Work Force.* Project construction and operations would not introduce any new intersections or adjust roadway geometry that would have the potential to introduce hazardous driving conditions. Therefore, the Project would have no impacts, and no mitigation would be required.

d) **Less-than-Significant Impact.** Project construction and operations would not require lane closures and would not change the configuration of the Project area's road network. While slow-moving construction-related vehicles could temporarily interfere with emergency response to the Project site (for example, emergency service vehicles traveling behind a slow-moving truck), all vehicles are required by law to yield to responding emergency vehicles. Therefore, it is anticipated that the Project would have a less-than-significant impact related to adequate emergency access.

3.17.1.1 References

Marin County. 2018. Marin County Unincorporated Area Bicycle and Pedestrian Master Plan, February 22, 2018. Available at: https://walkbikemarin.org/documents/BMP/2018%20Plan/UnincorpAreaBikePedPlanBOSDraft.pdf. Accessed 14 Nov. 2023.

Marin County. 2007. Marin Countywide Plan, November 6, 2007. Available at: https:// http://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/ county-wide-plan/cwp_2015_update.pdf. Accessed 14 Nov. 2023.

Marin Transit. 2023. Local Service Map. Available at: https://marintransit.org/map. Accessed 14 Nov. 2023.

Marin Transit. 2020. 2020-2029 Short Range Transit Plan. Available at: https://marintransit.org/sites/default/files/projects/2021/SHORT%20RANGE%20TRANSIT%20PLAN.pdf. Accessed 14 Nov. 2023.

Marin Water. 2005. Mt. Tamalpais Watershed Road and Trail Management Plan. July 2005. Available at: https://www.marinwater.org/sites/default/files/2022-04/Mt.%20Tam%20Watershed%20Road%20and%20Trail%20Management%20Plan.pdf. Accessed 20 Feb. 2024.

State of California, Governor's Office of Planning and Research (OPR). 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018. Available at: https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed 14 Nov. 2023.

Transportation Authority of Marin. 2023. Traffic Counts for the Congestion Management Plan. Available at: http://www.marinmap.org/Html5Viewer/index.html?viewer=Traffic_Counts.TrafficCounts_H5. Accessed 14 Nov. 2023.

Transportation Authority of Marin. 2021. 2021 Congestion Management Program, September 2021. Available at: https://www.tam.ca.gov/036-051_final-draft-2021-marin-county-cmp/. Accessed 14 Nov. 2023.

3.18 Tribal Cultural Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources. Code Section 5020.1(k), or	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

The cultural, archaeological, and historical resources of the Project area are discussed above in Section 3.5, *Cultural Resources*.

3.18.1 Discussion

a.i) **Less-than-Significant Impact with Mitigation.** Tribal cultural resources are: (1) sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are listed, or determined to be eligible for listing, in the California Register of Historical Resources (California Register), or local register of historical resources, as defined in PRC Section 5020.1(k); or (2) a resource determined by the CEQA lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). For a cultural landscape to be considered a tribal cultural resource, it must be geographically defined in terms of the size and scope of the landscape (PRC Section 21074[b]). A historical resource, as defined in PRC Section 21084.1, a unique archaeological resource, as defined in PRC Section 21083.2(g), or a non-unique archaeological resource, as defined in PRC Section 21083.2(h), may also be a tribal cultural resource.

Through background research at the Northwest Information Center of the California Historical Resources Information System, no known archaeological resources that could be considered tribal cultural resources, that are listed or determined eligible for listing in the California Register, or that are included in a local register of historical resources as defined in PRC Section 5020.1(k), pursuant to PRC Section 21074(a)(1), would be impacted by the Project.

According to the requirements of PRC Section 21080.3.1(b), one Tribe, the Federated Indians of Graton Rancheria, has previously requested consultation regarding projects in the vicinity of lands under the jurisdiction of Marin Water. On October 12, 2023, Marin Water sent a letter to the Federated Indians of Graton Rancheria. Via an email dated October 30, 2023, the Federated Indians of Graton Rancheria notified Marin Water of their formal request for tribal consultation. On October 30, 2023, the Tribe initiated consultation. Marin Water sent Project and site information on November 9, 2023. After multiple communications, Marin Water closed tribal consultation on January 29, 2024. However, Marin Water will coordinate with the Tribe if there are any inadvertent discoveries during construction.

Based on the above discussion, Marin Water did not identify any tribal cultural resources listed or eligible for listing in the California Register, nor did they determine any resources to be significant pursuant to criteria set forth in Subdivision (c) of PRC Section 5024.1. In the event that cultural materials are identified during Project implementation that are determined to be tribal cultural resources, implementation of **Mitigation Measure CUL-1: Cultural Resources Awareness Training and Inadvertent Discovery of Archaeological Resources or Tribal Cultural Resources**, outlined above in Section 3.5, *Cultural Resources*, would reduce potentially significant impacts to less than significant. This mitigation would ensure that work is halted in the vicinity of a find until a qualified archaeologist and a Native American tribal representative can make an assessment and provide additional recommendations.

a.ii) **Less-than-Significant Impact with Mitigation**. For the same reasons stated in the analysis of potential impacts on tribal cultural resources above for issue a.i, impacts would be potentially significant, but implementation of **Mitigation Measure CUL-1** would reduce impacts to less than significant.

3.19 Utilities and Service Systems

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

3.19.1 Discussion

a) **Less than Significant.** The purpose of the Project is to construct facilities to improve water services to Marin Water's customers. The Project would convey water from one reservoir to another in Marin Water's system. The impacts of constructing and operating the Project are evaluated throughout this Initial Study.

Wastewater treatment at the Project site is provided by the Ross Valley Sanitary District (RVSD) (RVSD, 2023). Solid waste services are regulated by the Waste Management Division of the Marin County Department of Public Works (Marin County, 2023) and are provided by Marin Sanitary Service (Marin Sanitary Service 2021). Construction activities would be staffed by the existing regional workforce. The Project would not require additional staff to operate. Therefore, new or expanded wastewater or solid waste facilities would not be needed during construction or operation, and there would be no impact.

As discussed in Section 3.10, *Hydrology and Water Quality*, additional new or expanded stormwater collection facilities would not be required during construction and operation; there would be no impact.

Telecommunication services at the Project site are regulated by the California Public Utilities Commission (Marin County, 1998) and provided by various private companies.

Electricity at the site is provided by PG&E. The new 450 hp pump would include associated electrical equipment. No PG&E gas transmission pipelines are mapped in the Project vicinity (PG&E, 2023). The Project would not require additional staff or otherwise increase demand for utilities once operational. Therefore, Project operations would not require or result in the construction of new or expanded utilities; there would be no impact.

PG&E is still determining whether a new electrical power service would be needed; however, electricity for Pump 2 would tie into the existing infrastructure. Pursuant to communications with PG&E, several options are being considered such as upgrading the existing service with a single meter or adding a new meter; upgrading the existing transformer; and/or modifying the existing distribution system. At the time of this analysis, PG&E has not determined how it would service the Project and electricity upgrades would be part of Phase 2 (starting in August 2025). It is unlikely the installation and improvements of utility infrastructure would require the relocation or construction of additional utility infrastructure such that it would have significant environmental impacts. This impact would be less than significant.

If it determined that PG&E requires additional poles or other structures for this Project, subsequent environmental analysis may be required at that time.

b) **No Impact.** The Project is a water conveyance project and would not in and of itself generate demand for water. Potable water for sanitary and drinking needs would be required for the onsite construction workers, but this demand would be temporary and limited, and there are sufficient water supplies to serve their needs. Because the Project would not result in a change in water use or consumption, the Project would not affect water supplies or the availability of Marin Water to serve reasonably foreseeable future development during normal, dry, and multiple dry years. For this reason, the Project would have no impact on water supplies.

c) **No Impact.** The Project would not generate wastewater or disrupt wastewater services during construction or operation. Temporary wastewater facilities would be provided for the on-site construction workers during construction, and there would be no new source of wastewater discharge. The Project would not generate wastewater or affect the RVSD's ability to provide wastewater treatment capacity to their existing customers. For these reasons, the Project would have no impact on wastewater capacity.

d) **Less-than-Significant Impact.** The California Integrated Waste Management Act of 1989 established the goal of diverting at least 75 percent of generated waste (based on per capita disposal rates) in California by 2020. In addition, the 2019 California Green Building Code (adopted by reference by Marin County) requires all construction and demolition projects to reuse or recycle at least 65 percent of materials generated, and Zero Waste Marin[6] ensures Marin County's compliance with state recycling mandates and provides

[6] Zero Waste Marin is the informal name for the Marin Hazardous and Solid Waste Joint Powers Authority, which provides education and information to residents and businesses about recycling, reducing solid waste, and safely

residents and businesses with information on household hazardous waste collection, recycling, composting, and waste disposal.

Solid waste would be recycled or disposed of in a landfill and would comply with local management and reduction statutes related to solid waste. The Redwood Landfill in the city of Novato is permitted to accept 2,310 CY of materials daily and is permitted for all types of waste that would be generated by Project construction. Redwood Landfill accepts and recycles concrete and asphalt, clean soil, construction and demolition debris, and other materials (Redwood Landfill, 2023a and 2023b).

Approximately 2,508 CY of material is anticipated to be excavated during construction. Some of the excavated material is anticipated to be re-used on site as backfill. Excavated material that is contaminated or in excess would be disposed at Redwood Landfill. Given the volume and type of solid waste that could be generated during construction, the Project would not generate solid waste more than State or local standards, or exceeding the capacity of local infrastructure, or otherwise impair attainment of solid waste reduction goals. For these reasons, the Project impact would be less than significant.

e) **Less-than-Significant Impact.** As stated above, approximately 2,508 CY of material is anticipated to be excavated during construction. Some of the excavated material is anticipated to be re-used on site as backfill. Excavated material that is contaminated or in excess would be disposed at Redwood Landfill. The Project would not generate solid waste during operations. The types of solid waste generated from Project construction would be consistent with Redwood Landfill permit requirements and may be recyclable; the remaining volume of solid waste would be negligible and would not reduce Redwood Landfill's capacity. For these reasons, Project construction and operation would comply with goals set by Zero Waste Marin, federal, and state reduction statutes and regulations related to solid waste and the Project's impact would be less than significant.

3.19.1.1 References

Marin Map. 2022. MarinMap Map Viewer. Available at: https://www.marinmap.org/dnn/default.aspx. Accessed November 2, 2023.

Marin Water. 2023. Mission and History | Marin Water. Available at: https://www.marinwater.org/mission-and-history#:~:text=About%2075%20percent%20of%20our,clean%2C%20fresh%20and%20sustainably%20sourced. Accessed November 2, 2023.

Marin County. 1998. Marin County Telecommunications Facilities Policy Plan. Available at: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/landuseplan/telecommunications_facilities_policy_plan_1998.pdf. Accessed November 27, 2023.

disposing of hazardous materials (Zero Waste Marin, 2023). The Authority also ensures compliance with California Integrated Waste Management Act and its waste reduction mandates.

_____. 2023. Waste Management – Public Works – County of Marin. Available at: https://www.marincounty.org/depts/pw/divisions/public-services/waste-management. Accessed November 27, 2023.

Pacific Gas & Electric (PG&E). 2023. Gas systems. Available at: https://www.pge.com/en/about/pge-systems/gas-systems.html. Accessed November 27, 2023.

Redwood Landfill. 2023. About Us | Redwood Landfill | Waste Management (wm.com). Available at: https://redwoodlandfill.wm.com/about-us/index.jsp. November 27, 2023.

