DRAFT ENVIRONMENTAL IMPACT REPORT

Laguna Creek Diversion Retrofit Project

Prepared for

City of Santa Cruz Water Department
212 Locust Street, Suite C • Santa Cruz, CA 95060

SEPTEMBER 2020

CITY OF SANTA CRUZ Water Department

Our Water, Our Future

Prepared by
DUDEK
725 Front Street, Suite 400
Santa Cruz, CA 95060

SCH NO. 2020030456
Contact: Jessica Martinez-McKinney

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AAQS	ambient air quality standards
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
Air Basin	North Central Coast Air Basin
AMBAG	Association of Monterey Bay Area Governments
amsl	above mean sea level
ANSI	American National Standards Institute
APE	area of potential effect
AQMP	air quality management plan
ASHCP	Anadromous Salmonid Habitat Conservation Plan
Basin Plan	*Water Quality Control Plan for the Central Coastal Basin*
BMPs	best management practices
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
CAP	climate action plan
CARB	California Air Resources Board
CARE	California Alternate Rates for Energy
CAS	Climate Action Strategy
CCC	California Coastal Commission
CCE	Community Choice Energy
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDP	coastal development permit
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFC	chlorofluorocarbon
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CHRIS	California Historical Resources Information System
CIP	Capital Improvement Program
City	City of Santa Cruz
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level

Acronym/Abbreviation	Definition
CNPS	California Native Plant Society
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
County	County of Santa Cruz
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CRPR	California Rare Plant Rank
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibels
dBA	A-weighted decibels
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EIA	U.S. Energy Information Administration
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act
EV	electric vehicle
Facility	Laguna Creek Diversion Facility
FEMA	Federal Emergency Management Agency
FESA	federal Endangered Species Act
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Administration
g	percent of gravity
GHG	greenhouse gas
GIS	geographic information system
GWP	global warming potential
HA	hydrologic area
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HCP	Habitat Conservation Plan
HFC	hydrofluorocarbon
HMBP	Hazardous Material Business Plan
HMMP	Hazardous Materials Management Plan
HRI	Historic Resources Inventory
HSA	hydrologic subarea
HU	hydrologic unit
HUC	hydrologic unit code
Hz	Hertz

Acronym/Abbreviation	Definition
in/sec	inches per second
IPaC	Inventory for Planning and Conservation
IPCC	Intergovernmental Panel on Climate Change
ISTEA	Intermodal Surface Transportation Efficiency Act
kWh	kilowatt hours
LACM	Natural History Museum of Los Angeles County
LCP	Local Coastal Program
Legislature	California State Legislature
L_{eq}	equivalent noise level
L_{dn}	day-night average noise level
L_{max}	maximum noise level
L_{min}	minimum noise level
LOS	level of service
LUST	leaking underground storage tank
MBARD	Monterey Bay Air Resources District
MBCP	Monterey Bay Community Power
MCL	maximum contaminant level
mL	milliliters
MMT	million metric tons
mpg	miles per gallon
mph	miles per hour
MPN	most probable number
MPO	metropolitan planning organization
MT	metric ton
Mw	moment magnitude
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NI	no impact
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTU	nephelometric turbidity units
O_3	ozone
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PCE	Passenger Car Equivalent
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric Company
$PM_{2.5}$	fine particulate matter
PM_{10}	coarse particulate matter
ppm	parts per million
PPV	peak particle velocity

Acronym/Abbreviation	Definition
Proposed Project	Laguna Creek Diversion Retrofit Project
PVC	polyvinyl chloride
R-M	Mountain Residential
R-R	Rural Residential
RA	Residential Agriculture
RCRA	Resource Conservation and Recovery Act
RFS	Renewable Fuel Standard
RMS	root mean square
ROG	reactive organic gas
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SAFE	Safer Affordable Fuel-Efficient
Santa Cruz Metro	Santa Cruz Metropolitan Transit District
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCADA	supervisory control and data acquisition
SCCC	Santa Cruz County Code
SCP	Standard Construction Practice
SCS	Sustainable Communities Strategy
SCWD	Santa Cruz Water Department
SCWRP	Santa Cruz Water Rights Project
SEL	sound exposure level
SF_6	sulfur hexafluoride
SLCP	short-lived climate pollutant
SLOAPCD	San Luis Obispo Air Pollution Control District
SO_2	sulfur dioxide
SSC	species of special concern
SU	Special Use
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TMDL	total maximum daily load
TP	Timber Production
UCSC	University of California, Santa Cruz
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V/C	volume-to-capacity
VdB	vibration decibels
VMT	vehicle miles traveled
VOC	volatile organic compound
WDR	waste discharge requirement

1 Summary

1.1 Introduction

This environmental impact report (EIR) evaluates the potential for significant environmental impacts from the Laguna Creek Diversion Retrofit Project (Proposed Project). This summary highlights the major areas of importance in the environmental analysis for the Proposed Project, as required by Section 15123 of the California Environmental Quality Act (CEQA). It also provides an overview of the Proposed Project, summary of impacts, alternatives to the Proposed Project, areas of controversy known to the Santa Cruz Water Department (SCWD), and issues to be resolved. The impacts summary in this chapter includes a table summarizing (1) the potential environmental impacts that would occur as the result of the Proposed Project; (2) the level of impact significance before mitigation; (3) the recommended mitigation measures that would avoid or reduce significant environmental impacts; and (4) the level of impact significance after mitigation measures are implemented.

1.2 Project Overview

1.2.1 Project Location and Setting

The Proposed Project would be located in the community of Bonny Doon, California, in unincorporated Santa Cruz County, approximately 7 miles northwest of downtown Santa Cruz (straight-line distance) at an elevation of approximately 620 feet. The project site is approximately 0.1 miles upstream of the confluence with Reggiardo Creek and approximately 4 miles upstream of the Pacific Ocean.

The approximately 2.1-acre project site contains the Laguna Creek Diversion Facility (Facility), which is operated by the SCWD and provides water from Laguna Creek to the SCWD's water supply system. The project site consists of the existing dam, intake structure, diversion flume, transmission pipeline, control building, access roads, and downstream plunge pool, as well as the surrounding area. The Facility was completed in 1890 and originally included the dam and diversion flume constructed from native stone and the cast iron Laguna Pipeline. Improvements have been installed subsequently to aid in the continued functionality of the Facility. The dam is a physical example of pioneering water management infrastructure in California and appears individually eligible for listing in the National Register of Historic Places, the California Register of Historical Resources, and the Santa Cruz County Historic Resources Inventory, and therefore, is considered a historic resource for the purposes of CEQA.

1.2.2 Project Components

The Proposed Project would involve construction of a new intake structure with an embedded Coanda screen at the downstream face of the dam's left/east abutment, as seen from the vantage point of looking downstream. Other components of the Proposed Project would include installation of intake structure appurtenances, a new valve control vault and diversion pipeline, new monitoring and control equipment, riprap bank stabilization along the creek bank, and site access and safety improvements.

Once operable, the Proposed Project would concentrate the Laguna Creek flows over a newly created notch in the dam where the new Coanda screen intake structure would be installed. The Coanda screen would allow a controlled portion of the streamflow to fall through the screen while excluding a majority of sediments. This design would allow

for the movement of sediment past the dam in sync with the transport capacity of the creek, restoring natural fluvial functions of sediment transport and deposition that benefit downstream fisheries and aquatic habitats. The Proposed Project would also provide appropriate fish screening and improved ability to regulate the rate of change in water diversions to prevent fish from becoming stranded by rapidly changing water levels in downstream reaches.

The Proposed Project would provide a flexible approach to manage the quantity and quality of water that can be diverted, minimize the use of power, and provide for economical and operational feasibility. The Proposed Project would also allow for fine-tuned control of diversion rates and would include improvements for safe access to the Facility. The Proposed Project would maintain the existing maximum diversion rate at the Facility.

A full description of all project components is provided in Chapter 3, Project Description.

1.2.3 Project Objectives

Section 15124 of the CEQA Guidelines indicates that EIR project descriptions must include a statement of the objectives sought by the lead agency for that project. A clearly written statement of objectives helps the lead agency develop a reasonable range of alternatives to evaluate in the EIR and aids the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of that project. The objectives for the Proposed Project are as follows:

- Protect a critical water supply for the City by addressing constraints at the Facility to maintain full system functionality and minimize service interruptions.
- Improve environmental conditions both at the intake with upgraded screen technology for fish protection and in downstream reaches by facilitating sediment movement to support aquatic species habitat.
- Improve overall operational efficiency by incorporating technology that allows for fine-tuned control of diversion rates to enhance the SCWD's ability to meet instream flow requirements and regulation of water levels downstream of the Facility.
- Improve safety and access at the Facility to facilitate the City's ability to maintain the Facility and conduct operational activities.
- Implement a project that is relatively cost-effective in terms of both capital and operation/maintenance costs.

1.3 Impact Summary

Table 1-1 on page 1-4 below provides a complete list of the Proposed Project's environmental impacts, including the level of significance before and after mitigation, based on the analysis and conclusions presented in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. No significant and unavoidable impacts have been identified in this EIR.

1.4 Alternatives to the Proposed Project

CEQA Guidelines Section 15126.6 requires that an EIR describe and evaluate alternatives to the Proposed Project that feasibly attain most of the basic objectives of the project and would avoid or substantially lessen any of the significant effects of the project. The following alternatives are evaluated in Chapter 6, Alternatives:

- **No Project Alternative.** This alternative would entail no action at the project site.
- **Alternative 1 (Spillway Gate and Fish Screen).** This alternative would entail installing a new cylindrical fish screen at the existing intake that would be compliant with fish protection regulations; cutting a notch in the dam and installing a spillway gate on a new support structure and having a spillway chute at the face of the dam to achieve sediment transport; and installing riprap protection along the base of the spillway and along the bank.
- **Alternative 2 (Plate Screen with Brush).** This alternative would entail replacing the existing intake screen with a new vertical plate screen that would be compliant with fish protection regulations and would have an automated mechanical traveling brush system to keep the screen clear of excess sediment.

Table 6-4 in Chapter 6 presents a comparison of impacts between the Proposed Project and the alternatives. Alternative 2 is considered the environmentally superior alternative under CEQA, as it would avoid one significant impact to cultural resources and reduce the magnitude of most project impacts. However, although Alternative 2 would moderately meet many of the project objectives, it would not meet the project objectives at the same level as the Proposed Project (see Table 6-2 in Chapter 6). See Chapter 6 for a full discussion of project alternatives.

1.5 Known Areas of Controversy

The City of Santa Cruz, as the lead agency, has identified areas of concern based on the EIR Notice of Preparation (NOP), which is included in Appendix A. The NOP for this EIR was circulated for a 30-day scoping period from March 16, 2020 to April 15, 2020. A public scoping meeting was held on March 31, 2020 regarding the scope of the analyses in the EIR.

In response to the NOP, letters of comment were received from three public agencies and four individuals. The majority of the comments pertain to biological resources; comments were also provided pertaining to cultural resources and wildfire hazards (see Section 2.4.1, Scoping, for details). Comments that address environmental issues have been taken into consideration in the preparation of this EIR. No known areas of controversy were identified in the agency or public comments or letters received.

1.6 Issues to be Resolved

CEQA Guidelines Section 15123 requires the EIR summary to identify "issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects." This EIR has presented mitigation measures and project alternatives, and the City Council will consider the Final EIR when considering the Proposed Project. In considering whether to approve the Proposed Project, the City Council will take into consideration the environmental consequences of the Proposed Project with mitigation measures and project alternatives, as well as other factors related to feasibility.

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Air Quality			
Impact AIR-1: Conflict with an Applicable Air Quality Plan. The Proposed Project would not conflict with or obstruct the Monterey Bay Air Resources District's Air Quality Management Plan.	Less than Significant	None	Less than Significant
Impact AIR-2: Criteria Pollutant Emissions. The Proposed Project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standards, or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Project would not 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.	Less than Significant	None	Less than Significant
Impact AIR-3: Exposure of Sensitive Receptors. The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	None	Less than Significant
Impact AIR-4: Result In Other Emissions Adversely Affecting a Substantial Number of People. The Proposed Project would not result in other emissions, such as those leading to odors, that would adversely affect a substantial number of people.	Less than Significant	None	Less than Significant
Impact AIR-5: Cumulative Air Quality Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to air quality.	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Biological Resources			
Impact BIO-1: Special-Status Species. The Proposed Project could have a substantial adverse effect on special-status species during construction.	Significant	**MM BIO-1a: Conduct Worker Environmental Awareness Training.** A qualified biologist shall conduct an education program for all persons employed on the Proposed Project prior to performing work activities. The presentation given by the qualified biologist will include a discussion of the biology and general behavior of any special-status species that may be in the area, how they may be encountered within the work area, and procedures to follow when they are encountered. The qualified biologist shall prepare and distribute handouts containing all of this information for workers to carry on site. Interpretation shall be provided for non-English speaking workers. All personnel working on the site will receive this training, and will sign a sign-in sheet showing they received the training. Any personnel joining the work crew after the training has been administered shall receive the same training before beginning work. **MM BIO-1b: Conduct Special-Status Amphibian Species Survey and Monitoring.** A pre-construction survey for Santa Cruz black salamander, California giant salamander, and California red-legged frog shall be conducted within 48 hours prior to the onset of construction activities. The survey area shall include all suitable habitat within the project site, plus a 50-foot buffer. Suitable habitat for these species in the project site consists of damp upland areas near/adjacent to existing aquatic features associated with Laguna Creek, and the wetted portion of Laguna Creek. Additionally, a qualified biologist shall be onsite daily during construction activities to ensure impacts to special-status wildlife are avoided and minimized. A daily pre-construction sweep for wildlife within all staging and work areas shall be conducted followed by construction monitoring when work is conducted within suitable habitat. Salamanders. If any individuals of Santa Cruz black salamander or California giant salamander are observed during the pre-construction survey or subsequent monitoring, their location(s) shall be recorded and identified for avoidance. Individuals found should be allowed to move out	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		of the area on their own. If avoidance is not feasible, they shall be moved to the nearest appropriate habitat outside of the construction footprint by a qualified biologist. Qualified biologists shall be approved by the California Department of Fish and Wildlife prior to handling/translocating individuals of these species. California Red-Legged Frogs. Although determined to have a low potential to occur within the project site, initial ground-disturbing activities shall avoid the period when California red-legged frogs are most likely to be moving through upland areas (November 1 through March 31). When ground-disturbing activities must take place between November 1 and March 31, a qualified biologist shall monitor construction activity daily for the species to ensure avoidance. If any California red-legged frogs are observed and take authorization has been provided for the Proposed Project, relevant conservation measures from the applicable take authorization shall be implemented. If any California red-legged frogs are observed and take authorization has not been provided for the Proposed Project, the monitoring biologist shall have the authority to temporarily stop work to allow the species to move out of the work area on its own volition. The U.S. Fish and Wildlife Service shall be contacted if frogs remain in work areas and appropriate avoidance and minimization measures shall be implemented, as determined by the qualified biologist and approved by the City, to ensure protection of the frogs. **MM BIO-1c: Conduct San Francisco Dusky-Footed Woodrat Survey and Relocation.** A pre-construction survey to locate woodrat middens shall be conducted by a qualified biologists within 48 hours prior to the onset of construction activities. The survey area shall include all suitable habitat within the project site, plus a 50-foot buffer. Woodrat middens found shall be mapped and flagged with high visibility flagging tape for avoidance. If middens are found and complete avoidance is not feasible, the following measures shall be implemented:	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• If construction is to occur during the breeding season (generally between January 1 and September 31), and young are suspected to be present, the existing midden shall be left undisturbed until such a time as the qualified biologist determines the young are capable of independent survival. • A qualified biologist shall construct replacement woodrat middens for each midden that would be removed. The replacement middens shall be located in similar habitat outside the area of disturbance. • A qualified biologist shall trap woodrats and relocate them to the constructed middens outside the area of disturbance. After trapping is complete, the biologist will disassemble the existing woodrat middens by hand to allow any remaining woodrats inside to escape unharmed. • Prior to implementation of any disturbance of the existing woodrat middens and/or trapping/relocation, approval from the California Department of Fish and Wildlife will be obtained. **MM BIO-1d: Conduct Preconstruction Nesting Bird and Roosting Bat Survey.** Construction and tree removal activities should avoid the migratory bird nesting season (typically February 1 through August 31), to reduce any potentially significant impact to birds that may be nesting on the study area. If construction and tree removal activities must occur during the migratory bird nesting season, an avian nesting survey of the project site and contiguous habitat within 300 feet of all impact areas must be conducted for protected migratory birds and active nests. The avian nesting survey shall be performed by a qualified wildlife biologist within 7 days prior to the start of ground or vegetation disturbance. Once construction has started, if there are breaks in ground or vegetation disturbance that exceed 14 days, then another avian nesting survey shall be conducted. If an active bird nest is found, the nest shall be flagged and mapped on the construction plans along with an appropriate no disturbance buffer, which will be determined by the biologist based on the species' sensitivity to disturbance (typically 250 feet for passerines and 500 feet for raptors and special-status species). The nest area shall be	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		avoided until the nest is vacated and the juveniles have fledged. The nest area shall be demarcated in the field with flagging and stakes or construction fencing. To the extent practicable, tree removal should occur outside peak bat activity timeframes when young or overwintering bats may be present, which generally occurs from March through April and August through October, to ensure protection of potentially occurring bats and their roosts on the project site. Additionally, daily restrictions on the timing of any construction activities should be limited to daylight hours to reduce disturbance to roosting (and foraging) bat species. Additionally, a visual bat survey should be conducted within 30 days of the removal of any trees. The survey should include a determination on whether active bat roosts are present on or within 50 feet of the project site. If a non-breeding and non-wintering bat colony is found, the individuals shall be evicted under the direction of a qualified biologist to ensure their protection and avoid unnecessary harm. If a maternity colony or overwintering colony is found in the control building or trees on the project site, then the qualified biologist shall establish a suitable construction-free buffer around the location. The construction-free buffer shall remain in place until the qualified biologist determines that the nursery is no longer active.	
Impact BIO-2: Sensitive Vegetation Communities. The Proposed Project could have a substantial adverse effect on the redwood forest alliance vegetation community during construction that would result in both temporary and permanent impacts.	Significant	**MM BIO-2: Compensate for Impacts to Sensitive Vegetation Communities.** Direct temporary impacts to 0.14 acres of redwood forest alliance would be mitigated through on-site rehabilitation to conditions similar to those that existed prior to grading and/or ground-disturbing activities. This would consist of re-contouring temporarily impacted areas to match pre-project grade and non-native species removal and monitoring over a 3-year period to inhibit non-native species encroachment. A one-time rehabilitation effort followed by monitoring and non-native weed removal for a minimum of 3 years shall compensate for temporary direct impacts to the redwood forest alliance vegetation community.	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Direct permanent impacts to 0.01 acres of redwood forest alliance vegetation community shall be mitigated through on-site enhancement activities at a 2:1 mitigation ratio. A conceptual Habitat Mitigation and Monitoring Plan shall be prepared and implemented that includes the enhancement activities, which may include non-native species removal and revegetation followed by monitoring, for all disturbed areas. The plan shall specify the criteria and standards by which the enhancement actions will compensate for impacts of the Proposed Project on the redwood forest vegetation community and shall at a minimum include discussion of the following: • The enhancement objectives including the type and amount of revegetation to be implemented taking into account enhanced areas where non-native invasive vegetation is removed and replanting specifications that take into account natural regeneration of species. • The specific methods to be employed for revegetation. • Success criteria and monitoring requirements to ensure vegetation community restoration success. • Remedial measures to be implemented in the event that performance standards are not achieved.	
Impact BIO-3: Jurisdictional Wetlands and Waters. The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts.	Significant	**MM-BIO-3: Compensate for Impacts to Jurisdictional Non-Wetland Waters.** Direct temporary and permanent impacts to jurisdictional non-wetland waters shall be mitigated on site. On-site measures shall include rehabilitation of areas temporarily impacted (approximately 0.13 acres) and permanently impacted (approximately 0.01 acres) within jurisdictional limits at a 1:1 mitigation ratio. Areas impacted shall be returned to conditions similar to those that existed prior to grading and/or ground-disturbing activities. The conceptual Habitat Mitigation and Monitoring Plan implemented as part of MM-BIO-6 shall include enhancement activities to address impacts to jurisdictional non-wetland waters, which may include non-native species removal and revegetation followed by monitoring, for all disturbed areas. The plan shall specify the criteria and standards by which the enhancement actions will compensate for impacts of the Proposed	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Project on jurisdictional non-wetland waters. Direct temporary and permanent impacts to jurisdictional non-wetlands waters shall be addressed through Section 401 and Section 404 of the Clean Water Act, the Porter-Cologne Water Quality Act, and Section 1602 of the California Fish and Game Code.	
Impact BIO-4: Wildlife Corridors. The Proposed Project would not substantially degrade the quality or interfere with the use of a wildlife corridor or migratory route, or otherwise impede wildlife movement or use of native wildlife nursery sites.	Less than Significant	None	Less than Significant
Impact BIO-5: Conflicts with Local Policies or Ordinances. The Proposed Project would not conflict with local policies or ordinances protecting biological resources.	Less than Significant	None	Less than Significant
Impact BIO-6: Cumulative Biological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to biological resources.	Less than Significant	None	Less than Significant
Cultural Resources and Tribal Cultural Resources			
Impact CUL-1: Historical Resources. The Proposed Project could cause a substantial adverse change in the significance of the Laguna Creek Dam, which is a historical resource, due to modifications of the Facility that would occur during construction.	Significant	MM NOI-2 (see below)	Less than Significant
Impact CUL-2: Archaeological Resources. The Proposed Project could cause a substantial adverse change in the significance of an archaeological resource during construction.	Significant	**MM CUL-2: Unanticipated Discovery of Archaeological Resources.** In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the Proposed Project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted.	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Depending upon the significance of the find under the California Environmental Quality Act (CEQA) (14 California Code of Regulations Section 15064.5[f]; Public Resources Code Section 21082), the archaeologist may record the find to appropriate standards (thereby addressing any data potential) and allow work to continue. If the archaeologist observes the discovery to be potentially significant under CEQA, additional treatment may be required.	
Impact CUL-3: Human Remains. The Proposed Project could inadvertently disturb human remains during construction.	Significant	**MM CUL-3: Unanticipated Discovery of Human Remains.** In accordance with California Health and Safety Code Section 7050.5, if potential human remains are found, the lead agency staff and the County Coroner must be immediately notified of the discovery. The coroner would provide a determination within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made. If the County Coroner determines that the remains are, or are believed to be, Native American, the coroner would notify the Native American Heritage Commission within 24 hours. In accordance with Public Resources Code Section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American. Within 48 hours of this notification, the MLD would recommend to the lead agency her/his preferred treatment of the remains and associated grave goods. Further, federal regulations require that Native American human remains, funerary objects, and object of cultural patrimony are handled consistent with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA) for all discovery situations in accordance with 43 Code of Federal Regulations Part 10.	Less than Significant
Impact CUL-4: Tribal Cultural Resources. The Proposed Project could cause a substantial adverse change in the significance of a tribal cultural resource during construction.	Significant	MM CUL-2 and MM CUL-3 (see above)	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact CUL-5: Cumulative Cultural Resources and Tribal Cultural Resources Impacts. The Proposed Project, in combination with other reasonably foreseeable future development, would not result in a significant cumulative impact related to cultural resources and tribal cultural resources.	Less than Significant	None	Less than Significant
Energy			
Impact ENE-1: Result in Wasteful, Inefficient or Unnecessary Consumption of Energy Resources. The Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources.	Less than Significant	None	Less than Significant
Impact ENE-2: Conflict with an Applicable Plan. The Proposed Project would not result in conflicts with or otherwise obstruct a state or local plan for renewable energy or energy efficiency.	Less than Significant	None	Less than Significant
Impact ENE-3: Cumulative Energy Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy.	Less than Significant	None	Less than Significant
Geology and Soils			
Impact GEO-1: Seismic Hazards. The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death resulting from seismic ground shaking or seismic-related ground failure, including liquefaction.	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact GEO-2: Unstable Geologic Unit or Soils. The Proposed Project would not cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse.	Less than Significant	None	Less than Significant
Impact GEO-3: Expansive Soils. The Proposed Project would not be located on expansive soil, as defined in the 2019 California Building Code.	Less than Significant	None	Less than Significant
Impact GEO-4: Paleontological Resources. The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature.	Significant	**MM GEO-4: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring.** Prior to commencement of any grading activity on site, the applicant shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (SVP) (2010) guidelines. The paleontologist shall prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the Proposed Project. The PRIMP shall be consistent with the SVP (2010) guidelines and outline requirements for preconstruction meeting attendance and worker environmental awareness training, where paleontological monitoring is required within the project site based on construction plans and/or geotechnical reports, procedures for adequate paleontological monitoring and discoveries treatment, and paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils), reporting, and collections management. The qualified paleontologist shall attend the preconstruction meeting and a qualified paleontological monitor shall be on site during all rough grading and other significant ground-disturbing activities (including augering) in previously undisturbed, Monterey Formation deposits, as defined by the PRIMP. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact GEO-5: Cumulative Geologic Hazards. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to geology and soils.	Less than Significant	None	Less than Significant
Impact GEO-6: Cumulative Paleontological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to paleontological resources.	Less than Significant	None	Less than Significant
Greenhouse Gas Emissions			
Impact GHG-1: GHG Emissions. The Proposed Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	Less than Significant	None	Less than Significant
Impact GHG-2: Conflict with an Applicable GHG Reduction Plan. The Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	None	Less than Significant
Impact GHG-3: Cumulative GHG Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to GHG emissions. However, the Proposed Project's contribution would not be cumulatively considerable.	Less than Significant	None	Less than Significant
Hazards and Hazardous Materials			
Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials. The Proposed Project would require use and transportation of petroleum products and small quantities of hazardous materials, but would not result in a significant hazard to the public or environment.	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact HAZ-2: Reasonably Foreseeable Upset or Accident Conditions. The Proposed Project would not 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.	Less than Significant	None	Less than Significant
Impact HAZ-3: Wildfire Hazards. The Proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	Less than Significant	None	Less than Significant
Impact HAZ-4: Cumulative Hazard Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to routine transport, use, disposal, or accidental release of hazardous materials, or related to significant risk of loss, injury, or death involving wildland fires.	Less than Significant	None	Less than Significant
Hydrology and Water Quality			
Impact HYD-1: Water Quality. The Proposed Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	Less than Significant	None	Less than Significant
Impact HYD-2: Alteration of Drainage Patterns. The Proposed Project would not 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 off site; iii) create or contribute runoff water which would exceed the	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows.			
Impact HYD-3: Cumulative Water Quality Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to water quality or alteration of drainage patterns.	Less than Significant	None	Less than Significant
Land Use and Planning			
Impact LU-1: Conflicts with Land Use Plans, Policies, or Regulations. The Proposed Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	Less than Significant	None	Less than Significant
Impact LU-2: Cumulative Land Use Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	Less than Significant	None	Less than Significant
Noise			
Impact NOI-1: Substantial Increase in Ambient Noise Levels. The Proposed Project would result in generation of a substantial temporary increase in ambient noise levels during construction in the vicinity of the project in excess of applicable standards. However, the Proposed Project would not result in generation of a substantial permanent increase in ambient noise levels during operation.	Significant	**MM NOI-1: Construction Noise.** The Proposed Project shall implement the following measures related to construction noise: • Restrict construction activities and use of equipment that have the potential to generate significant noise levels (e.g., use of concrete saw, mounted impact hammer, jackhammer, rock drill, etc.) to between the hours of 8:00 a.m. and 5:00 p.m. • Construction equipment and vehicles shall be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Internal-combustion-powered equipment shall be equipped with properly operating noise suppression devices (e.g., mufflers,	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		silencers, wraps) that meet or exceed the manufacturer's specifications. Mufflers and noise suppressors shall be properly maintained and tuned to ensure proper fit, function, and minimization of noise. • Pumps that are not submerged and aboveground conveyor systems shall be located within acoustically treated enclosures, shrouded, or shielded to prevent the propagation of sound into the surrounding areas. • Portable and stationary site support equipment (e.g., generators, compressors, rock crushers, and cement mixers) shall be located as far as possible from nearby noise-sensitive receptors. • Impact tools shall have the working area/impact area shrouded or shielded whenever possible, with intake and exhaust ports on power equipment muffled or suppressed. This may necessitate the use of temporary or portable, application-specific noise shields or barriers. • Construction equipment shall not be idled for extended periods (i.e., 5 minutes or longer) of time in the immediate vicinity of noise-sensitive receptors.	
Impact NOI-2: Groundborne Vibration. The Proposed Project would result in the potential generation of excessive groundborne vibration or groundborne noise levels during construction.	Significant	**MM NOI-2: Construction Vibration Effects on Historic Structures.** Prior to the use of construction equipment in the vicinity of the dam, a vibration damage threshold will be established by a qualified engineer under the direction of the City. The vibration damage threshold will be developed through the evaluation of the condition of the dam structure, underlying soil conditions, and type of construction operation to be performed. At the City's direction, a construction vibration monitoring plan will be prepared and implemented prior to the use of construction equipment near the dam. The monitoring plan shall report on the vibration damage threshold and the methods used to develop the threshold. The plan shall also establish the methodology for characterizing the existing baseline vibration levels present on the site, operational construction vibration monitoring consistent with the established threshold, and reporting to be completed during project construction.	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Should the construction vibration analysis undertaken during the preparation of the monitoring plan reveal that the proposed construction methods would exceed the vibration threshold established for the dam, alternative construction methods will be explored to find a method that would allow project construction to move forward while avoiding potential vibration-related damage to the dam during construction.	
Impact NOI-3: Cumulative Noise Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to noise and vibration.	Less than Significant	None	Less than Significant
Transportation			
Impact TRA-1: Conflict with a Program, Plan, Ordinance, or Policy Addressing the Circulation System. The Proposed Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	Less than Significant	None	Less than Significant
Impact TRA-2: Vehicle Miles Traveled. The Proposed Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b).	Less than Significant	None	Less than Significant
Impact TRA-3: Geometric Design Hazards. The Proposed Project would not substantially increase hazards due to a geometric design feature or incompatible use.	Less than Significant	None	Less than Significant
Impact TRA-4: Emergency Access. The Proposed Project would not result in inadequate emergency access.	Less than Significant	None	Less than Significant
Impact TRA-5: Cumulative Transportation Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to transportation.	Less than Significant	None	Less than Significant

2 Introduction

2.1 Purpose of the EIR

This environmental impact report (EIR) has been prepared by the City of Santa Cruz (City), which is the lead agency for the Laguna Creek Diversion Retrofit Project (Proposed Project). This EIR has been prepared in accordance with the California Environmental Quality Act (CEQA), which is found in the California Public Resources Code, Division 13, and with the CEQA Guidelines, which are found in Title 14 of the California Code of Regulations, commencing with Section 15000. Under CEQA, the lead agency for a project is the public agency with primary responsibility for carrying out or approving the project, and for implementing the requirements of CEQA.

As stated in the CEQA Guidelines Section 15002, the basic purposes of CEQA are to:

- Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Pursuant to CEQA Guidelines Section 15121, an EIR is an informational document that is required to (1) identify the potentially significant environmental effects of a project on the environment, (2) indicate the manner in which those significant effects can be avoided or significantly lessened via the implementation of potentially feasible mitigation measures, (3) identify a reasonable range of potentially feasible alternatives to a project that would eliminate or substantially lessen any significant environmental effects, and (4) identify any significant and unavoidable adverse impacts that cannot be mitigated or otherwise reduced. The lead agency must consider the information in the EIR along with other information which may be presented to the agency. While the information in the EIR does not control the ultimate decision about a project, the agency must consider the information in the EIR and respond to each significant effect identified in the EIR by making findings pursuant to Public Resources Code Section 21081.

Pursuant to Public Resources Code Section 21002, public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures which would substantially lessen the significant environmental effects of such projects. Furthermore, pursuant to CEQA Guidelines Section 15021, CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible. In deciding whether changes in a project are feasible, an agency may consider specific economic, environmental, legal, social, and technological factors. As defined in the CEQA Guidelines, "feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors. This section further indicates that under CEQA, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors, in determining whether and how a project should be approved. If an agency decides to approve a project that will cause one or more significant effects on the environment, the agency must prepare a "statement of overriding considerations" to reflect the ultimate balancing of competing public objectives. The environmental review process is further explained below in Section 2.4, Environmental Review and Approval Process.

2.2 Project Overview

This EIR addresses the potential environmental effects of construction of a new intake structure and appurtenances at the existing Laguna Creek Diversion Facility (Facility). The Proposed Project consists of the following primary components:

- Construction of a new intake structure with an embedded Coanda screen at the downstream face of the dam's left/east abutment (from the vantage point of looking downstream) which would include notching of the dam crest;
- Installation of intake structure appurtenances, including a collection chamber, diversion pipe, and sediment blowoff system;
- Construction of a new, cast-in-place concrete valve vault along the eastern creek bank to house the control valve equipment;
- Installation of riprap bank stabilization at the east side of the creek;
- Installation of new monitoring and control equipment, including water quality sensors, water meters, valve actuators, and telecommunications for operations and remote-control capabilities;
- Access and safety improvements, including a cast-in-place concrete stairway and guard rails at various locations within the Facility, as well as lighting; and
- Modification and decommissioning of the existing intake and capping and abandoning of the two existing sediment-control bypass valves in the dam.