_____. 2023b. Redwood Landfill Operations. Available at: https://redwoodlandfill.wm.com/about-us/operations.jsp. Accessed November 27, 2023.

Ross Valley Sanitary District (RSVD). 2023. Our Mission. Available at: https://www.rvsd.org/149/Our-Mission. Accessed November 28, 2023.

Zero Waste Marin. 2023. About Zero Waste Marin - Zero Waste Marin. Available at: https://zerowastemarin.org/who-we-are/about-zero-waste-marin/. Accessed November 28, 2023.

3.20 Wildfire

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

3.20.1 Discussion

a) **Less-than-Significant Impact.** As described under Hazards and Hazardous Materials, item (f), impacts related to impairment of or physical interference with an emergency response or evacuation plan would be less than significant.

b) **Less-than-Significant Impact.** The Project does not include the addition or modification of any structures intended for occupation and, therefore, would not expose occupants to increased risks associated with wildfire.

The Project site is in a very high Fire Hazard Severity Zone (CAL FIRE, 2007), and the Project site is adjacent to an Urban Wildland Interface area (Marin County, 2022b). Additionally, the Project site is along a steep slope and is subject to high winds (Marin County Fire Department, 2020), which can exacerbate wildfire risks. Further, construction would occur between August and January. Fall months are prone to Northern California Diablo wind conditions, which affect Marin County and exacerbate wildfire risks (Marin County Fire Department, 2020).

The use of construction equipment and the possible temporary on-site storage of fuels and/or other flammable construction chemicals could pose an increased fire risk, resulting in potential injury to workers or the public during construction.

As stated in Section 2.5.4, *Standard Environmental Protection Measures*, Marin Water would comply with its standard specifications for Environmental Protection (Section 18000) and High Fire Danger Alerts and Closures (Section 01000) (see **Appendix A**).

Fire prevention standards include requiring spark arrestors on all internal combustion engines, requiring that the storage and handling of flammable liquids would be in accordance with the Flammable and Combustible Liquids Code, and requiring that fire extinguishers would be provided at hazardous locations or operations. The High Fire Danger Alerts and Closures standards require the suspension of work in the watershed upon notification from the County Fire Department that a "Red Flag Warning - High Fire Danger Alert" exists for Marin County and provides guidance for the safe operation of vehicles, equipment, and tools as well as for grass and brush mowing and welding. Additionally, Chapter 7A of the CBC explicitly addresses the wildland fire threat to structures by requiring the use of fire-resistant materials and construction techniques, new buildings, additions, and exterior remodels to buildings located in any Fire Hazard Severity Zones or any Urban-Wildland Interface fire area designated by the enforcing are subject to CBC regulations.

Contractors would be required to comply with hazardous materials storage and fire protection regulations, which would minimize the potential for fire creation, and ensure that the risk of wildland fires during construction would be less than significant.

c) **Less-than-Significant Impact.** As stated in Section 2.2, *Project Purpose and Objectives*, the purpose of the Project is to improve operational efficiency and flexibility and allow for more frequent use of Phoenix Lake water. The Project would not exacerbate fire risk or result in temporary or ongoing environmental impacts. Project maintenance would include bi-annual testing of the pumps and would not exacerbate fire risk or result in temporary or ongoing environmental impacts. As stated under b) above, the Project would be required to implement fire prevention measures, including Marin Water's standard specifications. Compliance with applicable fire prevention requirements would reduce the fire risk, and this impact would be less than significant.

d) **Less-than-Significant Impact.** As discussed in Section 3.7, *Geology and Soils*, the Project site is along a steep slope and in an area that could be susceptible to landslides. However, Section 3.7, *Geology and Soils* and Section 3.10, *Hydrology and Water Quality* identify several erosion and sediment control measures, compliance of which would be required during construction (i.e., a SWPPP, and Marin Water's standard construction practices, see **Appendix A**).

The Project design features, in conjunction with the required erosion and sediment control measures, would reduce any potential impact related to runoff and drainage changes. Therefore, the Project would not result in changes to runoff or drainage patterns which could exacerbate downslope or downstream flooding and thereby expose people or structures to associated risks, and the impact would be less than significant.

3.20.1.1 References

California Department of Forestry and Fire Protection (CAL FIRE). 2007. Marin County Fire Hazard Severity Zones in State Responsibility Areas (SRA). Adopted by CAL FIRE on November 7, 2007. Forest Resource Assessment Program. Map. Scale 1:100,000.

Marin County. 2022a. Wildfire Evacuation Zones. Available at: https://www.marincounty.org/-/media/files/departments/fr/wildfire-evacuation-zones/mtz_kentfield.pdf. Accessed on November 9, 2023.

———. 2022b. Interactive Wildland Urban Interface Zone Map. Available at: https://www.marincounty.org/depts/fr/divisions/fire-prevention-investigation/prevention-documents. Accessed on November 13, 2023.

Marin County Fire Department (MCFD). 2020. Marin Community Wildfire Protection Plan. December 2020. Available at: https://j0i68d.p3cdn1.secureserver.net/wp-content/uploads/CWPP_2020_Final.pdf. Accessed on November 28. 2023.

3.21 Mandatory Findings of Significance

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

3.21.1 Discussion

a) **Less Than Significant Impact with Mitigation.** The Project has the potential to degrade the quality of the environment. As described above in Sections 3.1 through 3.20, the Project has the potential to cause significant impacts related to biological resources, cultural resources, geology and soils, hydrology and water quality, and tribal cultural resources. Mitigation measures have been identified to reduce these potential impacts to less than significant levels. No further mitigation would be required, and the Project would not degrade the quality of the environment (see Sections 3.1 through 3.20 above, for detailed analysis).

The Project has the potential to impact biological resources. As discussed above in Section 3.4, *Biological Resources*, the Project could result in impacts during construction on rare plants, special status bats, and existing heritage and protected trees. However, implementation of the following mitigation measures would ensure that impacts on biological resources would be less than significant:

- BIO-1: Protection of Rare Plants
- BIO-2: Protection of Reptiles and Amphibians
- BIO-3: Bat-Safe Tree Removal
- BIO-4: Habitat Restoration and Monitoring
- BIO-5: Minimize Impacts on Protected Trees

No other biological resources would be substantially affected, and the Project would not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal.

The Project has the potential to impact cultural and tribal cultural resources. As discussed in Section 3.5, *Cultural Resources*, and Section 3.18, *Tribal Cultural Resources*, there are no documented historical resources, archaeological or tribal cultural resources in the Project area. However, implementation of the following mitigation measures would ensure that inadvertent impacts on cultural and tribal cultural resources would be less-than-significant, and the Project would not eliminate important examples of the major periods of California history or prehistory.

- CUL-1: Cultural Resources Awareness Training and Inadvertent Discovery of Archaeological Resources or Tribal Cultural
- CUL-2: Inadvertent Discovery of Human Remains

The Project has the potential to result in soil erosion during excavation and grading on steep slopes, and from soil stockpiling. As discussed in Section 3.7, *Geology and Soils*, the Project has the potential to increase erosion, scouring of banks, contamination of water courses, and otherwise increase sedimentation. However, implementation of Mitigation Measure HYD-1, Water Control, Drainage, and Discharge Plan, would ensure that all erosion impacts would be less than significant.

The Project has the potential to violate water quality standards, degrade surface water quality, result in erosion or siltation on- or off-site, increase the rate or amount of surface runoff, or contribute to runoff that would exceed storm drain system capacities. Implementation of Mitigation Measure HYD-1, Water Control, Drainage and Discharge Plan and Mitigation Measure HYD-2, Adaptive Water Quality Management Plan, would ensure that surface water impacts would be less than significant.

b) **Less Than Significant Impact with Mitigation.** As described in Sections 3.1 through 3.20, the Project has the potential to cause significant impacts related to biological resources, cultural resources, geology and soils, hydrology and water quality, and tribal cultural resources. Mitigation measures have been identified to reduce these potential impacts to less than significant levels.

Cumulative environmental effects are multiple individual effects that, when considered together are considerable, or compound or increase other environmental impacts. The individual effects may result from a single project or several separate projects and may occur at the same place and point in time or at different locations and over extended periods of time.

As discussed in Sections 3.1 through 3.20, individual project-related potentially significant impacts have been identified for the Project, all of which would be mitigated

to less-than-significant levels through implementation of the identified mitigation measures. The Project would have limited impacts on the physical environment and the impacts associated with implementation of the Project would occur during construction, and thus would be short-term.

The potential for Project-generated impacts to contribute to a significant cumulative impact would arise if the impacts occurred within the same geographic area as other projects. In addition to the geographic scope, cumulative impacts can be determined by the timing of other projects relative to the Project. Schedule is particularly important for construction-related impacts. For a group of projects to generate cumulative construction impacts, they must be temporally as well as spatially proximate.

Under a separate project, Marin Water is maintaining and improving its internal roadway and trail network. Marin Water has been implementing a culvert maintenance program on Fish Grade Road since 2020, which physically overlaps the pipeline alignment. Both projects would temporarily affect culverts on Fish Grade Road. Marin Water has obtained and is currently implementing conditions contained in the following approvals:

- U.S. Army Corps of Engineers 404 Permit
- San Francisco Bay Regional Water Quality Control Board Clean Water Act 401 Permit
- California Department of Fish and Wildlife Lake or Streambed Alteration Agreement

Marin Water is implementing the conditions and measures identified in these approvals to avoid or lessen impacts to biological resources. The cumulative impacts to biological resources from this project and the proposed Project would be significant. Marin Water will continue to comply with the above approvals for the protection of Waters of the U.S. and State, sensitive species and other regulated resources, and Marin Water would implement adopted environmental protection measures (see **Appendix A**) and the mitigation measures identified in Sections 3.1 through 3.20 for the proposed Project. These actions would ensure that the Project's contribution to cumulative impacts on biological resources would be less-than-cumulatively considerable.

c) **Less Than Significant Impact with Mitigation.** As described in a) above, the Project has the potential to cause potentially significant /impacts related to biological resources, cultural resources, geology and soils, hydrology and water quality, and tribal cultural resources. Mitigation measures have been identified to reduce these potential impacts to less than significant levels. Impacts on air quality (i.e., fugitive dust during construction), water quality (i.e., release of pollutants due to Project construction), and hazardous materials (i.e., exposure to hazardous materials) resulting from the Project could directly affect human beings, and all CEQA impacts discussed above could indirectly affect human beings. Mitigation measures discussed in Sections 3.1 through 3.20 would ensure that impacts would be reduced to less than significant and would not cause substantial adverse effects on human beings, either directly or indirectly. No further mitigation would be required.

Appendix A

Marin Water Standard Environmental Protection Measures

Attachment SPEC: Marin Water Standard Construction Specifications

SECTION 18000

ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 SCOPE

A. The requirements of Division 1 form a part of this section.

B. During the progress of the work, keep the premises occupied in a neat and clean condition and protect the environment both on site and off site, throughout and upon completion of the construction project.

1.2 SUBMITTALS

Contractor shall develop an Environmental Protection Plan in detail and submit to the Engineer within seven (7) days from the date of the Notice to Proceed. Distribute the plan to all employees and to all subcontractors and their employees.

The Environmental Protection Plan shall include, but not be limited to, the following items:

A. Copies of required permits.

B. Proposed sanitary landfill site.

C. Other proposed disposal sites.

D. Copies of any agreements with public or private landowners regarding equipment, materials storage, borrow sites, fill sites, or disposal sites. Any such agreement made by the Contractor shall be invalid if its execution causes violation of local or regional grading or land use regulations.

E. Proposed project site winterization plan.

1.3 ENVIRONMENTAL REQUIREMENTS

All operations shall comply with all federal, state and local regulations pertaining to water, air, solid waste and noise pollution.

1.4 DEFINITIONS

Sediment - Soil and other debris that have been eroded and transported by runoff water.

Solid Waste - Rubbish, debris, garbage and other discarded solid materials resulting from construction activities, including a variety of

combustible and non-combustible wastes, such as ashes, waste materials that result from construction or maintenance and repair work, leaves and tree trimmings.

Chemical Waste - Includes petroleum products, bituminous materials, salts, acids, alkalies, herbicides, pesticides, disinfectants, organic chemicals and inorganic wastes. Some of the above may be classified as "hazardous."

Sanitary Wastes-

Sewage - That which is considered as domestic sanitary sewage.

Garbage - Refuse and scraps resulting from preparation, cooking, dispensing and consumption of food.

Hazardous Mat'ls - As defined by applicable laws and regulations. Undisclosed hazardous material contamination, if encountered will constitute a changed site condition. The District may retain a separate contractor to dispose of undisclosed hazardous material encountered.

PART 2 - PRODUCTS

(None)

PART 3 - EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

A. GENERAL

It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed under this Contract be preserved in their existing condition or be restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the public roads, easements, and work area limits shown on the Drawings. Return construction areas to their pre-construction elevations except where surface elevations are otherwise noted to be changed. Maintain natural drainage patterns. Conduct construction activities such that ponding of stagnant water conducive to mosquito breeding habitat will not occur at any time.

B. LAND RESOURCES

1. Contractor Responsibility

Do not remove, cut, deface, injure or destroy trees, grapevines or shrubs outside the work area limits. Do not remove, deface, injure or destroy trees within the work area without permission from the Engineer. Such improvements shall be removed and replaced, if required, by the Contractor at his own expense.

2. Protection

Protect trees that are located near the limits of the Contractor's work areas which may possibly be defaced, bruised or injured or otherwise damaged by the Contractor's operations. No ropes, cables or guys shall be fastened to or attached to any existing nearby trees, grapevines or shrubs for anchorages unless specifically authorized. Where such special emergency use is permitted, the Contractor shall be responsible for any damage resulting from such use.

3. Trimming

Trim tree limbs overhanging the line of the work and in danger of being damaged by the Contractor's operations in accordance with recognized standards for such work. Remove other tree limbs under the direction of the Engineer, so that the tree will present a balanced appearance.

4. Treatment of Roots

Do not cut roots unnecessarily during excavating or trenching operations. Expose major roots encountered in the course of excavation and do not sever. Wrap them in burlap as a protective measure while exposed. Neatly trim all other roots (one inch in diameter and larger) that are severed in the course of excavation at the edge of the excavation or trench and paint them with a heavy coat of an approved tree seal as directed by the Engineer.

5. Repair or Restoration

Repair or replace any trees or other landscape features scarred or damaged by equipment or construction operations as specified below. The repair and/or restoration plan shall be favorably reviewed prior to its initiation.

6. Temporary Construction

Obliterate all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Engineer. Level all temporary roads, parking areas and any other areas that have become compacted or shaped. Any unpaved areas where

vehicles are operated shall receive a suitable surface treatment or shall be periodically wetted down to prevent construction operations from producing dust damage and nuisance to persons and property, at no additional cost to the Owner. Keep haul roads clear at all times of any object which creates an unsafe condition. Promptly remove any contaminants or construction material dropped from construction vehicles. Do not drop mud and debris from construction equipment on public streets. Sweep clean turning areas and pavement entrances as necessary.

C. WATER RESOURCES

Investigate and comply with all applicable federal, state and local regulations concerning the discharge (directly or indirectly) of pollutants to the underground and natural waters. Perform all work under this Contract in such a manner that any adverse environmental impacts are reduced to a level that is acceptable to the Engineer and regulatory agencies. Refer to Section 02200, EARTHWORK, paragraph on control of water for "dewatering" water disposal requirements.

1. Oily Substances

At all times, special measures shall be taken to prevent oily or other hazardous substances from entering the ground, drainage areas or local bodies of water in such quantities as to affect normal use, aesthetics or produce a measurable impact upon the area. Any soil or water which is contaminated with oily substances due to the Contractor's operations shall be disposed of in accordance with applicable regulations.

2. Chlorinated Water

Take special measures to prevent chlorinated water from entering the ground or surface waters. Dechlorinate chlorinated water prior to discharge.

D. FISH AND WILDLIFE RESOURCES

Perform all work and take such steps required to prevent any interference or disturbance to fish and wildlife. The Contractor will not be permitted to alter water flows or otherwise significantly disturb native habitat adjacent to the project area which are critical to fish and wildlife except as may be indicated or specified.

E. CULTURAL RESOURCES

The project does not pass through any known archaeological sites. However, it is conceivable that unrecorded archaeological sites could be discovered during the construction. In the event that artifacts, human remains, or other cultural

resources are discovered during subsurface excavations at locations of the work, the Contractor shall protect the discovered items, notify the Engineer, and comply with applicable law.

3.2 NUISANCE ABATEMENT

A. NOISE CONTROL

1. Location – except as modified in Section 09870 – Coating Systems

Maximum Noise Levels within 1,000 Feet of any Residence, Business, or Other Populated Area: Noise levels for trenchers, pavers, graders and trucks shall not exceed 90 dB at 50 feet as measured under the noisiest operating conditions. For all other equipment, noise levels shall not exceed 85 dB at 50 feet.

2. Equipment

Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used, where feasible.

Jack hammers shall be equipped with exhaust mufflers and steel muffling sleeves. Air compressors should be of a quiet type such as a "whisperized" compressor.

All noise-producing project equipment and vehicles using internal combustion engines (including haul trucks) shall be fitted with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features. These devices shall be maintained in good operating condition so as to meet or exceed original factory specifications. Mobile or fixed “package” equipment (e.g., air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.

All mobile or fixed noise-producing equipment used on the project, which is regulated for noise output by a local, state, or federal agency, shall comply with such regulations while in the course of project activities.

3. Operations

Keep noisy equipment as far as possible from noise-sensitive site boundaries. Machines should not be left idling. Use electric power in lieu of internal combustion engine power wherever possible. Maintain equipment properly to reduce noise from excessive vibration, faulty mufflers, or other sources. All engines shall have mufflers.

The use of noise-producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only.

4. Scheduling

Schedule noisy operations so as to minimize their duration at any given location.

5. Monitoring

To determine whether the above noise limits are being met and whether noise barriers are needed, the Contractor shall use a portable sound level meter meeting the requirements of American National Standards Institute Specification S1.4 for Type 2 sound level meters. If non-complying noise levels are found, the Contractor shall be responsible for monitoring and correction of excessive noise levels.

B. DUST CONTROL, AIR POLLUTION, AND ODOR CONTROL

1. Unpaved areas where vehicles are operated shall be periodically wetted down or given an equivalent form of treatment, to eliminate dust formation.

2. Store all volatile liquids, including fuels or solvents in closed containers.

3. No open burning of debris, lumber or other scrap will be permitted.

4. Properly maintain equipment to reduce gaseous pollutant emissions.

3.3 CONSTRUCTION STORAGE AREAS

A. Store and service equipment at the designated Contractor's storage area where oil wastes shall be collected in containers. Oil wastes shall not be allowed to flow onto the ground or into surface waters. Containers shall be required at the construction site for the disposal of materials such as paint, paint thinner, solvents, motor oil, fuels, resins and other environmentally deleterious substances. No dumping of surplus concrete or grout on the site will be permitted.

3.4 FIRE PREVENTION

A. Provide spark arresters on all internal combustion engines.

B. Store and handle flammable liquids in accordance with the Flammable and Combustible Liquids Code, NFPA 30.

C. Provide fire extinguishers at hazardous locations or operations, such as welding.

3.5 EROSION AND SEDIMENT TRANSPORT CONTROL

A. Discharge construction runoff into small drainages at frequent intervals to avoid buildup of large potentially erosive flows.

B. Prevent runoff from flowing over unprotected slopes.

C. Keep disturbed areas to the minimum necessary for construction.

D. Keep runoff away from disturbed areas during construction.

E. Direct flows over vegetated areas prior to discharge into public storm drainage systems.

F. Trap sediment before it leaves the site, using such techniques as check dams, sediment ponds, or siltation fences.

G. Remove and dispose of all project construction-generated siltation that occurs in offsite retention ponds.

H. Confine construction to the dry season, whenever possible. If construction needs to be scheduled for the wet season, ensure that erosion and sediment transport control measures are ready for implementation prior to the onset of the first major storm of the season.

I. Stabilize disturbed areas as quickly as possible.

3.6 DISPOSAL OPERATIONS

A. SOLID WASTE MANAGEMENT

Supply solid waste transfer containers. Daily remove all debris such as spent air filters, oil cartridges, cans, bottles, combustibles and litter. Take care to prevent trash and papers from blowing onto adjacent property. Encourage personnel to use refuse containers. Convey contents to a sanitary landfill.

Washing of concrete containers where waste water may reach adjacent property or natural water courses will not be permitted. Remove any excess concrete to the sanitary landfill.

B. CHEMICAL WASTE AND HAZARDOUS MATERIALS MANAGEMENT

Furnish containers for storage of spent chemicals used during construction operations. Dispose of chemicals and hazardous materials in accordance with applicable regulations.

C. GARBAGE

Store garbage in covered containers, pick up daily and dispose of in a sanitary landfill.

D. CLEARING AND GRUBBING

Dispose of vegetation, weeds, rubble, and other materials removed by the clearing, stripping and grubbing operations off site at a suitable disposal site in accordance with applicable regulations.

E. EXCAVATED MATERIALS

1. Native soil complying with the requirements of Section 02200, EARTHWORK, may be used for backfill, fill and embankments as allowed by that section.

2. Spoil Material: Remove all material which is excavated from the site and dispose of offsite in accordance with applicable regulations disposal site indicated in the Environmental Protection Plan. No additional compensation will be paid to the Contractor for such disposal. Include all such costs in the lump sum prices bid for the project. Remove rubbish and materials immediately following excavation.

   Rubbish shall consist of all materials not classified as suitable materials or rubble and shall include shrubbery, trees, timber, trash and garbage.

3. Excavated material may be stockpiled offsite for reuse in accordance with the requirements of Section 02200, EARTHWORK. Offsite stockpile locations shall be legally obtained by the Contractor and shall meet all of the applicable regulations and requirements of this Section. No additional compensation will be paid to the Contractor for such stockpiling and reuse of native soil.

END OF SECTION

SECTION 01000

ENVIRONMENTAL PROTECTION HIGH FIRE DANGER ALERTS AND CLOSURES

Marin County open space is very susceptible to wild land fires during the warm seasons of the year. This includes all "Open Space" lands such as MMWD lands, Marin County Open Space District (MCOSD) lands and any other private open space lands. Contractor must be aware of the possibility of fires at other times also and must use their own good judgment to work in a safe manner to prevent wild land fires. Contractors are encouraged to bring to any fire safety problems they observe or suggestions they may have to the attention of the Engineer. **Smoking is prohibited. This includes no smoking inside vehicles while on open space land.**

Red Flag Warning - Interagency Fire Closure Upon notification from the County Fire Department that a "Red Flag Warning - High Fire Danger Alert" exists for Marin County, Contractor shall suspend work at all affected open space lands. Contractors should monitor fire conditions with the Marin County Fire Department to know when closures are in effect. Contractor shall call the Marin County Fire Department contact the day before at 5 pm (415-499-7191) or otherwise as set by the County, each day to determine the fire conditions projected for the following day and plan their schedule accordingly.