A full description of all project components is provided in Chapter 3, Project Description, of this EIR.

2.3 Scope of the EIR

Regarding the scope of the EIR analysis, CEQA Guidelines Section 15060(d) states, "if the lead agency can determine that an EIR will be clearly required for a project, the agency may skip further initial review of the project and begin work directly on the EIR process….In the absence of an initial study, the lead agency shall still focus the EIR on significant effects of the project and indicate briefly its reasons for determining that other effects would not be significant or potentially significant." CEQA Guidelines Section 15128 state that an EIR "shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and therefore were not discussed in detail in the EIR."

A Notice of Preparation (NOP) was published for the Proposed Project to determine the scope and extent of environmental issues to be addressed in this EIR and is it included in Appendix A. Based on review of the Proposed Project (see Chapter 3) and public comments received in response to the NOP (see Section 2.4.1, Scoping, below), the City has determined that certain environmental resource topics merit a detailed analysis while others were determined not to be significant and will not be discussed in detail in the EIR. The EIR also evaluates topics required by CEQA and the CEQA Guidelines, including growth inducement, project alternatives, and cumulative impacts.

Section 4.2, Impacts Not Found to be Significant, of this EIR is intended to satisfy the requirement of CEQA Guidelines Section 15128 state above. Environmental resource topics discussed in that section are: aesthetics, agriculture and forestry resources, mineral resources, population and housing, public services, recreation, utilities and service systems, and wildfire.

In the other sections of Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the EIR provides a detailed evaluation of the following environmental resource topics:

- Air Quality
- Biological Resources
- Cultural Resources and Tribal Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Transportation

As indicated above, the environmental review focuses on the potentially significant environmental effects of the Proposed Project. As defined in CEQA Guidelines Section 15382, a "significant effect on the environment" is "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether a physical change is significant."

In evaluating the significance of the environmental effect of a project, the CEQA Guidelines require the lead agency to consider direct physical changes in the environment and reasonably foreseeable indirect physical changes in the environment which may be caused by the project (CEQA Guidelines Section 15064[d]). A direct physical change in the environment is a physical change in the environment which is caused by and immediately related to the project. An indirect physical change in the environment is a physical change in the environment which is not immediately related to the project, but which is caused indirectly by the project. An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project.

CEQA Guidelines Section 15064(e) further indicates that economic and social changes resulting from a project shall not be treated as significant effects on the environment, although they may be used to determine that a physical change shall be regarded as a significant effect on the environment. In addition, where a reasonably foreseeable physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project.

2.4 Environmental Review and Approval Process

2.4.1 Scoping

CEQA Guidelines Section 15083 authorizes and encourages an early consultation or scoping process to help identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed and

considered in an EIR, and to help resolve the concerns of affected regulatory agencies, organizations, and the public. Scoping is designed to explore issues for environmental evaluation, ensuring that important considerations are not overlooked and uncovering concerns that might otherwise go unrecognized.

The NOP for this EIR was circulated for a 30-day comment period from March 16, 2020 to April 15, 2020. The NOP was circulated to the State Clearinghouse and to local, regional, and federal agencies in accordance with the CEQA Guidelines. The NOP also was sent to organizations and interested citizens that have requested notification for City projects. Additionally, the NOP was circulated to owners of properties that are contiguous with the project site. A public scoping meeting was held on March 31, 2020 over the phone and the corresponding presentation about the Proposed Project was posted on the City's website at http://www.cityofsantacruz.com/waterenvdocs. No comments regarding the scope of EIR analysis were received at the scoping meeting.[1]

Written comments were received from three public agencies and four individuals. These letters are included, along with the NOP, in Appendix A. Comments that address environmental issues have been taken into consideration in the preparation of this EIR. Table 2-1 provides a summary of scoping comments and indicates where they are addressed in the EIR or if they are beyond the scope of the EIR.

Table 2-1. Scoping Comment Summary

Summary of Comment	EIR Section Considered
California Department of Fish and Wildlife (CDFW) – Bay Delta Region	
Include complete descriptions of the following project features in the EIR Project Description: detailed descriptions and cross sections of the armored streambank and apron, and operation and maintenance of the new system, including but not limited to, timing of sediment releases.	Chapter 3, Project Description
Recommends that the EIR provide habitat assessments for special-status species potentially located in and surrounding the project area to use in assessing which special-status species are likely to occur in the project area.	Section 4.4, Biological Resources
Recommends exploring other stabilization techniques before installing riprap. If riprap is deemed necessary, CDFW recommends methods for enhancing habitat on riprap. The EIR should discuss the direct and cumulative effects of riprap on fish and wildlife and include mitigation measures to address significant impacts.	Section 4.4, Biological Resources
Expresses concerns about Proposed Project impacts on California Giant Salamander, California red-legged frog, Santa Cruz Black Salamander, and nesting birds, and suggests various recommended mitigation measures.	Section 4.4, Biological Resources

[1] Due to the Shelter-In-Place Order issued on March 16, 2020, by the County in response to the 2019 novel coronavirus disease (COVID-19) pandemic, the meeting was held on the phone for remote participation. Notice of this meeting, how to attend the virtual meeting, and how to access the materials online was sent to the City's mailing list in advance of the scoping meeting. This notice was posted on the City's website, the City Hall campus notice board, and on the project site, and it was sent to the same distribution list as the NOP (excluding the State Clearinghouse and the County Clerk).

Table 2-1. Scoping Comment Summary

Summary of Comment	EIR Section Considered
California Department of Forestry and Fire Protection (CAL FIRE), San Mateo-Santa Cruz Unit	
If commercial tree species (ponderosa pine, Douglas fir, or coast redwood) would be removed as part of the Proposed Project, a timber harvest plan, timberland conversion permit, or conversion exemption would be required prior to the cutting of any commercial tree species.	Section 4.2, Impacts Found Not to be Significant Section 4.4, Biological Resources
Though not required, CAL FIRE recommends creation of 100 feet of defensible space around project infrastructure to provide protection during wildfire.	Section 4.2, Impacts Not Found to be Significant Section 4.9, Hazards and Hazardous Materials
Care should be taken to prevent the spread of Sudden Oak Death during tree removal.	Section 4.4, Biological Resources
Native American Heritage Commission (NAHC)	
Description of regulations requiring consultation with Native American tribes and recommendation to initiate consultation as early as possible.	Section 4.5, Cultural Resources and Tribal Cultural Resources Appendix D, Cultural Resources Inventory, Evaluation, and Finding of Effect Report
List of NAHC recommendations for cultural resources assessments.	Section 4.5, Cultural Resources and Tribal Cultural Resources Appendix D, Cultural Resources Inventory, Evaluation, and Finding of Effect Report
Marty Demare	
Request to access the Anadromous Salmonids Habitat Conservation Plan.	Not applicable to EIR scope of analysis. The City responded directly to the commenter.
Tony Hoffman	
Request to have survey stakes and flags removed after project completion.	Not applicable to EIR scope of analysis. The City responded directly to the commenter.
Patrick Orozco (Costanoan Ohlone Rumsen-Mutsen Tribe)	
Request to avoid disturbance to Native American sites SCR 58, 13, 14, 15, 16, and 17.	Section 4.5, Cultural Resources and Tribal Cultural Resources
Robert Vallone	
Confident that the EIR will adequately address all potential environmental issues.	Chapter 4, Environmental Setting, Impacts, and Mitigation Measures
Pleased with the Santa Cruz Water Department's communication, coordination, and collaboration regarding the Proposed Project and beyond.	Not applicable to EIR scope of analysis

2.4.2 Public Review of the Draft EIR

This Draft EIR has been published and circulated for review and comment by the public and other interested parties, agencies, and organizations for a 45-day public review period from September 18, 2020 through November 2, 2020. The Draft EIR will be available for public review during the comment period at the following locations:

- City of Santa Cruz Water Department Engineering Counter, located at 212 Locust Street, Suite C in Santa Cruz, by appointment only.[2]
- Online at http://www.cityofsantacruz.com/waterenvdocs.
- Online at the Santa Cruz Public Library at https://catalog.santacruzpl.org/polaris/.

Written comments on this Draft EIR may be submitted to the City of Santa Cruz at the address below or by email to Jessica Martinez-McKinney at jmartinezmckinney@cityofsantacruz.com.

Jessica Martinez-McKinney, Associate Planner II
City of Santa Cruz Water Department
212 Locust Street, Suite C
Santa Cruz, CA 95060

The City of Santa Cruz encourages public agencies, organizations, community groups, and all other interested persons to provide written comments on the Draft EIR prior to the end of the public review period. Two public meetings in the format of online webinars will be held on October 14, 2020 to provide information on the Proposed Project and take public written comments on the Draft EIR.

CEQA Guidelines Section 15204(a) provides guidance on the focus of review of EIRs, indicating that in reviewing draft EIRs, persons and public agencies "should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated," and that comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. This section further states that "CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good faith effort at full disclosure is made in the EIR."

2.4.3 Final EIR and Consideration of Project Approval

Following the close of the public comment period on this Draft EIR, responses will be prepared for all comments received that raise CEQA-related environmental issues regarding the Proposed Project. The Final EIR will include written responses to comments received in accordance with CEQA Guidelines Section 15088 and will also include any text changes to Draft EIR that become necessary after consideration of public comments.

The Final EIR will be presented to the Santa Cruz City Council for a final decision on the Proposed Project. Prior to making a decision to approve a project, the City Council must certify that it has reviewed and considered the information in the EIR, that the EIR has been completed in conformity with the requirements of CEQA, and that the document reflects the City's independent judgment.

[2] Due to the 2019 novel coronavirus disease (COVID-19) pandemic, in-person review of hard copies requires advance appointments, which can be made Monday through Thursday, 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 4:00 p.m. Please email waterengineering@cityofsantacruz.com or call (831) 420-5210 to schedule an appointment.

Pursuant to Sections 21002, 21002.1, and 21081 of CEQA and Sections 15091 and 15093 of the CEQA Guidelines, no public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant effects unless both of the following occur:

(a) The public agency makes one or more of the following findings with respect to each significant effect:

  (1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects on the environment.

  (2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by such other agency.

  (3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternative identified in the environmental impact report.

(b) With respect to significant effects which were subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment.

Although the Draft EIR must provide information regarding the significant effects of the proposed project, must identify the potentially feasible mitigation measures, and provide alternatives for consideration by the decision-making body as described in Section 2.1, Purpose of the EIR, above, the decision to adopt a project must take into account the findings described above, especially regarding feasibility, based on the entirety of the agency's administrative record as it exists after completion of a Final EIR.

2.4.4 Adoption of Mitigation Monitoring and Reporting Program

CEQA requires that a program to monitor and report on mitigation measures be adopted by a lead agency as part of the project approval process. CEQA requires that such a program be adopted at the time the agency approves a project or determines to carry out a project for which an EIR has been prepared to ensure that mitigation measures identified in the EIR are implemented. The Mitigation Monitoring and Reporting Program will be included in the Final EIR.

2.5 Use of the EIR

This EIR is an informational document for decision makers. The EIR includes a "project-level" analysis, meaning that no additional CEQA review should be required if the Proposed Project is approved and constructed without change. Pursuant to CEQA Guidelines Section 15161, the EIR examines all phases of the Proposed Project including construction and operation.

The City of Santa Cruz is the lead agency and responsible for approving and implementing the Proposed Project. CEQA requires that decision makers review and consider the EIR in their consideration of this Proposed Project, as noted in Section 3.8, Project Permits and Approvals.

2.6 Organization of the EIR

The content and format of this EIR are designed to meet the requirements of CEQA and the CEQA Guidelines (Sections 15122 through 15132). This EIR is organized into the following chapters:

- **Chapter 1, Summary**, presents an overview of the Proposed Project, provides a summary of the impacts of the Proposed Project and mitigation measures, provides a summary of the alternatives being considered, includes a discussion of known areas of controversy, and any issues to be resolved.
- **Chapter 2, Introduction**, explains the CEQA process, and describes the scope and purpose of this EIR, provides information on the review and approval process, and outlines the organization of this EIR.
- **Chapter 3, Project Description**, provides information about the location, setting, and background of the Proposed Project; identifies project-specific objectives; and provides a detailed description of the Proposed Project components and its construction and operation.
- **Chapter 4, Environmental Setting, Impacts, and Mitigation Measures**, explains the approach to the environmental analysis for this EIR and provides the environmental setting, impacts, and mitigation measures for the topics identified for detailed analysis in the EIR. Section 4.1, Introduction to Analysis, includes a description of the cumulative condition, and Section 4.2, Impacts Not Found to Be Significant, describes the topics that do not warrant further analysis. For the subsequent sections pertaining to the environmental resource topics for which a detailed analysis is provided, each section presents information in three parts, including existing conditions, regulatory framework, and impacts and mitigation measures. See Section 4.1 for additional information about the organization and content of this chapter.
- **Chapter 5, Other CEQA Considerations**, evaluates the topics required to be included in an EIR, including significant and unavoidable impacts, significant irreversible environmental changes, and growth-inducing impacts.
- **Chapter 6, Alternatives**, evaluates alternatives to the Proposed Project that would eliminate or substantially reduce significant impacts identified in the EIR while reasonably attaining project objectives. Alternatives that were reviewed but eliminated from further consideration in the EIR are also discussed.
- **Chapter 7, List of Preparers**, identifies individuals who were involved in preparing this EIR.
- **Appendices** contain additional information used in preparing this EIR. Appendix A contains the NOP and the comments that were submitted in response to the NOP. Appendix B includes a summary of construction phases, estimated workers and vehicle trips, and construction equipment, as well as the results of the air quality and greenhouse gas emissions modeling conducted for the Proposed Project. Appendix C contains the Biological Resources Assessment prepared for the Proposed Project. Appendix D contains the Cultural Resources Inventory, Evaluation, and Finding of Effect Report prepared for the Proposed Project. Appendix E includes results of the noise modeling conducted for the Proposed Project. Appendix F includes estimated vehicle trip generation during the peak construction period.

3 Project Description

This chapter provides a detailed description of the proposed Laguna Creek Diversion Retrofit Project (Proposed Project), and includes information about the location and setting; existing facilities and operations; background; project purpose and objectives; project design and components; construction schedule and activities; operations and maintenance; approvals and permits; and the Santa Cruz Water Department's (SCWD) Standard Construction Practices. The chapter is based on the 30% design drawings and Basis of Design Report prepared by the City of Santa Cruz's (City's) consulting design engineer, as well as other background studies prepared for the Proposed Project (B&V 2020a, 2020b; Wood Rodgers 2002).

3.1 Project Location and Setting

The Proposed Project would be located in the community of Bonny Doon, California, in unincorporated Santa Cruz County, approximately 7 miles northwest of downtown Santa Cruz (straight-line distance) at an elevation of approximately 620 feet. The project site is located within the U.S. Geological Survey's Davenport Quadrangle. Figure 3-1 shows the project location and vicinity.

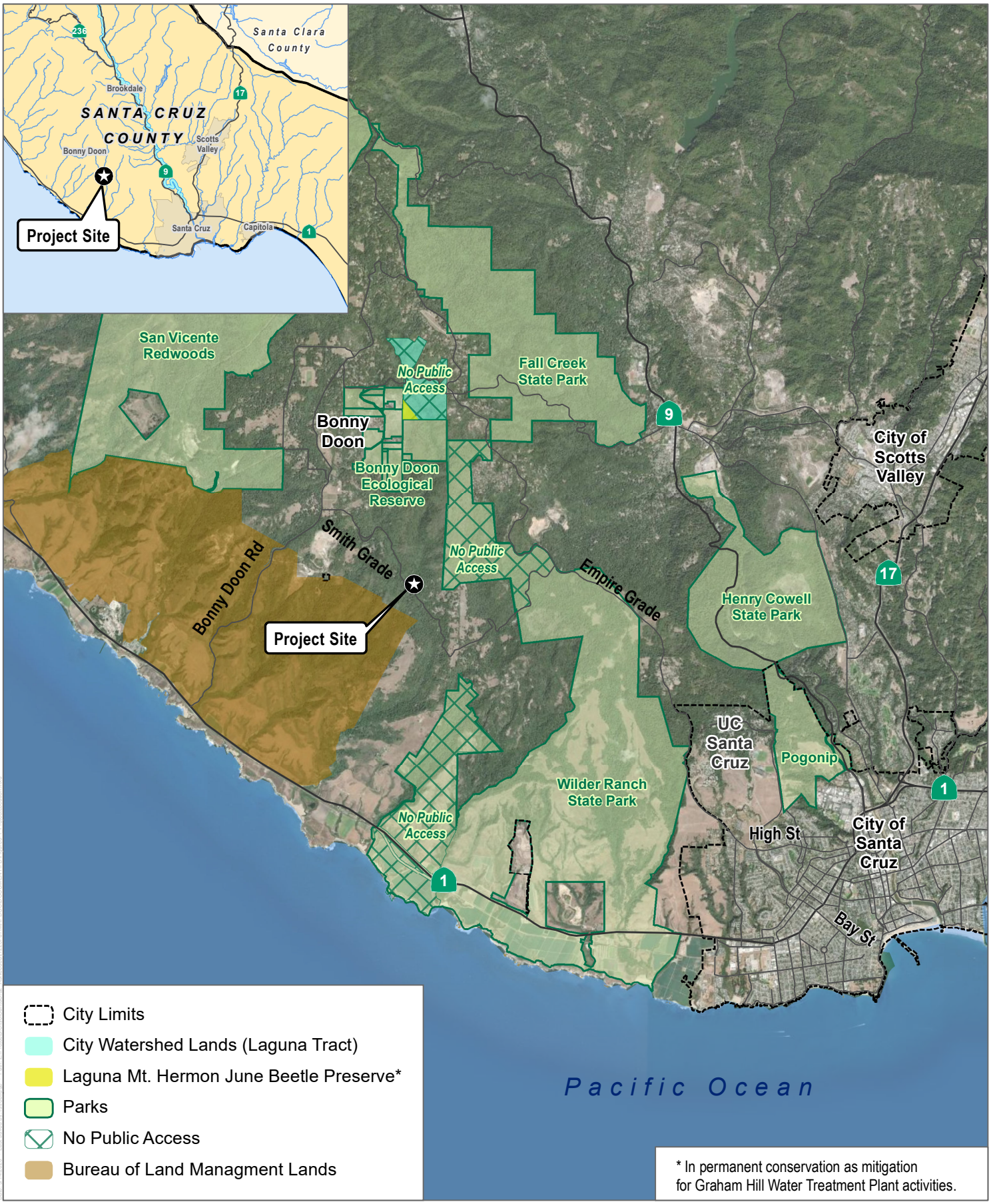
As shown in Figure 3-2, the approximately 2.1-acre project site contains the Laguna Creek Diversion Facility (Facility), which is operated by the SCWD and provides water from Laguna Creek to the SCWD's water supply system. The project site consists of the existing dam, intake structure, diversion flume, transmission pipeline, control building, access roads, and downstream plunge pool, as well as the surrounding area. Laguna Creek passes under Smith Grade approximately 400 feet downstream from the Facility through a box culvert maintained by the County of Santa Cruz (County). The project site is approximately 0.1 miles upstream of the confluence with Reggiardo Creek and approximately 4 miles upstream of the Pacific Ocean.

The project site is located on a portion of Assessor's Parcel Number 06210103, which is privately owned land. The City has deeded access and rights for operation of the Facility per an agreement from January 1889 (Henneuse 1889). Access to the project site is provided by three unimproved access roads off Smith Grade. The project site is approximately 5 miles from State Route 1 via Bonny Doon Road to Smith Grade, and approximately 12 miles from State Route 17 via State Route 1, Bay Street, and High Street/Empire Grade to Smith Grade.

The project site is surrounded predominantly by undeveloped, heavily forested land, with scattered, low-density residential development to the east, south, and west. The nearest residence to the project site is located along the southern edge of the project site, approximately 100 feet to the south across Smith Grade.

3.2 Existing Facilities

The Facility is one of four surface water collection/diversion sources supplying raw water to the City's North Coast System. The North Coast System provides approximately 15% to 35% of the City's overall water supply and contributes to systemwide operational flexibility due to its favorable water quality and year-round reliability. The Facility consists of a concrete and limestone dam and diversion flume, a reinforced concrete intake structure and debris screen, two debris/sediment-control bypasses with pneumatically operated gate valves, an electronic diversion control valve, and a control building. The Facility directs water from Laguna Creek into the North Coast System through the Laguna Pipeline.



SOURCE: ESRI 2020, City of Santa Cruz 2020

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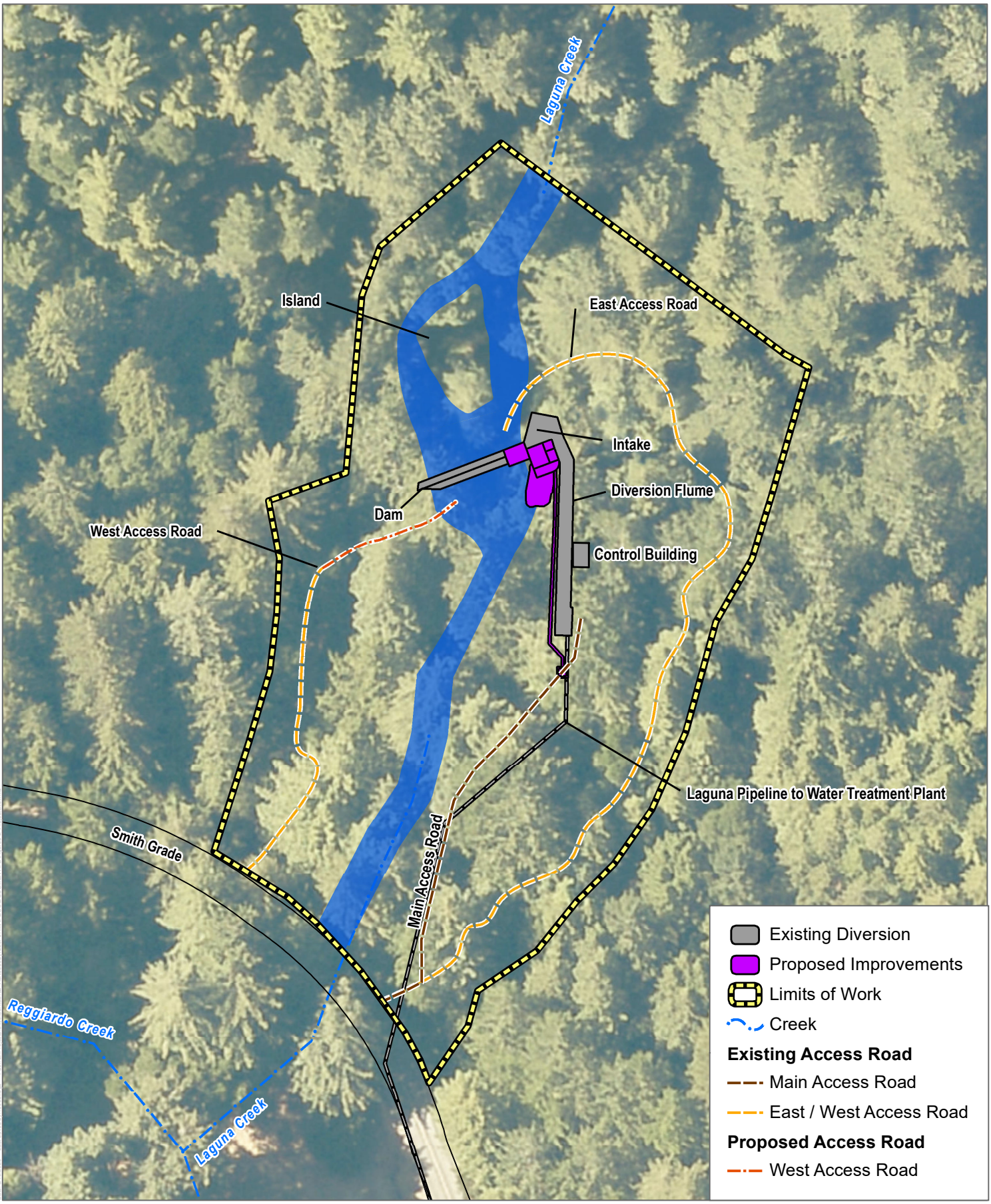
0 4,200 8,400 Feet

FIGURE 3-1

Project Location and Vicinity

Laguna Creek Diversion Retrofit Project - EIR



SOURCE: ESRI 2020, City of Santa Cruz 2020, Black & Veatch 2020

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0 35 70 Feet

FIGURE 3-2

Project Site

Laguna Creek Diversion Retrofit Project - EIR

The Facility was completed in 1890 and originally included the dam and diversion flume constructed from native stone and the cast iron Laguna Pipeline. Improvements have been installed subsequently to aid in the continued functionality of the Facility, including the installation of an iron sluice gate in 1897, replacement of the original Laguna Pipeline and construction of a chlorination station (now the control building) in 1965, modification of the intake structure and access platform built at the dam's left/east abutment in 1980, installation of sediment-control bypass valves in the dam in 1983, installation of a cribwall upstream of the intake in 1986, and fiberglass decking and handrails on the diversion flume in 2002.

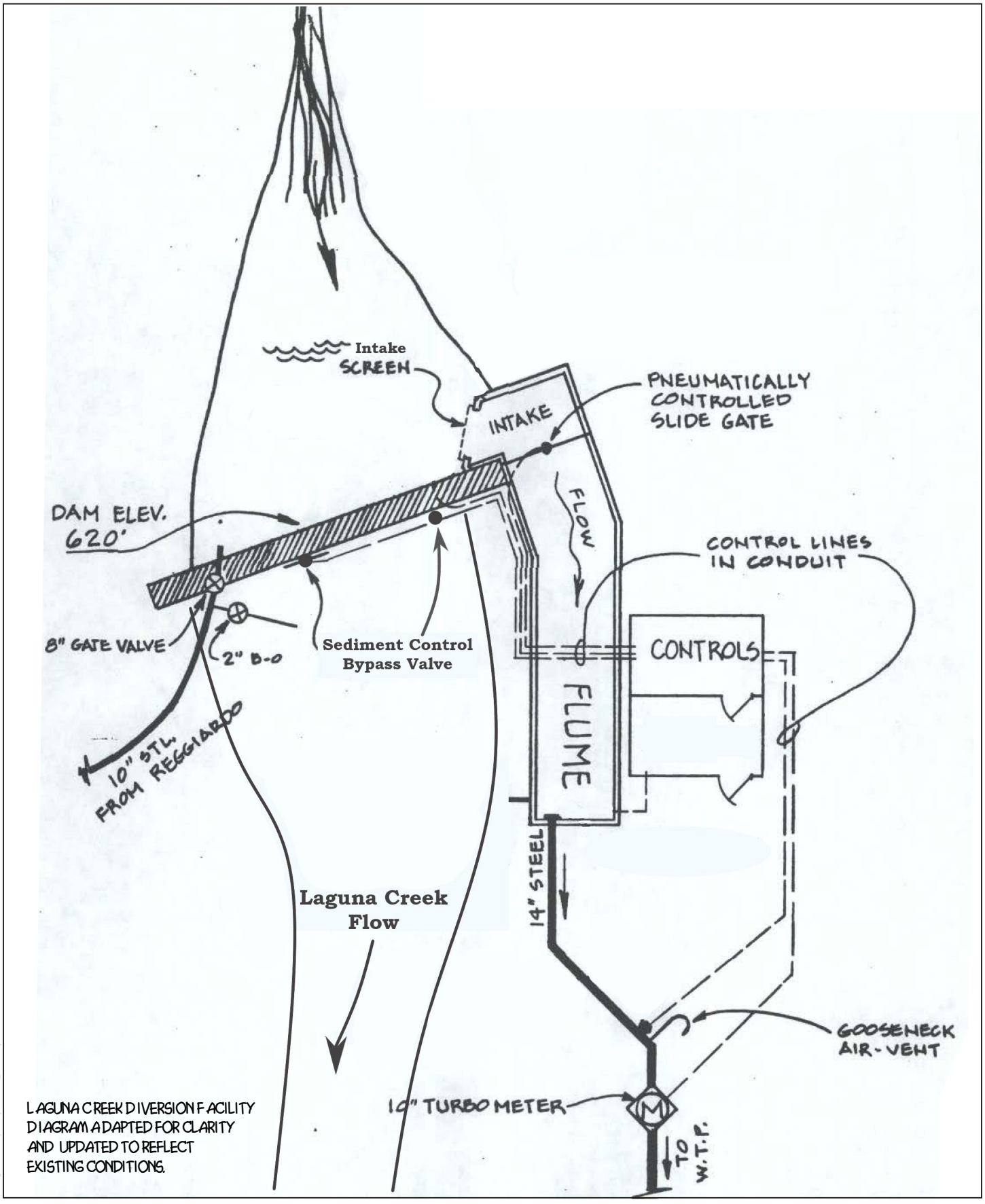
As described in Section 4.5, Cultural Resources, the dam is a physical example of pioneering water management infrastructure in California and appears individually eligible for listing in the National Register of Historic Places, the California Register of Historical Resources, and the Santa Cruz County Historic Resources Inventory, and therefore, is considered a historic resource for the purposes of CEQA.

Figure 3-3 shows the Facility layout and flows through the Facility. The dam is approximately 60 feet long and 12 feet high and spans the entire width of the Laguna Creek channel. The dam creates an impoundment upstream that passively directs water into a screened intake structure on the upstream side of the dam's left/east abutment (from the vantage point of looking downstream). The intake structure is connected to a concrete diversion flume that is approximately 100 feet long by 4 feet wide and channels the diverted water into the Laguna Pipeline, which connects to the North Coast Pipeline. The 14-inch-diameter steel Laguna Pipeline extends for approximately 3.8 miles from the diversion to the North Coast Pipeline. Overall, water is conveyed approximately 13 miles from the diversion at the Facility via gravity to the City's Coast Pump Station, where it is pumped for treatment at the City's Graham Hill Water Treatment Plant.[1]

The rate at which water is diverted from Laguna Creek to the Laguna Pipeline is controlled either manually or via the City's supervisory control and data acquisition (SCADA) system by an electronic diversion control valve and measured by a propeller-type flowmeter. This system allows adjustments to the diversion rate to ensure that adequate in-stream flow levels are maintained downstream of the Facility, as further described below. A control building houses operational equipment. Piping from the flume also allows for flow to be returned to Laguna Creek to meet in-stream flow requirements, as needed.

The City has historically diverted water from Laguna Creek as needed throughout the year based on established pre-1914 senior water rights. However, since 2007, the City has limited its diversions to maintain beneficial in-stream flows suitable for various salmonid life stages within the downstream anadromous reaches of Laguna Creek, based on ongoing agreements with the California Department of Fish and Wildlife (CDFW). Although the City is capable of diverting up to approximately 7 cubic feet per second based on current infrastructure, during the various salmonid life stages, water diversions are limited from Laguna Creek and often unavailable, as flows naturally recede below the agreed upon in-stream flows of 2 cubic feet per second. There is no typical diversion rate or diversion season, since the available flows are highly dependent on rainfall volume and timing.

[1] The Reggiardo Creek Pipeline conveys water diverted from the Reggiardo Creek diversion, approximately 850 feet from the Facility to the upstream side of the dam. Water from Reggiardo Creek was intended to supplement the water supply at Laguna Creek. The pipeline includes a valve at the discharge of the pipe allowing flow to be regulated and a 10-inch blowoff pipe. The Reggiardo Creek Pipeline is not physically connected to the Facility and is not a component of the Facility.



SOURCE: City of Santa Cruz 2020

FIGURE 3-3

Existing Schematic for the Facility

Laguna Creek Diversion Retrofit Project - EIR

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The existing operation and maintenance of the Facility includes:

- Weekly station checks. When the City is diverting water from Laguna Creek, the weekly site visit also includes cleaning the intake screens.
- Raw water sampling every other week.
- Monthly visits to clean and calibrate turbidimeters, read the flow meters, test the generator, and conduct general landscape maintenance.
- Annual visits to calibrate flow meters, maintain valves and actuators, and service the generator.
- Road maintenance every 5 years.

The Facility includes two sediment-control bypass valves in the dam that are operated pneumatically to move sediment past the dam. In 2007, the City started routine excavation of sediment behind the dam, consistent with the Streambed Alteration Agreement issued by CDFW for the purposes of sediment management at the site (Notification Number 1600-2013-0291-R3).