If after 5 pm a high fire condition causes closure for the following day, then that Periods of high fire danger which result in the contractor being required to suspend work shall be considered Unavoidable Delays as described in Article 86 of the Standard Conditions. Additionally, during these periods the contractor may be prohibited from entering the open space lands.

RADIO COMMUNICATIONS

Whenever any work is being performed that may pose a potential fire danger, cell phones or 2-way radios must be on site to permit a rapid emergency response if necessary.

VEHICLES, EQUIPMENT, TOOLS

Trucks, Tractors Heat from exhaust systems can ignite a fire. Do not drive off road or in any area with tall grass whenever possible. Be sure all trucks and tractors are equipped with a fire extinguisher. Inspect trucks and tractors before use to be sure the spark arrestor exhaust system is in good condition and that there are no fires related defects. The Contractor shall not drive off road or park near or drive through tall grasses or other flammable vegetation types without approval from the District Inspector. Based upon authorization by District staff, the Contractor shall remove all grasses and other types of flammable vegetation from the off road work area approved for vehicle access.

Equipment, Tools Heat from power equipment exhaust systems, or sparks from equipment or tools can ignite a fire. Clear a space with a radius at least five feet from the exhaust in which to place equipment such as generators, chainsaws and power weed cutters. Be careful when using tools that produce sparks and be sure spark arrestors are

in good condition. Do not allow heated tools to contact ignitable fuels. If power equipment or tools that produce sparks are in use, a fire extinguisher must be kept onsite. Larger equipment should have a fire extinguisher mounted on it.

Fueling Equipment Before fueling power equipment or tools in the field, clear a space in which to perform the task. Fuel should be stored in a cleared space and, where possible, in the shade. If power equipment stays in one location during the task, store fuel and equipment and perform fueling operation in the same clearing. Be sure equipment is turned off while fueling. Take extra care when fueling heated equipment. Be sure gas spout/funnel is used to avoid spills and that gas caps are kept in place. Remove or dry any fuel spillage prior to starting equipment. During fueling operations, a fire extinguisher should be onsite ready for use.

GRASS AND BRUSH MOWING

Equipment and tools used to perform this fire hazard reduction task could instead ignite a fire. Suspend this task during "High Fire Danger Alert" periods. Use extreme caution in dry areas. Follow all procedures for equipment and tools. Use only non-metallic heads on weed cutters. Do not lay heated tools down in ignitable fuels. Carry a portable fire extinguisher at all times when working or fueling the brush cutter. When a tractor mower is used, a truck with a fire pumper must accompany the tractor. When the truck cannot follow due to terrain or tall grass conditions, then the truck driver must walk, carrying an additional fire extinguisher.

WELDING

Suspend this task during "High Fire Danger Alert" periods, on other hot dry days and when winds exceed five miles per hour. Perform this task in the morning prior to 10 am. Remove grass within a twelve-foot radius of the welding site. Wet the ground and surrounding vegetation prior to welding and every fifteen minutes thereafter. Maintain a portable welding screen around the welder. A truck-mounted pumper must be at the welding site, with the pump engaged during welding. An extra person must be present with no other duty except to watch for fire and operate the pumper.

FIRE SAFETY EQUIPMENT OPERATION

Where a truck with water pump is required, a person fully trained in truck and water pump operation must be present. All operators must be fully trained in use of the fire extinguishers.

Contractors shall have fire extinguishers onsite and follow fire safe procedures.

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

This section includes specifications for furnishing, placing and performing earthwork for excavations, shoring, dewatering, backfilling, compaction and grading, at the required lines and grades, as shown on the drawings. The excavation shall include, without classification, the removal and disposal of all materials of whatever nature encountered, except hazardous waste. Water and all other obstructions, that would interfere with the proper construction and completion of the required work shall be removed and disposed of in accordance with the requirements of Section 18000 - ENVIRONMENTAL PROTECTION.

1.2 RELATED SECTIONS

A. Section 02713 - DISTRIBUTION PIPING SYSTEM

B. Section 03400 - CONTROL DENSITY FILL

1.3 REFERENCES

A. ASTM D1557 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb rammer and 18 inch drop.

B. ASTM D2216 - Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures

C. ASTM D2419 – Sand Equivalent Value of Soils and Fine Aggregates

D. ASTM D2487 - Classification of Soils for Engineering Purposes

E. ASTM D2844 - Resistance R Value and Expansion Pressure of Compacted Soils

F. ASTM D2922 - Density of Soil and Soil-Aggregate in place by Nuclear Methods (Shallow Depth)

G. ASTM D3017 - Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.4 SUBMITTALS

A. Sheeting and Shoring Plan: Refer to General Specifications, Article 11.

B. Samples and Test Results: Furnish, without additional cost to the District, such quantities of import materials as may be required by the Engineer for test

purposes. The Contractor shall cooperate with the Engineer and furnish necessary facilities for sampling and testing of all materials and workmanship. Submit test results for import materials. All material furnished and all work performed shall be subject to rigid inspection, and no material shall be delivered to the site until it has been favorably reviewed by the Engineer, or used in the construction work until it has been inspected in the field by the Engineer.

1.5 DUST CONTROL

Refer to Section 18000, Paragraph 3.2B.

1.6 SITE ACCESS

Access to the site will be over public and private roads. The Contractor shall exercise care in the use of such roads and shall repair at his own expense any damage thereto caused by his operations. Such repair shall be to the satisfaction of the owner or agency having jurisdiction over the road. The Contractor shall take whatever means are necessary to prevent tracking of mud onto existing roads.

1.7 SOILS TESTING

Listed below are the standard test methods to be employed by the District or by the Contractor's soils testing firm. The intent of these tests is to insure the quality of backfill material and the workmanship, methods and final product of the Contractor.

A. In determining the in-place Density of Soil and Soil-Aggregate by nuclear methods, testing shall conform to ASTM D2922 or California Test Method No. 216.

B. In determining laboratory moisture-density relationships of soils, testing shall conform to by ASTM D1557 or California test method No. 216.

C. In determining the in-place moisture content of soils, testing shall follow ASTM D3017, ASTM D2216, California Test Method No. 226.

D. In determining the Sand Equivalent, ASTM D2419 or California Test method No. 217 shall be used.

E. In determining the resistance value, testing shall conform to ASTM D2844 or California Test Method No. 301.

F. Classification of soils for Engineering Purposes shall be in accordance with ASTM D2487.

PART 2 - MATERIALS

2.1 EARTHWORK BACKFILL

The types of backfill material indicated below may be used for backfilling trenches as indicated in the specifications, shown on the Drawings or directed by the Engineer.

A. CLASS 2 AGGREGATE BASE

This material shall conform to the requirements set forth in Section 26 of the most recent CALTRANS Standard Specifications for the ¾" maximum size aggregate. Aggregate grading and quality requirements shall conform to the moving average criteria unless otherwise specified by the Engineer, and shall apply to material both before and after compaction.

Aggregate may include material processed from reclaimed asphalt concrete, portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. The amount of reclaimed material may account for up to 100% of the total volume of the aggregate used. Reclaimed material shall conform to the grading and quality requirements set forth in Section 26 of the most recent CALTRANS Standard Specifications for the ¾" maximum size aggregate." The Contractor shall be required to demonstrate that the recycled Class 2 aggregate base material meets CALTRANS standards. See the following link to the CALTRANS web site:

https://dot.ca.gov/programs/design/standard-plans-and-standard-specifications

B. SELECT SAND

This material shall be a clean material free of organic or other deleterious substances and of such gradation that a minimum of 90% will pass a No. 4 sieve and not more than 5% will pass a No. 200 sieve. If low chloride sand is required, the chloride content shall not exceed 30 parts per million by weight.

C. PEA GRAVEL

This material shall be a clean material free of organic or other deleterious substances and shall consist of smooth rock with no facets or sharp edges. Stones shall have a maximum size of 3/8 inch, and not more than 5% will pass a No. 16 sieve.

D. CONTROL DENSITY FILL

If CDF is used, see Section 03400 - Control Density Fill.

E. NATIVE BACKFILL

Where use of native soil is directed, prepare native soil as necessary to be free from clods or rocks larger than 3 inches in greatest dimension, and free from organic material and as approved by the Engineer.

F. DRAIN ROCK OR GRAVEL

If drain rock or gravel is required, river run or crushed rock with a maximum dimension of ¾ inch, with no more than 10 percent passing the No. 200 sieve, and with a durability index of 40 or higher shall be used.

2.2 UNACCEPTABLE MATERIAL

Unless otherwise specified, backfill material shall not contain quarry waste, quarry fines, pea gravel, recycled materials and like material. In addition, any material not conforming to the specifications of Section 2.1 or failing performance testing shall also be unacceptable.

2.3 TRENCHLESS TOOLS

The following is a list of manufacturers that supply equipment relevant to the trenchless techniques described elsewhere in this section.

1. "Ditch Witch" by Charles Machine Works, Inc. (Perry OK) 800-654-6481.

2. "Pow-R Mole" by Petersen Underground Equipment, Inc. (Murray UT) 800-325-6419.

3. "Hole-Hog" or "Red Hog Express" by Allied Construction Products (Cleveland, OH), 216-431-2600.

4. "Ferret" by Footage Tools (Weston, Ontario Canada), 416- 746-2911.

5. "GRUNDOMAT" and "GRUNDORAM" by TT Technologies, available from Plank, (Petaluma CA), 707-763-7070.

6. LTA Corporation (Columbia Heights, MN) 612-781-4292.

7. Hacker Industries (Henderson TX) 908-657-3546.

8. ACCU-PUNCH by Vibra King, Inc. (Mankato, MN), 507-387-6574.

9. "Mighty Mole" by McLaughlin Boring Systems (Greenville, SC) 800-435-9360.

10. Grice Industries, 541-341-4644

PART 3 - EXECUTION

3.1 USA NOTIFICATION AND UTILITY FIELD MEETING

The Contractor shall contact Underground Service Alert (USA) (1-800-642-2444) seven (7) calendar days prior to start of each section and shall be responsible for maintaining a valid USA location tag through renewal during the construction. The Contractor shall schedule a utility field meeting prior to any excavation. This shall be so stated in the USA Notification. The Contractor shall be responsible to coordinate the utility field meeting at which time he shall explain the limits and impacts to USA member utilities.

See CA Government Code 4215

3.2 EXISTING UTILITIES

The Contractor shall expose all existing utilities along the trench alignment and at connections prior to commencement of the work on the project for the pipeline installation. This is to be done in order to determine the line and grade of existing utilities, possible conflicts and mismarks. At connections, the Contractor shall expose the existing pipeline to determine the depth at which the connection is to be made and verify existing pipe material and sizes.

If the contractor damages any existing utilities, the contractor shall immediately notify that utility and make repairs satisfactory to that utility.

3.3 PROTECTION OF EXISTING SURVEY MONUMENTS

The Contractor shall not disturb, remove, alter or destroy any existing land survey monument. In the event that the contractor believes that a monument will be thus impacted, the Contractor shall notify the Engineer. The Contractor shall allow 10 working days for the Engineer to establish sufficient data to reset the monument after the completion of the construction.

3.4 SITE GRADING

A. Rough Grading: After completion of stripping, the Contractor shall rough grade cut areas to the lines, grades and contours shown on the Drawings.

B. Proof-Rolling: After rough grading, the Contractor shall proof-roll the areas where on-grade structures are to be constructed in order to detect soft zones. Proof-roll shall consist of passing over all required areas with a loaded scraper, front-end loader with loaded bucket, or other heavy rubber tired vehicle with high tire pressure, in the presence of the Engineer. The Engineer will determine which areas tested by proof-rolling are soft zones that require the Contractor to complete following corrective work.

1. Soft Zone Corrective Work: Remove all soft material as indicated by the Engineer from all soft zones exposed by proof-rolling. Properly dispose of unsuitable material off site.

2. Fill the resulting voids with moisture-conditioned Native Backfill, in level 8-inch uniform layers measured before compaction. Compact with appropriate equipment to at least 95 percent relative compaction.

3. Soft zone corrective work will be considered a change in the scope of project work and will be paid for in accordance with Article 47 "Changed Conditions" of the General Conditions.

C. Scarifying: The Contractor shall scarify, to a minimum 6-inch depth, all areas where fills are required. Moisture condition the scarified surface to within two percent of optimum water content, and compact to minimum 95 percent relative compaction.

D. Fills:

1. Do not place any fill until the Engineer has inspected, tested to his satisfaction, and favorably reviewed the prepared subgrade.

2. Construct fills as shown on the Drawings, true to line, grade and cross-section. Construct fills of Native Backfill unless otherwise indicated. Place material in approximately 8-inch thick horizontal layers measured before compaction, and carried across the entire width to the required slopes. Compact all fills to a relative compaction of at least 90% unless otherwise specified. Properly moisture condition before compaction.

3. The Contractor may be required to overbuild slopes and trim back to the compacted core to achieve adequate compaction of slope faces.

E. Compaction requirements shall be 90% relative compaction. Material shall be moistened as required to aid compaction.

F. Ditches: Cut ditches accurately to the cross sections and grades shown. Take care not to overexcavate ditches, and backfill excessive excavation to grade. Trim all roots, stumps, rock and other foreign matter from the sides and bottom of the ditches. Compact the surfaces of ditch slopes and bottom.

3.5 PAVEMENT REMOVAL

A. GENERAL

Excavation for the pipe installation shall be open cut and shall include the removal of all paving, concrete, soils, abandoned utilities, water, or other objects of any nature that would interfere with the performance of the work.

B. SAWCUTTING

In locations where the pipe is to be installed by open cut method under asphaltic concrete or concrete pavement sections, the outline of all pavement areas to be removed shall be cut prior to removal as required by the local jurisdiction in which the work is being performed. Any cutting that requires water shall be done with a vacuum system that collects all the water and does not allow any water or cutting products to flow into the storm drain. Cuts shall be neat and true, shall be cut completely through the existing pavement section to subgrade and shall be done without damaging adjacent pavement that is not to be removed. No jack-hammer, "drop hammer," or similar equipment will be allowed to cut the pavement. Grinding that results in cuts wider than 0.5 inch shall not be considered as sawcuts. The Contractor shall anticipate that variations in the thickness of paving exist.

C. DISPOSAL

Pavement removed from the pipeline trench shall be hauled from the job and disposed at a County approved disposal site.

3.6 TRENCH EXCAVATION

A. GENERAL

Trench excavation for pipelines shall be open cut, except that service piping may be installed using either open cut or trenchless methods defined later in this section.

The trench shall be excavated to the lines and grades shown on the drawings and in accordance with trench details. If the trench is excavated below the required grade, the Contractor shall refill the trench excavated below the grade with compacted Class II Aggregate Base at no additional cost to the District.

The Contractor shall perform all excavation regardless of the type, nature, or condition of the material encountered to accomplish the construction. No blasting shall be permitted.

B. TRANSPORT OF SPOILS

Backfill stockpiles and excavation spoils which are not immediately loaded and hauled away shall have local approval from local jurisdiction. This material shall be placed on the site away from trenches, street corners, and active work areas and shall be placed in such a manner as to minimize obstruction to traffic. Gutters and ditches shall be kept clear, or other provisions shall be made for the handling of drainage.

C. EXCAVATION FOR VALVE PLACEMENT

Mains shall be lowered below required minimum depths in the vicinity of gate valves 10-inches and larger in size. To accommodate the valve stem, the main shall be lowered as necessary to achieve the following minimum covers:

- For 10" valves, minimum cover of 36 inches
- For 12" valves, minimum cover of 38 inches

D. ALIGNMENT

The Contractor shall conform, as nearly as possible, to the pipeline alignment indicated on the plans unless modified by the Engineer. Whenever vertical or horizontal deflection of the pipe is required to avoid obstructions or where long radius curves are permitted, the degree of deflection at joints shall be approved by the Engineer.

E. EXCAVATION AT BELL HOLES

When bell holes are required they shall be excavated at each point where pipe ends are to be joined. Bell holes shall be adequately sized to permit ease in making the joint. When necessary, bell holes shall be shored and protected in conformance with CAL/OSHA requirements.

F. SHORING

The Contractor shall at all times comply with Safety Regulations set forth in the State of California, Construction Safety Orders and Trench Construction Safety Orders, issued by CAL/OSHA's Division of Industrial Safety. No excavation shall start until the Engineer has received 1) a copy of the Contractor's permit for the project from the State Division of Industrial Safety and 2) a copy of all project notification forms and/or letters that he has forwarded to the CAL/OSHA District office.

Shoring shall follow a District approved shoring plan submitted by the Contractor. In order to prevent cave-ins and protect adjacent areas, excavation in unstable material shall be adequately shored and braced. Shoring shall remain in place until the pipeline has been installed, inspected and the earth compacted around and over the top of the pipe. Upon completion of the work the Contractor shall remove all shoring unless otherwise specified by the Engineer.

G. ROCK EXCAVATION

Wherever the word "Rock" appears in these Specifications, it shall be interpreted to mean any of the following: (1) material in ledges, bedding deposits of unstratified masses which cannot be removed without the use of hydraulic or pneumatic hammers or continuous drilling and blasting, (2) boulders larger than

one cubic yard which, when first exposed, cannot be broken down from their original state with a modern ¾ cubic yard backhoe power excavator or a Caterpillar D8 with a single tooth ripper, in good condition, and cannot be safely transported in a vehicle for disposal, (3) concrete, asphalt or masonry structures which have been abandoned and cannot be broken down from their original state with a modern ¾ cubic yard backhoe power excavator and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock and cannot be removed without systematic drilling.

H. TRENCHLESS INSTALLATION OF PIPELINES

Trenchless installation of pipelines shall be defined as installation of pipe using a technique that does not require open cut excavation along the length of the pipe installed. Examples of typical equipment include a pneumatic "mole" or directional bore. Specific techniques may be required in certain areas as indicated on the Drawings.

3.7 DEWATERING AND DRAINAGE

The Contractor shall provide all equipment and labor adequate to keep all trenches and excavations free of water. The Contractor shall keep excavated areas free of standing or flowing water during pipe installation, concrete placement, and backfilling operations by draining or pumping from a point that is outside the structural limits of work and below that of the excavation. The Contractor shall also provide a positive means to assure that no water will enter previously installed pipe. The Contractor is responsible for obtaining and complying with any discharge permits required by any appropriate regulatory authority and shall not direct drainage effluent in such a manner that damage to adjacent property or natural watercourses occurs.

3.8 REFILLING TRENCHES

A. GENERAL

The Contractor shall place backfill material around structures and in other areas, including overexcavation areas, as shown on the plans and as specified by the Engineer. Backfill shall be placed immediately subsequent to installation of the pipeline and appurtenances, and shall be installed in loose lifts not exceeding eight inches in depth. Compaction requirements shall be 95% relative compaction for Class II Aggregate Base Rock and 90% for native backfill to a depth of 18 inches below the bottom of the required paving and 90% relative compaction below that level. Material shall be moistened as required to aid compaction. No foreign materials (blocking) shall be left in the trench.

B. GEOTECHNICAL TESTING

1. TESTING BY ENGINEER

a. The District shall conduct all soils testing. Soils compaction tests will be taken on a random basis, approximately one test per 100 feet (location determined by the Engineer). Where testing is done, one test shall be taken on the lower lift and one on the upper lift of the base rock.

b Testing shall be accomplished in accordance with ASTM D2922 or California Test Method No. 216.

c. The District will bear all costs of testing except that of a failed retest. The cost of $100 per each retest shall be deducted from any payment due to the Contractor.

C. STEEL PLATES

Steel traffic plates shall not be used without the expressed written approval of the Engineer and the local jurisdiction in control of street openings and encroachments. It is the Contractor's responsibility to contact and secure permission for steel plate use prior to construction within each specific jurisdiction. Steel traffic plates, where approved, shall have a non-skid surface. The determination for use shall be made by the Engineer and shall be final.

D. COMPACTION EQUIPMENT, METHODS, AND REQUIREMENTS

1. GENERAL

Care shall be exercised in any method of backfilling to avoid damage to the protective coating or mortar lining of the pipe. It is important that proper precautions be taken to prevent floating of the pipe. The Contractor shall be wholly responsible for any damage resulting from failure to take necessary precautions when placing and compacting backfill. Compaction equipment or methods that produce horizontal or vertical earth pressures, which may cause excessive displacement or which may damage nearby structures, shall not be used. Use of a hydraulic hammer for compaction will not be allowed.

Backfilling shall conform to the requirements of the applicable local jurisdiction or those included in these specifications, whichever is more stringent. In the case of conflict between the requirements, the Engineer shall determine which shall prevail.

The Contractor should note that he shall be required to install impermeable dikes in areas where existing grades are 10% or greater. The Contractor shall be responsible to determine grades. Impermeable dikes shall be made of Type II concrete, or native clay soils compacted to 95%. Each impermeable dike shall be as wide as the trench, a minimum of six inches in thickness and extend from the bottom of the trench to a point 12

inches above the pipe. Dikes shall be located every 50 feet where required.

2. PAVED AREAS

Backfill materials shall be moistened to near optimum moisture content and shall be placed in the trench on both sides of the pipe for the full width of the trench. Sand shall be brought up evenly on both sides of the pipe. Said materials shall be placed into the trench by hand or by approved mechanical methods, and be compacted to provide solid backing against the external surface of the pipe. The Contractor shall not place or compact backfill above springline until the Engineer has inspected and approved the lower portion of backfill. Flooding of this lower portion of backfill will not be permitted.

The remaining backfill shall be placed in uniform horizontal layers not to exceed eight inches in loose thickness before compaction. Each layer shall be dampened sufficiently and uniformly tamped, rolled with a vibratory compactor or otherwise compacted throughout until the relative compaction is satisfactory. Non-uniform compacted surfaces may be rejected. Inundation of this upper portion of backfill will not be permitted. The material between the bottom of pavement and a plane 18 inches below that, shall be worked until a minimum relative compaction of 95% throughout is reached. Material below that plane shall be compacted to a minimum of 90% relative compaction throughout.

Backfill within 10 feet of any mainline valve shall be placed and compacted in 6-inch lift thicknesses. Backfill shall be compacted to within one inch of finished grade prior to placement of temporary pavement. The Contractor shall compact temporary pavement as required in Section 02500 daily on all surfaces where paving has been removed.

Impact compaction machines, such as a “Hydra Hammer”, and backhoe mounted compaction machines, such as a HedShaker, shall not be used. The Contractor shall compact all backfill to the specified relative compaction as it is being installed. Wheel-rolling will not be allowed.

All excavations shall be restored to the elevation of surrounding pavement prior to completion of each day’s work. If any sections of restored trench settles below the surrounding pavement, the Contractor shall re-work the trench to the same elevation as the surrounding pavement each day.