3.3 Project Background

SCWD serves approximately 24,535 connections in the approximately 20-square-mile service area, which includes the City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, University of California Santa Cruz, and coastal agricultural lands north of the City of Santa Cruz. The population within this service area is approximately 98,000 persons. The City's average water production is approximately 5 to 7 million gallons per day during the winter and approximately 7 to 10 million gallons per day during the summer. The Facility is a critical component of the City's water supply and operational and maintenance issues present challenges, as described below.

The dam has impounded sediment and debris in the upstream reservoir, causing the streambed to fill in to the crest of the dam. Nevertheless, the overall condition of the Facility is structurally sound, with no signs of major deterioration or structural defects, and it has adequate strength and stability for continued service (B&V 2018). The following operational constraints related to management of sediment, fisheries protection, and maintenance challenges have been identified:

- In-Stream Transport of Sediment. The dam impedes natural movement of sediment downstream. Although two sediment-control bypass valves can be operated during periods of sediment transport (e.g., during storms) to allow sediment to pass through the dam, they are intermittently clogged with large materials during high-flow storm events and have limited capacity, resulting in sediment buildup behind the dam, often during one large storm event. Periodic dredging and sediment removal are required to conduct maintenance activities and to clear the intake screen of sediment.
- Fish Protection Consistent with Regulatory Requirements. The existing intake screen is aged and buried in sediment. The screen was designed to prevent entrainment of debris within the diverted water and has a woven-wire opening of approximately 0.5 inches. Weekly maintenance and cleaning of the existing intake screen is required to clear sediment from the intake structure when the Facility is in service.

The existing screen panels do not meet current regulatory requirements for screening of non-anadromous fish species; screen openings are too large to eliminate the potential for entrainment of juvenile fish and other aquatic organisms. Although federally or state-listed anadromous fish species are not present in the project area due to several downstream natural barriers, Laguna Creek contains populations of rainbow trout (*Oncorhynchus mykiss*), prickly sculpin (*Cottus asper*), and coastrange sculpin (*Cottus aleuticus*). Fish habitat downstream of the dam has also been degraded by sediment impoundment.

- Maintenance, Safety, and Access. The location of the existing control building impairs access to the diversion structures by mechanized maintenance equipment, the diamond-plate cover on the existing flume requires confined-space entry procedures when staff need to enter the structure, and the Facility does not have permanent fall-protection infrastructure in place for use during dam maintenance.

Since the early 2000s, CDFW has corresponded with the City requesting improvements to sediment management and fisheries protection at the Facility. Potential improvements were analyzed at a programmatic level in the 2005 Program Environmental Impact Report (EIR) for the North Coast System Repair and Replacement Project (SCWD 2005). The 2005 Program EIR considered improvements to be implemented over a period of 15 to 20 years, including replacement of the existing intake screen with a self-cleaning screen system that meets CDFW specifications for protection of fish and other aquatic organisms, an automatically operated spillway gate based on changes in flow and turbidity to help flush sediment downstream, and pipeline rehabilitation or replacement. As analyzed in the 2005 Program EIR, construction activities involved a cofferdam and a temporary creek bypass system, dewatering, earthwork, reinforced concrete demolition and construction, metal work fabrication and installation, stone protection, and miscellaneous electrical and mechanical services. To address the aforementioned operational and maintenance constraints, the City is now pursuing the implementation of the Proposed Project and has developed project-level definition of the Proposed Project, which is the subject of this project-level EIR.

Furthermore, the City's Anadromous Salmonid Habitat Conservation Plan, which is under preparation, includes improvements at the Facility as a biological objective associated with operating facilities to enable unimpaired sediment transport dynamics. Specifically, the draft plan calls for modifying the Facility at Laguna within 10 years of the signed Incidental Take Permit to provide sediment transport during high flows. The Proposed Project is intended to meet this biological objective.

3.4 Project Purpose and Objectives

The project purpose and need and project objectives are described below.

3.4.1 Purpose and Need

The Proposed Project is necessary to allow the City's continued ability to utilize the Facility for delivery of high-quality water to the City's water treatment plant. The purpose of the Proposed Project is to improve the reliability of the City's water supply by addressing sediment transport issues, fisheries protection requirements, safe access, and changing environmental conditions (B&V 2020a). Specifically, the Proposed Project would prevent impounded sediment from clogging the intake and disrupting the function of the Facility. To address the operational and maintenance constraints described in Section 3.3, Project Background, the City has developed the Proposed Project, which is the subject of this project-level EIR. The Proposed Project would address these issues as follows:

- Instream Transport of Sediment. The Proposed Project would change the type and orientation of the water intake so that sediment would not obstruct water intake through the screen. Although the dam would remain in place and most of the existing sediment would remain impounded behind the dam, the new system would be designed to allow for the movement of sediment past the dam in sync with the transport capacity of the creek, restoring natural fluvial functions of sediment transport and deposition that benefit downstream fisheries and aquatic habitats.
- Fish Protection Consistent with Regulatory Requirements. The Proposed Project would provide appropriate fish screening and improved ability to meet instream flow requirements.
- Maintenance, Safety, and Access. The Proposed Project would provide a flexible approach to manage the quantity and quality of water that can be diverted, minimize the use of power, and provide for economical and operational feasibility. The Proposed Project would also allow for fine-tuned control of diversion rates and would include improvements for safe access to the Facility.

3.4.2 Project Objectives

Section 15124 of the California Environmental Quality Act (CEQA) Guidelines indicates that EIR project descriptions must include a statement of the objectives sought by the lead agency for that project. A clearly written statement of objectives helps the lead agency develop a reasonable range of alternatives to evaluate in the EIR and aids the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of that project. The objectives for the Proposed Project are as follows:

- Protect a critical water supply for the City by addressing constraints at the Facility to maintain full system functionality and minimize service interruptions.
- Improve environmental conditions both at the intake with upgraded screen technology for fish protection and in downstream reaches by facilitating sediment movement to support aquatic species habitat.
- Improve overall operational efficiency by incorporating technology that allows for fine-tuned control of diversion rates to enhance the SCWD's ability to meet instream flow requirements and regulation of water levels downstream of the Facility.
- Improve safety and access at the Facility to facilitate the City's ability to maintain the Facility and conduct operational activities.
- Implement a project that is relatively cost-effective in terms of both capital and operation/maintenance costs.

3.5 Project Design and Components

The project design and key elements of the Proposed Project are described below.

3.5.1 Project Overview

As described above, the Proposed Project would improve the reliability of the City's diversion by allowing natural sediment transport past the dam and protecting fish species and habitat. The Proposed Project would allow for the regulation of flows up to the maximum diversion rate at the Facility as described above (see Section 3.2, Existing Facilities) while enhancing the ability to fine-tune diversion rates in order to maintain sustained diversions while continuing to meet in-stream flow requirements.

Once operable, the Proposed Project would concentrate the Laguna Creek flows over a newly created notch in the dam where the new Coanda screen intake structure would be installed on the downstream side of the dam's left/east abutment (from the vantage point of looking downstream). The Coanda screen would allow a controlled portion of the streamflow to fall through the screen while excluding a majority of sediments. The flow would collect in a chamber connected to a diversion pipeline that would extend approximately 100 feet downstream, alongside the existing diversion flume, and connect with the City's existing transmission pipeline. The rate of diversion would be regulated by a new diversion control valve. A separate blowoff piping system with valve and actuator would be installed to allow for the clearing of fine sediment that falls through the Coanda screen and into the chamber so that the sediment does not enter the intake pipeline. The control valve equipment would be installed within a concrete valve control vault along the creek bank.

As shown in Figure 3-4, Figure 3-5, and Figure 3-6, the Proposed Project would involve construction of a new intake structure with an embedded Coanda screen at the downstream face of the dam's left/east abutment. Other components of the Proposed Project would include installation of intake structure appurtenances, a new valve control vault and diversion pipeline, new monitoring and control equipment, riprap bank stabilization along the creek bank, and site access and safety improvements. Table 3-1 lists the key Proposed Project components that are described further below.

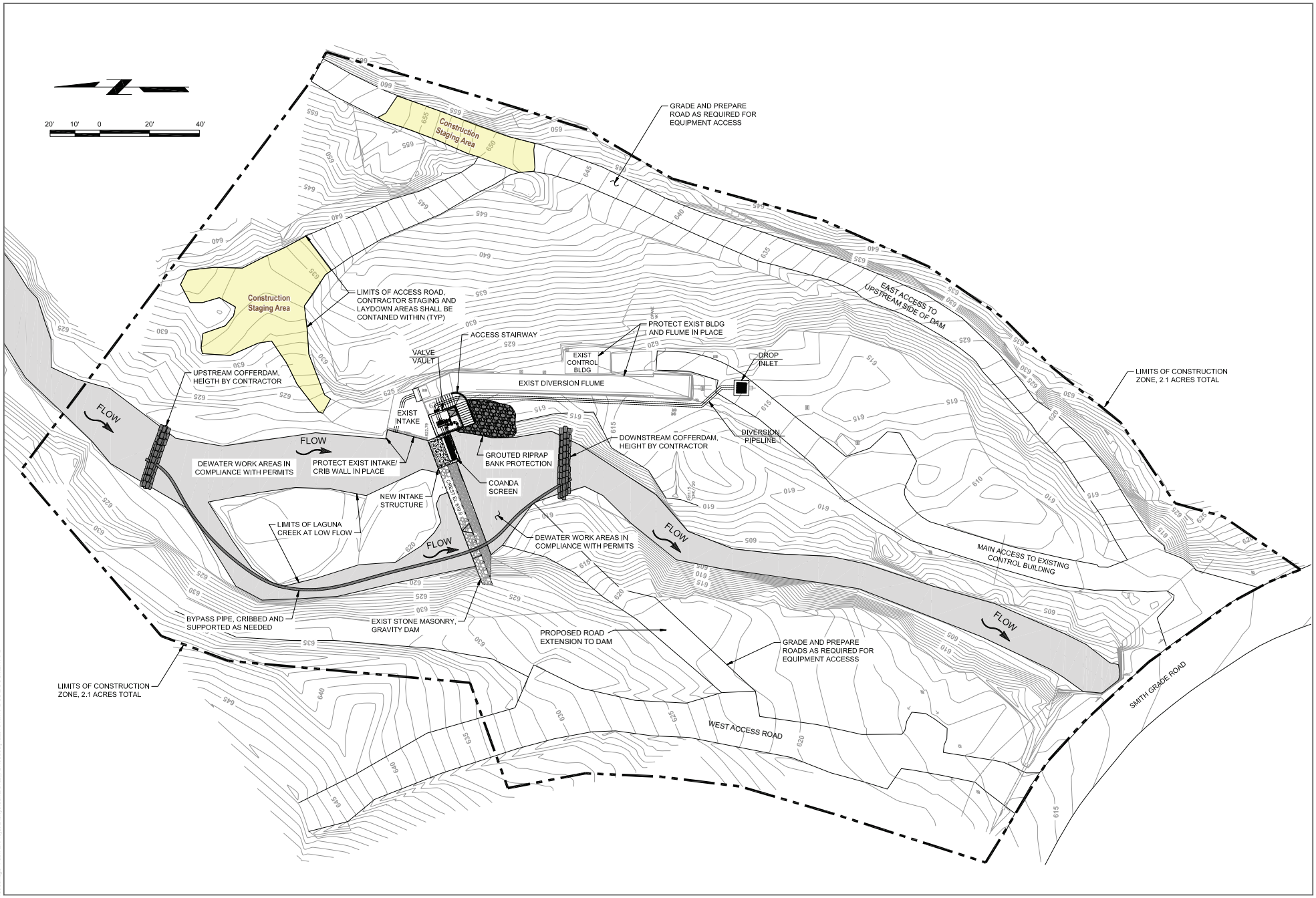
3.5.2 New Coanda Screen Intake Structure

The Coanda screen technology offers an efficient way of screening fine materials from diverted water with minimal clogging and maintenance. The screen is considered self-cleaning (Coanda Intakes, Ltd. n.d.). The design and orientation of the screen allows the natural flow of the creek (hydraulic action) to keep material moving over it, and requires no moving parts. The design criteria for the Coanda screen are based on CDFW's fish screen criteria, which include considerations for structure placement, approach velocity, sweeping velocity, screen openings and porosity, and screen construction (CDFW 2002). See Figure 3-6 for images of the Coanda screen technology.

The Coanda screen technology features a screen that is steeply inclined at the downstream face of a dam. A Coanda screen consists of finely spaced, wedge-shaped wires that deflect a portion of the water to a collection chamber below the screen. Flows pass over the crest of the dam and across a solid steel plate, referred to as an accelerator plate because it creates an increase in the flow rate as water passes over the dam crest. A portion of the water then flows across and through the slotted Coanda screen panel. Flow that passes through the screen is collected in a collection chamber and by a diversion pipe to conveyed to the Laguna Pipeline. See Section 3.5.4, Other Components, for additional description of the diversion pipe.

The Coanda screen would be embedded within a concrete support structure on the downstream side of the dam's left/east abutment, with the face of the screen sloped steeply downward such that water would pass over it at a high velocity, transporting sediment and debris downstream while skimming thin layers of water that would be directed into the collection chamber below.

Installation of the Coanda screen would require a portion of the dam crest to be notched to channel the creek flow over the screen. When the creek flow is relatively low, approximately 7 cubic feet per second or less, water would flow entirely through the notch and over the screen. At higher creek flows, water would cascade over the dam crest as well as through the notch and over the screen.



SOURCE: City of Santa Cruz 2020, Black & Veatch 2020

FIGURE 3-4

Proposed Site Plan and Construction Access/Staging

Laguna Creek Diversion Retrofit Project - EIR

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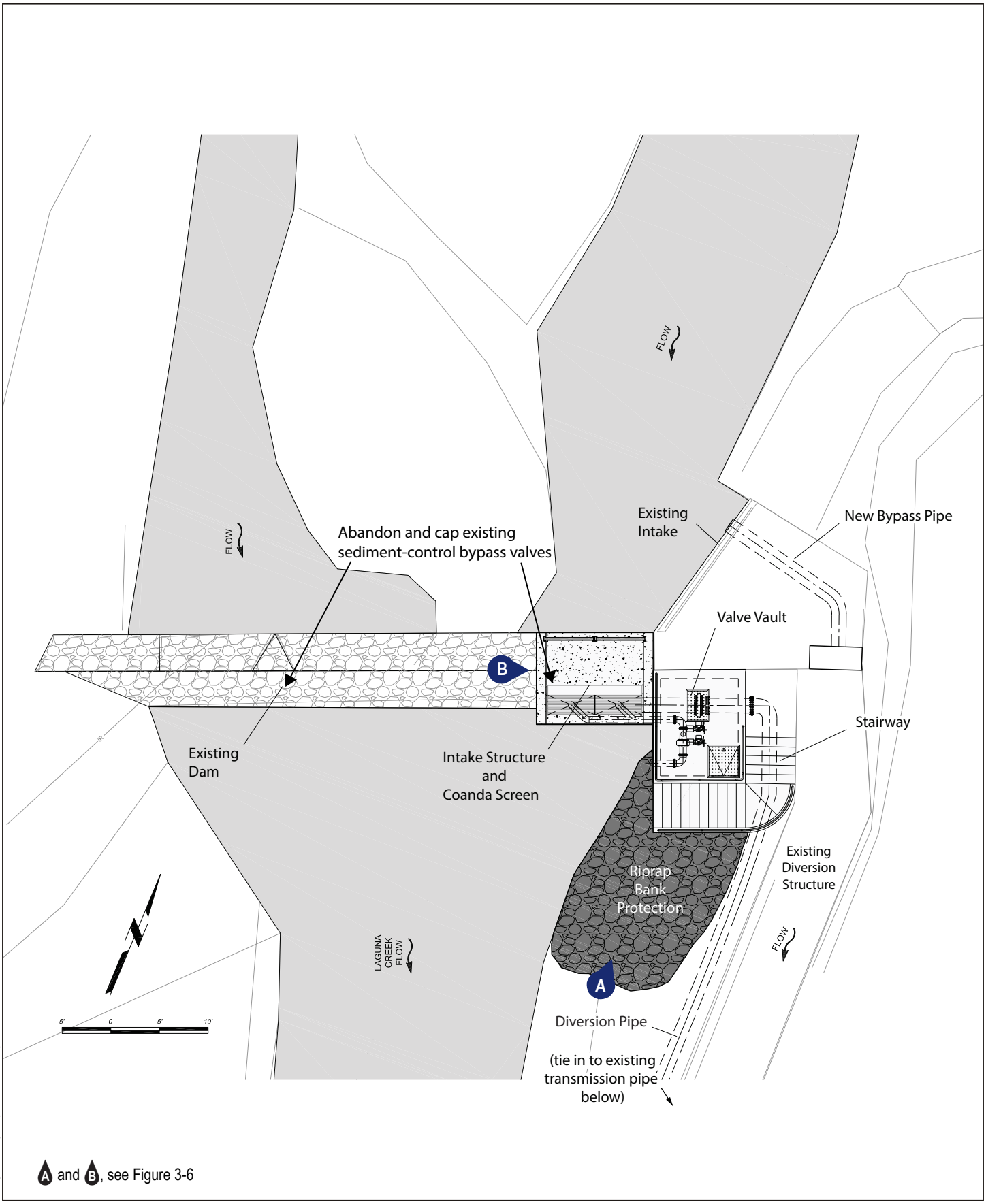

SOURCE: City of Santa Cruz 2020, Black & Veatch 2020

FIGURE 3-5

Proposed Project (Plan View)

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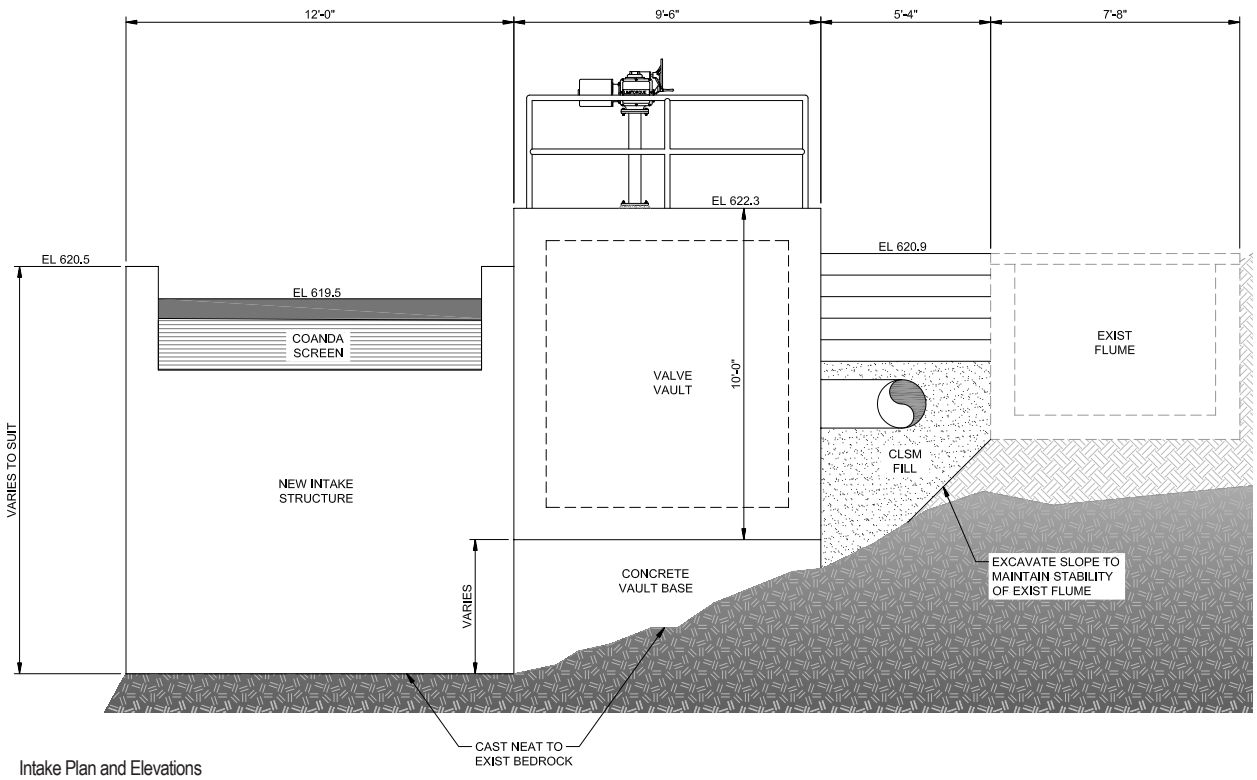
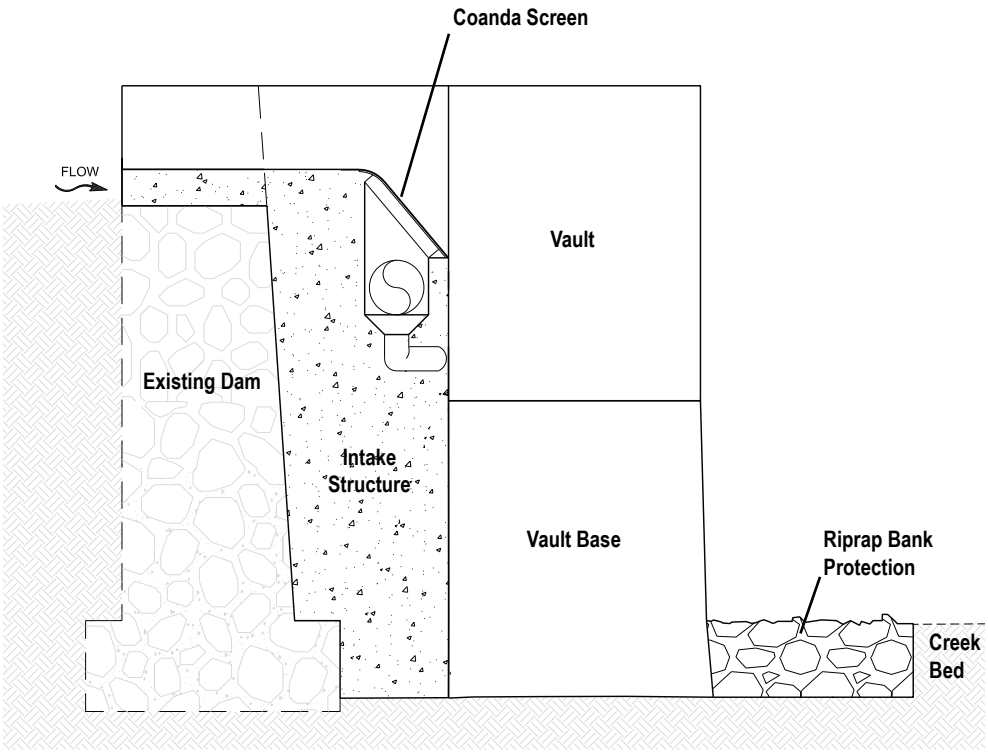


Intake Plan and Elevations

A from Figure 3-5

(Dimensions are approximate.)



Proposed Facility Improvements (Cross-section)

B from Figure 3-5

SOURCE: City of Santa Cruz 2020, Black & Veatch 2020

FIGURE 3-6

Proposed Project (Section Views)

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Table 3-1. Key Proposed Project Components

Component	Description	Approximate Dimensions (if applicable)
New Coanda Screen Intake Structure		
Support Structure	Reinforced concrete structure tied (or doweled) into existing dam	12 feet wide × 10 feet long × 12 feet tall
Coanda Screen	Stainless steel wedge wire plate screen (0.5-millimeter openings), accelerator plate, pre-manufactured housing	10 feet wide × 2.5 feet long
Other Features	Collection chamber, portion of diversion pipe (described below), sediment blowoff system	—
Valve Vault and Creek Bank Components		
Valve Vault and Control Valves	Cast-in-place concrete, reinforced; access hatches/actuator pedestals; butterfly valve and electric actuator on the diversion pipe	9.5 feet wide × 11.5 feet long x 10 feet tall
Vault Base	Structural concrete	Approximately 10 cubic yards (matching footprint of valve vault)
Access Stairs and Safety Improvements	Cast-in-place concrete, reinforced; removable handrails to provide access to downstream plunge pool; task lighting	Approximately 5 cubic yards (5 feet wide x 20 feet long)
Riprap Bank Stabilization	Grouted facing class riprap, 12-ounce non-woven geotextile fabric	Approximately 25 cubic yards (20 feet long x 10 feet wide)
Other Components		
Diversion Pipe	Welded steel pipe and polyvinyl chloride pipe	100 feet long, 18-inch-diameter pipe
Pre-Cast Drop Inlet	Pre-cast concrete inlet with 2-foot sump and cast-iron cover connecting new diversion pipe to existing Laguna Pipeline	4 feet × 4 feet × 8 feet deep
Power and Controls	Conduits, conductors, devices	—
Modified Existing Components		
Existing Intake	Install pipe for emergency diversion and backfill with concrete	—
Existing Sediment-Control Bypass Valves	Abandoned in place and capped	—

Source: B&V 2020a.

A notch approximately 16 inches below the top of the dam and 12 feet wide would be cut in the dam. The new concrete intake support structure would be installed along the length of the notch at the downstream face of the dam. It would be approximately 12 feet wide (along the face of the dam), 12 feet tall, and 10 feet long (as it projects downstream from the dam). It would be tied to the bedrock and the face of the dam with rebar anchors that would be doweled into the dam. See Section 3.6, Project Construction, for additional details.

The Coanda screen technology would allow the intake screen to function regardless of sediment accumulation and buildup within the reservoir (i.e., upstream impoundment). The Coanda screen would divert some water that passes through the screen while the flow over it would transport the majority of entrained sediment downstream. Specifically, sediment greater than 0.25-millimeter grain size (50% of the screen opening size), which (based on

previous sediment studies) characterizes the vast majority of the sediments found in Laguna Creek upstream of the Facility, would flow over the screen. Removal of smaller sediment that accumulates within the screen housing would be facilitated by a blowoff system incorporated into the design. Periodic manual brushing of the screen would occur to keep the intake operating as designed.

3.5.3 Valve Vault and Creek Bank Components

The valve vault and other improvements along the downstream side of the dam's left/east abutment (eastern creek bank) are described below.

3.5.3.1 Valve Vault

A concrete vault would be cast-in-place and installed along the eastern creek bank to house the control-valve equipment. The approximately 9.5-foot-wide by 11.5-foot-long valve vault would be installed along the creek bank along the left/east abutment of the dam and adjacent to the existing intake structure, in a location that is accessible to City staff for maintenance and operation. The valve vault base would be constructed of structural concrete and anchored to bedrock with rebar. A cement curb up to 12 inches in height may be installed along the top of the valve vault to confine the 100-year storm event within Laguna Creek and to keep new infrastructure from flooding.

As described above, water from the collection chamber below the Coanda screen would enter the diversion piping and then pass through the valve vault. Then the water would flow through the diversion pipe to the existing transmission pipeline as described further below. A new control valve would be installed to allow diversion rates to be regulated at fine intervals. The sediment blowoff piping would also be housed in the valve vault.

3.5.3.2 Access Stairs and Safety Improvements

The Proposed Project would include access and safety improvements including a cast-in-place concrete stairway (approximately 5 feet wide and 20 feet long) to provide access to the downstream plunge pool and guard rails at various locations within the Facility, such as along the creek bank, at the new intake structure, across the dam, and at the valve vault.

These improvements would allow City staff and contractors to safely conduct regular biotic surveys, collect water quality samples, as well as to access the Coanda structure and dam for maintenance purposes (such as Coanda screen removal and/or cleaning of the chamber). Other safety features would include anchorage points for fall safety and task lighting along the valve vault and stairs. The lighting would be on timers and switches to provide lighting during emergency work.

3.5.3.3 Riprap Bank Stabilization

Limited reinforcement of the creek bank may be necessary and may entail installation of riprap bank stabilization at the east side of the creek to protect the bank from erosion. Stabilization of an area approximately 20 feet long by 10 feet wide (approximately 25 cubic yards) may be required.

3.5.4 Other Components

Other components of the Proposed Project including the diversion pipe, pre-cast drop inlet, and power and controls are described below.

3.5.4.1 Diversion Pipe

The new intake would be linked to a new diversion pipe that would extend approximately 100 feet downstream, which would be placed underground parallel to the existing diversion flume. Water from the collection chamber would be diverted into the new diversion pipe that would connect to the existing Laguna Pipeline downstream of the flume.

3.5.4.2 Pre-Cast Drop Inlet

A sediment trap structure would be installed at the interconnection of the new diversion pipe and the existing Laguna Pipeline within a pre-cast drop inlet feature that would allow for sediment removal using a hydro-vacuum truck or a hand-held shop vacuum, if needed.

3.5.4.3 Power and Controls

The Proposed Project would include additional electro-mechanical equipment for operations and remote-control capabilities. New monitoring and control equipment, including turbidity sensors, water meters, valve actuators, and telecommunications, would be connected to the existing communications system and electrical distribution system on site to provide essential data for operations.

An in-line control valve and electric actuator would be included to regulate flow into the City's diversion downstream of the flume. New electrical circuits would be installed for powering, monitoring, and remotely operating the new control valve actuators. The Facility's existing electrical distribution and SCADA equipment are deemed sufficient to accomplish automation and control functions at the Facility. The existing control building and SCADA equipment would accommodate new equipment required by the Proposed Project. The existing single-phase electrical service and data-grade telephone line would continue to provide power supply and communication capabilities for diversion control and automation.

3.5.5 Modified Existing Components

The existing intake would be modified and decommissioned in place once the proposed improvements are implemented. A bypass pipe would be incorporated in the intake to allow for emergency diversion of water and the intake would be backfilled with concrete. This bypass pipe would extend from the intake to the existing diversion flume to allow water to be conveyed to the City's water treatment plant in the event that the new intake structure needs to be taken out of service for repair. A new cement curb up to 12 inches in height may be installed along the top of the existing intake to confine the 100-year storm event within Laguna Creek and to keep new infrastructure from flooding.

In addition, the two existing sediment-control bypass valves on the downstream face of the dam would be removed and the bypass pipes abandoned in place and capped as follows:

- At the dam's right/west sediment-control bypass valve (from the vantage point of looking downstream), the existing gate and actuator and its hood would be removed, and a blind flange—a circular steel plate covering the exposed end of the valve—would be installed on the end of the bypass pipe. The conduits and electrical components would also be removed including the metal conduit/cable across the face of the dam.
- The dam's left/east sediment-control bypass valve is at the location where the new intake structure would be installed. Prior to installation of the intake structure, the piece of the bypass pipe that protrudes from the dam and the actuator would be removed and the pipe would be backfilled with concrete.

3.6 Project Construction

This section describes the anticipated Proposed Project construction schedule, construction activities and methods, construction routes, spoils, equipment, and Standard Construction Practices.

3.6.1 Construction Schedule

Construction is projected to occur in 2021 upon completion of the environmental review process, approval of the Proposed Project by the City Council, and acquisition of the necessary permits. Construction would take place over approximately 3 months, planned to occur during the low-flow period (between the months of June to October). Construction work would be performed from 7 a.m. to 5 p.m. on weekdays. Work outside of these hours, including weekend work is not anticipated. However, if it is required, work outside of these hours would require approval from the SCWD Director.

It is expected work crews would generally consist of a staff of 5 workers during normal construction activities, possibly increasing to approximately 10 workers during concrete placements.

3.6.2 Construction Activities

Construction activities would generally include the following phases, which are described further in the section below: (1) improvement of access roads, site preparation, and mobilization; (2) installation of the cofferdam and temporary creek bypass system; (3) construction of the Coanda screen intake structure, including dam preparation, foundation work, and concrete formwork, and installation of the intake screen, piping, and valves; (4) modification of the existing intake and sediment-control valves; (5) installation of the valve vault; (6) installation of electrical; (7) installation of the access stairs and riprap bank stabilization; and (8) startup and testing, site restoration, and construction closeout. No blasting or pile-driving is required for construction.

The anticipated sequencing of construction activities for the purpose of the analyses in this EIR is listed below:

- Equipment mobilization to the site using ground transportation and development of access roads and staging areas.
- Installation of the temporary streamflow bypass system.
- Excavation on the upstream and downstream sides of the dam and notching the top of the dam to accommodate the Coanda screen, anchoring to the bedrock, formation of the new intake structure form with cement, and installation of the Coanda screen.
- Modification of the existing intake structure and sediment-control valves.

- Installation of the new valve vault and new sediment blowoff and diversion piping.
- Installation of electrical components.
- Testing of the new system.
- Backfilling of void space between the new valve vault and existing covered diversion flume, installation of stairs, and placement of riprap in areas where creek bank protection is required.
- Removal of temporary facilities, demobilization, site restoration, and revegetation of disturbed areas.

3.6.2.1 Access Road Improvements, Site Preparation, and Mobilization

Three private, unpaved roads on the site provide existing access from Smith Grade, as shown in Figure 3-4. These roads may be improved to allow access of equipment to the site, which may entail limited tree removal to accommodate road widening, grading, compaction, and placement of aggregate.

The east access road would provide construction access to the upstream side of the dam. The main gate and access road are well graded and would provide access to the existing control building. The west access road would be extended by approximately 100 feet to provide construction access to the downstream plunge pool from the west side.