Any backfill material which cannot be compacted to the specified degree will be rejected. Any backfill material which pumps or is not firm will be rejected even if compaction requirements are satisfied. The Contractor, at his expense, shall remove the rejected material and replace it with suitable material.

Particular care shall be taken in the backfilling and compaction of the area around the taps to the main. Hand tamping will be required rather than equipment tamping or rolling.

3.9 FINISH GRADING

Except where shown otherwise in the Drawings, restore the finish grade to the original contours and to the original drainage patterns. Grade surfaces to drain away from structures. The finished surfaces of the tank pad and access road shall be smooth and compacted. The graded surfaces to receive slope protection shall be furrowed to better match the surface of the undisturbed natural areas adjacent to the project site.

3.10 DISPOSAL OF MATERIAL

Any excess backfill material or material rejected by the Engineer shall be removed from the job site by the Contractor. He shall make all necessary arrangements for the proper and legal disposal of excess material, at his cost, and upon request shall provide written evidence indicating approval to use the disposal site.

END OF SECTION

Appendix B
CalEEMod Results

Phoenix-Bon Tempe v3 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Phoenix-Bon Tempe v3
Construction Start Date	8/1/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	24.0
Location	37.95445426256828, -122.59118536594676
County	Marin
City	Unincorporated
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	907
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Linear	1.46	Mile	25.0	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.46	6.26	51.9	55.0	0.12	2.21	3.07	5.27	2.03	1.38	3.41	—	12,745	12,745	0.52	0.11	0.49	12,793
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.46	6.25	51.9	55.0	0.12	2.21	3.07	5.27	2.03	1.38	3.41	—	12,747	12,747	0.52	0.11	0.01	12,794
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.27	1.91	15.5	17.2	0.04	0.66	1.10	1.74	0.61	0.50	1.08	—	3,978	3,978	0.16	0.04	0.07	3,993
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.41	0.35	2.84	3.14	0.01	0.12	0.20	0.32	0.11	0.09	0.20	—	659	659	0.03	0.01	0.01	661

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	7.46	6.26	51.9	55.0	0.12	2.21	3.07	5.27	2.03	1.38	3.41	—	12,745	12,745	0.52	0.11	0.49	12,793
2025	6.16	5.16	42.4	46.5	0.10	1.73	3.07	4.80	1.59	1.38	2.98	—	10,710	10,710	0.44	0.10	0.46	10,750
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	7.46	6.25	51.9	55.0	0.12	2.21	3.07	5.27	2.03	1.38	3.41	—	12,739	12,739	0.52	0.11	0.01	12,786
2025	7.07	5.93	47.1	53.8	0.12	1.95	3.07	5.02	1.79	1.38	3.17	—	12,747	12,747	0.52	0.11	0.01	12,794
2026	5.96	4.99	39.8	45.9	0.10	1.59	3.07	4.66	1.46	1.38	2.84	—	10,707	10,707	0.44	0.10	0.01	10,747
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.23	1.87	15.5	16.5	0.04	0.66	0.92	1.58	0.61	0.41	1.02	—	3,814	3,814	0.16	0.03	0.06	3,829
2025	2.27	1.91	15.5	17.2	0.04	0.64	1.10	1.74	0.59	0.50	1.08	—	3,978	3,978	0.16	0.04	0.07	3,993
2026	0.36	0.30	2.41	2.79	0.01	0.10	0.19	0.28	0.09	0.08	0.17	—	650	650	0.03	0.01	0.01	652
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.41	0.34	2.84	3.00	0.01	0.12	0.17	0.29	0.11	0.08	0.19	—	632	632	0.03	0.01	0.01	634
2025	0.41	0.35	2.84	3.14	0.01	0.12	0.20	0.32	0.11	0.09	0.20	—	659	659	0.03	0.01	0.01	661
2026	0.07	0.06	0.44	0.51	< 0.005	0.02	0.03	0.05	0.02	0.02	0.03	—	108	108	< 0.005	< 0.005	< 0.005	108

3. Construction Emissions Details

3.1. Linear, Grading & Excavation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	7.41	6.22	51.8	54.6	0.12	2.21	—	2.21	2.03	—	2.03	—	12,603	12,603	0.51	0.10	—	12,646

Dust From Material Movement	—	—	—	—	—	—	2.97	2.97	—	1.36	1.36	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	7.41	6.22	51.8	54.6	0.12	2.21	—	2.21	2.03	—	2.03	—	12,603	12,603	0.51	0.10	—	12,646
Dust From Material Movement	—	—	—	—	—	—	2.97	2.97	—	1.36	1.36	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.22	1.86	15.5	16.3	0.04	0.66	—	0.66	0.61	—	0.61	—	3,774	3,774	0.15	0.03	—	3,786
Dust From Material Movement	—	—	—	—	—	—	0.89	0.89	—	0.41	0.41	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.34	2.83	2.98	0.01	0.12	—	0.12	0.11	—	0.11	—	625	625	0.03	0.01	—	627
Dust From Material Movement	—	—	—	—	—	—	0.16	0.16	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.42	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	87.9	87.9	< 0.005	< 0.005	0.38	89.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.08	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.9	53.9	0.01	0.01	0.11	56.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.38	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	82.0	82.0	< 0.005	< 0.005	0.01	83.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.09	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.9	53.9	0.01	0.01	< 0.005	56.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.11	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	24.7	24.7	< 0.005	< 0.005	0.05	25.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.1	16.1	< 0.005	< 0.005	0.01	17.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.08	4.08	< 0.005	< 0.005	0.01	4.14
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.67	2.67	< 0.005	< 0.005	< 0.005	2.81

3.3. Linear, Grading & Excavation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	7.03	5.89	46.9	53.4	0.12	1.95	—	1.95	1.79	—	1.79	—	12,614	12,614	0.51	0.10	—	12,657
Dust From Material Movement	—	—	—	—	—	—	2.97	2.97	—	1.36	1.36	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	2.85	3.24	0.01	0.12	—	0.12	0.11	—	0.11	—	765	765	0.03	0.01	—	768
Dust From Material Movement	—	—	—	—	—	—	0.18	0.18	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.52	0.59	< 0.005	0.02	—	0.02	0.02	—	0.02	—	127	127	0.01	< 0.005	—	127
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.35	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.4	80.4	< 0.005	< 0.005	0.01	81.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.08	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	52.8	52.8	0.01	0.01	< 0.005	55.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.90	4.90	< 0.005	< 0.005	0.01	4.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.20	3.20	< 0.005	< 0.005	< 0.005	3.37
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.81	0.81	< 0.005	< 0.005	< 0.005	0.82
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.56

3.5. Linear, Drainage, Utilities, & Sub-Grade (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	6.12	5.13	42.3	46.1	0.10	1.73	—	1.73	1.59	—	1.59	—	10,570	10,570	0.43	0.09	—	10,607
Dust From Material Movement	—	—	—	—	—	—	2.97	2.97	—	1.36	1.36	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	6.12	5.13	42.3	46.1	0.10	1.73	—	1.73	1.59	—	1.59	—	10,570	10,570	0.43	0.09	—	10,607
Dust From Material Movement	—	—	—	—	—	—	2.97	2.97	—	1.36	1.36	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.83	1.53	12.7	13.8	0.03	0.52	—	0.52	0.48	—	0.48	—	3,165	3,165	0.13	0.03	—	3,176
Dust From Material Movement	—	—	—	—	—	—	0.89	0.89	—	0.41	0.41	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.33	0.28	2.31	2.52	0.01	0.09	—	0.09	0.09	—	0.09	—	524	524	0.02	< 0.005	—	526
Dust From Material Movement	—	—	—	—	—	—	0.16	0.16	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.02	0.39	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	86.2	86.2	< 0.005	< 0.005	0.35	87.6

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.08	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.2	53.2	0.01	0.01	0.11	56.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.35	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.4	80.4	< 0.005	< 0.005	0.01	81.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.08	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.2	53.2	0.01	0.01	< 0.005	55.9
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	24.2	24.2	< 0.005	< 0.005	0.05	24.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.9	15.9	< 0.005	< 0.005	0.01	16.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.00	4.00	< 0.005	< 0.005	0.01	4.06
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.64	2.64	< 0.005	< 0.005	< 0.005	2.77

3.7. Linear, Drainage, Utilities, & Sub-Grade (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.91	4.96	39.7	45.6	0.10	1.59	—	1.59	1.46	—	1.46	—	10,576	10,576	0.43	0.09	—	10,612

Dust From Material Movement	—	—	—	—	—	—	2.97	2.97	—	1.36	1.36	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.36	0.30	2.41	2.76	0.01	0.10	—	0.10	0.09	—	0.09	—	642	642	0.03	0.01	—	644
Dust From Material Movement	—	—	—	—	—	—	0.18	0.18	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.05	0.44	0.50	< 0.005	0.02	—	0.02	0.02	—	0.02	—	106	106	< 0.005	< 0.005	—	107
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.33	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	78.9	78.9	< 0.005	< 0.005	0.01	80.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.08	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	52.1	52.1	0.01	0.01	< 0.005	54.8

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.81	4.81	< 0.005	< 0.005	0.01	4.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.16	3.16	< 0.005	< 0.005	< 0.005	3.33
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.80	0.80	< 0.005	< 0.005	< 0.005	0.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.52	0.52	< 0.005	< 0.005	< 0.005	0.55

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Linear, Grading & Excavation	Linear, Grading & Excavation	8/1/2024	1/31/2025	5.00	132	—

Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	8/1/2025	1/31/2026	5.00	131	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Linear, Grading & Excavation	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Average	2.00	8.00	150	0.36
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Linear, Grading & Excavation	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Linear, Grading & Excavation	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Grading & Excavation	Dumpers/Tenders	Diesel	Average	2.00	8.00	16.0	0.38
Linear, Grading & Excavation	Other Material Handling Equipment	Diesel	Average	1.00	8.00	93.0	0.40
Linear, Grading & Excavation	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Linear, Grading & Excavation	Graders	Diesel	Average	2.00	8.00	148	0.41
Linear, Grading & Excavation	Bore/Drill Rigs	Diesel	Average	1.00	8.00	83.0	0.50
Linear, Grading & Excavation	Cement and Mortar Mixers	Diesel	Average	12.0	8.00	10.0	0.56
Linear, Grading & Excavation	Cranes	Diesel	Average	1.00	8.00	367	0.29

Linear, Grading & Excavation	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Grading & Excavation	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Linear, Drainage, Utilities, & Sub-Grade	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Drainage, Utilities, & Sub-Grade	Dumpers/Tenders	Diesel	Average	2.00	8.00	16.0	0.38
Linear, Drainage, Utilities, & Sub-Grade	Other Material Handling Equipment	Diesel	Average	1.00	8.00	93.0	0.40
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	2.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Bore/Drill Rigs	Diesel	Average	1.00	8.00	83.0	0.50
Linear, Drainage, Utilities, & Sub-Grade	Cement and Mortar Mixers	Diesel	Average	12.0	8.00	10.0	0.56
Linear, Drainage, Utilities, & Sub-Grade	Cranes	Diesel	Average	1.00	8.00	367	0.29
Linear, Drainage, Utilities, & Sub-Grade	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Drainage, Utilities, & Sub-Grade	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	10.0	11.7	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	0.00	8.40	HHDT,MHDT
Linear, Grading & Excavation	Hauling	0.71	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	10.0	11.7	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	8.40	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	0.72	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Linear, Grading & Excavation	500	250	25.0	0.00	—
Linear, Drainage, Utilities, & Sub-Grade	500	250	25.0	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
User Defined Linear	25.0	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	9.66	annual days of extreme heat
Extreme Precipitation	18.8	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	7.65	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	5	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	5	1	1	4
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	3.91
AQ-PM	13.5
AQ-DPM	4.83
Drinking Water	36.5
Lead Risk Housing	29.9
Pesticides	0.00
Toxic Releases	41.9
Traffic	75.4
Effect Indicators	—
CleanUp Sites	86.7
Groundwater	35.0
Haz Waste Facilities/Generators	35.6
Impaired Water Bodies	93.4
Solid Waste	22.1
Sensitive Population	—
Asthma	9.90
Cardio-vascular	5.16

Low Birth Weights	99.5
Socioeconomic Factor Indicators	—
Education	0.84
Housing	—
Linguistic	17.3
Poverty	25.7
Unemployment	9.72

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—
Transportation	—
Auto Access	—
Active commuting	—
Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—

Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—
Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—
Insured adults	—
Arthritis	0.0
Asthma ER Admissions	83.6
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	84.2
Physically Disabled	80.2
Heart Attack ER Admissions	96.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0

Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	13.9
SLR Inundation Area	45.1
Children	95.4
Elderly	12.0
English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	49.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	96.9
Traffic Density	0.0
Traffic Access	46.6
Other Indices	—
Hardship	0.0
Other Decision Support	—
2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	17.0

Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Characteristics: Project Details	Project specific information
Construction: Construction Phases	Project specific information
Construction: Off-Road Equipment	Project specific information
Construction: Trips and VMT	Project specific assumptions for number of workers.