In addition, construction staging/laydown areas would be established in areas that are already fairly level along the access roads, as shown in Figure 3-4. Staging areas would be used for storage of materials and products, treatment and storage of spoils, and equipment laydown. Clearing and grubbing would be completed for these areas and for the work area on the east side of the dam to allow for installation of the valve vault and riprap bank stabilization. Up to 14 trees (approximately 12 coast redwoods and 2 tan oaks) may need to be removed. During construction startup, equipment and supplies would be mobilized to the site on trucks, including a mobile office and porta-potties.

Based on the City's Standard Construction Practices, described further below in Section 3.6.3, Standard Construction Practices, best management practices would be installed where necessary to prevent soil migration into the creek channel; these best management practices would most likely include silt fence or straw wattles. Vegetation that is removed may be left on site at construction completion or hauled off site.

3.6.2.2 Cofferdam and Temporary Creek Bypass System

Construction would be performed in the summer and early fall when creek flows are typically at their lowest, and natural creek flows would be maintained at all times during construction by a temporary creek bypass system.

As shown in Figure 3-4, this system would consist of two cofferdams—one installed upstream and one downstream of the dam—and a 12-inch-diameter, approximately 240-foot-long high-density polyethylene bypass pipe. The cofferdam would be expected to consist of gravel-filled sacks and sandbags or an alternative technology such as an inflatable dam. Water would be impounded behind the upstream cofferdam and flow by gravity through the bypass pipe around the dam to a location below the construction area to the lower cofferdam, where it would rejoin the creek. To accommodate equipment access to the downstream face of the dam, the bypass pipe would be anchored using sandbags and buried near the west access route for vehicles.

Once the creek bypass system is functional, dewatering and leakage control pump systems would be installed in the construction work areas. Between the upstream cofferdam and the dam, a sump pit would be excavated to at

least 1 foot below the lowest excavation point, which would be in front of the existing intake structure so that the construction area could be isolated from seepage. Additional spot pumping would also occur at the downstream side of the diversion dam. Dewatering and leakage control pumps would be electric submersible and be powered with electricity from the control building. To manage water quality from dewatering efforts during excavation activities, discharge piping from dewatering pumps would be treated appropriately prior to discharge back into the creek channel.

3.6.2.3 New Coanda Screen Intake Structure

The new Coanda screen intake structure would require excavation of creek materials upstream and downstream of the dam to allow the dam to be notched and the bedrock to be exposed, anchoring of the structure's foundation to the bedrock and dam, installation of rebar and pouring concrete for the structure, and placement of the Coanda screen and other intake components.

Excavation at the upstream side of the dam would be required to expose the base of the existing intake structure and the area along the dam where it would be notched for the new Coanda screen. Impounded materials upstream of the dam would be temporarily excavated approximately 3 feet at the deepest point along the left/east abutment and existing intake. A mini-excavator or similar equipment is expected to be used to move the material away from the structures at safe temporary cut slopes. The downstream side of the dam would also be excavated to the bedrock for the Coanda screen concrete structure and foundation for the new valve fault.

As shown in Figure 3-5 and Figure 3-6, a notch would be incised into the crest of the dam adjacent to the existing intake on the left/east side of the dam facing downstream; the dam would be notched approximately 16 inches below the top of the dam for an approximately 12 -foot width. The dam crest would be sawcut to score neat lines for stone masonry removal. The use of a wire saw would avoid excess material removal and would prevent unraveling of stone masonry beyond the limits of the new intake structure and the slurry would be captured using a shop vacuum system and off-hauled from the site. Scaffolding would be installed on the downstream side of the dam to support construction workers. After wire saw cutting is complete, the section of the dam to be removed would be demolished by hand with pneumatic hand tools. The remaining rubble from the notch of the dam would either be off-hauled or cleaned and used as riprap for bank stabilization, described below.

After removal of the notch is complete, the downstream face of the dam where the new intake structure would be installed would be water-blasted to remove debris. Surface cleaning of the dam would be performed to achieve the best bonding possible between the new concrete structure and the dam but would not be critical as the new intake structure is self-supporting. The pressure washing methods would avoid eroding the mortar; the contractor would be required to test washing methods prior to the work and develop the least impactful method of dam cleaning.

Rebar anchors would be secured with epoxy to the dam, on the exposed surfaces, and on bedrock for the Coanda structure foundation; these anchors would be covered by the new intake structure. Temporary timber formwork with would be used for forming the new concrete surfaces. Forms and rebar would be installed, the intake collection chamber and components would be embedded, and concrete would be placed using a line concrete pump. Once the intake structure is set, the Coanda screen would be installed.

3.6.2.4 Modifications to Existing Intake and Sediment-Control Values

The existing intake structure would be closed and abandoned in place, and a bypass pipe for emergency diversion would be installed before the structure is backfilled with concrete to provide connectivity between the creek and

the existing diversion flume in case the City needs to bypass the new intake during repairs or an emergency. Holes would be drilled in the top of the existing intake structure to fill the void space with concrete around the new pipe. A blind flange would be installed at the upstream end of the proposed 18-inch-diameter pipe to allow emergency bypass flows, if needed, through the emergency diversion pipe to the existing diversion flume. A piece of the existing transmission pipeline that connects to the flume would be removed and capped for the new diversion pipe connection. In the event of an emergency, the cap would be removed and a spool piece of the pipe would be placed into the gap to allow water to flow from the flume into the transmission pipe and into the City's water system.

The existing sediment-control valve on the left/east side of the dam would be removed and the new pipe penetration would be integrated within the new intake structure. The existing sediment-control valve and pipe at the right/west side of the dam would be abandoned in place and blind flanged.

3.6.2.5 Valve Vault Installation

The valve vault would be embedded into the creek bank near the new intake but would be exposed or visible on the creek channel side. The foundation would have a stem wall configuration, and the vault and its foundation would be cast in place. The foundation would be anchored to bedrock with rebar.

Once the foundation for the new valve vault has been installed, mechanical installation would begin. The blowoff drain that would connect to the bottom of the Coanda collection chamber and piping and valves would be installed. The new diversion piping with diversion butterfly valve would be connected to the Coanda collection chamber and would extend parallel past the existing diversion flume to the existing Laguna Pipeline where it would connect via the pre-cast drop inlet. After vault construction is complete, valve stems, pedestals, and electric actuators would be installed. Hatches for the vault and handrails would be installed. The space between the new valve vault and the existing covered diversion flume would be backfilled with structural concrete.

3.6.2.6 Electrical Installations

Electrical work would begin with running conduits from the existing control building to the valve vault, followed by installation of the required electrical and communication panels. Power for the electrical equipment would come from the existing electrical drop and metered for 208 volts/Single Phase/100 ampere service. The electrical work would include wire pulling, terminations, and remote terminal unit/SCADA control panel upgrades. New lighting and grounding would also be installed to provide for nighttime safety if sight access is required during an emergency or other activity.

3.6.2.7 Access Stairs and Riprap Bank Stabilization

At the downstream end of the new valve vault, a stairway would be installed from the downstream pool up to the top of the valve vault. Once the stairs are cast, grouted riprap bank stabilization would be constructed along the creek bank where slope protection is required. The bank armoring would serve as a transition from the sloped profile of the stairway to the near vertical slope of the existing creek bank downstream.

3.6.2.8 Startup and Testing, Site Restoration, and Construction Closeout

After construction is complete, startup and testing would commence. Typical startup and testing activities include: circuit merger and continuity testing, local-manual equipment checks, loop testing (i.e., manually simulate an input

at the control panel and verify appropriate output occurs). Demonstration testing (e.g., of the diversion and sediment bypass valves) may occur during winter/spring months under more representative streamflow conditions.

Final erosion control best management practices described in Section 3.6.3 would be installed in areas of disturbed soils. Disturbed soils would be stabilized with erosion control materials, and hydroseeded, hand-seeded, or replanted with some combination thereof. The cofferdam and bypass system would be removed, and creek flows would flow over the new Coanda screen. The mobile office and any other temporary facilities would be removed, and workers and equipment would be demobilized. The site would be restored to as near pre-project conditions as is practical. Restoration planting and tree planting would occur as required.

3.6.2.9 Construction Routes

Access for vehicles carrying materials, equipment, and personnel to and from the project site would be provided via existing roadways in the vicinity. The primary routes for construction traffic would likely be from State Route 1 via Bonny Doon Road to Smith Grade, or from State Route 17 to State Route 1, Bay Street, then High Street/Empire Grade to Smith Grade. Roadways in the immediate vicinity of the site, including Bonny Doon Road, Empire Grade, and Smith Grade, are winding, two-lane roads that traverse densely forested land. To facilitate transport of construction equipment, public roads could be closed temporarily, but would not be closed for extended durations during construction.

3.6.2.10 Spoils Disposal

Temporary excavation of material (approximately 10 cubic yards) upstream of the dam would be stockpiled on site and the material would be returned to its original location after construction completion. Spoils would be generated during excavation of material on the downstream side of the dam. Approximately 40 cubic yards of material would be excavated downstream of the dam; 10 cubic yards would be reused as engineered fill and 30 net cubic yards of excavated sediments would be hauled off site to the City's Resource Recovery Facility (landfill), approximately 10 miles away. Spoils generated from pipeline trenching and other project excavations would be hauled off site to a disposal location in accordance with state and federal regulations.

3.6.2.11 Construction Equipment

The Proposed Project would require use of heavy equipment such as excavators, drill rigs, forklifts, graders, tractors, loaders, backhoes, dumpers, and generators. Haul trucks would be used to transport materials to the site and to transport spoils off site to a permanent disposal location. Water trucks would also be used at the site. Appendix B summarizes equipment and assumptions used for each construction phase.

Construction worker vehicle trips would be approximately 5 one-way trips per day, with up to 18 one-way trips per day if multiple construction phases overlap (during less than a month period). Approximately 35 one-way haul truck trips would be required during the 3-month construction period, with two to three trips per week.

3.6.3 Standard Construction Practices

The City has identified standard construction practices, presented in this section that would be implemented by the City and its contractors during construction activities associated with the Proposed Project.

Erosion Control and Air Quality Control

1. Implement erosion control best management practices for all construction activities occurring in or adjacent to jurisdictional aquatic resources (resources subject to permitting under Clean Water Act Section 404, Clean Water Act Section 401, and/or California Fish and Game Code Section 1600). These measures may include, but are not limited to, (1) installation of silt fences, fiber or straw rolls, and/or bales along limits of work/construction areas and from the edge of the water course; (2) covering of stockpiled spoils; (3) revegetation and physical stabilization of disturbed graded and staging areas; and (4) sediment control including fencing, dams, barriers, berms, traps, and associated basins.
2. Provide stockpile containment and exposed soil stabilization structures (e.g., Visqueen plastic sheeting, fiber or straw rolls, gravel bags, and/or hydroseed).
3. Provide runoff control devices (e.g., fiber or straw rolls, gravel bag barriers/chevrons) used during construction phases conducted during the rainy season. Following all rain events, runoff control devices shall be inspected for their performance and repaired immediately if they are found to be deficient.
4. Implement wind erosion (dust) controls, including the following:
    - Use a water truck;
    - Water active construction areas as necessary to control fugitive dust;
    - Hydro seed and/or apply non-toxic soil binders to exposed areas after cut and fill operations;
    - Cover inactive storage piles;
    - Cover all trucks hauling dirt, sand, or loose materials off site; and
    - Install appropriately effective track-out capture methods at the construction site for all exiting trucks.

Water Quality Protection

5. Locate and stabilize spoil disposal sites and other debris areas such as concrete wash sites. Sediment control measures shall be implemented so that sediment is not conveyed to waterways or jurisdictional resources (resources subject to permitting under Clean Water Act Section 404, Clean Water Act Section 401, and/or California Fish and Game Code Section 1600).
6. Minimize potential for hazardous spills from heavy equipment by not storing equipment or fueling within a minimum of 65 feet of any active stream channel or water body unless approved by permitting agencies along with implementation of additional spill prevention methods such as secondary containment and inspection.
7. Ensure that gas, oil, or any other substances that could be hazardous to aquatic life or pollute habitat are prevented from contaminating the soil or entering waters of the state or of the United States by storing these types of materials within an established containment area. Vehicles and equipment would have spill kits available, be checked daily for leaks, and would be properly maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease. Any gas, oil, or other substance that could be considered hazardous shall be stored in water-tight containers with secondary containment. Emergency spill kits shall be on site at all times.
8. Prevent equipment fluid leaks through regular equipment inspections.
9. Implement proper waste/trash management.

In-Channel Work and Fish Species Protection

10. Avoid activities in the active (i.e., flowing) channel whenever possible.
11. Isolate work areas as needed and bypass flowing water around work site (see dewatering measures below).
12. Personnel shall use the appropriate equipment for the job that minimizes disturbance to the channel bed and banks. Appropriately tired vehicles, either tracked or wheeled, shall be used depending on the situation.

General Habitat Protection

13. Avoid disturbance of retained riparian vegetation to the maximum extent feasible when working in or adjacent to an active stream channel.
14. Restore all temporarily disturbed natural communities/areas by replanting native vegetation using a vegetation mix appropriate for the site.
15. Require decontamination of any used tools and equipment prior to entering water ways.
16. A qualified biologist shall conduct a training-educational session for project construction personnel prior to any mobilization-construction activities within the project sites to inform personnel about species that may be present on site. The training shall consist of basic identification of special-status species that may occur on or near the project site, their habitat, their basic habits, how they may be encountered in the work area, and procedures to follow when they are encountered. The training will include a description of the project boundaries; general provisions of the Migratory Bird Treaty Act, California Fish and Game Code, and federal and state Endangered Species Acts; the necessity for adhering to the provision of these regulations; and general measures for the protection of special-status species, including breeding birds and their nests. Any personnel joining the work crew later shall receive the same training before beginning work.

Dewatering

17. Prior to the start of work or during the installation of temporary water diversion structures, capture native aquatic vertebrates in the work area and transfer them to another reach as determined by a qualified biologist. Capture and relocation of aquatic native vertebrates is not required at individual project sites when site conditions preclude reasonably effective operation of capture gear and equipment, or when the safety of the biologist conducting the capture may be compromised.
18. When work in a flowing stream is unavoidable, isolate the work area from the stream. This may be achieved by diverting the entire streamflow around the work area by a pipe or open channel. Coffer dams shall be installed upstream and downstream, if needed, of the work areas at locations determined suitable based on site-specific conditions, including proximity to the construction zone and type of construction activities being conducted. Cofferdam construction shall be adequate to prevent seepage to the maximum extent feasible into or from the work area. Where feasible, water diversion techniques shall allow streamflows to flow by gravity around or through the work site. If gravity flow is not feasible, streamflows may be pumped around the work site using pumps and screened intake hoses. Sumps or basins may also be used to collect water, where appropriate (e.g., in channels with low flows). The work area will remain isolated from flowing water until any necessary erosion protection is in place. All water shall be discharged in a non-erosive manner (e.g., gravel or vegetated bars, on hay bales, on plastic, on concrete, or in storm drains when equipped with filtering devices).
19. If a bypass will be of open channel design, the berm confining the channel may be constructed of material from the channel.

20. Diversions shall maintain ambient flows below the diversion, and waters discharged below the project site shall not be diminished or degraded by the diversion. All imported materials placed in the channel to dewater the channel shall be removed when the work is completed. Dirt, dust, or other potential discharge material in the work area will be contained and prevented from entering the flowing channel. Normal flows shall be restored to the affected stream as soon as is feasible and safe after completion of work at that location.
21. To the extent that streambed design changes are not part of the Proposed Project, return the streambed, including the low-flow channel, to as close to pre-project condition as possible unless the pre-existing condition was detrimental to channel condition as determined by a qualified biologist or hydrologist.
22. Remove all temporary diversion structures and the supportive material as soon as reasonably possible, but no more than 72 hours after work is completed.
23. Completely remove temporary fills, such as for access ramps, diversion structures, or coffer dams upon finishing the work.

Other Practices

24. In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the Proposed Project, immediately stop all construction work occurring within 100 feet of the find until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find. The archaeologist will determine whether additional study is warranted. Should it be required, the archaeologist may install temporary flagging around a resource to avoid any disturbances from construction equipment. Depending upon the significance of the find under CEQA (14 CCR 15064.5[f]; California Public Resources Code, Section 21082), the archaeologist may record the find to appropriate standards (thereby addressing any data potential) and allow work to continue. If the archaeologist observes the discovery to be potentially significant under CEQA, preservation in place or additional treatment may be required.
25. In accordance with Section 7050.5 of the California Health and Safety Code, if potential human remains are found, immediately notify the lead agency staff and the County Coroner of the discovery. The coroner would provide a determination within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made. If the County Coroner determines that the remains are, or are believed to be, Native American, the coroner would notify the Native American Heritage Commission within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the Native American Heritage Commission must immediately notify those persons it believes to be the Most Likely Descendant from the deceased Native American. Within 48 hours of this notification, the Most Likely Descendant would recommend to the lead agency her/his preferred treatment of the remains and associated grave goods.
26. Notify adjacent property owners of nighttime construction schedules. A Construction Noise Coordinator will be identified. The contact number for the Construction Noise Coordinator will be included on notices distributed to neighbors regarding planned nighttime construction activities. The Construction Noise Coordinator will be responsible for responding to any local complaints about construction noise. When a complaint is received, the Construction Noise Coordinator shall notify the City within 48 hours of the complaint, determine the cause of the noise complaint, and implement as possible reasonable measures to resolve the complaint, as deemed acceptable by the City.

Project-Specific Practices for Biological Resources

27. To protect fish, the following shall be implemented:
    - Relocate fish to suitable habitat during dewatering activities.
    - Maintain adequate water depth within downstream plunge pool. A depth of 3 to 4 feet is preferred to conform to the existing pool depth and minimize potential for degrading the suitability of the pool for trout habitat. Greater depth also reduces the potential for harm to fish passing over the Coanda screen and entering the plunge pool below.
    - Maintain soft bank stabilization features identified during project design that provides potential habitat for trout.
    - Maintain native riparian shrubs and small trees in (as appropriate) and around riprap to provide overhead cover and shading when the plants have matured.
28. To protect trees that are retained on site, the following will be implemented:
    - Implement measures to minimize the potential for pathogen spread. Sanitize tools and equipment used in vegetation clearing including tree removal operations. If soil is collected on equipment, rinse equipment on site with a portable water tank or water truck, or at a designated rinsing station, to remove soil-borne pathogens and prevent transport to new sites. Alternatively, debris can be cleaned from tools/equipment via brushing, sweeping, or blowing with compressed air.
    - Implement additional prevention methods for sudden oak death and pitch canker. A qualified biologist, arborist, or forester should inspect loads of logs and equipment leaving the site to ensure that no host material is being transported without a permit if material is being transported to outside locations. If importing vegetative material for restoration purposes, ensure that material that has been produced in conformance with the latest horticultural standards in pest and disease avoidance and sanitation.
    - Implement recommendations from the Tree Inventory, Impact Assessment, and Protection Plan (Fouts 2020) prepared for the Proposed Project.
29. To prevent inadvertent entrapment of wildlife during construction activities, all excavated, steep-walled holes or trenches more than 2 feet deep and/or all open pipeline segments will be covered at the close of each working day with plywood or similar materials, to the extent feasible. These areas will be inspected for trapped wildlife before and after placement of exclusionary materials.

Project-Specific Practices for Cultural Resources

30. To protect the dam during construction, the following will be implemented:
    - Notching crest of dam. The notch in the crest of the dam shall be sawcut to score neat lines for stone masonry removal. The use of a wire saw would avoid excess material removal and would prevent unraveling of stone masonry beyond the limits of the new intake structure. Given the strength and hardness of the dam, the cuts may first be initiated using chisel hammers to remove materials as necessary.
    - Water-pressure washing of dam to remove debris. To remove loose material and organics such as dirt and moss water-blasting of the downstream face of the dam may be required. Prior to completing any water-blasting work, and at the direction of the City and under supervision of the Project inspector, the contractor shall test washing methods and develop the least impactful method of dam cleaning. The pressure washing methods shall avoid eroding the mortar. The contractor shall start with a low-pressure water wash, and if unsuccessful, use water of slightly higher pressure. As feasible, the test shall be

conducted in an inconspicuous location. Pressure washing shall be limited to the area where the new intake structure will be cast, with approximately 1-foot buffer. A bonding agent such as a high solids, water-based emulsion admixture suitable for modifying Portland cement compositions, shall be spray applied to the dam face within the limits of the new concrete formwork for the new intake structure.

31. Documentation of the historical resource. The City will work with a qualified architectural historian to develop interpretative text and content for a dedicated webpage on the City's public website that explains the history of the site and its importance within the water management system. This text and supporting content (historic era images) will be utilized to develop a brochure with a one-time limited pressing for distribution to local libraries and museums. In addition, the City will include a brief history of the project site as an entry in its Santa Cruz Municipal Utilities Review, a quarterly newsletter that is sent to all customers in the Water Service Area.

Project-Specific Practices for Wildfire Hazards

32. Internal combustion engine equipment shall include spark arrestors, fire suppression equipment (e.g. fire extinguishers and shovels) must be stored onsite during use of such mechanical equipment, and construction activities may not be conducted during red flag warnings issued by the California Department of Forestry and Fire Protection (CAL FIRE). Red flag warnings and fire weather watches are issued by CAL FIRE based on weather patterns (low humidity, strong winds, dry fuels, etc.) and listed on their website (https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/).

3.7 Operations and Maintenance

After construction and commissioning of the Proposed Project, operations and maintenance of the Facility would be improved as follows 1) sediment would no longer obstruct the intake of water and routine excavation of sediment from behind the dam would not be required; and 2) new controls for diversion rates, new stairs, railings, and emergency lighting would support operations personnel and improve safety during maintenance within the valve vault, which is a confined space.

Other than these improvements, the operations and maintenance activities at the Facility would generally remain similar to existing operations, as described in Section 3.2, Existing Facilities, above. Specifically, operations and maintenance activities would entail 1) weekly station checks consisting of visual inspection of the Facility, collection of water meter and turbidimeter data, clearing of fallen leaves, needles, and branches on the intake screen and access roads; 2) bi-weekly raw water sampling; 3) monthly cleaning, inspections of equipment, testing of the generator, and landscape maintenance; 4) annual inspections of equipment and service of the generator; and 5) road maintenance every 5 years.

It is anticipated that these operations and maintenance activities would also occur with a similar frequency and intensity of activities under existing conditions. In addition, landscape restoration is anticipated to occur over approximately 2 to 5 years; landscape restoration activities would include weeding, monitoring, and installation of irrigation or monthly/biweekly watering, which could require water to be trucked periodically to the site. If nighttime emergency work is required, task lighting that would be installed as part of the Proposed Project as described above would be used. Emergency work could include use of a Vactor truck with vacuum and high-pressure water jetting capabilities for cleaning out sediment from the intake.

Propane for the emergency backup generator would continue to be stored on the site (250-gallon aboveground tank). No other fuels, gas, oil, solvents, petroleum products, etc. would be stored on site. Overall, during operation of the Proposed Project, demand for electricity and water, generation of solid waste and wastewater, and vehicle trips to the site for maintenance would not substantially increase over existing conditions.

Because the majority of sediment in the creek would flow over the screen and not fall through the screen, only a minor amount of sediment is anticipated to fall into the collection chamber within the intake structure (i.e. approximately 97% of entrained sediment would pass over the screen). An adaptive management plan would be developed for the flushing out of the minor amount of sediments that could collect within the intake structure. This plan would be developed in collaboration with applicable resource agencies.

The City would continue to maintain in-stream flow levels established with CDFW pursuant to ongoing agreements and ultimately would maintain the in-stream flow levels established by the Anadromous Salmonid Habitat Conservation Plan that is currently under preparation. As described above, these in-stream flows are intended to protect anadromous salmonids and other species.

3.8 Project Permits and Approvals

In addition to CEQA, the Proposed Project would be subject to compliance and permitting requirements under federal, state, and local regulations. The anticipated agency permits/approvals necessary for the implementation of the Proposed Project are described below.

The City of Santa Cruz is the lead agency and is responsible for approving and implementing the Proposed Project. The Santa Cruz City Council is the decision-making body tasked with certification of the Final EIR, approval of the Proposed Project, and adoption of CEQA findings and the mitigation monitoring and reporting program.

In addition to the City, other public agencies that have review or approval authority of the Proposed Project are outlined below. This Draft EIR is intended to provide the information and environmental analysis necessary to assist state permitting agencies (also known under CEQA as "responsible agencies") in considering the approvals required for the Proposed Project.

- **U.S. Army Corps of Engineers.** Approval of a Clean Water Act Section 404 permit.
- **U.S. Fish and Wildlife Service.** Endangered Species Act Section 7 consultation.
- **State Historic Preservation Office.** National Historic Preservation Act Section 106 consultation.
- **California Central Coast Regional Water Quality Control Board.** Approval of a Clean Water Act Section 401 Water Quality Certification Permit.
- **California Department of Fish and Wildlife.** Approval of a California Fish and Game Code Section 1602 Lake or Streambed Alteration Agreement.
- **CAL FIRE.** Minor conversion permit exemption per (14 CCR Section 1104.1[a]) for removal of trees and replacement with developed uses.
- **County of Santa Cruz.** Approval of a Coastal Development Permit and an encroachment permit and County-approved Traffic Control Plan for ingress to/egress from the site.

Although the project site is located within the unincorporated area of Santa Cruz County, the City is not required to obtain building or grading permits from the County, pursuant to state law. California Government Code Sections 53091(d) and (e) provide that facilities for the production, generation, storage, treatment, or transmission of water supplies are exempt from local zoning and building ordinances.

3.9 References

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4 Environmental Setting, Impacts, and Mitigation Measures

4.1 Introduction to Analysis

This chapter provides a project-level analysis of the physical environmental effects of implementing the Laguna Creek Diversion Retrofit Project (Proposed Project). The following sections within this chapter evaluate the environmental impacts of the Proposed Project:

- 4.2 — Impacts Not Found to Be Significant
- 4.3 — Air Quality
- 4.4 — Biological Resources
- 4.5 — Cultural Resources and Tribal Cultural Resources
- 4.6 — Energy
- 4.7 — Geology and Soils
- 4.8 — Greenhouse Gas Emissions
- 4.9 — Hazards and Hazardous Materials
- 4.10 — Hydrology and Water Quality
- 4.11 — Land Use and Planning
- 4.12 — Noise
- 4.13 — Transportation

4.1.1 Scope of Analyses

4.1.1.1 Section Organization

Each environmental resource section listed above generally has a similar format as described below.

- **Existing Conditions.** This section provides a general overview of the existing physical environmental conditions related to the topic being addressed.
- **Regulatory Framework.** This section describes applicable federal, state, and local, laws and regulations relevant to the environmental resource topic and the Proposed Project.
- **Impacts and Mitigation Measures.** This section identifies thresholds of significance used to evaluate whether an impact is considered significant, based on standards identified in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. In some cases, agency policies and regulations or professional judgment are used to further define CEQA standards of significance.

  This section first presents a discussion of the standards of significance for which no impacts have been identified, if any. The section then evaluates and analyzes project impacts, states the level of significance prior to mitigation, and proposes mitigation measures for significant impacts that would reduce such

impacts, if feasible. A statement regarding the level of significance of each impact after mitigation precedes the mitigation measures for that impact.

Cumulative impacts are discussed in each environmental resource section following the description of the project-specific impacts. The cumulative impact analysis considers the effects of the Proposed Project together with other past, present, or reasonably foreseeable future projects proposed in the project vicinity and region. The cumulative impact analysis is based on the same setting, regulatory framework, and significance thresholds presented for each respective resource topic. Additional mitigation measures may be identified if the analysis determines that the Proposed Project's contribution to a significant cumulative impact would be cumulatively considerable and, therefore, significant. Section 4.1.2, Cumulative Impacts Overview, below describes the assumptions and methodology for assessing cumulative impacts.

4.1.1.2 Significance Determinations

In accordance with CEQA, specifically Public Resources Code Section 21068, a "significant effect on the environment" means a substantial or potentially substantial adverse change in the environment. The significance thresholds used for each environmental resource topic are presented in each section of this chapter immediately before the discussion of impacts. For each impact described, one of the following significance determinations is made:

- **No Impact.** This determination is made if there is no potential that the Proposed Project could affect the resource at issue.
- **Less than Significant.** This determination applies if there is a potential for a limited impact on a resource, but the impact is not significant in accordance with the standard of significance.
- **Less than Significant with Mitigation.** This determination applies if there is the potential for a substantial adverse effect in accordance with the standard of significance, but mitigation is available to reduce the impact to a less-than-significant level.
- **Significant and Unavoidable.** This determination applies to impacts that are significant, and for which there appears to be no feasible mitigation available to substantially reduce the impact.

4.1.2 Cumulative Impacts Overview

The section below presents the CEQA requirements pertaining to the cumulative impacts analysis and the cumulative projects that have been considered in the cumulative impacts analysis presented for each environmental resource topic, at the end of each section in this chapter.

4.1.2.1 CEQA Guidelines Requirements

CEQA Guidelines Section 15130(a) requires that an environmental impact report (EIR) discuss cumulative impacts of a project "when the project's incremental effect is cumulatively considerable." As defined in CEQA Guidelines Section 15355, a cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. Pursuant to CEQA Guidelines Section 15065(a)(3), "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects. Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," the lead agency need not consider the effect significant.

CEQA requires an evaluation of cumulative impacts when they are significant. When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. Furthermore, according to CEQA Guidelines Section 15130 (a)(1), there is no need to evaluate cumulative impacts to which the project does not contribute.

An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus not significant when, for example, a project funds its fair share of a mitigation measure designed to alleviate the cumulative impact. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide detail as great as that provided for the impacts that are attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified project contributes.

CEQA Section 21094(e)(1) states that if a lead agency determines that a cumulative effect has been adequately addressed in a prior environmental impact report, that cumulative effect is not required to be examined in a later EIR. The section further indicates that cumulative effects are adequately addressed if the cumulative effect has been mitigated or avoided as a result of the prior EIR and adopted findings or can be mitigated or avoided by site-specific revisions, imposition of conditions or other means in connection with the approval of the later project (CEQA Section 21094[e][4]).

4.1.2.2 Cumulative Projects and Scope of Analysis

The analysis of cumulative impacts may consider either 1) a list of past, present, and probable future projects producing cumulative impacts or 2) a summary of growth projections contained in an adopted plan that evaluates conditions contributing to cumulative impacts, such as those contained in a General Plan. Projects that are relevant to the cumulative analysis include projects that could:

- Contribute incremental environmental effects on the same resources as, and would have similar impacts to, those discussed in the EIR applicable to the Proposed Project.
- Be located within the defined geographic scope for the cumulative effect. The defined geographic scope is dependent on the environmental resource affected.
- Contribute impacts that coincide with the Proposed Project's impacts during either construction (short-term) or operation (long-term).

This EIR uses a list-based approach for the development of the cumulative projects. Based on the above factors, cumulative projects considered for the analysis include other capital improvement projects planned by the Santa Cruz Water Department (SCWD) that would be located in proximity to the project site or whose impacts would otherwise combine with the impacts of the Proposed Project. Santa Cruz County Planning Department staff were also contacted to determine if other proposed or pending projects are located in proximity to the project site; staff indicated that there are not any substantive proposed or pending development projects on the North Coast (DiSalvo 2020). Cumulative projects are discussed below and summarized in Table 4.1-1 on page 4.1-7.

Santa Cruz Water Department Projects

The SCWD Capital Improvement Program (CIP) includes plans and funding for numerous capital improvement projects, including rehabilitation or replacement projects, upgrades and improvements projects, water supply augmentation components, and water main replacements (SCWD 2020a, 2020b).[1] SCWD is implementing the City Council-adopted recommendations of the Water Supply Advisory Committee for supplemental water supply, which are incorporated in the 2015 Urban Water Management Plan (SCWD 2016), to which some of these projects relate.

A list of CIP projects was reviewed to determine those projects that could potentially contribute incremental environmental effects that would be located within the defined geographic scope for cumulative effects, or otherwise contribute impacts that coincide with the Proposed Project's impacts during either construction (short-term) or operation (long-term). Table 4.1-1 reflects the comprehensive list of capital projects that were reviewed for this EIR and identifies the three projects that are the focus of the cumulative analysis based on that review. Projects that are not the focus of the cumulative analysis are those that are not located in proximity to the project site, are not within the same watershed as the Proposed Project (the Laguna Watershed), and/or their construction periods would not overlap with the construction period for the Proposed Project. These three projects are further described below.

North Coast System Repair and Replacement Project (Phases 4 and 5)

The North Coast System Repair and Replacement Project consists of phased projects to repair or replace significant portions of the North Coast Pipeline, which connects the City's coastal stream sources—Liddell, Laguna, Reggiardo, and Majors—to the City's raw water system at the Coast Pump Station.[2] Prior phases replaced approximately 12,500 feet—nearly all of the pipeline located within the City limits, and focused on the segment of pipe that ran along the High Street corridor to Harvey West/Coast Pump Station. In addition, an 18,500-linear-foot portion of the North Coast pipeline segment along State Route 1, between Scaroni Road to the west of the entrance to Wilder Ranch State Park, was also previously replaced. Future phases, referred to as Phases 4 and 5, include replacements/repairs to the following pipeline reaches: Liddell Pipeline, Laguna Pipeline, Laguna-Liddell Pipeline, Majors Pipeline, and a segment of the North Coast Pipeline from west of the entrance to Wilder Ranch State Park through Moore Creek Preserve to the Westside of Santa Cruz. The Laguna Pipeline and the Laguna-Liddell Pipeline reaches would be within the Laguna Watershed and the Laguna Pipeline reach would partially occur within the project site for the Proposed Project. Construction is planned to occur between 2025 and 2027.

Santa Cruz Water Rights Project

The SCWD is proposing changes to its existing water rights through the Santa Cruz Water Rights Project (SCWRP) to address key issues needed to improve the City's water system flexibility while enhancing stream flows for local anadromous fisheries, particularly for Central California Coast coho salmon, a federally and state-listed endangered species, and Central California Coast steelhead, a federally listed threatened species. An Initial Study and Notice of Preparation for an EIR were issued for the project on October 15, 2018 and new change petitions were filed with the State Water Resources Control Board in August 2020. The EIR is anticipated to be completed by mid-2021. The SCWRP includes:

[1] Projects under this program are independent and separate from the Proposed Project and would undergo their own environmental review prior to their approval and implementation.

[2] A condition assessment and basis of design was completed in 2005. A Program EIR was prepared in 2005 (SCWD 2005) and preferred alignments were selected as part of the EIR certification by City Council in October 2005.

1. Water rights modifications:
    a. Expanding the authorized places of use of the City's pre-1914 and post-1914 appropriative water rights to include the City's full service area, two local groundwater basins, and the service areas of neighboring water agencies, including Soquel Creek Water District, Scotts Valley Water District, San Lorenzo Valley Water District, and Central Water District.
    b. Explicitly authorizing direct diversion as a method of diversion under the City's Newell Creek License and Felton Permits, which is not explicitly authorized under the current license and permits.
    c. Adding the City's existing Beltz system as points of rediversion into and out of groundwater storage to the City's Tait Licenses and Felton Permits, and adding the Tait Diversion as a new point of diversion for the Felton Permits, which would provide the ability to divert water under the Felton Permits with or without activation of the Felton Diversion inflatable dam.
    d. Adding an Underground Storage Supplement to the City's Tait Licenses and Felton Permits to allow for the City's Beltz system aquifer storage and recovery component (see below).
    e. Granting an extension of time of 25 years to beneficially use water allowed under certain City water rights permits.
    f. Modifying City water rights to include minimum bypass flows as negotiated with state and federal resource agencies to protect fisheries (Agreed Flows).
2. Water supply augmentation components:
    a. City aquifer storage and recovery
    b. Beltz System aquifer storage and recovery
    c. Water transfers and exchanges and intertie improvements
3. Surface water diversion improvements:
    a. Felton Diversion fish passage improvements
    b. Tait Diversion and Coast Pump Station improvements

The SCWRP would commit the City to maintaining minimum bypass flows, including at the Facility, as indicated in 1(f) above. No construction or development within the Laguna Watershed is proposed as part of the SCWRP. No change is proposed to the volume of water that can be diverted at the Facility under the City's existing water rights; however, as indicated above, minimum bypass flows would be maintained and therefore diversion volumes would be significantly lower than under historical operational conditions.

Habitat Conservation Plans

Since 2001, SCWD has been developing two Habitat Conservation Plans (HCPs)[3], one pertaining to anadromous salmonids[4] with the National Marine Fisheries Service and one pertaining to other listed species[5] with the U.S. Fish

[3] A HCP is prepared under Section 10 of the Federal Endangered Species Act by nonfederal parties seeking to obtain a permit for incidental take of federally listed fish and wildlife species. A HCP can also form the basis for an application for incidental take of state-listed species under Section 2081 of the California Endangered Species Act. A HCP includes descriptions of likely impacts to the subject species and the steps an applicant will take to avoid, minimize, and mitigate such impacts.

[4] The anadromous salmonids covered by the ASHCP include Central California Coast coho salmon (coho salmon) (*Oncorhynchus kisutch*), a state- and federally listed endangered species, and the Central California Coastal steelhead (steelhead) (*Oncorhynchus mykiss*), a federally listed threatened species.

[5] Listed species covered by the other HCP include Ohlone tiger beetle (*Cicindela ohlone*), a federally listed endangered species; Mount Hermon June beetle (*Polyphylla barbata*), a federally listed endangered species; tidewater goby (*Eucyclogobius newberryi*),

and Wildlife Service (USFWS). The HCPs will provide for California Endangered Species Act and Federal Endangered Species Act compliance for SCWD's ongoing operations that may affect special-status species. For the Anadromous Salmonid HCP (ASHCP) being developed with the National Marine Fisheries Service, the preliminary draft chapters and permit applications were submitted to the agencies for review in late spring 2019 and the administrative draft was submitted for agency review in summer of 2020. Initiation of environmental review for the ASHCP and associated permit applications is expected to commence in fiscal year 2021 with the goal of completing the permit process by late 2022 or early 2023. For the multiple species operations and maintenance HCP being developed with the USFWS, a draft of the HCP has been submitted to the USFWS, and environmental review is expected to commence in fiscal year 2021.

Like the SCWRP, the ASHCP would also commit the City to maintaining minimum bypass flows for anadromous fisheries, including at the Facility. The conservation strategies of both HCPs are designed to avoid, minimize, and fully mitigate the effects of the City's "Covered Activities" on "Covered Species" and their habitat in support of the long-term viability of these populations within streams and habitats affected by the Covered Activities.[6] In particular, the biological goals and objectives of the ASHCP includes: (1) the minimum bypass flows noted above; (2) creating, restoring or enhancing aquatic habitat including removal of passage obstacles, placement of large wood structures, riparian conservation easements, spawning gravel augmentation, riparian restoration, and sediment control projects; (3) avoiding, minimizing and fully mitigating effects from City operations and maintenance activities by implementing ramping rates during flow changes at diversions to limit flow reductions, by reducing the introduction of sediment, by upgrading diversion facilities on Laguna (the Proposed Project), Reggiardo and Majors Creek (see Table 4.1-1) to provide sediment transport during high flows to avoid pulsing of sediment to downstream habitat, and by enhancing fish passage through the Felton and Tait Diversions (included in the SCWRP).

The only construction that the biological goals and objectives of the ASHCP anticipate in the Laguna Watershed is the Proposed Project and upgrading the Reggiardo Diversion. The ASHCP includes diversion improvements in the Laguna Watershed at the Facility and at the Reggiardo Diversion as a biological objective associated with operating facilities to enable unimpaired sediment transport dynamics and allow more timely, accurate, and precise adjustments of water diversion. Specifically, the draft ASHCP calls for modifying the Laguna Facility and the Reggiardo Diversion within 10 years of the signed Incidental Take Permit to provide improved sediment transport during high flows. The Proposed Project is intended to meet this biological objective as it relates to the Laguna Diversion.

Unlike the ASHCP, the operations and maintenance HCP being developed with the USFWS does not include construction projects that improve habitat conditions. The biological goals and objectives and conservation measures include restoring habitat temporarily disturbed by Covered Activities, contributing to protected and managed lands that support populations of Covered Species, pursing conservation actions that will result in conservation benefits to Covered Species, and implementing general and species-specific minimization and best management practices.

a federally listed endangered species; Pacific lamprey (*Lampetra tridentata*), a species not currently listed under the Endangered Species Act; California red-legged frog (*Rana draytonii*), a federally listed threatened species; western pond turtle (*Actinemys marmorata*), a federal species of concern; Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*), a federally listed endangered species; Robust spineflower (*Chorizanthe robusta* var. *robusta*), a federally listed endangered species; Santa Cruz tarplant (*Holocarpha macradenia*), a federally listed threatened species; and San Francisco popcornflower (*Plagiobothrys diffuses*), a state-listed endangered species.

6 The Covered Activities include operation, maintenance and rehabilitation of the City's water supply and water system facilities, including surface water diversions; operation and maintenance of the City's municipal facilities; and management of City lands.

Given that the conservation strategies of the HCPs are being designed to avoid, minimize, and fully mitigate the effects of the City's activities on listed species and that the only construction projects identified in the Laguna Watershed in the HCPs is the Proposed Project and upgrading the Reggiardo Diversion, the cumulative analysis in the EIR related to these HCPs focuses on the Reggiardo Diversion upgrade.

The City has one other low-effect HCP and related Incidental Take Permit covering the Mount Hermon June beetle, Zayante band-winged grasshopper, and the Ben Lomond spineflower at the Graham Hill Water Treatment Plant (City of Santa Cruz 2013). This HCP has been implemented since 2013 and it includes establishment of a permanent 17-acre preserve in the Laguna Watershed, which serves as off-site mitigation for Mount Hermon June beetle (see Figure 3-1 in Chapter 3, Project Description). This preserve is in place and is being managed by the City under a Habitat Management and Monitoring Plan for the Laguna Sandhills Preserve (SCWD 2014). Ongoing management activities are intended to protect and preserve habitat at the preserve and would not contribute to cumulative impacts. Therefore, this preserve and its Habitat Management and Monitoring Plan are not further evaluated in the cumulative analysis.

Table 4.1-1. City of Santa Cruz Water Program Capital Improvement Projects

CIP No.	Project Name	Project Description	Estimated Construction Schedule
Projects Considered in Cumulative Analysis			
2.1	North Coast System Repair and Replacement Project (Phases 4 and 5)	The City diverts water from several north coast streams to the North Coast Pipeline. Phases 4 and 5 of the North Coast System Repair and Replacement Project consist of replacements/repairs to the following pipeline reaches: Liddell Pipeline, Laguna Pipeline, Laguna-Liddell Pipeline, Majors Pipeline, and a segment of the North Coast Pipeline from west of the entrance to Wilder Ranch State Park through Moore Creek Preserve to the Westside of Santa Cruz. The Laguna Pipeline and the Laguna-Liddell Pipeline reaches would be within the Laguna Watershed and the Laguna Pipeline reach would partially occur within the project site for the Proposed Project.	2025-2027
1.3 1.4 3.3 3.4 7.1	Santa Cruz Water Rights Project (includes Felton Diversion and Tait Diversion and Coast Pump Station upgrades, and aquifer storage and recovery in Mid-County and Santa Margarita Groundwater Basins)	The SCWD is proposing changes to its existing water rights through the SCWRP to address key issues needed to improve the City's water system flexibility while enhancing stream flows for local anadromous fisheries, particularly for Central California Coast coho salmon, a federally listed endangered species, and Central California Coast steelhead, a federally listed threatened species. This project also includes infrastructure upgrades at the Felton and Tait Diversions and Coast Pump Station, aquifer storage and recovery in Mid-County and Santa Margarita Groundwater Basins, and water transfers and exchanges with neighboring water agencies and associated intertie facilities.	2021-2030
7.2	Habitat Conservation Plans	Two HCPs under development: anadromous species (National Marine Fisheries Service) and operations and maintenance (U.S. Fish and Wildlife Service).	Not applicable

Table 4.1-1. City of Santa Cruz Water Program Capital Improvement Projects

CIP No.	Project Name	Project Description	Estimated Construction Schedule
Projects Reviewed but not Focused on in Cumulative Analysis[1]			
1.2	North Coast System Majors Diversion Rehab	To improve the performance, increase structural integrity, and ease operation and maintenance requirements at the Majors Creek Diversion to regain full use of the asset.	2027-2030
1.5	Newell Creek Dam Inlet/Outlet Replacement Project	The Newell Creek Dam was constructed in the 1960s. A pipeline runs through the base of the dam to deliver water to the reservoir from Felton Diversion and from the reservoir to the Graham Hill Water Treatment Plant. The pipeline is reaching the end of its design life and will be replaced along with all related infrastructure. This project is being implemented with oversight by the Division of Safety of Dams and, having demonstrated compliance with existing seismic regulations, is strictly addressing rehabilitation and replacement issues. CEQA and permitting were completed in 2019 and 2020.	2020-2023
2.2	Newell Creek Pipeline Rehab/Replacement	Rehabilitate or replace the Newell Creek Pipeline between Felton Diversion, Loch Lomond Reservoir, and Graham Hill Water Treatment.	2022-2028
4.1	Graham Hill Water Treatment Plant Tube Settlers Replacement	Design and replacement of tube settlers and related appurtenances. As part of the project, the tube settlers for three basins will be replaced-in-kind and will also include the replacement of associated valves and piping, and making concrete crack repairs in the basins.	2019-2021
4.2	Graham Hill Water Treatment Plant Flocculator Rehab/Replacement	Design and repair or replacement of aging paddle wheel flocculators at the Graham Hill Water Treatment Plant. A condition assessment and alternatives analysis will be performed to determine the best path forward considering cost, schedule, and operations.	2020-2021
4.3	Graham Hill Water Treatment Plant Concrete Tanks Project	Infrastructure improvements to the Graham Hill Water Treatment Plant are necessary to meet regulatory requirements, improve operations and increase overall reliability. The design phase of this project is nearly complete for the replacement of the Filtered Water Tank, Wash Water Reclamation Tank (Reclaim Tank), and Sludge Storage Tank.	2020-2024
4.4	Graham Hill Water Treatment Plant Facility Improvement Plan	Process improvements to the Graham Hill Water Treatment Plant are necessary to meet regulatory requirements, improve operations and increase overall system reliability. This project currently includes condition assessments, alternatives analyses, preliminary designs and preparation of a Facilities Improvement Project report. Final design and construction services are future phases included in this project.	2023-2028

Table 4.1-1. City of Santa Cruz Water Program Capital Improvement Projects

CIP No.	Project Name	Project Description	Estimated Construction Schedule
4.5	River Bank Filtration Study	This project assesses the feasibility of locating new riverbank filtration wells along the San Lorenzo River near two different existing surface water diversions: Tait Street and Felton. If found feasible, locations and design parameters for installation of vertical or horizontal wells would be recommended. Construction would be scheduled and budgeted in future years.	2023-2028
6.1	University Tank No. 4 Rehab/Replacement	Perform engineering analysis and condition assessment of the aging University 4 tank and associated piping to ensure reliable service. Project will include condition assessment, design, acquisition of construction easements from the University of California, Santa Cruz, permitting, and construction.	2023-2025
CIP2	Main Replacements	Recurring program to replace distribution system water mains, identified and prioritized based on maintaining water system reliability, delivering adequate fire flows, improving circulation and water quality, and reducing maintenance costs.	To be determined
CIP3	Beltz 10 and 11 Rehab and Development	This project involves the rehabilitation of Beltz 10 (an existing groundwater production well) and the conversion of an existing monitoring well to a production well (Beltz 11). This project will shift pumping to different geologic layers of the basin.	To be determined

Source: SCWD 2020a, 2020b.

Notes: CEQA = California Environmental Quality Act; CIP = Capital Improvement Program; HCP = Habitat Conservation Plan; SCWD = Santa Cruz Water Department; SCWRP = Santa Cruz Water Rights Project.

[1] These projects are not located in proximity to the project site, are not within the Laguna Watershed, and/or the construction periods would not overlap with the construction period for the Proposed Project; therefore, they were not considered in the cumulative analysis.

4.1.3 References

City of Santa Cruz. 2013. *Low-Effect Habitat Conservation Plan for the Issuance of an Incidental Take Permit Under Section 10(a)(1)(B) of the Endangered Species Act for the Federally Endangered Mount Hermon June Beetle Zayante Band Winged Grasshopper and Ben Lomond Spineflower for the City of Santa Cruz Graham Hill Water Treatment Plant Operations, Maintenance, and Construction Activities.* Prepared by Ebbin, Moser + Skaggs LLP and Richard A. Arnold, Ph.D. June 2013.

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SCWD. 2014. *Habitat Management and Monitoring Plan for the Laguna Sandhills Preserve.* Prepared by Jodi McGraw Consulting. December 30, 2014.

SCWD. 2016. *City of Santa Cruz 2015 Urban Water Management Plan.* August 2016.

SCWD. 2020a. *Water Department CIP.* Fiscal Years 2020-2024.

SCWD. 2020b. "Capital Improvement Program." Accessed August 19, 2020 at https://www.cityofsantacruz.com/government/city-departments/water/engineering/santa-cruz-water-program.

4.2 Impacts Not Found to be Significant

CEQA Guidelines Section 15128 requires that an environmental impact report (EIR) contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. For this EIR, issues related to aesthetics, agriculture and forestry resources, mineral resources, population and housing, public services, recreation, utilities and service systems, and wildfire were found not to be significant, as discussed below.

4.2.1 Aesthetics

Scenic Vistas. The project site contains the existing Laguna Creek Diversion Facility (Facility), which consists of a masonry dam and associated infrastructure such as the diversion flume, a control building, and access roads. The County of Santa Cruz General Plan/Local Coastal Program (LCP) indicates that visual and scenic resource areas are defined as areas having regional public importance for their natural beauty or rural agricultural character, including but not limited to, ocean views, agricultural fields, wooded forests, open meadows, mountain hillside views, and unique hydrologic, geologic, and paleontological features (County of Santa Cruz 2020a). While the project site is located in a wooded (redwood) forest and is in an area identified as "scenic" in the County's Geographic Information System, public views of the site are limited to views from Smith Grade of dense forest along the road. The entrances to the site—unimproved access roads with gates and fencing—are also visible from Smith Grade.

The Proposed Project would entail retrofitting the existing dam, which is set back from the road, and may also include limited tree removal to accommodate road improvements to facilitate access to the site for construction equipment. Once complete, these project modifications would not likely be visible from Smith Grade or otherwise have a negative impact on the scenic views or characteristics along Smith Grade near the site. Therefore, the Proposed Project would have a less-than-significant impact on scenic views and vistas.

Scenic Roads/Resources. There are no state-designated scenic highways within the project vicinity. However, Smith Grade is identified as a County-designated scenic road in the General Plan/LCP (County of Santa Cruz 2020a). Public views of the project site from Smith Grade are limited due to dense tree cover. As described above, the existing unimproved access roads and Facility fencing and gates are visible from Smith Grade. The Proposed Project may entail limited tree removal to accommodate road improvements to facilitate access to the site for construction equipment. As indicated above, once complete the project modifications, including tree removal, would not likely be visible from Smith Grade or otherwise have a negative impact on the scenic resources along Smith Grade near the site. Therefore, the Proposed Project would have a less-than-significant impact on scenic resources within a scenic road.

Visual Character. The project site contains diversion infrastructure amid a redwood forest. Project-related improvements would consist of upgrades to diversion infrastructure at the existing Facility, which would be similar in character to the existing Facility. As described above, public views of the project site are limited due to dense tree cover. The majority of the project site is not visible to the public. Improvements to existing access roads, which are partially visible from Smith Grade leading into the site, would be similar to the existing visual character and would be consistent with the existing use of the site as a diversion facility. Therefore, the Proposed Project would have a less-than-significant impact on visual character or quality of the site.

Light and Glare. During construction, the Proposed Project would not create a substantial new source of light or glare as no nighttime construction work would occur and therefore nighttime lighting would not be required. During operations, the Proposed Project would include new lighting to provide for nighttime safety during emergency work.

This new lighting would be on project components that are set back from Smith Grade and would be on timers and switches to providing lighting only during emergency work. The Proposed Project would generally continue the existing operations on the project site and would not create a substantial new source of light or glare. Therefore, the Proposed Project would have a less-than-significant impact related to light or glare.

See Section 4.4, Biological Resources, for a discussion of the potential impact of new nighttime lighting on special-status wildlife.

4.2.2 Agriculture and Forestry Resources

Agricultural Land. No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance is located on or near the project site. The project site and surrounding land are mapped as "Other Land" by the California Department of Conservation's Farmland Mapping and Monitoring Program (California Department of Conservation 2016). The project site is not zoned for agricultural use. Additionally, neither the project site nor surrounding land is within a Williamson Act contract (County of Santa Cruz 2020b). Therefore, the Proposed Project would not result in the conversion of agricultural land or conflict with agricultural zoning.

Forestland. The project site is zoned Timber Production (TP) and is located in a heavily forested area. Local zoning ordinances are not applicable to the Proposed Project pursuant to California Government Code Section 53091(e), which provides that facilities for the production, generation, storage, treatment, and transmissions of water supplies are exempt. Nevertheless, the Proposed Project would be considered an allowed use (utilities) under Santa Cruz County Code Section 13.10.372(B) and would not conflict with TP zoning. The Proposed Project also meets the definition of a "Compatible Use" under California Government Code Section 51104(h), which includes "the erection, construction, alteration, or maintenance of gas, electric, water, or communication transmission facilities." The Proposed Project does not include rezoning of forestland or timberland, as defined. Therefore, the Project would not conflict with existing zoning or result in rezoning related to forest lands.

The proposed removal of up to 14 trees, including redwoods, would constitute a Minor Conversion as defined in Chapter 16.52.195 of the Santa Cruz County Code. Minor Conversion permits are administered by the California Department of Forestry and Fire Protection (CAL FIRE; 14 California Code of Regulations [CCR] Section 1104[a][4]). As such, a tree inventory and protection plan has been developed for the Proposed Project and would require a minor conversion permit exemption prior to tree removal.

It is anticipated that a less than 3-acre conversion exemption (14 CCR Section 1104.1[a]) approved by CAL FIRE would be required to remove these redwood trees. Timber operations conducted under an exemption are exempt from conversion permit and timber harvesting plan requirements of the California Forest Practice Rules, although they are still required to comply with all other applicable provisions of the Z'berg-Nejedly Forest Practice Act, regulations of the Board of Forestry, and currently effective provisions of county general plans, zoning ordinances and any implementing ordinances. Although the Proposed Project would result in limited tree removal subject to the CAL FIRE permit process, it would not result in rezoning of forest land to non-forest use or the conversion of forest land to non-forest uses, as the forest canopy and forest land functions on the project site would be retained. Therefore, impacts related to loss or conversion of forest land would be less than significant.

See Section 4.4, Biological Resources, for additional detail regarding forestry resources.

4.2.3 Mineral Resources

The California Geological Survey is responsible for classifying land into Mineral Resource Zones (MRZs) under the Surface Mining Control and Reclamation Act. There are no areas classified by the State Geologist and designated by the State Mining and Geology Board as Regionally or Statewide Significant Mineral Resource Areas or areas classified by the State as MRZ-2 Zones (i.e., areas containing significant mineral deposits) on or adjacent to the project site (County of Santa Cruz 2020c). Therefore, the Proposed Project would have no impact on known or locally important mineral resources.

4.2.4 Population and Housing

The Proposed Project would consist of modifications to existing infrastructure and associated improvements at the existing Facility. No residential land uses are located on the project site and the Proposed Project would not include any new residential land uses or displace existing housing or people. Although the Proposed Project would generate a limited number of short-term construction jobs, these jobs could be accommodated within the regional workforce and would not require substantial relocation of workers for these jobs. The Proposed Project would not result in changes to permanent employment. The Proposed Project would not extend roads or other infrastructure or procure additional water supplies, and therefore, would not include activities that could result in indirect population growth. Therefore, the Proposed Project would have no impact on population and housing.

4.2.5 Public Services

The construction of the Proposed Project would occur over a limited duration of approximately 3 months and have a crew of approximately 5 workers and up to 10 workers during certain activities. Any temporary demand for services during construction could be accommodated by existing facilities and services and would not require new or physically altered public service facilities. The operation of the Proposed Project would not entail new land uses or activities that would generate additional demand for public services. As described above, the Proposed Project would not include residences or businesses and associated population or employees on site. Given that, the Proposed Project would not result in the need for new or physically altered public service facilities in order to maintain acceptable service ratios, response times, or other public service performance objectives. Therefore, the Proposed Project would have a less-than-significant impact on public services.

See also Section, 4.9, Hazards and Hazardous Materials, for discussion related to wildfire hazards.

4.2.6 Recreation

The Proposed Project would not involve the construction of parks or recreational facilities, would not create a need for the construction or expansion of recreational facilities, and would not increase the use of existing recreational facilities such that substantial deterioration would occur. The Proposed Project would not include new residences or permanent employment; therefore, there would be no population increase that could generate increased demand for or use of parks and recreational facilities as a result of the Proposed Project. Furthermore, the project site is private property, is fenced, and is not open to the public for recreational uses. Therefore, the Proposed Project would have no impact on parks and recreational facilities.

4.2.7 Utilities and Service Systems

The Proposed Project would involve improvements to existing water supply facilities and infrastructure. The Proposed Project would not increase demand for electricity and water, as well as generation of wastewater or stormwater, and no change in the number of residences or permanent employment would occur with implementation of the Proposed Project.

Construction activities would generate solid waste. Excavation during construction would generate spoils, some of which would be reused on the project site as fill material. It is estimated that approximately 30 cubic yards of spoils may require off-site disposal. Spoils that could not be accommodated on the project site would be hauled to the City of Santa Cruz Resource Recovery Facility (landfill) at 650 Dimeo Lane in Santa Cruz, located approximately 10 miles from the project site. Based on the most recent facility capacity evaluation in May 2017, the landfill had a remaining capacity of approximately 4.8 million cubic yards and an estimated closure date of January 2058 (CalRecycle 2019). Therefore, the City's landfill would have adequate capacity to serve the Proposed Project and impacts would be less than significant.

4.2.8 Wildfire

The project site is located within a state responsibility area and CAL FIRE has designated the project site and surrounding area as a High Fire Hazard Severity Zone (CAL FIRE 2007). The Proposed Project would include upgrades to an existing dam and associated infrastructure. Construction and operation of the Proposed Project would not exacerbate wildfire risks or include habitable structures that could expose people or structures to wildfire. The Proposed Project would not include drainage changes or other features that could exacerbate wildfire risk or wildfire-related hazards such as flooding or landslides. The Proposed Project would not interfere with emergency response or evacuation in the event of a wildfire, as no change in public roadways or access would occur as part of the Proposed Project. Therefore, the Proposed Project would have a less-than-significant impact related to wildfire.

See also Section, 4.9, Hazards and Hazardous Materials, for an additional discussion of hazards related to wildfire and Section 4.13, Transportation, for a discussion of emergency access and response.

4.2.9 References

CAL FIRE (California Department of Forestry and Fire Protection). 2007. *Santa Cruz County Fire Hazard Severity Zones in SRA*. November 7, 2007. Accessed April 23, 2020 at https://osfm.fire.ca.gov/media/6768/fhszs_map44.pdf.

California Department of Conservation. 2016. Farmland Mapping and Monitoring Program. *Santa Cruz County Important Farmland 2016*. Accessed May 11, 2020 at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/scr16.pdf.

CalRecycle. 2019. SWIS Facility Detail: City of Santa Cruz Resource Recovery Center (44-AA-0001). Accessed April 23, 2020 at https://www2.calrecycle.ca.gov/swfacilities/Directory/44-AA-0001/.

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4.3 Air Quality

This section describes the existing air quality conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on air quality modeling conducted for the Proposed Project, as part of the preparation of this environmental impact report (EIR). The results of the air modeling are summarized in this section, and are included in Appendix B.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to air quality.

4.3.1 Existing Conditions

4.3.1.1 Meteorological and Topographical Conditions

The project site is in the North Central Coast Air Basin (Air Basin), which encompasses an area of 5,159 square miles and consists of Monterey, Santa Cruz, and San Benito counties. The northwest sector of the Air Basin is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary and, together with the southern extent of the Santa Cruz Mountains, forms the Santa Clara Valley, which extends into the northeastern tip of the Air Basin. Farther south, the Santa Clara Valley merges into the San Benito Valley, which extends northwest–southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at the northwest end to King City at the southeast end. The western side of the Salinas Valley is formed by the Sierra de Salinas, which also forms the eastern side of the smaller Carmel Valley. The coastal Santa Lucia Range defines the western side of the valley (MBARD 2008). This series of mountain ranges and valleys influences the dispersion of criteria air pollutants through the Air Basin.

The semi-permanent Pacific High pressure cell in the eastern Pacific Ocean is the basic controlling factor in the climate of the Air Basin. In the summer, the Pacific High pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High pressure cell forming a stable temperature inversion of hot air over a cool coastal layer of air. As the air currents move onshore, they pass over cool ocean waters and bring fog and relatively cool air into the coastal valleys. The warmer air above acts as a lid to inhibit vertical air movement.

During the summer, the generally northwest–southeast orientation of mountainous ridges tends to restrict and channel the onshore air currents. Elevated ground-surface temperatures in the interior portion of the Salinas and San Benito valleys create a weak low pressure area that intensifies the onshore air flow during the afternoon and evening. In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay Area or the Central Valley into the Air Basin. During the winter, the Pacific High migrates southward and has less influence on the Air Basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant

in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually results in good air quality for the Air Basin in winter and early spring (MBARD 2008).

4.3.1.2 Pollutants and Effects

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The national and California standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.[1]

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and reactive organic gases (ROGs, also termed volatile organic compounds or VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (ground-level O_3). [2] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Inhalation of O_3 causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in and cause shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies of O_3's effects on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons

[1] The descriptions of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (EPA 2018a) and the CARB's Glossary of Air Pollutant Terms (CARB 2019a).

[2] The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2019b).

Nitrogen Dioxide and Oxides of Nitrogen. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x, which includes NO_2 and nitric oxide, plays a major role, together with ROG, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources of NO_x are transportation and stationary fuel combustion sources (such as electric utility and industrial boilers).

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards (AAQS) for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher levels of exposure compared to children with lower exposure levels. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2019c).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, light-headedness, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2019d).

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure, compared with the non-asthmatic population. Effects at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 part per million [ppm]) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. The elderly and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2019e).

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (NRC 2005). People with asthma are of particular concern, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow resistance is greater than in healthy people, and it increases with the severity of their asthma (NRC 2005). SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides, NO_x, and ROG.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. PM_{10} tends to collect in the upper portion of the respiratory system, whereas $PM_{2.5}$ is small enough to penetrate deeper into the lungs and damage lung tissue. Suspended particulates also produce haze and reduce regional visibility and damage and discolor surfaces on which they settle.

A number of adverse health effects have been associated with exposure to both $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24-hour duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all of the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and worldwide

based on the World Health Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2017).

Long-term exposure (months to years) to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (CARB 2017).

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere and can result in respiratory impairment, as well as reduced visibility.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above.

Reactive Organic Gases. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as ROGs (also referred to as VOCs). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of ROGs result from the formation of O_3 and its related health effects. High levels of ROGs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for ROGs as a group.

Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the California State Legislature (Legislature) in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples of TACs include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic

effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2019f). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known carcinogenic organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2019f). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (17 California Code of Regulations [CCR] Section 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars; and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2019f). Those most vulnerable to non-cancer health effects are children, whose lungs are still developing, and the elderly, who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. In a phenomenon known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

4.3.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. The term "sensitive receptors" is used to refer to facilities and structures where people who are sensitive to air pollution live or spend considerable amounts of time. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005).

As described in Chapter 3, Project Description, the project site is surrounded predominantly by undeveloped, heavily forested land, with scattered, low-density residential development to the east, south, and west. The nearest sensitive receptor to the project site is a residence approximately 100 feet to the south of the site, across Smith Grade.

4.3.2 Regulatory Framework

4.3.2.1 Federal

Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants (HAPs) to protect public health and welfare. HAPs include certain VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

4.3.2.2 State

Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. As stated previously, an ambient air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. For each pollutant, concentrations must be below the relevant CAAQS before an air basin can attain the corresponding CAAQS. Air quality is considered in attainment if pollutant levels are continuously below the CAAQS and violate the

standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

California air districts have based their thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date that attainment will be achieved in the Air Basin for the NAAQS or CAAQS. Thresholds established by air districts are protective of human health, as they are based on attainment of the ambient air quality standards, which reflect the maximum pollutant levels in the outdoor air that would not result in harm to the public's health. Table 4.3-1 presents the NAAQS and CAAQS.

Table 4.3-1. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 µg/m^3)	—	Same as Primary[f]
	8 hours	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)[f]	
NO_2	1 hour	0.18 ppm (339 µg/m^3)	0.100 ppm (137 µg/m^3)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
SO_2	1 hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)[h]	—
	3 hours	—	—	0.5 ppm (1,300 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}	24 hours	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m^3	—	
$PM_{2.5}$	24 hours	—	35 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3 [i]	15.0 µg/m^3
Lead	30-day Average	1.5 µg/m^3	—	
	Calendar Quarter	—	1.5 µg/m^3 (for certain areas)[k]	
	Rolling 3-Month Average	—	0.15 µg/m^3	
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)	—	—
Vinyl Chloride	24 hours	0.01 ppm (26 µg/m^3)[j]	—	—
Sulfates	24 hours	25 µg/m^3	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	—	

Source: CARB 2016.
Notes: ppm = parts per million by volume; µg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter.