Results Summary

Average Daily Construction-related Criteria Pollutant Emissions

Project Construction Year	Average Daily Emissions (pounds per day)			
	ROG	NOX	Exhaust PM10	Exhaust PM2.5
2024	6.2	52.1	2.2	2.0
2025	5.3	43.0	1.8	1.7
2026	5.5	40.0	1.8	1.8
BAAQMD Thresholds of Signifi	*54*	*54*	*82*	*54*
Threshold Exceeded?	**No**	**No**	**No**	**No**

Construction Phase	Start Date	End Date	Year	Start	End	Workdays
Linear, Grading & Excavation	8/1/2024	1/31/2025	2024	8/1/2024	12/31/2024	109
Linear, Drainage, Utilities, & Sub-Grade	8/1/2025	1/31/2026	2025	1/1/2025	1/31/2025	23
			2025	8/1/2025	12/31/2025	109
			2026	1/1/2026	1/31/2026	22

lbs/ton 2000

Phase Name	Phase Type	Start Date	End Date	Days Per V	Work Days per Phase
Linear, Grading & Excavation	Linear, Gra	8/1/2024	1/31/2025	5	132
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drai	8/1/2025	1/31/2026	5	131

CalEEMod Outputs

2.2. Construction Emissions by Year, Unmitigated

Year	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																		
2024	7.46	6.26	51.9	55	0.12	2.21	3.07	5.27	2.03	1.38	3.41		12745	12745	0.52	0.11	0.49	12793
2025	6.16	5.16	42.4	46.5	0.1	1.73	3.07	4.8	1.59	1.38	2.98		10710	10710	0.44	0.1	0.46	10750
Daily - Winter (Max)																		
2024	7.46	6.25	51.9	55	0.12	2.21	3.07	5.27	2.03	1.38	3.41		12739	12739	0.52	0.11	0.01	12786
2025	7.07	5.93	47.1	53.8	0.12	1.95	3.07	5.02	1.79	1.38	3.17		12747	12747	0.52	0.11	0.01	12794
2026	5.96	4.99	39.8	45.9	0.1	1.59	3.07	4.66	1.46	1.38	2.84		10707	10707	0.44	0.1	0.01	10747
Average Daily																		
2024	2.23	1.87	15.5	16.5	0.04	0.66	0.92	1.58	0.61	0.41	1.02		3814	3814	0.16	0.03	0.06	3829
2025	2.27	1.91	15.5	17.2	0.04	0.64	1.1	1.74	0.59	0.5	1.08		3978	3978	0.16	0.04	0.07	3993
2026	0.36	0.3	2.41	2.79	0.01	0.1	0.19	0.28	0.09	0.08	0.17		650	650	0.03	0.01	0.01	652
Annual																		
2024	0.41	0.34	2.84	3	0.01	0.12	0.17	0.29	0.11	0.08	0.19		632	632	0.03	0.01	0.01	634
2025	0.41	0.35	2.84	3.14	0.01	0.12	0.2	0.32	0.11	0.09	0.2		659	659	0.03	0.01	0.01	661
2026	0.07	0.06	0.44	0.51	< 0.005	0.02	0.03	0.05	0.02	0.02	0.03		108	108	< 0.005	< 0.005	< 0.005	108

Energy Calculations - Construction

Source	MT of CO2
Total GHG from Diesel use	1,393.7
Total GHG from Gasoline Use	9.83
Onsite GHG from diesel use	1,387.0
Onroad GHG from diesel use	6.7
Percent onsite diesel	99.5%
Percent onroad diesel	0.5%

CO2 from diesel fuel combustion (a) = 10.2 kg of CO2/gallon of diesel

CO2 from gasoline fuel combustion (a) = 8.78 kg of CO2/gallon of gasoline

(a) Emissions factors per The Climate Registry 2019 Default Emission Factors (Table 2.1 - US Default Factors for Calculating CO2 Emissions from Combustion of Transport Fuels)

Conversion 1 MT = 1000 kg
0.00045359 MT= 1 lb

Source	Fuel Use (gallons)
Onsite Diesel	135,847.2
Offsite Diesel	655.2
Total Diesel	136,502.4
Offsite Gasoline	1,119.6

Total Fuel sales in Marin County 2022 | | % of County fuel
Diesel 5000000 gal 2.73%
Gasoline 86000000 gal 0.001%
https://www.energy.ca.gov/media/3874

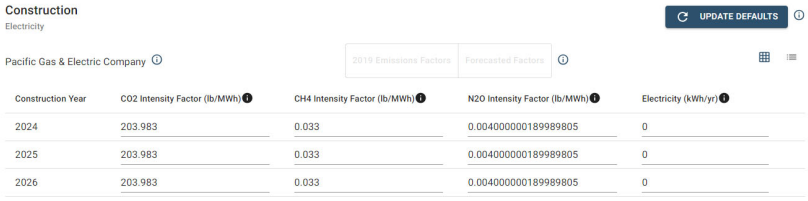
kWh from operational pump usage	converted to MWh	lbs of CO2e/MWh	2021 PG&E CO2e ghg emissions intensity (lbs co2e/MWh)
95763	95.763	19727.178	206

Operational MT CO2e associated with pumps (worst case scenario)
8.9

CO2	CH4	N2O
203.983	0.033	0.004

GWP from AR4

CO2	1
CH4	25
N2O	298



Appendix C

Ross Creek Hydrology for Phoenix-Bon Tempe Connection

ESA

180 Grand Avenue
Suite 1050
Oakland, CA 94612
510.839.5066 phone
510.839.5825 fax

esassoc.com

memorandum

date	January 19, 2024
to	Elysha Irish, Marin Water
from	Darcy Kremin, AICP; Andrew Collison, PhD, ESA
subject	DRAFT Ross Creek Hydrology for Phoenix-Bon Tempe Connection

Introduction

The purpose of this memorandum is to present results of the Phoenix Lake - Ross Creek hydrology modeling. A water balance model has been created to explore whether the proposed project could change the timing or volume of the Ross Creek hydrograph significantly enough to impact its hydrological or biological function. A hypothetical example of the type of hydrograph change the model was created to assess is whether the proposed diversions would significantly delay or reduce flows at times when steelhead may be using fall pulse flows in Ross Creek as a cue to trigger upstream migration and spawning activity.

Methodology

ESA developed a water budget model for Phoenix Lake using hydrologic data collected by Marin Water between January 2017 and September 2022. This time series includes two very wet winters (2017 and 2019) and one of the most extreme droughts in Marin Water's history (2020-2021). The data include daily measurements or calculations of watershed inflows to Phoenix Lake, water level in Phoenix Lake and pan evaporation loss. Marin Water also provided a rating curve that relates Phoenix Lake elevation with the lake's volume and surface area. ESA used these data to develop a daily water balance model of Phoenix Lake in Microsoft Excel. The model takes the previous day's lake level and adds the current day's watershed inflow to calculate an initial volume for the day. It then uses the rating curve to estimate water level for comparison with the dam spillway elevation: if the water level exceeds this value the excess volume spills to Ross Creek as outflow. The remaining water volume in the lake is used to calculate the lake area. This is combined with the daily pan evaporation rate (modified by a monthly adjustment factor) to estimate the lake's evaporation volume, which is deducted from the day's total to provide a final value for the day. That value is then used the following day to repeat the process. The model outputs are lake level, evaporation losses and spills to Ross Creek. The model assumes that the lake capacity is 411 acre-feet with an associated water surface elevation of 174 feet NAVD[1]: flows that exceed 411 acre-feet are assumed to cause water to overflow into Ross Creek.

[1] North American Vertical Datum

ESA is still developing a time series of diversions from Phoenix Lake to run the existing conditions model, but as a placeholder ESA ran a hypothetical scenario which assumed that no diversions occur under existing conditions, to compare with the Proposed Project. This comparison is highly conservative (it makes the Proposed Project effect appear larger than it really is, since in reality water is diverted under existing conditions), but it helps illustrate the Project effects.

Project Simulation

In the proposed Project simulation, two diversions of 260-acre feet were set to occur: the first from January 1 to 28 and the second from April 1 to 28. The diversions were set to occur at a rate of 9.2 acre-feet per day provided that the lake elevation was higher than 147 feet NAVD. Diversions below this elevation are constrained because of geotechnical issues related to allowable drawdown of the lake: for simplicity the model assumed that diversions would not take place if the lake fell below 147 feet.[2] **Figure 1** (No Diversion assumed) and **Figure 2** (Proposed Project with two diversions assumed) show the watershed inflow (upper panel), lake level and diversion volume middle panel), and overflow to Ross Creek (lower panel) for the period of simulation (January 1, 2017 to September 30, 2022). **Figure 3** shows the outflows to Ross Creek under the No Diversion and Proposed Project superimposed for comparison.

Results

Under the hypothetical No Diversion scenario, the lake inflow and Ross Creek outflow almost matched, and the lake level remained within 2 feet of the spillway height at all times (minimum level of 172 feet). The small drawdown of the lake level was due to evaporation, which accounted for 282 acre-feet over the almost 6-year simulation. In total 21,275 acre-feet of water flowed into Ross Creek over the simulation period.

Under the Proposed Project the watershed inflow was the same as the No Diversion scenario, but two 260 acre-foot diversions were simulated each January and April. The diversions and associated lowering of the lake level can be seen in the middle panel of Figure 2. Typical drawdowns lowered the lake level by around 5 to 10 feet until the next watershed runoff event, whereupon the lake refilled to the spillway elevation. The greatest drawdown was associated with the April 2021 diversion (which followed a very dry winter), which lowered the modeled water level to around 155 feet (17 feet below the spillway) and subsequently to 154 feet over the summer due to evaporation losses. Despite the diversions, the hydrograph showing the outflow to Ross Creek under the Proposed Project was very similar to the No Diversion scenario (Figure 3), and the cumulative outflow was 19,093 acre-feet, 2,182 acre-feet less than under the No Diversion scenario (a 10 percent reduction in outflow).