Table 4.3-1. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	*Primary*[c,d]	*Secondary*[c,e]

[a] California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in 17 CCR Section 70200.

[b] National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] On October 1, 2015, the primary and secondary NAAQS for O_3 were lowered from 0.075 ppm to 0.070 ppm.

[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated non-attainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The state's TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. In 1987, the Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment Program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several airborne toxic control measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR Section 2449 et seq.), In-Use On-Road Diesel-Fueled Vehicles (13 CCR Section 2025), and Limit Diesel-Fueled Commercial Motor Vehicle Idling (13 CCR Section 2485).

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property (Health and Safety Code Section 41700). This section also applies to sources of objectionable odors.

4.3.2.3 Regional

Monterey Bay Air Resources District

The Monterey Bay Air Resources District (MBARD) is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the Air Basin, where the Proposed Project is located. The MBARD operates monitoring stations in the Air Basin, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The MBARD's Air Quality Management Plans (AQMPs) include control measures and strategies to be implemented to attain CAAQS and NAAQS in the Air Basin. The MBARD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

Air Quality Management Plan. The 1991 AQMP for the Air Basin was the first plan prepared in response to the California Clean Air Act of 1988, which established specific planning requirements to meet the O_3 standard. The California Clean Air Act requires that the AQMP be updated every 3 years. The most recent update is the *2012–2015 Air Quality Management Plan* (2012–2015 AQMP), which was adopted in March 2017, and is an update to the elements included in the 2012 AQMP. The primary elements updated from the 2012 AQMP are the air quality trends analysis, emission inventory, and mobile source programs.

The Air Basin is a non-attainment area for the CAAQS for both O_3 and PM_{10}. The AQMP addresses only attainment of the O_3 CAAQS. Attainment of the PM_{10} CAAQS is addressed in the MBARD's *2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region* (Particulate Matter Plan), which was adopted in December 2005 and is summarized further below. Maintenance of the 8-hour NAAQS for O_3 is addressed in MBARD's *2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region* (Federal Maintenance Plan), which was adopted in March 2007 and is also summarized below.

A review of the air monitoring data for 2013 through 2015, from the most recent AQMP, indicates that there were fewer exceedance days compared to previous periods (MBARD 2017). The long-term trend shows that progress has been made toward achieving O_3 standards. The number of exceedance days has continued to decline during the past 10 years despite population increases. The MBARD's 2012 to 2015 AQMP identifies a continued trend of declining O_3 emissions in the Air Basin primarily related to lower vehicle miles traveled (VMT). Therefore, the MBARD determined progress was continuing to be made toward attaining the 8-hour O_3 standard during the 3-year period reviewed (MBARD 2017).

Federal Maintenance Plan. The Federal Maintenance Plan (May 2007) presents the strategy for maintaining the NAAQS for O_3 in the Air Basin. It is an update to an earlier maintenance plan (1994) that was prepared for maintaining the 1-hour NAAQS for O_3 and has since been revoked and superseded by the current 8-hour O_3 standard. Effective June 15, 2004, the EPA designated the Air Basin as an attainment area for the 8-hour NAAQS for O_3. The plan includes an emission inventory for the years 1990 to 2030 for ROG and NO_x, the two primary O_3 precursor gases. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (MBARD 2007).

Particulate Matter Plan. The purpose of the Particulate Matter Plan (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction with local air pollution control districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (MBARD 2005). The Particulate Matter Plan's proposed activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the MBARD's smoke management and emission-reduction incentive programs.

Rules and Regulations. The MBARD establishes and administers a program of rules and regulations to attain and maintain state and national air quality standards and regulations related to TACs. Rules and regulations that may apply to the Project during construction and/or operations include the following:

- Regulation IV (Prohibitions), Rule 400 (Visible Emissions). This rule provides limits for visible emissions for sources within the MBARD jurisdiction.
- Regulation IV (Prohibitions), Rule 402 (Nuisances). This rule establishes a prohibition against sources creating public nuisances while operating within the MBARD jurisdiction.
- Regulation IV (Prohibitions), Rule 403 (Particulate Matter). This rule provides particulate matter emissions limits for sources operating within the MBARD jurisdiction.
- Regulation IV (Prohibitions), Rule 424 (National Emission Standards for Hazardous Air Pollutions). This rule is to provide clarity on the MBARD's enforcement authority for the National Emission Standards for Hazardous Air Pollution including asbestos from demolition.
- Regulation IV (Prohibitions), Rule 425 (Use of Cutback Asphalt). This rule establishes VOC emissions limits associated with the use of cutback and emulsified asphalts.
- Regulation IV (Prohibitions), Rule 426 (Architectural Coatings). This rule establishes VOC emissions limits associated with the use of architectural coatings.

4.3.2.4 Air Quality

North Central Coast Air Basin Attainment Designations

Pursuant to the 1990 federal Clean Air Act amendments, the EPA classifies air basins (or portions thereof) as "attainment" or "non-attainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as attainment for that pollutant. If an area exceeds the standard, the area is classified as non-attainment for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to meet the standard despite a lack of monitoring data. Areas that achieve the standards after a non-attainment designation are redesignated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards. Similar to the federal Clean Air Act, the California Clean Air Act, designated areas as attainment or non-attainment, but based on CAAQS rather than the NAAQS. Table 4.3-2 identifies the current attainment status of the Air Basin, including the project site, with respect to the NAAQS and CAAQS, and the attainment classifications for the criteria pollutants; the Air Basin is designated as a non-attainment area for the state O_3 and PM_{10} standards. The Air Basin is designated as unclassified or attainment for all other state and federal standards (EPA 2018b; CARB 2018b). Since the Air Basin has met all federal AAQS, it is no longer subject to federal conformity requirements (MBARD 2008).

Table 4.3-2. North Central Coast Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification
National Standards		
O_3	8 hours	Unclassifiable/Attainment
NO_2	1 hour, annual arithmetic mean	Unclassifiable/Attainment
CO	1 hour; 8 hours	Unclassifiable/Attainment
SO_2	24 hours; annual arithmetic mean	Unclassifiable/Attainment
PM_{10}	24 hours	Unclassifiable/Attainment
$PM_{2.5}$	24 hours; annual arithmetic mean	Unclassifiable/Attainment
Lead	Quarter; 3-month average	Unclassifiable/Attainment
California Standards		
O_3	1 hour; 8 hours	Non-attainment
NO_2	1 hour; annual arithmetic mean	Attainment
CO	1 hour; 8 hours	Attainment
SO_2	1 hour; 24 hours	Attainment
PM_{10}	24 hours; annual arithmetic mean	Non-attainment
$PM_{2.5}$	Annual arithmetic mean	Attainment
Lead	30-day average	Attainment
SO_4	24 hours	Attainment
H_2S	1 hour	Unclassified
Vinyl chloride	24 hours	No designation
Visibility-reducing particles	8 hours (10:00 a.m.–6:00 p.m.)	Unclassified

Sources: EPA 2018b (national); CARB 2018b (California).
Notes: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SO_4 = sulfates; H_2S = hydrogen sulfide.

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across California. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Table 4.3-3 presents the most recent background ambient air quality data from 2016 to 2018, collected at the following stations:

- The Santa Cruz monitoring station located at 2544 Soquel Avenue in Santa Cruz is the nearest air quality monitoring station to the project site, located approximately 10 miles south of the project site. This station monitors O_3, and NO_2.
- The nearest station that monitors CO and $PM_{2.5}$ is at 855 E. Laurel Drive in Salinas, approximately 36 miles southeast of the project site.
- The nearest station that monitors PM_{10} is at 1979 Fairview Road in Hollister, approximately 41 miles southeast of the project site.

The data collected at these stations is considered generally representative of the air quality experienced in the vicinity of the project site as these stations are the closest available monitoring stations to the project site. This data is shown in Table 4.3-3 and includes the number of days that the ambient air quality standards were exceeded.

Table 4.3-3. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2016	*2017*	*2018*
Ozone (O_3) – Santa Cruz Monitoring Station				
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.064	0.082	0.075
Number of days exceeding state standard (days)		0	0	0
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.057	0.075	0.061
	0.070 ppm (federal)	0.057	0.075	0.061
Number of days exceeding state standard (days)		0	1	0
Number of days exceeding federal standard (days)		0	1	0
Nitrogen Dioxide (NO_2) – Santa Cruz Monitoring Station				
Maximum 1-hour concentration (ppm)	0.18 ppm (state)	0.033	0.034	0.047
	0.100 ppm (federal)	0.033	0.034	0.047
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Annual concentration (ppm)	0.030 ppm (state)	0.005	0.004	0.005
	0.053 ppm (federal)	0.005	0.004	0.005
Carbon Monoxide (CO) – Salinas Monitoring Station				
Maximum 1-hour concentration (ppm)	20 ppm (state)	4.2	2.7	3,5
	35 ppm (federal)	4.2	2.7	3.5
Number of days exceeding state standard (days)		0	0	0
Number of days exceeding federal standard (days)		0	0	0
Maximum 8-hour concentration (ppm)	9.0 ppm (state)	0.9	0.9	1.2
	9 ppm (federal)	0.9	0.9	1.2
Number of days exceeding state standard (days)		0	0	0
Number of days exceeding federal standard (days)		0	0	0

Table 4.3-3. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2016	*2017*	*2018*
Fine Particulate Matter ($PM_{2.5}$) – Salinas Monitoring Station				
Maximum 24-hour concentration (µg/m³)	35 µg/m³ (federal)	28.7	42.2	64.0
Number of days exceeding federal standard[a]		*0.0 (0)*	*1.0 (1)*	*3.0 (1)*
Annual concentration (µg/m³)	12 µg/m³ (state)	5.3	5.5	*6.1*
	12.0 µg/m³ (federal)	5.2	5.6	*6.1*
Coarse Particulate Matter (PM_{10}) – Hollister Monitoring Station				
Maximum 24-hour concentration (µg/m³)	50 µg/m³ (state)	ND	ND	*ND*
	150 µg/m³ (federal)	44.3	80.9	*78.0*
Number of days exceeding state standard[a]		*ND*	*ND*	*ND*
Number of days exceeding federal standard[a]		*0.0 (0)*	*0.0 (0)*	*0.0 (0)*
Annual concentration (state method) (µg/m³)	20 µg/m³ (state)	ND	ND	ND

Sources: CARB 2018a; EPA 2018c.
Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
Santa Cruz Monitoring Station is located at 2544 Soquel Avenue, Santa Cruz, 95060
Salinas Monitoring Station is located at 855 E Laurel Drive, Salinas, 93901.
Hollister Monitoring Station is located at 1979 Fairview Road, Hollister, 95023.

[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

4.3.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to air quality. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.3.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to air quality are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

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.

The MBARD has established thresholds of significance for criteria air pollutants of concern for construction and operations (MBARD 2008). For construction, the threshold is 82 pounds per day of PM_{10}. For operations, a project would result in a significant impact if it results in the generation of emissions of, or in excess of, 137 pounds per day for ROG or NO_x, 550 pounds per day of CO, 150 pounds per day of sulfur oxides (SO_x), and 82 pounds per day of PM_{10} from on-site sources. As stated above, the Air Basin met all federal AAQS. As a result, it is no longer subject to federal conformity requirements (MBARD 2008).

Consistency with the AQMP is used by MBARD to determine a project's cumulative impact on regional air quality (i.e., ozone levels). Projects which are not consistent with the AQMP have not been accommodated in the AQMP and will have a significant cumulative impact on regional air quality unless emissions are totally offset (MBARD 2008). For localized impacts of the Proposed Project (i.e., PM_{10}), the threshold for cumulative impacts is the same as that noted above (82 pounds per day of PM_{10}). The localized impacts related to CO hotspots and MBARD's associated thresholds are not applicable, as the Proposed Project would not generate a net increase in operational traffic.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The MBARD recommends an incremental cancer risk threshold of 10 in 1 million. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology. In addition, some TACs have noncarcinogenic effects. The MBARD recommends a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) effects.[3]

4.3.3.2 Analytical Methods

Construction Emissions

Proposed construction activities would result in the temporary emissions of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment and soil disturbance) and off-site sources (i.e., on-road haul trucks, delivery trucks, and worker vehicle trips). The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to estimate emissions from construction of the project (CAPCOA 2017). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and GHG emissions associated with construction activities and operation of a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters, including the land use type used to represent the project and its size, construction schedule, and anticipated use of construction equipment, were based on information provided for the Proposed Project or default model assumptions if project specifics were unavailable. Construction emissions can vary substantially from day-to-day, depending on the level of activity; the

[3] Non-cancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various noncarcinogens from the Project to published reference exposure levels that can cause adverse health effects.

specific type of operation; and, specifically for dust, the prevailing weather conditions. Therefore, emission levels presented in the analysis below are approximate with a corresponding uncertainty in precise ambient air quality impacts.[4] The construction phasing schedule and duration, vehicle trip assumptions, and construction equipment mix used for estimating the project-generated daily emissions are shown in Table 4.3-4.

Table 4.3-4. Construction Assumptions Used In Project-Generated Daily Emissions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Trips*	*Total Haul Trucks*	*Type*	*Quantity*	*Hours*
Access Road Improvements, Site Preparation, and Mobilization						
Site Preparation	10	0	4	Excavators	1	8
				Tractors/Loaders/Backhoes	1	8
Access Road Grading	2	0	14	Graders	1	8
Cofferdam and Temporary Stream Bypass System						
Cofferdams Installation	10	0	0	Tractors/Loaders/Backhoes	1	8
Pipe Installation	10	0	0	Excavators	1	8
				Pumps	1	8
				Tractors/Loaders/Backhoes	1	8
Installation of Control Systems	2	0	0	Generator Sets	4	8
				Pumps	2	8
				Tractors/Loaders/Backhoes	1	8
				Welders	1	8
New Coanda Screen Intake and Valve Vault Structures						
Excavation	2	0	8	Excavators	1	8
				Tractors/Loaders/Backhoes	1	8
Doweling	2	0	6	Bore/Drill Rigs	1	8
Concrete Pour	10	0	20	Cement and Mortar Mixers	1	8
				Excavators	1	8
				Pumps	1	8
New Intake Structure, Coanda Screen	2	0	2	Cement and Mortar Mixers	1	8
				Excavators	1	8
				Tractors/Loaders/Backhoes	1	8
Diversion Pipeline	8	0	0	Concrete/Industrial Saws	1	8
				Excavators	1	8
				Forklifts	1	8
				Pumps	1	8
				Tractors/Loaders/Backhoes	1	8

[4] The analysis assumes a construction start date in 2021. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and greenhouse gas emissions, because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Table 4.3-4. Construction Assumptions Used In Project-Generated Daily Emissions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Trips*	*Total Haul Trucks*	*Type*	*Quantity*	*Hours*
Modifications to Existing Intake and Sediment Control Values						
Pipe Installation	4	0	0	Concrete/Industrial Saws	1	8
				Excavators	1	8
				Tractors/Loaders/Backhoes	1	8
Backfill Structures	6	0	12	Cement and Mortar Mixers	1	8
				Concrete/Industrial Saws	1	8
Electrical Installations						
Electrical Conduit	2	2	0	Concrete/Industrial Saws	1	8
				Excavators	1	8
				Forklifts	1	8
				Pumps	1	8
				Tractors/Loaders/Backhoes	1	8
Access Stairs and Riprap Bank Stabilization						
Access Stairs	8	2	4	Cement and Mortar Mixers	1	8
Riprap Installation	8	2	6	Tractors/Loaders/Backhoes	1	8
Startup and Testing, Site Restoration, and Construction Closeout						
Start up and Testing	6	0	0	Generator Sets	1	8
				Tractors/Loaders/Backhoes	2	8

Source: B&V and SCWD 2020; see Appendix B.

Internal combustion engines used by construction equipment, trucks, and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. Emissions of PM_{10} and $PM_{2.5}$ would also be generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil. As described in Section 3.6.3, Standard Construction Practices, dust control measures including watering of active construction areas would be implemented (Standard Construction Practice #4). These measures are accounted for in the construction analysis for the Proposed Project.

Operational Emissions

As described in Chapter 3, Project Description, the Proposed Project's operation and maintenance be improved but activities would generally remain similar to existing activities and would have a similar frequency and intensity. However, unlike existing conditions, the Proposed Project would not require periodic sediment removal from behind the dam.

Similar to existing conditions, operation and maintenance would include weekly station checks; monthly cleaning, inspections of equipment, testing of the generator, and landscape maintenance; annual inspections of equipment and service of the generator; and road maintenance every 5 years. Overall, the demand for electricity and water, generation of solid waste and wastewater, and vehicle trips to the site for maintenance would not substantially increase over existing conditions. Because the Proposed Project would not result in substantial changes to energy

use, vehicle trips, or equipment use during operations and maintenance activities at the site, there would be no air quality impacts associated with operations and maintenance of the Proposed Project.

4.3.3.3 Project Impact Analysis

This section provides a detailed evaluation of air quality impacts associated with the Proposed Project.

Impact AIR-1: Conflict with an Applicable Air Quality Plan (Significance Standard A). The Proposed Project would not conflict with or obstruct the MBARD's AQMP. ***(Less than Significant)***

As described in the MBARD CEQA Guidelines (2008), Proposed Project emissions that are not accounted for in the AQMP's emission inventory are considered a significant cumulative impact to regional air quality. However, construction exhaust emissions from planned and projected projects have already been accounted for in the AQMP emissions inventory (MBARD 2018), and therefore the Proposed Project construction emissions, which are accounted for in the inventory, would not result in a significant impact. Furthermore, as determined in Impact AIR-2 (discussed below), construction emissions from the Proposed Project would not exceed the MBARD thresholds of significance.

During operations, long-term emissions would be similar to the existing conditions at the project site, and therefore the Proposed Project would not result in operational impacts.

Therefore, the construction and operation of the Proposed Project would not conflict with or obstruct implementation of the AQMP, and this impact would be less than significant.

Impact AIR-2: Criteria Pollutant Emissions (Significance Standard B). The Proposed Project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standards or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Project would not 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. ***(Less than Significant)***

Construction Emissions

Construction of the Proposed Project is anticipated to occur over approximately 3 months, targeted to occur between June and October, and would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and ROG off-gassing) and off-site sources (i.e., on-road haul trucks and worker vehicle trips). Construction emissions would vary substantially from day-to-day, depending on the level of activity, the specific type of operation, and specifically for dust, the prevailing weather condition. Detailed assumptions used to estimate criteria air pollutant emissions are discussed above.

Specific construction emissions anticipated from the Proposed Project are described below. Fugitive dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, as well as re-entrainment from on-road vehicles, resulting in PM_{10} and $PM_{2.5}$ emissions. Internal combustion engines used by construction equipment, haul trucks, and worker vehicles would result in emissions of ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$. Based on MBARD CEQA Guidelines (2008), ROG and NO_x exhaust emissions from typical construction activities generally would not result in a significant impact because their emissions are already accounted for in the emissions inventories of the state- and federally-required air plans, and they would not have a significant

impact on the attainment and maintenance of the O_3 AAQS. Table 4.3-5 presents the estimated maximum daily construction emissions. The approach to the emission calculations is discussed in Section 4.3.2.2, Analytical Methods, above, and additional details are provided in Appendix B.

Table 4.3-5. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Construction Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Year 2021	6.70	57.44	73.85	0.12	2.67	3.22
Maximum daily emissions	6.70	57.44	73.85	0.12	2.67	3.22
MBARD threshold	N/A	N/A	N/A	N/A	82	N/A
Threshold exceeded?	N/A	N/A	N/A	N/A	No	N/A

Source: Appendix B.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; MBARD = Monterey Bay Air Resources District; N/A = Not applicable.

As shown in Table 4.3-5, maximum daily emissions of PM_{10} associated with Proposed Project construction would not exceed the applicable MBARD significance threshold. Therefore, the Proposed Project's construction emissions would be less than significant.

Operational Emissions

As explained above, the operation of the Proposed Project would not result in changes in operational activities; no additional routine daily equipment operation or additional vehicle trips would be required. Because the Proposed Project would not result in changes to long-term operational activities, there would be no air quality impacts associated with operational air pollutant emissions.

Given the conclusions above, the Proposed Project would not 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. See Impact AIR-5 for additional information about cumulative air quality impacts.

Impact AIR-3: Exposure of Sensitive Receptors (Significance Standard C). The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations. ***(Less than Significant)***

This impact evaluates the health effects of criteria air pollutants and toxic air contaminants that would be emitted by the Proposed Project.

Health Effects of Criteria Air Pollutants

Reactive Organic Gases, Oxides of Nitrogen, and Ozone. The health effects associated with O_3 are generally associated with reduced lung function and the Air Basin is designated as non-attainment for the O_3 CAAQS. Both ROG and NO_x are precursors to O_3. The contribution of ROG and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the Air Basin due to O_3 precursor emissions tend to be found downwind from the source location due to the time required for the photochemical reactions to occur. In addition, the potential for exacerbating O_3 concentrations depends on the time of year that the ROG emissions occur; exceedances of the O_3 AAQS tend to occur between April and October when solar radiation is highest.

Overall, the analysis of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods available to assess this impact. However, ROG and NO_x exhaust emissions for typical construction activities are already accounted for in the emissions inventories of the state- and federally-required air plans. Therefore, the Proposed Project's emissions would not have a significant impact on the attainment and maintenance of the O_3 AAQS or result in potential health effects associated with O_3.

Nitrogen Dioxide and Oxides of Nitrogen. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Construction and operation of the Proposed Project would not create substantial, localized NO_x impacts nor would it contribute to exceedances of the NAAQS and CAAQS for NO_2. Therefore, the Proposed Project is not anticipated to result in potential health effects associated with NO_2 and NO_x.

Carbon Monoxide. Mobile source impacts related to CO occur both regionally and locally. Regionally, project-related construction travel would add to regional trip generation and increase the VMT within the local airshed and the Air Basin. Locally, project-generated traffic would be added to the roadway system near the project site during construction. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of substantially elevated and localized CO emissions, such as around congested intersections.

During construction, the Proposed Project would result in CO emissions from construction worker vehicles, haul trucks, and off-road equipment. Title 40, Section 93.123(c)(5) of the California Code of Regulations, Procedures for Determining Localized CO, PM_{10}, and $PM_{2.5}$ Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last 5 years or less at any individual site" (40 CCR Section 93.123). Since construction activities would be temporary, a project-level construction hotspot analysis is not required. Furthermore, the Proposed Project would not result in additional traffic trips during operation above those already occurring under existing conditions and therefore would not exceed the MBARD CO screening criteria resulting in the formation of potential CO hotspots. Therefore, the Proposed Project's CO emissions would not contribute to significant health effects associated with this pollutant.

Particulate Matter. As depicted in Table 4.3-5 above, construction of the Proposed Project would result in minimal emissions of PM_{10} and $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the Air Basin's attainment status of these pollutants. Since PM_{10} is representative of the levels of DPM, the Proposed Project would also not result in substantial DPM emissions during construction and operation, and therefore, would not result in significant health effects related to DPM exposure. Due to the minimal emissions of PM_{10} and $PM_{2.5}$ during construction, it is not anticipated that the Proposed Project would result in potential health effects related to particulate matter.

In summary, because construction and operation emissions of criteria air pollutants from the Proposed Project would not exceed the applicable MBARD significance thresholds, and because the MBARD thresholds are based on levels that the Air Basin can accommodate without affecting the attainment date for the AAQS and the AAQS are established to protect public health and welfare, it is anticipated that the Proposed Project would not result in health effects associated with criteria air pollutants. Therefore, the Proposed Project would have less-than-significant impacts related to health effects of criteria air pollutants.

Toxic Air Contaminants

There are several rural residential land uses located in proximity to the project site, with the nearest approximately 100 feet south of the project site. DPM emissions would be emitted from heavy equipment operations, and heavy-duty trucks. As discussed above, heavy-duty construction equipment and commercial trucks are subject to CARB Air Toxic Control Measures to reduce diesel particulate emissions. As described in Table 4.3-5 above, maximum daily total particulate matter (PM_{10}) emissions generated by construction equipment operation and haul trucks trips (exhaust particulate matter, or DPM, combined with fugitive dust generated by equipment operation and vehicle travel), would be well below the MBARD significance threshold. Moreover, the duration of construction would be short term, lasting approximately 3 months. No residual TAC emissions or corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the Proposed Project. Due to the relatively short period of exposure at any individual sensitive receptor, including the nearest receptor 100 feet from the southern site boundary, and the minimal particulate emissions generated, TACs emitted during construction would not result in concentrations causing significant health risks. Therefore, the Proposed Project would have less-than-significant impacts related to TACs.

Impact AIR-4: Result In Other Emissions Adversely Affecting a Substantial Number of People (Significance Standard D). The Proposed Project would not result in other emissions, such as those leading to odors, that would adversely affect a substantial number of people. ***(Less than Significant)***

The occurrence and severity of potential odor impacts depends on numerous factors, including the nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of the receptor. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints. Typical sources of odors can include exhaust emissions during construction, or operational uses such as landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries.

During construction of the Proposed Project, odors would be potentially generated from vehicles and equipment exhaust emissions from concentrations of unburned hydrocarbons in the tailpipes of construction equipment, architectural coatings, or asphalt pavement. Such odors would disperse rapidly from the project site and given the rural nature of the surrounding area and projected distance from sensitive receptors, odors from construction would not affect a substantial number of people. Therefore, impacts associated with odors during construction would be less than significant.

During operations, the Proposed Project would entail the continued uses on the project site, specifically water diversion through the operation of the Facility infrastructure and associated activities. Any odors produced would be minimal and would be similar to existing conditions. Overall, the Proposed Project would not result in odors that would affect a substantial number of people and this impact would be less than significant.

4.3.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative air quality impacts associated with the Proposed Project and other reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area considered for cumulative air quality impacts is the Air Basin.

Impact AIR-5: Cumulative Air Quality Impacts (Significance Standards A, B, C and D). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to air quality. ***(Less than Significant)***

By its nature, air pollution is largely a cumulative impact. The non-attainment status of regional pollutants is a result of past and present development, and the MBARD has developed and implemented plans for maintaining attainment of AAQS and bringing the region into attainment for those pollutants for which it is currently in non-attainment (i.e. the state O_3 and PM_{10} standards). Therefore, as indicated in Section 4.3.3.1, Thresholds of Significance, consistency with the AQMP is used by MBARD to determine a project's cumulative impact on regional air quality (i.e., ozone levels) (MBARD 2008). As indicated in Impact AIR-1, the Proposed Project would not conflict with the AQMP and therefore would not have a significant cumulative impact related to ozone. Likewise, as indicated in Impact AIR-2, construction emissions from the Proposed Project would not exceed MBARD thresholds of significance. Additionally, the construction periods of the other known cumulative construction projects planned within the Laguna Watershed, including the Laguna Pipeline portion of the North Coast System Repair and Replacement Project and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan would not overlap with construction of the Proposed Project; therefore, the Proposed Project would not have a significant cumulative impact related to localized impacts (PM_{10}). Furthermore, the Proposed Project would not exceed the MBARD significance thresholds for any other criteria air pollutant. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future projects would result in less-than-significant cumulative impacts to air quality.

4.3.3.5 Mitigation Measures

As described above, the Proposed Project would not result in any significant air quality impacts, and therefore, no mitigation measures are required.

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4.4 Biological Resources

This section describes the existing biological resources conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on a Biological Resources Assessment prepared for the Proposed Project. The Biological Resources Assessment is included in Appendix C.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. Comments related to biological resources were received from the California Department of Fish and Wildlife (CDFW) and California Department of Forestry and Fire Protection (CAL FIRE). Issues identified in the public comments related to potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or issues raised by responsible and trustee agencies are identified and addressed in this EIR.

4.4.1 Existing Conditions

4.4.1.1 Study Area

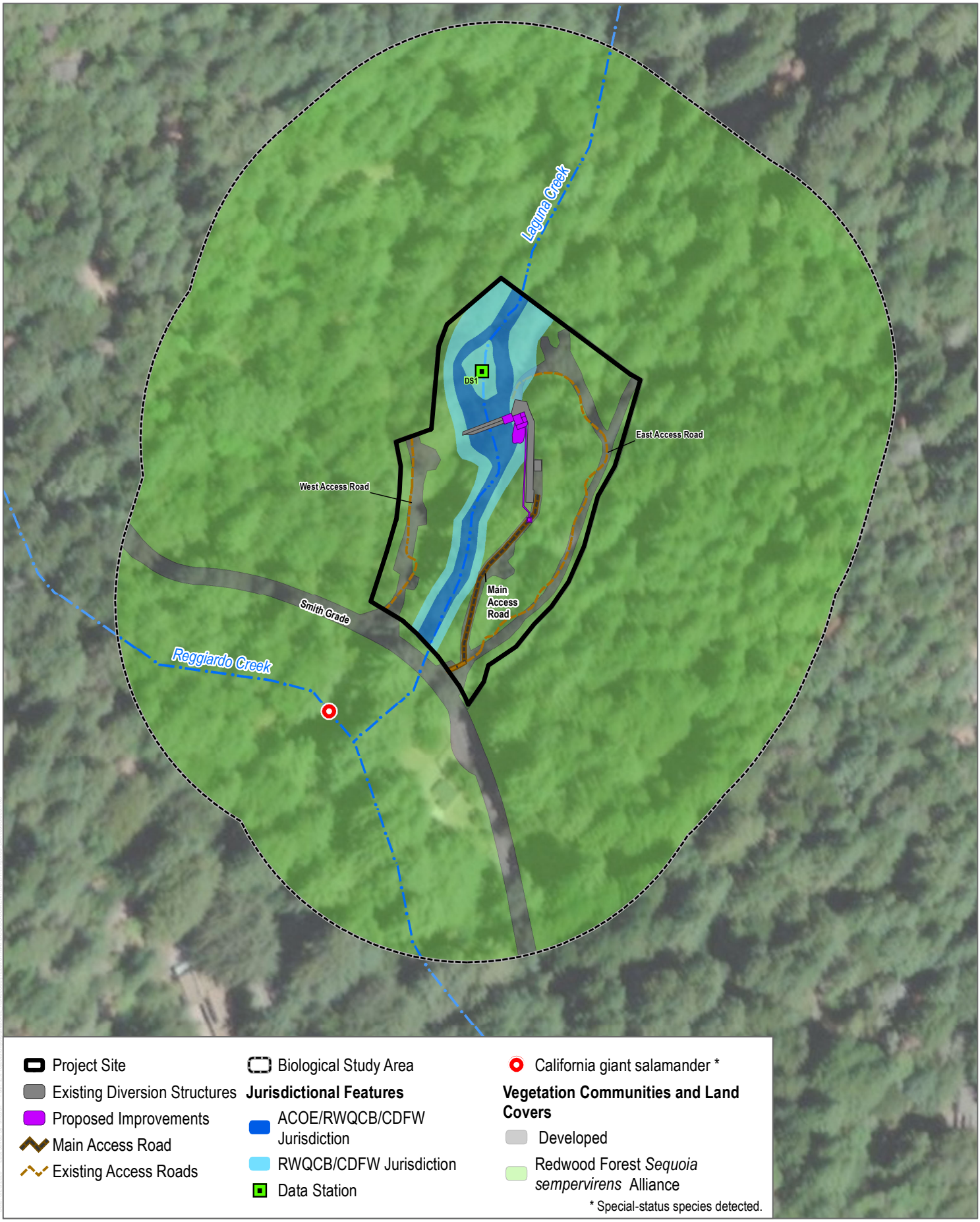
The study area for the evaluation of impacts on biological resources includes the 2.1-acre project site and a 300-foot buffer, which comprises a total area of approximately 17.44 acres. Literature reviews and field surveys were conducted to characterize the existing biological resources setting, including vegetation communities, wildlife species distribution, and special-status species present or potentially present in the study area. Section 4.4.3.2, Analytical Methods, provides additional information about how biological resources in the study area were identified and evaluated. Figure 4.4-1 shows biological resources within the study area, including vegetation communities and land covers, jurisdictional aquatic resources, and special-status species, which are discussed in more detail in the following sections.

4.4.1.2 Vegetation Communities and Land Covers

As shown on Figure 4.4-1, the study area is primarily composed of redwood forest alliance (16.65 acres)—a sensitive vegetation community—aside from developed structures and roads (0.79 acres). These vegetation communities and land covers are described as follows.

Redwood Forest Alliance

The redwood forest alliance includes redwood (*Sequoia sempervirens*) as the dominant or co-dominant tree in the canopy. The alliance has a continuous to intermittent canopy less than 400 feet in height with an infrequent to common shrub canopy and a variable herbaceous layer (Sawyer et al. 2009). Associated species include bigleaf maple (*Acer macrophyllum*), California bay (*Umbellularia californica*), red alder (*Alnus rubra*), giant chinquapin (*Chrysolepis chrysophylla*), tanoak (*Notholithocarpus densiflorus*), Douglas fir (*Pseudotsuga menziesii*), and Pacific madrone (*Arbutus menziesii*) among others (Sawyer et al. 2009).



SOURCE: Santa Cruz County 2016, ESRI 2020

DUDEK

0 75 150 Feet

FIGURE 4.4-1

Project Area Biological Resources

Laguna Creek Diversion Retrofit Project - EIR

Redwood forest alliance supports an overstory of redwood and tanoak with scattered bigleaf maple in the tree layer. The shrub layer is dominated by California blackberry (*Rubus ursinus*), poison oak (*Toxicodendron diversilobum*), and Himalayan blackberry (*Rubus armeniacus*); and the herbaceous layer includes redwood sorrel (*Oxalis oregana*), western sword fern (*Polystichum munitum*), sugar scoop (*Tiarella trifoliata*), stinging nettle (*Urtica dioica*), American speedwell (*Veronica americana*), western rush (*Juncus patens*), and horsetail (*Equisetum* sp.). The redwood forest alliance is listed as a sensitive vegetation community (Global and State rarity rank of 3) under the California Natural Community List (CDFW 2019a).

Urban/Developed Mapping Unit

The urban/developed mapping unit refers to areas that have been constructed on or otherwise physically altered to the point where vegetation is no longer present. Urban or developed areas are characterized by permanent or semi-permanent structures, hardscapes, and landscaped areas that require irrigation. This mapping unit also includes areas that lack vegetation such as paved roads or unimproved areas that still retain a pervious surface.

Within the study area, the urban/developed land cover includes 0.79 acres associated with Smith Grade, the main access road, the eastern and western access roads, and the existing Laguna Creek Diversion Facility (Facility) including the diversion flume, control building, and dam.

4.4.1.3 Special-Status Biological Resources

Special-status species include those plants and animals that have been formally listed or proposed for listing as endangered or threatened under either the state or federal Endangered Species Acts; candidates for either state or federal listing; species that meet the definition of rare or endangered under CEQA Guidelines Section 15380; animals on the CDFW's list of "species of special concern" and "special animals" list; plants listed as rare under the California Native Plant Protection Act or included in the California Native Plant Society (CNPS) California Rare Plant Ranks (CRPR) 1A, 1B, 2A, and 2B; plant species listed as having special status by CDFW; and raptors (e.g., eagles, hawks, and owls) and their nests protected under both the federal Migratory Bird Treaty Act and California Fish and Game Code (CFGC) Section 3513, as described in Section 4.4.2, Regulatory Framework. Section 4.4.3.2, Analytical Methods, describes the literature and data sources reviewed and the surveys conducted to identify the known and potential for occurrence of the identified special-status plant and wildlife species.

Plants

Based on the results of the literature review and database searches, 57 special-status plant species were identified as potentially occurring within the region of the study area. Of these, three special-status plant species have a moderate potential to occur within the study area based on the soils, vegetation communities (habitat) present, elevation range, and previous known locations. These include tear drop moss (*Dacryophyllum falcifolium*), minute pocket moss (*Fissidens pauperculus*), and white-flowered rein orchid (*Piperia candida*). However, none were observed during surveys of the study area, and would have been detected if present. Table 4.4-1 summarizes special-status plant species potentially occurring within the study area. Additionally, there is no critical habitat designated by the U.S. Fish and Wildlife Service (USFWS) for listed plant species within the study area or within 10 miles (USFWS 2020).

Table 4.4-1. Special-Status Plant Species Potentially Occurring within the Study Area

Species	Status[1]	Potential to Occur	Life Form	Primary Habitat Associations	Occurrence[2]
Tear drop moss (*Dacryophyllum falcifolium*)	CRPR 1B.3	Moderate	Moss	Limestone substrates, damp coastal soil, and rock outcrops within north coast coniferous forest.	**Not observed** during January 2020 survey, and would have been detected if present. Nearest documented occurrence is on limestone rock above mixed coniferous forest in Henry Cowell Redwoods State Park.
Minute pocket moss (*Fissidens pauperculus*)	CRPR 1B.2	Moderate	Moss	Damp soil along the coast, in dry streambeds, and on stream banks within north coast coniferous forest.	**Not observed** during January 2020 survey, and would have been detected if present. Nearest documented occurrence is along a trail edge on bare soil between mixed evergreen forest and grassland in upper University of California, Santa Cruz campus at four corners.
White-flowered rein orchid (*Piperia candida*)	CRPR 1B.2	Moderate	Perennial herb (blooms May to September)	Broadleafed upland forest, lower montane coniferous forest, and north coast coniferous forest habitats occasionally on serpentine soils, and prefers forest duff, mossy streambanks, rock outcrops, and dry streambed microhabitats.	**Not observed** during January 2020 survey, and would have been detected if present. Nearest documented occurrence is along the streambank of Boulder Creek near Hesse Brook.

Source: CDFW 2020, CNPS 2020 (see Appendix C).
Notes: CRPR = California Rare Plant Rank.
1 Species listed do not have federal or state status.
CRPR List 1B: Plants rare, threatened, or endangered in California and elsewhere
.2 Fairly endangered in California (20% to 80% of occurrences threatened)
.3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known)
2 Although the study area provides potential habitat, the proposed work areas do not support suitable habitat for the tear drop moss, minute pocket moss, and white-flowered rein orchid.

Wildlife

Based on the results of the literature review and database searches, 30 special-status wildlife species were identified as occurring within the vicinity of the study area. Of these species, one special-status wildlife species has a high potential to occur and two special-status wildlife species have a moderate potential to occur within the study area, based on vegetation communities (habitat) present and previous known locations. These species include California giant salamander (*Dicamptodon ensatus*), Santa Cruz black salamander (*Aneides flavipunctatus niger*), and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), respectively. California giant salamander was incidentally observed within the study area during surveys conducted in January 2020. Table 4.4-2 summaries special-status wildlife species detected or potentially occurring within the study area.

Table 4.4-2. Special-Status Wildlife Species Detected or Potentially Occurring within the Study Area

Species	Status[1]	Potential to Occur	Life Form	Primary Habitat Associations	Occurrence[2]
Santa Cruz black salamander (*Aneides flavipunctatus niger*)	SSC	Moderate	Amphibian	Restricted to mesic deciduous or coniferous forests in the fog belt of outer Coast Range of San Mateo, Santa Cruz, and Santa Clara counties; occurs in moist streamside microhabitats and is typically found under rocks near streams, in talus, and under damp woody debris.	**Not observed** during January 2020 survey. Known to occur in the upper reaches of Laguna Creek, having been collected in 1979 in the vicinity of the Ice Cream Grade and Laguna Creek intersection.
California giant salamander (*Dicamptodon ensatus*)	SSC	High	Amphibian	Wet coastal forests near streams and seeps. Range is limited to Mendocino County, south to Monterey County and east to Napa County. Aquatic larvae are found in cold, clear streams and occasionally occur in lakes and ponds. Adults occur in wet forests under rocks and woody debris in the vicinity of streams or lakes.	**Observed** during January 2020 survey within the creekbed of Reggiardo Creek adjacent to the Laguna Creek confluence.
San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)	SSC	Moderate	Mammal	Forest habitats with moderate canopy and dense to moderate understories, particularly on the upper banks of riparian forests or within poison oak-dominated shrublands. Requires ample midden building materials to construct middens of shredded grass, leaves, or other materials.	**Not observed** during January 2020 survey. Known to occur along Smith Grade and was observed in 2006 near the intersection with Bonny Doon Road where multiple middens were observed primarily located in redwood forest and coyote brush scrub habitat.

Source: CDFW 2019b, 2020b (see Appendix C).
Notes: SSC = California species of special concern.
[1] Species listed do not have federal status.

Two other special-status wildlife species have historic records and/or mapped habitat within the vicinity of the study area: California red-legged frog (CRLF) and anadromous fishes including steelhead (*Oncorhynchus mykiss irideus*) and coho salmon (*Oncorhynchus kisutch*). These species are discussed further below to explain why these species either do not occur in the study area (anadromous fishes) or have a low potential to occur in the study area (CRLF). Additionally, the study area is within USFWS-designated critical habitat for the CRLF, Unit SCZ-1 for Santa Cruz County (75 Federal Register [FR] 12815-12959; USFWS 2020).

California Red-Legged Frog

The CLRF is a federally threatened species and a state species of special concern (SSC) (CDFW 2019b). It generally inhabits lowland streams, wetlands, riparian woodland, and livestock ponds. CRLFs require dense, shrubby, or emergent vegetation associated with deep, still or slow-moving water (CDFW 2020).

Based on a review of the California Natural Diversity Database (CNDDB) and other sources, no CRLF occurrences are known within the study area. The nearest CNDDB records are located approximately 1.2 to 1.6 miles southwest of the Facility. All of these records are from the Liddell Creek and East Branch of Liddell Creek (CDFW 2020). As stated above, the study area is within USFWS-designated CRLF critical habitat Unit SCZ-1 for Santa Cruz County (USFWS 2020).

The entire reach of Laguna Creek within the study area is characterized as a uniform, perennial drainage with an approximate 10-foot grade change at the dam (from 619 feet to 609 feet above mean sea level). Due to the geomorphological differences within Laguna Creek around the diversion dam, the evaluation of aquatic habitats for CRLF breeding and foraging suitability is presented in two segments: upstream of the dam and downstream of the dam.

In general, the upstream reach of Laguna Creek within the study area is characterized by an earthen, trapezoidal-shaped channel that ranged in width from 8 to 20 feet. A few large logs were observed in the creek; however, no instream, emergent vegetation was observed. The adjacent banks were steep with an 80% slope on the western side and 20% slope on the eastern side. The vegetation was dense with an average 70% canopy cover and little sunlight exposure. This reach of Laguna Creek supports low suitable foraging opportunities for CRLF on the eastern side of the channel due to accessible slope and presence of woody debris and downed logs, which could be used as refugia. However, the western bank is unlikely to support potential foraging habitat due to its steepness. No breeding habitat occurs within or near the creek due to the lack of in-channel or adjacent pools/ponds and the associated high surface water velocities during the breeding season. A small, in-channel pool occurs immediately northwest of the dam. Some large woody debris was present; however, no emergent vegetation occurred within the pool. No additional pools or depressions were observed within or adjacent to Laguna Creek above the dam. The pool may support some marginal, low-flow foraging habitat along the edges, but poor breeding habitat due to the associated high water velocities during the breeding season and lack of backwater habitats.

Immediately below the dam, the downstream reach of Laguna Creek within the study area is characterized by a large, in-channel pool that measures approximately 40 feet by 20 feet wide. The area is heavily shaded with a covered canopy, with little to no sunlight available. The banks are steep, approximately 80% to 90% grade on either side of the pool, and vegetation is sparse. Although the pool may offer some low-velocity edge water habitat for CRLF, there was no emergent or overhanging vegetation around the pool. The pool may support some low-flow foraging habitat along the edges, but offers poor breeding habitat because of the associated high water velocities during the breeding season and lack of backwater habitats. No emergent/aquatic vegetation was observed within the downstream section of the creek, and woody debris buildup was minimal. The banks were steep and rocky in this section, with a 60% to 80% grade throughout the downstream section of the creek within the study area. Given the lack of pools or depressions in this downstream section of Laguna Creek, and the expected high water velocities, CRLF breeding is not expected. CRLF foraging is unlikely given the steep, rocky gradients on both sides of the creek.

In addition to Laguna Creek, a small tributary that feeds into Laguna Creek further downstream of the Facility within the study area (Reggiardo Creek) was assessed for potential CRLF habitat components. Reggiardo Creek is a steep (30% grade), narrow, perennial creek (approximately 3 feet wide), that contains large rocks, boulders, and significant woody debris buildup. The banks of this creek are narrow and steep, and no pools, depressions, or

aquatic and emergent vegetation was observed within this creek. The steep, confined channel of Reggiardo Creek likely creates high velocity conditions during the winter and spring, and likely does not provide appropriate CRLF breeding or foraging habitat.

The potential for upland refugia immediately surrounding the project site is considered low due to the presence of downed redwood logs and debris, redwood duff and vegetation. However, no mammal burrows (which can serve as habitat for CRLF) were observed anywhere within the study area.

Steelhead and Coho Salmon

The federally and state endangered Central California Coast Evolutionarily Significant Unit of coho salmon (*Oncorhynchus kisutch* pop. 4) occurs in streams of the north coast of Santa Cruz County. The federally threatened Central California Coast Distinct Population Segment of steelhead (*Oncorhynchus mykiss irideus* pop. 8) also occurs in streams along the coast of Santa Cruz County. Laguna Creek lagoon, which is located approximately 4 miles downstream of the Facility, supports both of these species, with coho salmon observed in the lower Laguna Creek lagoon in 2015 and steelhead observed in the lower Laguna Creek lagoon as recently as 2018 (Berry et. al 2019). The study area, however, is not expected to support either of these species due to a large bedrock waterfall that serves as a natural barrier to anadromy approximately 1.4 miles upstream of the ocean, which precludes anadromous fish from traveling further upstream (Hagar et al. 2017). Resident rainbow trout are known to occur both upstream and downstream of the Facility within Laguna Creek, and the Santa Cruz Water Department has conducted annual abundance surveys in the stream reaches downstream and upstream of the dam since 2006, measuring the fluctuations of the separated populations of rainbow trout (City of Santa Cruz 2020).

Jurisdictional Aquatic Resources

As further described in Section 4.4.3.2, Analytical Methods, an aquatic resources jurisdictional delineation was conducted of the project site to identify potential jurisdictional aquatic resources, including wetlands, streams, and creeks, among other aquatic features, that are regulated by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife, and/or California Coastal Commission (CCC). Jurisdictional aquatic resources mapped within the project site included one perennial drainage, Laguna Creek. Laguna Creek is a natural drainage that originates in the Santa Cruz Mountains near Pine Flat Road in Bonny Doon and drains to the Pacific Ocean. The mainstem and active channel of the drainage (including the ordinary high water mark) run through the center of the project site. This natural perennial drainage is characterized by a redwood forest alliance vegetation community and supports a clearly defined bed and bank, as well as has connectivity to downstream receiving waters (Pacific Ocean). The study area is within the coastal zone as defined by the California Coastal Act (discussed in Section 4.4.2, Regulatory Framework, below). Figure 4.4-1 illustrates the location and extent of jurisdictional aquatic resources within the study area.

The USACE/RWQCB/CDFW jurisdictional width encompassed the lateral extent of Laguna Creek's ordinary high water mark within the survey area and ranged in width from 17 to 60 feet. The CDFW and RWQCB-only jurisdictional width also encompasses the lateral extent of the Laguna Creek's top-of-bank within the survey area and ranged from 40 to 110 feet. A total of 0.29 acres of USACE jurisdictional non-wetland waters of the United States occur within the project site, and a total of 0.65 acres of RWQCB and CDFW jurisdictional non-wetland waters of the state occur within the project site. No state- or federally defined wetlands occur within the project site.

Wildlife Corridors/Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by assuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals and may also serve as primary habitat for smaller animals, such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as steppingstones for dispersal.

Laguna Creek, between its headwaters and coastal terminus, may serve as a local movement corridor that connects habitat for certain amphibians, reptiles, and localized fish species. However, the study area is not recognized as an important regional wildlife corridor by any state agency or jurisdiction, and is not considered critical to the ecological functioning of adjoining watersheds and open space areas. The most obstructive aspect of the Facility for aquatic-dependent species is the dam across Laguna Creek that has been present since 1890, which effectively separates the upstream and downstream portions of the creek for strictly aquatic organisms. This barrier to aquatic-dependent species is one of several natural and artificial barriers within Laguna Creek. As described above, there is a bedrock waterfall barrier to anadromy approximately 1.4 miles upstream of the ocean within Laguna Creek that prevents anadromous steelhead and coho salmon from traveling further upstream to the study area (Hagar et al. 2017), so the existing Facility does not pose a barrier to movement to anadromous fishes. However, the rest of the Facility is non-intrusive and does not pose an obstruction to habitat connectivity or wildlife movement.

4.4.1.4 Sudden Oak Death

Sudden Oak Death is a tree disease caused by the fungus-like plant pathogen *Phytophthora ramorum* affecting oak species (primarily coast live oak [*Quercus agrifolia*]), tanoak (*Notholithocarpus densiflorus*), and California bay (*Umbellularia californica*) trees. Host species include many found within the project site, including, but not limited to, redwood (*Sequoia sempervirens*), bigleaf maple (*Acer macrophyllum*), madrone (*Arbutus menziesii*), and Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*). Pitch canker is a disease of pine trees that is caused by the fungus *Fusarium circinatum*. Douglas-fir can also be infected, but this disease primarily affects Monterey pine (*Pinus radiata*) trees. As described below in Section 4.4.2, Regulatory Framework, the project site is located within the Sudden Oak Death Zone of Infestation and the "Regulated Area" for Sudden Oak Death, as designated by the California Department of Food and Agriculture.

4.4.2 Regulatory Framework

4.4.2.1 Federal

Clean Water Act

The Federal Water Pollution Control Act of 1972 (Clean Water Act) (33 United States Code Section 1251 et seq.), as amended by the Water Quality Act of 1987 (PL 100-4), is the major federal legislation governing water quality. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Discharges into waters of the United States are regulated under Section 404. Waters of the

United States include (1) all navigable waters (including all waters subject to the ebb and flow of tides); (2) all interstate waters and wetlands; (3) all other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, and natural ponds; (4) all impoundments of waters mentioned above; (5) all tributaries to waters mentioned above; (6) the territorial seas; and (7) all wetlands adjacent to waters mentioned above. In California, the State Water Resources Control Board and the RWQCBs are responsible for implementing the Clean Water Act. Important applicable sections of the Clean Water Act are as follows:

- Section 401 requires an applicant for any federal permit for an activity that may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the Clean Water Act. Certification is provided by the respective RWQCB.
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. The National Pollutant Discharge Elimination System program is administered by the RWQCB. Conformance with Section 402 is typically addressed in conjunction with water quality certification under Section 401.
- Section 404 provides for issuance of dredge/fill permits by USACE. Permits typically include conditions to minimize impacts on water quality. Common conditions include (1) USACE review and approval of sediment quality analysis before dredging, (2) a detailed pre- and post-construction monitoring plan that includes disposal site monitoring, and (3) required compensation for loss of waters of the United States.

Federal Endangered Species Act

The federal Endangered Species Act (FESA) of 1973 (16 United States Code Section 1531 et seq.), as amended, is administered by USFWS for most plant and animal species and by the National Oceanic and Atmospheric Administration National Marine Fisheries Service for certain marine species. This legislation is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend and to provide programs for the conservation of those species, thus preventing the extinction of plants and wildlife. FESA defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under FESA, it is unlawful to take any listed species; "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." As part of this regulatory act, FESA provides for designation of critical habitat, defined in FESA Section 3(5)(A) as specific areas within the geographical range occupied by a species where physical or biological features "essential to the conservation of the species" are found and that "may require special management considerations or protection." Critical habitat may also include areas outside the current geographical area occupied by the species that are nonetheless "essential for the conservation of the species." Critical habitat designations identify with the best available knowledge, those biological and physical features (primary constituent elements) which provide for the life history processes essential to the conservation of the species.

FESA allows for the issuance of incidental take permits for listed species under Section 7, which is generally available for projects that also require other federal agency permits or other approvals, and under Section 10, which provides for the approval of habitat conservation plans on public or private property without any other federal agency involvement.

The study area occurs within USFWS-designated California red-legged frog critical habitat Unit SCZ-1 for Santa Cruz County (75 FR 12815-12959; USFWS 2020). According to USFWS, the following items are the primary constituent elements identified for California red-legged frog (75 FR 12815-12959):

1. **Aquatic Breeding Habitat.** Standing bodies of fresh water (with salinities less than 4.5 parts per thousand), including natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.
2. **Aquatic Non-Breeding Habitat.** Freshwater pond and stream habitats, as described above, that may not hold water long enough for the species to complete its aquatic life cycle but which provide for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult California red-legged frogs. Other wetland habitats considered to meet these criteria include, but are not limited to: plunge pools within intermittent creeks, seeps, quiet water refugia within streams during high water flows, and springs of sufficient flow to withstand short-term dry periods.
3. **Upland Habitat.** Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile (1.6 kilometers) in most cases (i.e., depending on surrounding landscape and dispersal barriers) including various vegetation types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance for the California red-legged frog. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the aquatic, wetland, or riparian habitat. These upland features contribute to: (1) filling of aquatic, wetland, or riparian habitats; (2) maintaining suitable periods of pool inundation for larval frogs and their food sources; and (3) providing non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), small mammal burrows, or moist leaf litter.
4. **Dispersal Habitat.** Accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within 1 mile (1.6 kilometers) of each other, and that support movement between such sites. Dispersal habitat includes various natural habitats, and altered habitats such as agricultural fields, that do not contain barriers (e.g., heavily traveled roads without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large lakes or reservoirs over 50 acres (20 hectares) in size, or other areas that do not contain those features identified in primary constituent elements 1, 2, or 3 as essential to the conservation of the species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act was originally passed in 1918 as four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The primary motivation for the international negotiations was to stop the "indiscriminate slaughter" of migratory birds by market hunters and others. The Migratory Bird Treaty Act protects over 800 species of birds (including their parts, eggs, and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

4.4.2.2 State

California Environmental Quality Act

CEQA requires identification of a project's potentially significant impacts on biological resources and ways that such impacts can be avoided, minimized, or mitigated. The act also provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts.

CEQA Guidelines Section 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" (14 California Code of Regulations [CCR] Section 15380[b][1]). A rare animal or plant is defined in Section 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or … [t]he species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened if it meets the criteria for listing, as defined further in CEQA Guidelines Section 15380(c).

CDFW has developed a list of "special status species" as "a general term that refers to all of the taxa the CNDDB is interested in tracking, regardless of their legal or protection status." This is a broader list than those species that are protected under FESA, the California Endangered Species Act (CESA), and other CFGC provisions, and includes lists developed by other organizations, such as the Audubon Watch List Species. Guidance documents prepared by other agencies, including the Bureau of Land Management Sensitive Species and USFWS Birds of Special Concern, are also included on this CDFW Special Species list. Additionally, CDFW has concluded that plant species included on the CNPS CRPR List 1 and 2 are covered by CEQA Guidelines Section 15380.

CEQA Guidelines Section IV, Appendix G (Environmental Checklist Form), requires an evaluation of impacts to "any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service" (14 CCR Section 15000 et seq.).

California Endangered Species Act

CESA (CFGC Section 2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species listed by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Take is defined similarly to FESA and is prohibited for both listed and candidate species. Take authorization may be obtained by the project applicant from the CDFW under CESA Section 2081, which allows take of a listed species for educational, scientific, or management purposes. In this case, project applicants consult with CDFW to develop a set of measures and standards for managing the listed species, including full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

California Fish and Game Code

Fully Protected Species

The classification of "fully protected" was the state's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles, birds, and mammals. Fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. "Take" is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Lake or Streambed Alteration

Under the CFGC Section 1602, CDFW has authority to regulate work that will substantially divert or obstruct the natural flow of or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake. CDFW also has authority to regulate work that will deposit or dispose of debris, water, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement and is applicable to any person, state, or local governmental agency or public utility (CFGC Section 1601). CDFW jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. In practice, CDFW marks its jurisdictional limit at the top of the stream or lake bank or the outer edge of the riparian vegetation, where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries, as defined by Clean Water Act Section 404, sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under Section 1602 may encompass a greater area than those regulated under Clean Water Act Section 404; CDFW does not have jurisdiction over ocean or shoreline resources.

California Fish and Game Code Sections 3503, 3511, 3513, 4150

CFGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. CFGC Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests. Section 3511 states fully protected birds or parts thereof may not be taken or possessed at any time. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act. All nongame mammals, including bats, are protected by CFGC Section 4150.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the State Water Resources Control Board and RWQCB as the principal state agencies responsible for the protection of water quality in California. The Central Coast Regional Water Quality Control Board (RWQCB) has regulatory authority over the project site. The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the state are privileges, not rights." Waters of the State are defined in Section 13050(e) of the Porter-Cologne Water Quality Control Act as "…any surface water or groundwater, including saline waters, within the boundaries of the state." All dischargers are subject to regulation under the Porter-Cologne Water Quality Control Act, including both point and nonpoint source dischargers. The Central Coast RWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction. As noted above, the Central Coast RWQCB is the appointed authority for Section 401 compliance in the project site.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 directed CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The Native Plant Protection Act gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. CESA expanded on the original Native Plant Protection Act and enhanced legal protection for plants, but the Native Plant Protection Act remains part of the CFGC. To align with federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals

into the act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in CESA, appropriate compensatory mitigation measures for significant impacts to rare plants are typically negotiated with the CDFW.

California Coastal Act

In 1976, the State Legislature enacted the California Coastal Act (Public Resources Code [PRC] Section 30000 et seq.) to provide long-term protection of the state's 1,100-mile coastline for the benefit of current and future generations. The California Coastal Act provides for the management of lands within California's coastal zone boundary, as established by the Legislature and defined in California Coastal Act (Section 30103). The boundary of the coastal zone varies across the state and each location varies in width from several hundred feet in highly urbanized areas up to 5 miles in certain rural areas (CCC 2020). The coastal boundary extends approximately three miles offshore. The goals of the California Coastal Act, per PRC Section 30001.5 are:

- Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.
- Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.
- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sounds resources conservation principles and constitutionally protected rights of private property owners.
- Assure priority for coastal-dependent and coastal-related development over other development on the coast.
- Encourage state and local initiative and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

Furthermore, the California Coastal Act includes specific policies to achieve these goals within the coastal zone (see Division 20 of the PRC). These policies include the legal standards applied to coastal planning and regulatory decisions made by the CCC in pursuant to the California Coastal Act. The California Coastal Act requires that individual jurisdictions adopt a Local Coastal Program (LCP) to implement the California Coastal Act at the local level. After the CCC certifies the LCP, and the local government becomes the coastal development permit permitting authority. See below for information about the County's LCP.

California Government Code – Local Exemptions

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, and transmissions of water supplies are exempt from local (i.e., county and city) building and zoning ordinances. The Proposed Project evaluated in this report relate to operation, utilization, and storage of water resources, therefore, the Proposed Project is legally exempt from Santa Cruz County building and zoning ordinances.

California Public Resources Code – Timberland and Forest Land

PRC Section 4526 defines "Timberland" to mean "land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees." While the project site is not used for growing timber for commercial purposes, the definition of timber under PRC Section 4526 is broad enough to include areas where commercial species of trees such as coast redwoods grow.

Furthermore, the project site is zoned Timber Production by Santa Cruz County. PRC Section 12220(g) defines forest land as "land that can support 10% native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." The redwood forest at the project would be considered forestland.

California Government Code – Timberland Production

The California Government Code includes definitions applicable to timber production and timber harvest, including the following:

- Section 51104(g) defines "timberland production zone" (TPZ[1]) to mean an area that has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses as defined under Section 51104(h).
- Section 51112 identifies situations that would warrant a decision that a parcel is not devoted to and used for growing and harvesting timber or for growing and harvesting timber and compatible uses.
- Section 51113 allows the opportunity for a landowner to petition that his or her land be zoned for timberland production.

California Timberland Productivity Act of 1982

The California Timberland Productivity Act (California Government Code Section 51100 et seq.) establishes the statewide basis for timberland production zoning. A county may zone lands for timberland production and thereby qualify the landowner for the preferential taxation provided for under the Forest Taxation Reform Act. Land within a TPZ is restricted to growing and harvesting timber and other compatible uses approved by the county. The use of this land must be "enforceably restricted" to growing and harvesting timber in order to qualify for preferential taxation.

Z'berg-Nejedly Forest Practice Act

Commercial harvesting of timber on non-federal lands in California, whether or not the property is under timberland contract, is regulated under the state's Z'berg-Nejedly Forest Practice Act (PRC Section 4511 et seq.) and the related Forest Practice Rules (14 CCR Chapters 4, 4.5, and 10). Through this legislation, the state has established a comprehensive and specialized program for reviewing and regulating the harvesting of timber. Harvest is strictly regulated through the review and approval of plans (e.g., Timber Harvesting Plan) by CAL FIRE. An approved Timber Harvesting Plan would be required prior to timber operations (as defined in Section 4527 of the Act) conducted in support of project-related activities.

California Department of Food and Agriculture Sudden Oak Death Zone of Infestation

The project site is located within the Sudden Oak Death Zone of Infestation and the "Regulated Area" for Sudden Oak Death, as designated by the California Department of Food and Agriculture (3 CCR Section 3700). This designation requires a permit from the County Agricultural Commissioner prior to the movement of regulated plant material from the regulated area. The project site is also located within the Pitch Canker Zone of Infestation. PRC Article 5, Sections 4712-4718 outlines the authority of the California Board of Forestry to designate a Zone of

[1] TPZ is used to represent "Timberland Production Zone" and "Timberland Preserve Zone" interchangeably in California Government Code Section 51110. Both terms are intended to represent land zoned for the purposes of growing and harvesting timber. TPZ used in this chapter refers to land with such zoning.

Infestation associated with forest pests. The PRC requires timberland owners to eradicate such pests and outlines the authority of the Board to take such actions within a designated Zone of Infestation. Since the City is not the landowner, it would not be responsible for pest eradication.

4.4.2.3 Local

County of Santa Cruz General Plan and Local Coastal Program

The County of Santa Cruz General Plan and LCP is a comprehensive, long-term planning document for the unincorporated areas of the County and includes the County's LCP, which was certified by the California Coastal Commission in 1994 (County of Santa Cruz 2020a). The County General Plan and LCP provides policies and programs to establish guidelines for future growth and all types of physical developments.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.2 (Riparian Corridors and Wetlands), establishes definitions for riparian corridors and wetlands to ensure their protection. Policies 5.2.1 through 5.2.5 identify and define riparian corridors and wetlands, determine the uses which are allowed in and adjacent to these habitats, and specify required buffer setbacks and performance standards for land in and adjacent to these areas. Riparian corridors are defined as (a) 50 feet from the top of a distinct channel or physical evidence of high water mark of perennial stream; (b) 30 feet from the top of a distinct channel or physical evidence of high water mark of an intermittent stream as designated on the General Plan maps and through field inspection of undesignated intermittent and ephemeral streams; (c) 100 feet of the high water mark of a lake, wetland, estuary, lagoon, or natural body of standing water; (d) the landward limit of a riparian woodland plant community; and (e) wooded arroyos within urban areas. The County definitions are consistent with those used for CEQA purposes.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.1 (Biological Diversity), establishes definitions for sensitive habitats to ensure their protection. Policies 5.1.1 through 5.1.11 identify and define sensitive habitats, determine the uses which are allowed in and adjacent to these habitats, and specify performance standards for land in and adjacent to these areas.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.12 (Timber Resources), describes lands to be designated for timber production to encourage economic production of forest products on a sustained yield basis under high environmental standards. Policies 5.12.1 through 5.12.14 identify and define permitted and conditional uses in timber production zones and specify performance standards for land in and adjacent to these areas.

The County's certified LCP is administered by the County Planning Department, pursuant to the California Coastal Act, and includes specific plans and ordinances for activities within the coastal zone. The LCP implementing ordinances in the Santa Cruz County Code (SCCC) that are relevant in the evaluation of biological resources of the Proposed Project include the following:

- County Grading Ordinance (Chapter 16.20)
- Erosion Control Ordinance (Chapter 16.22)
- Riparian Corridor and Wetlands Protection (Chapter 16.30)
- Sensitive Habitat Protection (Chapter 16.32)
- Significant Trees Protection (Chapter 16.34)
- Timber Harvesting Regulations (Chapter 16.52)

As the Proposed Project occurs within the coastal zone and is not exempt from the LCP, it would require compliance with the LCP and the standards contained in the above LCP implementing ordinances. While some of these ordinances require separate approvals or permits (e.g., Riparian Exception), such approvals are not required for the Proposed Project, as it falls under California Government Code Section 53091 (d) and (e) and is legally exempt from Santa Cruz County building and zoning ordinances, as described above. The relevant LCP implementing ordinances that are addressed through the CDP process are described below.

Grading and Erosion Control Ordinances

Chapter 16.20, Grading Regulations, sets forth rules and regulations to control all grading, including excavations, earthwork, road construction, dredging, diking, fills and embankments. Chapter 16.22 requires control of all existing and potential conditions of accelerated (human-induced) erosion; sets forth required provisions for project planning, preparation of erosion control plans, runoff control, land clearing, and winter operations.