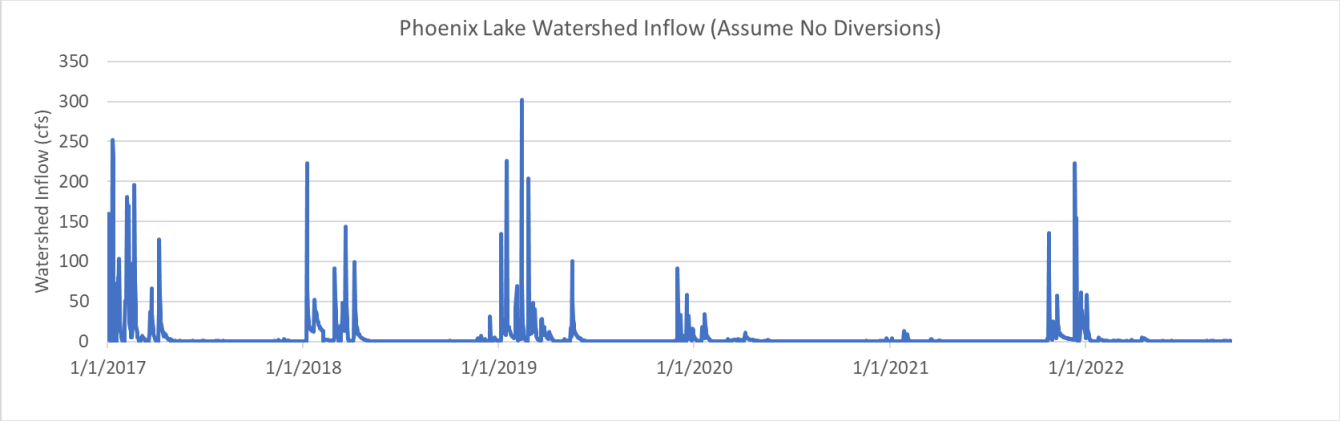
As can be seen in the hydrographs, all 29 peak flows over 25 cubic feet per second (cfs) in the modeled 7-year period occurred on the same day under the proposed Project as they would under No Diversion scenario, and with peak flows that were reduced by around 12 to 14 percent. This means that pulse flows that may attract native salmonids to migrate up into Ross Creek would occur on the same day and with a very similar flow rates as under a No Diversion scenario. For example, the peak overflow for water years 2017-2018 under the Proposed Project would be 200 cfs, which is slightly below the modeled No Diversion scenario overflow of approximately 225 cfs. In water year 2018-2019, the modeled peak overflow for Proposed Conditions would be approximately the same

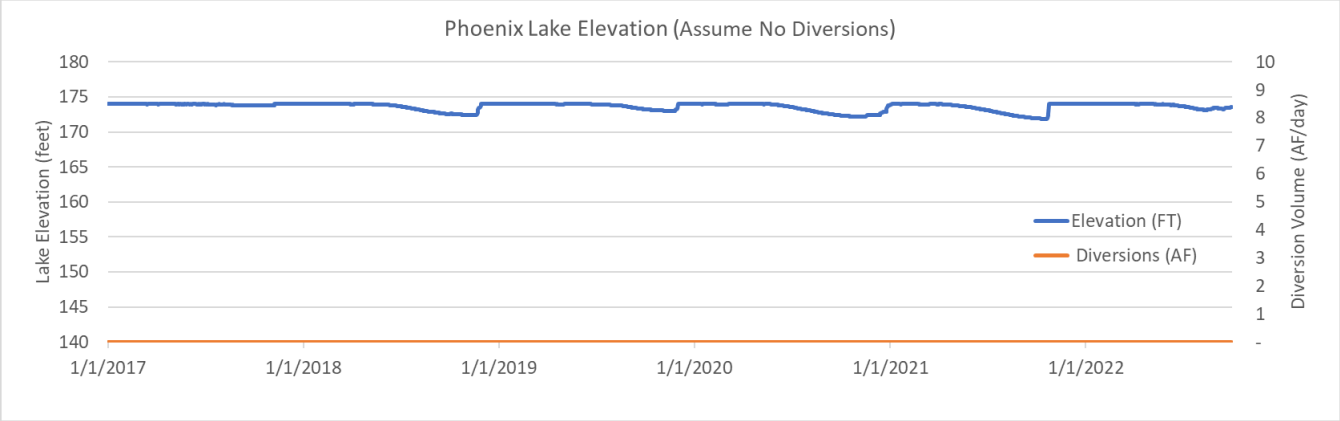
[2] This assumption never came into effect for the two-diversion scenario that became the proposed Project and so did not change the model results, but it did apply in some years when other hypothetical scenarios were tested, such as making three diversions in a year.

as the No Diversion scenario (300 cfs). The only situation where peak flows were eliminated under Proposed Project conditions was in the winter of 2021 where dry conditions resulted in only a single event of 13 cfs overtopping Phoenix Lake under the No Diversion scenario. Under the proposed Project that event would have been captured and diverted. The lack of a significant difference between flows into Ross Creek under the No Diversion and proposed Project scenarios is due to the small size of Phoenix Lake relative to its watershed inflow: during the 6 years and 9 months simulated the average annual inflow was 3,192 acre-feet compared with a lake capacity of 411 acre-feet and proposed diversions totaling 520 acre-feet. Even when drawn down by diversions earlier in the year, Phoenix Lake can be refilled rapidly by the first typical winter runoff event.

Based on this modeling the hydrologic regime of Ross Creek is not expected to be substantially changed by the proposed Project.

Figure 1 Phoenix Lake Inputs, Water Level, Diversions and Outflow to Ross Creek: Assuming No Diversions





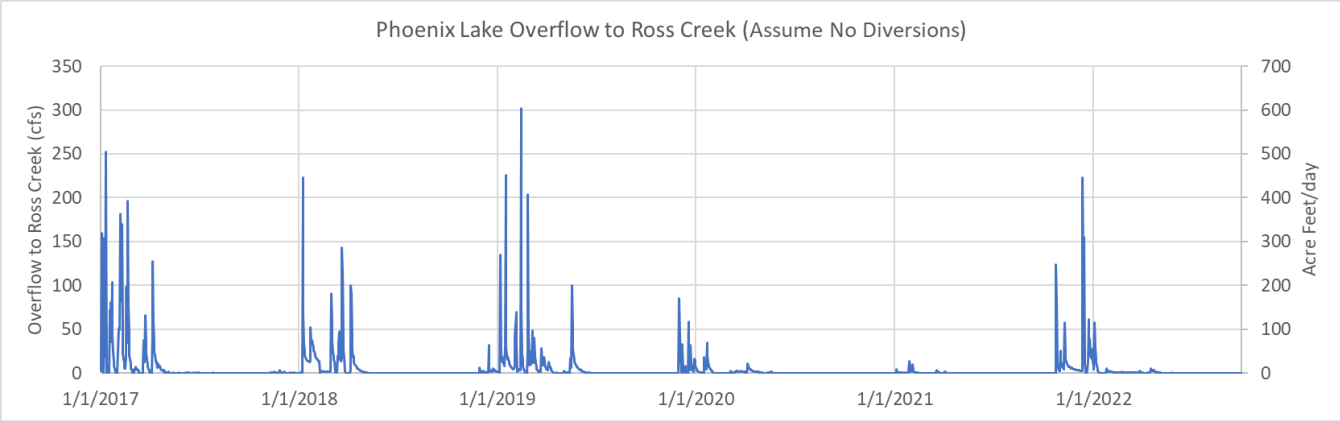


Figure 2 Phoenix Lake Inputs, Water Level, Diversions and Outflow to Ross Creek: Proposed Project

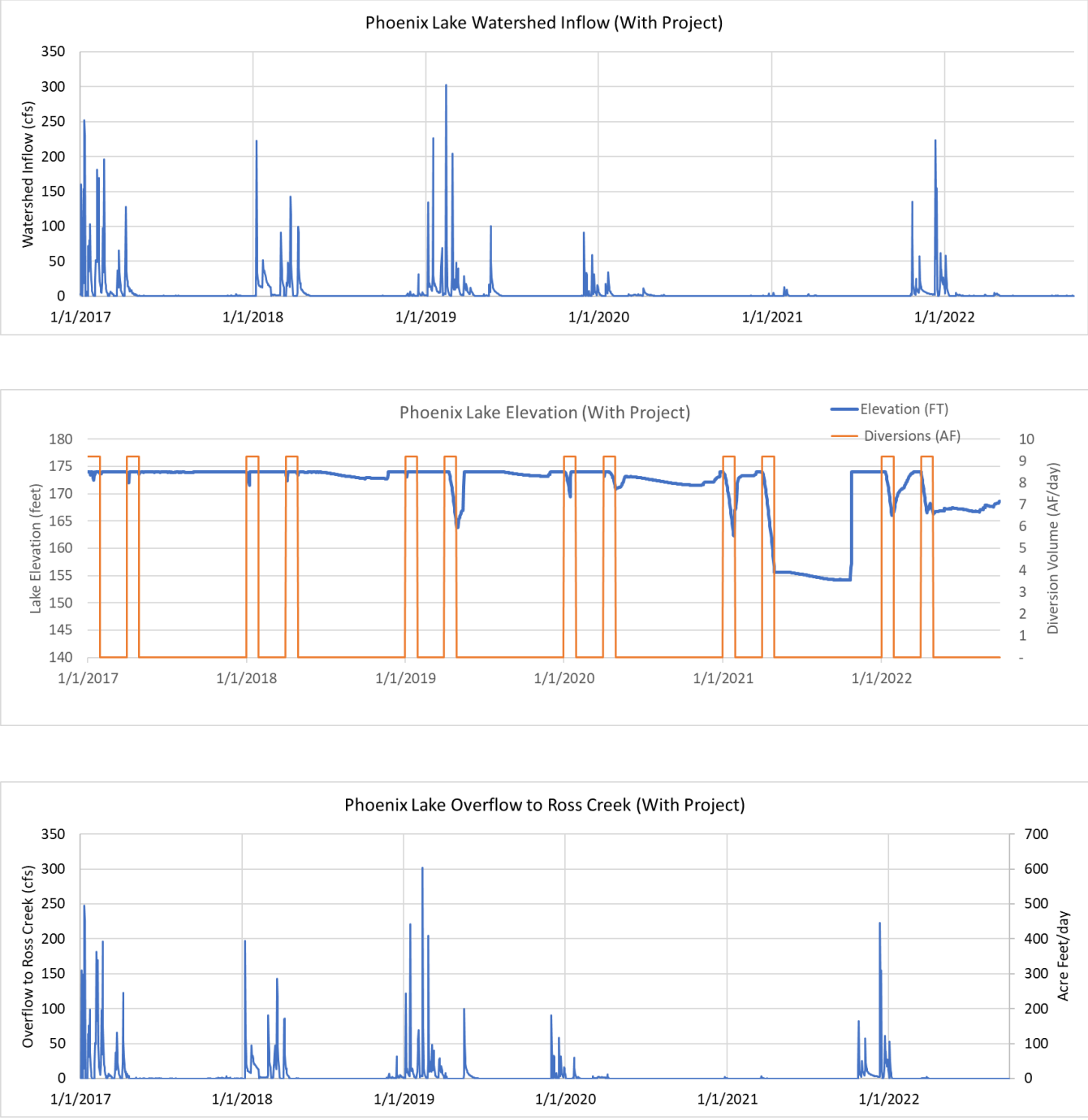


Figure 3 Phoenix Lake Outflow to Ross Creek: Comparison of No Diversions and Proposed Project Scenarios