Riparian Corridor Protection Ordinance

Chapter 16.30, Riparian Corridor and Wetlands Protection, includes regulations to limit development activities in riparian corridors. The regulations provide that "no project shall undergo developmental activities in riparian corridors or areas with urban or rural service lines which are within a buffer zone as measured from the top of the arroyo." Buffer areas are specified in the regulations and shall be determined from characteristics found in the riparian area, including average slope within 30 feet of water's edge, vegetation, and stream characteristics. The buffer shall always extend 50 feet from the edge of riparian woodland and 20 feet beyond the edge of other woody vegetation as determined by the dripline. After the buffer is determined, a 10-foot setback from the edge of the buffer is required for all structures, which allows construction equipment and use of yard area. Exceptions and conditioned exceptions to the provisions of the chapter may be authorized. Findings meeting the following criteria define the circumstances necessary in granting an exception to the above requirements:

1. That there are special circumstances or condition affecting the property.
2. That the exception is necessary for the proper design and function of some permitted or existing activity on the property.
3. That the granting of the exception will not be detrimental to the public welfare or injurious to other property downstream or in the area in which the project is located.
4. That the granting of the exception, in the coastal zone, will not reduce or adversely impact the riparian corridor, and there is no feasible less environmentally damaging alternative.
5. That the granting of the exception is in accordance with the purpose of this chapter, and with the objectives of the General Plan and elements thereof, and the LCP Land Use Plan.

Sensitive Habitats Protection Ordinance

SCCC Chapter 16.32 regulates development in or adjacent to specified environmentally sensitive habitat areas. An area is defined as "sensitive habitat" under this ordinance includes various criteria, and includes all lakes, wetlands, estuaries, lagoons, streams, rivers, and riparian corridors. No development activity may occur within an area of biotic concern unless approval is issued or unless the activity is reviewed concurrently with the review of an associated development of land-division application. All development within environmentally sensitive habitat must be mitigated or restored. The following findings are necessary in granting an exception to the provisions and requirements of this ordinance:

1. That adequate measures will be taken to ensure consistency with the purpose of this chapter to minimize the disturbance of sensitive habitats; and
2. One of the following situations exists:
   a. The exception is necessary for restoration of a sensitive habitat; or
   b. It can be demonstrated by biotic assessment, biotic report, or other technical information that the exception is necessary to protect public health, safety, or welfare.

Any development activity that has received a riparian exception according to the provisions of Chapter 16.30 would not likely be subject to this chapter according Chapter 16.32.105, if the Planning Director determines that the Proposed Project received an equivalent review in granting a riparian exception.

Significant Trees Protection Ordinance

Chapter 16.34 regulates the removal of trees in the coastal zone, which could reduce scenic beauty and the attractiveness of the area to residents and visitors. The ordinance establishes the type of trees to be protected, the circumstances under which they may be removed, and the procedures for obtaining a permit for their removal. This chapter defines Significant Trees (Section 16.34.030) as:

> "any tree, sprout clump, or group of trees, as follows:
>
> (A) Within the urban services line or rural services line, any tree which is equal to or greater than 20 inches d.b.h. (approximately five feet in circumference); any sprout clump of five or more stems each of which is greater than 12 inches d.b.h. (approximately three feet in circumference); or any group consisting of five or more trees on one parcel, each of which is greater than 12 inches d.b.h. (approximately three feet in circumference).
>
> (B) Outside the urban services line or rural services line, where visible from a scenic road, any beach, or within a designated scenic resource area, any tree which is equal to or greater than 40 inches d.b.h. (approximately 10 feet in circumference); any sprout clump of five or more stems, each of which is greater than 20 inches d.b.h. (approximately five feet in circumference); or, any group consisting of 10 or more trees on one parcel, each greater than 20 inches d.b.h. (approximately five feet in circumference).
>
> (C) Any tree located in a sensitive habitat as defined in Chapter 16.32 SCCC. Also see SCCC 16.34.090(C), exemption of projects with other permits."

A tree removal permit would not be required for the Proposed Project, as tree removal would be authorized under the County's coastal zone regulations. Specifically, the coastal development permit application shall address removal of any significant tree located within the coastal zone. The site plan submitted with the application shall include the Tree Inventory, Impact Assessment and Protection Plan (Fouts 2020), which identifies the trees to be removed, a description of the species, size, and condition of the tree(s) to be removed, a description of the method to be used in removing the tree(s), the reason(s) for removal of the tree(s), and proposed visual impact mitigation measures, including identification of the size, location, and species of replacement trees on a site plan (if necessary).

Timber Harvesting Regulations

The project site is zoned Timber Production by Santa Cruz County. SCCC Chapter 16.52 establishes the definitions and procedures to protect and maintain the timberlands through regulation of timber harvesting. The regulations encourage the continued production of forest products in compliance with performance standards, which emphasize protection of environmental and open space values while fostering increased productivity of forest land. This regulation also serves to protect, maintain and improve the forest land of Santa Cruz County. This zoning designation is consistent with the zoning mandates of the California Timberland Productivity Act of 1982 described above. The ordinance restricts timber harvesting to specified zone districts within the County and requires development of a timber harvest plan, timberland conversion permit, or conversion exemption prior to the cutting of any commercial tree species. The Proposed Project would require a minor conversion permit exemption from CAL FIRE, which is consistent with SCCC Chapter 16.52.195 that addresses minor conversions.

4.4.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to biological resources. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.4.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to biological resources are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

B. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

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 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.

4.4.3.2 Analytical Methods

Data regarding biological resources present within the study area were obtained through a review of pertinent literature, field reconnaissance, an aquatic resources jurisdictional delineation, and habitat assessments, which are described further below.

Potential impacts to biological resources in the study area were evaluated based on a review of the available literature regarding the status and known distribution of the special-status species or their habitat within the project site and surrounding areas. Literature and data sources reviewed to determine the occurrence or potential for occurrence of special-status species in the study area include: the County of Santa Cruz online geographic information system (GIS) database (County of Santa Cruz 2020b), CNDDB (CDFW 2020), USFWS Inventory for Planning and Conservation (IPaC) database (USFWS 2020), CNPS Inventory of Rare and Endangered Plants data (CNPS Inventory) (CNPS 2020), and U.S. Department of Agriculture Web Soil Survey (USDA 2020). The CNPS Inventory and CNDDB were queried based on the U.S. Geological Survey 7.5-minute quadrangle in which the study area is located (Davenport) and the six surrounding quadrangles (Santa Cruz, Felton, Año Nuevo, Castle Rock Ridge, Big Basin, and Franklin Point). The IPaC databases was queried using GIS software based on a 1-mile buffer around the study area.

Once all data sources were reviewed, a final list of special-status species with moderate or greater potential to occur in the vicinity of the project area was compiled (see Table 4.4-1 and Table 4.4-2 in Section 4.4.1.3, Special-Status Biological Resources), and each of the species was evaluated for presence or absence on the site. In addition, the presence of suitable habitat characteristics was evaluated based on all data sources and site surveys. Qualified biologists conducted a biological resources reconnaissance survey, vegetation mapping, and a formal CRLF habitat assessment within the study area on January 14, 2020. Focused, USFWS-protocol-level surveys were not warranted for CRLF. During this site visit, the site's potential to support sensitive natural communities and special-status plant and wildlife species was evaluated. Also on January 14, 2020, an aquatic resources jurisdictional delineation was conducted within the project site to investigate and delineate potential waters of the United States, including wetlands under USACE jurisdiction, pursuant to Section 404 of the federal Clean Water Act; and waters of the state under RWQCB jurisdiction, pursuant to the Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act and CDFW jurisdiction, pursuant to Section 1602 of the CFGC (Dudek 2020). Table 4.4-3 outlines the type, location, and dates for each of these surveys. Additional detail on survey methods is provided in Appendix C.

Table 4.4-3. Biological Surveys Completed within the Study Area

Survey Type	Location	Date
Biological reconnaissance survey, vegetation mapping, general habitat assessments	Study area	January 14, 2020
CRLF habitat assessment	Project site, plus 1-mile buffer	January 14, 2020
Aquatic resources jurisdictional delineation	Project site	January 14, 2020

Source: Appendix C.
Notes: CRLF = California red-legged frog.

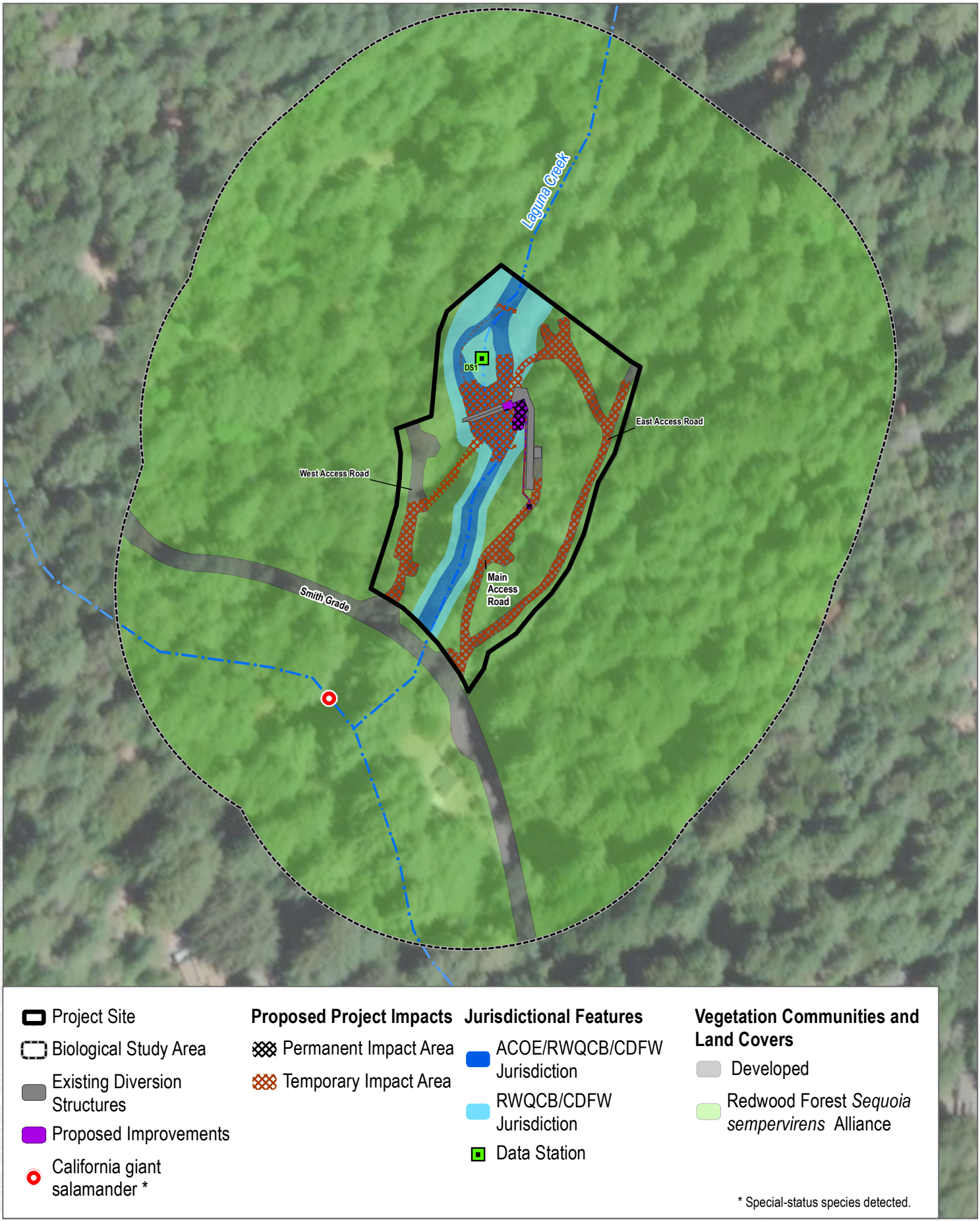
The impact analysis presented below focuses on temporary construction-related impacts and permanent impacts due to the placement of a Coanda screen and new intake structure, a new concrete control vault to house new control values and additional diversion piping, downstream streambank stabilization, new access and safety provisions including stairways, and a drop inlet at the interconnection of the new diversion pipe and the existing Laguna Pipeline. Figure 4.4-2 shows the general location of direct biological resources impact areas that would occur within the project site. The new concrete control vault, access stairways, and streambank stabilization would be located within a small segment of the wetted and top-of-bank portions of Laguna Creek, just downstream of the existing intake screen. The bulk of temporary impacts during construction would be limited to the use of the existing unimproved access routes; however, additional grading beyond the limits of both western and eastern access routes would be necessary to adequately access the upstream and downstream dam areas. Installation of a new diversion pipeline adjacent to the existing diversion flume, temporary dewatering of the work area with downstream and upstream cofferdam installation, diversion of Laguna Creek flows past the active work area, minor channel grading, and sediment removal upstream and downstream of the dam would also contribute to construction-related temporary impacts within the project site, as shown on Figure 4.4-2. Access road improvements are also proposed as a part of project implementation.

The operations and maintenance activities would generally remain similar to existing operations and maintenance activities, which are conducted weekly, monthly, and annually. However, unlike existing conditions, the Proposed Project would not require periodic sediment removal from behind the dam. Additionally, it is anticipated that the operations and maintenance activities would also occur with a similar frequency and intensity of activities under existing conditions.

The City would continue to maintain in-stream flow levels established with CDFW pursuant to ongoing agreements and ultimately would maintain the in-stream flow levels established by the Anadromous Salmonid Habitat Conservation Plan that is currently under preparation and by the Santa Cruz Water Rights Project that is being pursued by the City. As described above, these in-stream flows are intended to protect anadromous salmonids and other species.

Future operations and maintenance activities would result in reduced long-term impacts to biological resources as compared to current conditions due to better management of diversions and required downstream flows. Specifically, the Proposed Project would result in improved in-stream transport of sediment by changing the format and orientation of water intake so sediment would not obstruct water intake and be able to pass downstream unimpeded, particularly during high stream flows similar to how sediment transport would occur in a more natural system. While federally or state-listed anadromous fish species are not expected to occur in the project area due to several downstream natural barriers (Hagar et al. 2017), Laguna Creek does contain resident rainbow trout populations, and therefore appropriate fish screening would be implemented by the Proposed Project. Finally, the Proposed Project would provide better remote controls of diversions to improve the regulation of downstream water levels so that fish and other aquatic organisms would not be stranded by rapid changes in water levels when the City diverts Laguna Creek and maintains the water intake.

Therefore, the impact analysis below focuses on the construction phase of the Proposed Project (and not operations and maintenance) in relation to the project site, given that operations and maintenance activities would have beneficial impacts on biological resources, as indicated above.



SOURCE: Santa Cruz County 2016, ESRI 2020

DUDEK

0 75 150 Feet

FIGURE 4.4-2

Biological Resource Impacts

Laguna Creek Diversion Retrofit Project - EIR

4.4.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not **conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (Significance Standard F)**. The Proposed Project is not located within any adopted habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plan. Therefore, the Proposed Project would have no impact related to conflicts with any such plans and this standard is not further evaluated.

Impacts

This section provides a detailed evaluation of biological resources impacts associated with the Proposed Project.

Impact BIO-1: Special-Status Species (Significance Standard A). The Proposed Project could have a substantial adverse effect on special-status species during construction. ***(Less than Significant with Mitigation)***

Plants

Potential direct temporary and permanent impacts could occur to three special-status plant species that have moderate potential to occur within the study area: tear drop moss, minute pocket moss, and white-flowered rein orchid. During construction, these impacts could result from grading activities to establish temporary access and construction work areas, as well as installation of a new concrete control vault/stairway and bank stabilization. However, these special-status plant species were not detected during field surveys and are unlikely to occur within the project footprint (i.e., along the existing unimproved roadways or within the streambed of Laguna Creek), as the specific area does not support suitable habitat for these species. Additionally, even if present, loss of individuals or the habitat of these species would not threaten their regional populations as a result of the Proposed Project. Therefore, the temporary and permanent direct impacts to special-status plant species would be less than significant during construction.

While special-status plant species are unlikely to occur within the project footprint, construction-related erosion, runoff, and dust could indirectly impact any potentially occurring special-status plant species outside the immediate work areas, but within the study area. Given the temporary nature of these construction-related indirect impacts and the implementation of Standard Construction Practices listed in Section 3.6.3, Standard Construction Practices, potential impacts would be less than significant. Specifically, the City would implement the following to avoid and minimize effects to special-status plant species: install erosion control best management practices (Standard Construction Practice #1), provide stockpile containment and exposed soil stabilizing structures (Standard Construction Practice #2), provide runoff control devices (Standard Construction Practice #3), provide wind erosion controls (Standard Construction Practice #4), located and stabilize spoil disposal sites (Standard Construction Practice #5), restore temporarily disturbed natural communities/areas by replanting with natives (Standard Construction Practice #14), and conduct a training-education session for project construction personnel (Standard Construction Practice #16). Overall, both potential direct and indirect impacts to special-status plants related to construction would be less than significant.

Impacts to special-status plant species would not result from operation and maintenance activities as such activities would not entail vegetation removal. Therefore, operations of the Proposed Project would result in no impacts to special-status plants.

Wildlife

During construction, potential direct temporary and permanent impacts resulting from grading activities to establish temporary access and construction work areas, as well as installation of a new concrete control vault/stairway and bank stabilization, could result in significant impacts to some special-status wildlife species. Short-term, indirect impacts to special-status wildlife resulting from increased human presence and noise generated during construction activities could also result in significant impacts to special-status wildlife species.

Santa Cruz Black Salamander, California Giant Salamander, and San Francisco Dusky-Footed Woodrat. As described above in Table 4.4-2, these three special-status wildlife species would have a moderate to high potential to occur within the project site. A total of 0.14 acres of temporary impacts and 0.01 acres of permanent impacts to potential habitat for these species would be affected during construction-related ground disturbance. Construction-related activities could have a substantial adverse effect on these species, if present. The impact of the Proposed Project on these species would be potentially significant.

Nesting Birds and Roosting Bats. The study area contains suitable nesting habitat for ground and tree-nesting bird species and roosting bats, particularly within the riparian areas associated with Laguna Creek and the undeveloped lands surrounding the project site. Construction-related activities that occur within the general nesting season (February through August) could result in a substantial adverse effect to nesting birds. Construction activities that could result in direct impacts to nesting birds and roosting bats include vegetation and tree removal during grading activities. Indirect impacts to nesting birds and roosting bats that could occur during construction include an increase in human activity, construction noise, and dust in the immediate vicinity of an active nest that could result in significant harassment and nest abandonment, causing loss of the nest. Therefore, the impact of the Proposed Project on nesting birds and roosting bats would be potentially significant.

California Red-Legged Frog. The project site occurs within federally designated critical habitat for the CRLF. Based on the focused habitat assessment conducted for the CRLF, the study area does not support the primary constituent elements established for this species. Aquatic breeding habitat, aquatic non-breeding habitat, upland habitat, and dispersal habitat were each assessed during the habitat assessment conducted and were considered either unsuitable or marginally suitable. As a result, USFWS-protocol-level surveys within the study area were not warranted for this species. Furthermore, the CRLF could have a low potential to move through the project site during construction activities as described in Section 4.4.1, Existing Conditions. If frogs were present within the vicinity, implementation of the Proposed Project would have long-term beneficial effects to CRLF by reducing the need for future emergency repairs and for sediment removal at the Facility. Therefore, the Proposed Project's impacts on the CRLF or its potential habitat would be less than significant.

Steelhead and Coho Salmon. These special-status fish species are not expected to occur within the study area due to several barriers to anadromy downstream of the Facility, as previously described. As a result, the Proposed Project would not have any direct impact on these species. Indirect impacts associated with decreased water quality during construction downstream of the work areas would be avoided with implementation of the Standard Construction Practices. Downstream reaches of Laguna Creek would continue to receive base flows during construction to support these species as required. The Proposed Project would not adversely affect suitable spawning and rearing habitat for steelhead or coho salmon located approximately 2 miles downstream of the Proposed Project. Additionally, implementation of the Proposed Project would have long-term beneficial effects to steelhead and coho salmon by improving sediment management at the Facility and maintaining in-stream flows suitable for various salmonid life stages within the downstream anadromous reaches of Laguna Creek. As a result, the Proposed Project would have a less-than-significant impact on these species.

As described in in Section 3.6.3, Standard Construction Practices, the City would implement the following to avoid and minimize effects to special-status wildlife species: install erosion control best management practices (Standard Construction Practice #1), provide stockpile containment and exposed soil stabilizing structures (Standard Construction Practice #2), provide runoff control devices (Standard Construction Practice #3), provide wind erosion controls (Standard Construction Practice #4), located and stabilize spoil disposal sites (Standard Construction Practice #5), store equipment at least 65 feet from active channel to minimize potential hazardous spills (Standard Construction Practices #6 and #7), prevent equipment leaks through regular maintenance (Standard Construction Practice #8), implement proper waste/trash management (Standard Construction Practice #9), avoid activities in active channel (Standard Construction Practice #10), isolate activities in active channel (Standard Construction Practice #11), use appropriate equipment to minimize disturbance to channel (Standard Construction Practice #12), avoid retained riparian vegetation (Standard Construction Practice #13), restore temporarily disturbed natural communities/areas by replanting with natives (Standard Construction Practice #14), conduct a training-education session for project construction personnel (Standard Construction Practice #16), and prevent inadvertent entrapment of wildlife during construction activities (Standard Construction Practice #29).

Implementation of MM BIO-1a through MM BIO-1d, would reduce potentially significant direct and indirect impacts from construction to special-status wildlife species to a less-than-significant level. See Section 4.4.3.5, Mitigation Measures, for details.

Operation and maintenance activities under the Proposed Project would not result in significant impacts to special-status wildlife, as such activities would not involve construction or substantial ground disturbance. New nighttime lighting at the Facility would be task lighting along the valve vault and stairs, which would be on timers and switches to provide lighting during emergency work or maintenance activities. Given that the new lighting would be localized in particular areas, would not be used regularly, and would not appreciably contribute to existing ambient lighting conditions when compared to lighting currently being used in the surrounding area, it would not have a substantial adverse effect on special-status wildlife. Therefore, operation of the Proposed Project would result in less-than-significant impacts to special-status wildlife species.

Impact BIO-2: **Sensitive Vegetation Communities (Significance Standard B).** The Proposed Project could have a substantial adverse effect on the redwood forest alliance vegetation community during construction that would result in both temporary and permanent impacts. ***(Less than Significant with Mitigation)***

The only natural vegetation community within the project site is the redwood forest alliance, which is considered a sensitive vegetation community. Direct temporary and permanent impacts to the redwood forest alliance would result from grading activities to establish temporary access and construction work areas, as well as installation of a new concrete control vault/stairway and bank stabilization. A total of 0.01 acres of permanent impacts and 0.14 acres of temporary impacts to this natural vegetation community could result from Proposed Project implementation. Up to 14 trees (approximately 12 coast redwoods and 2 tan oaks) may need to be removed. While the vast majority of the redwood forest habitat over Laguna Creek and within the project site would remain intact, the Proposed Project could result in a substantial adverse effect on redwood forest alliance. Therefore, the direct impact of the Proposed Project on sensitive natural communities would be potentially significant.

Potential indirect impacts to the redwood forest alliance would consist of short-term construction-related impacts due to erosion, runoff, and dust. Given the temporary nature of these construction-related indirect impacts and the implementation of Standard Construction Practices listed in Section 3.6.3, Standard Construction Practices, potential impacts would be less than significant. Specifically, the City would implement the following to avoid and

minimize effects to the redwood forest alliance vegetation community: install erosion control best management practices (Standard Construction Practice #1), provide stockpile containment and exposed soil stabilizing structures (Standard Construction Practice #2), provide runoff control devices (Standard Construction Practice #3), provide wind erosion controls (Standard Construction Practice #4), located and stabilize spoil disposal sites (Standard Construction Practice #5), restore temporarily disturbed natural communities/areas by replanting with natives (Standard Construction Practice #14), and conduct a training-education session for project construction personnel (Standard Construction Practice #16).

Implementation of MM BIO-2 would reduce potentially significant direct impacts from construction-related activities on sensitive vegetation communities to a less-than-significant level by requiring on-site rehabilitation to pre-construction conditions and monitoring of restoration success.

Direct temporary and permanent impacts to redwood forest alliance would not result from operation and maintenance activities as such activities would not result in vegetation removal. Therefore, operation of the Proposed Project would result in no impacts to this vegetation community.

Impact BIO-3: **Jurisdictional Wetlands and Waters (Significance Standard C).** The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts. ***(Less than Significant with Mitigation)***

No state or federally protected wetlands occur within the study area; however, non-wetland waters of the United States/state under the jurisdiction of USACE, RWQCB, and CDFW do occur within the study area. Construction of the Proposed Project could have direct temporary and permanent effects to jurisdictional non-wetland waters of the United States/state. A total of 0.13 acres of temporary impacts to jurisdictional waters would result from diversion, dewatering, minor channel grading, and sediment removal upstream and downstream of the dam. A total of 0.01 acres of permanent impacts to jurisdictional waters would result from the construction and placement of a new concrete control vault, access stairways, and streambank stabilization within a small portion of the Laguna Creek streambed, but primarily along the upper banks of Laguna Creek. The direct impact of the Proposed Project on jurisdictional non-wetland waters due to construction would be potentially significant.

Short-term and long-term indirect impacts to jurisdictional non-wetland waters relating to construction activities (edge effects) and trash/pollution would be less than significant with implementation of the Standard Construction Practices that would be implemented during Proposed Project construction. As described in in Section 3.6.3, Standard Construction Practices, the City would implement the following to avoid and minimize effects to jurisdictional non-wetland waters: install erosion control best management practices (Standard Construction Practice #1), provide stockpile containment and exposed soil stabilizing structures (Standard Construction Practice #2), provide runoff control devices (Standard Construction Practice #3), provide wind erosion controls (Standard Construction Practice #4), located and stabilize spoil disposal sites (Standard Construction Practice #5), store equipment at least 65 feet from active channel to minimize potential hazardous spills (Standard Construction Practice #6 and #7), prevent equipment leaks through regular maintenance (Standard Construction Practice #8), avoid activities in active channel (Standard Construction Practice #10), isolate activities in active channel (Standard Construction Practice #11), use appropriate equipment to minimize disturbance to channel (Standard Construction Practice #12), avoid retained riparian vegetation (Standard Construction Practice #13), restore temporarily disturbed natural communities/areas by replanting with natives (Standard Construction Practice #14), and conduct a training-education session for project construction personnel (Standard Construction Practice #16).

Potentially significant direct impacts to jurisdictional non-wetland waters of the United States/state due to construction would be mitigated to less than significant through implementation of MM-BIO-3 requiring on-site rehabilitation. This mitigation measure would overlap with the mitigation measures taken to address impacts to special-status species (MM-BIO-1a through MM BIO-1d) and sensitive vegetation communities (MM-BIO-2).

Implementation of the Proposed Project would not have direct temporary and permanent effects to non-wetland waters of the United States/state as a result of operation and maintenance activities, as such activities would not result in the fill of such waters. Therefore, operation of the Proposed Project would result in no impacts to jurisdictional non-wetland waters.

Impact BIO-4: **Wildlife Corridors (Significance Standard D).** The Proposed Project would not substantially degrade the quality or interfere with the use of a wildlife corridor or migratory route, or otherwise impede wildlife movement or use of native wildlife nursery sites. ***(Less than Significant)***

As described above, the study area is not recognized as an important regional wildlife corridor by any state agency or jurisdiction and is not considered critical to the ecological functioning of adjoining watersheds and open space areas. However, Laguna Creek may serve as a local movement corridor that marginally connects habitat for certain amphibians, reptiles, and localized fish species. Overall, the Proposed Project would not substantially alter the vegetation communities or physical setting of Laguna Creek.

During construction, activities could block or otherwise hinder wildlife movement along Laguna Creek or temporarily affect the ability of wildlife to access other habitat areas upstream or downstream of the study area. However, this impact would be temporary and would not substantially degrade the quality or use of a wildlife corridor or migratory route. Existing habitat linkages and wildlife corridor functions would remain intact while construction activities are conducted and following completion. Construction activities would not result in impacts to wildlife movement because no new structures that would impede wildlife movement would be installed.

Following temporary construction disturbances and during continued operation and maintenance of the Facility, the function and values of Laguna Creek and the remainder of the site would remain the same as existing conditions, and would improve downstream of the dam due to sediment management at the Facility and maintenance of in-stream flows facilitated by the Proposed Project. While a small area within the banks of Laguna Creek would be permanently impacted due to the placement of diversion improvement structures, this small displacement of habitat would not impact wildlife movement or use of native wildlife nursery sites within the project site and surrounding areas. Since the existing dam already functions as a barrier to the movement of aquatic species, the existing wildlife corridor functions within Laguna Creek would remain intact during and post construction.

Some indirect impacts to localized wildlife movement could occur during construction due to construction-related noise and in-water work. However, these impacts would be temporary and would not be expected to significantly disrupt wildlife movement during or following construction activities. The environmental conditions and uses surrounding Laguna Creek post-construction, during operation and maintenance activities, would remain and actually improve for riparian-dependent species as a result of the Proposed Project's design and operation to provide better flow to downstream fish habitat during diversions. These factors would also reduce the potential for any long-term indirect impacts to wildlife movement as a result of the Proposed Project.

Therefore, direct and indirect impacts on wildlife corridors and migratory routes resulting from the Proposed Project would be less than significant.

Impact BIO-5: Conflicts with Local Policies or Ordinances (Significance Standard E). The Proposed Project would not conflict with local policies or ordinances protecting biological resources. ***(Less than Significant)***

The Proposed Project was analyzed for compliance with the County of Santa Cruz LCP and LCP implementing ordinances (see Section 4.11, Land Use and Planning). The Proposed Project occurs within the protected buffer zone of Laguna Creek. However, the Proposed Project qualifies as a riparian exception considering the unique circumstances of its design, function, and net benefit to natural resources. Since the Proposed Project is considered a riparian exception according to the provisions of Chapter 16.30, implementation of the Proposed Project would not conflict with the County's Riparian Corridor Protection Ordinance or Sensitive Habitats Protection Ordinance, and the impact would be less than significant.

Removal of significant trees and protection of avoided trees within the coastal zone would be addressed through the coastal development permit process. Tree removal associated with the Proposed Project would also require a minor conversion permit exemption from Cal FIRE. Furthermore, Standard Construction Practices described in Section 3.6.3, Standard Construction Practices, would protect trees from construction damage and reduce impacts related to the Sudden Oak Death Zone of Infestation (and the "Regulated Area") and the Pitch Canker Zone of Infestation. Specifically, the City would implement the following to avoid and minimize effects to protected trees: avoid retained riparian vegetation (Standard Construction Practice #13), restore temporarily disturbed natural communities/areas by replanting with natives (Standard Construction Practice #14), conduct a training-education session for project construction personnel (Standard Construction Practice #16), and implement measures (i.e. sanitize tools/equipment, designate rinsing stations, and inspect loads of logs/equipment/materials entering and leaving the site) to minimize the potential for pathogen spread (Standard Construction Practice #26).

The Proposed Project would not be in conflict with any local policies or ordinances protecting biological resources. Therefore, the impact of the Proposed Project related to conflicts with local policies would be less than significant.

4.4.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative biological resources impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area considered in the cumulative analysis for this topic is the Laguna Watershed.

The Proposed Project would not contribute to cumulative impacts related to conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (Significance Standard F) because it would have no impact related to this standard, as described above. Therefore, this significance standard is not further evaluated.

Impact BIO-6: Cumulative Biological Resources Impacts (Significance Standards A, B, C, D, and E). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to biological resources. ***(Less than Significant)***

The known cumulative projects planned within the Laguna Watershed include the Santa Cruz Water Rights Project (SCWRP), the Laguna Pipeline portion of the North Coast System Repair and Replacement Project, and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan. During operations, the SCWRP would commit the City to maintaining minimum bypass flows for fish, including at the Facility and at the Reggiardo Diversion. No construction or development within the Laguna Watershed is proposed as part of the

SCWRP, and therefore this project would not contribute to cumulative construction impacts in the watershed. The Laguna Pipeline and the Reggiardo Diversion upgrade are anticipated to result in construction impacts that can be reduced to a less-than-significant level with standard mitigation measures similar to those identified in this EIR. Additionally, as these two projects would not be constructed at the same time as the Facility they would not result in significant cumulative impacts during construction in the Laguna Watershed. Long-term benefits to biological resources would result from implementation of the SCWRP, which would commit the City to maintaining minimum bypass flows for fish, and from the Reggiardo Diversion upgrade, which would provide sediment transport during high flows to avoid pulsing of sediment to downstream habitat.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects in the Laguna Watershed that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts to biological resources. As described above, implementation of the Proposed Project would result in impacts to areas immediately surrounding the Facility during project construction. Post construction, the project site would be operated and maintained similar to existing conditions. Mitigation measures listed in Section 4.4.3.5, Mitigation Measures, have been identified to reduce potentially significant impacts to special-status wildlife species, sensitive vegetation communities, and jurisdictional wetlands resulting from project implementation to less-than-significant levels. Similar standard mitigation measures would be implemented for the other two construction projects in the Laguna Watershed. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the Laguna Watershed would result in less-than-significant cumulative impacts to biological resources and no further mitigation measures are required.

4.4.3.5 Mitigation Measures

Implementation of the following mitigation measures would reduce potentially significant biological resources impacts of the Proposed Project related to special-status wildlife species, sensitive vegetation communities, and jurisdictional aquatic resources, as described in the sections above, to a less-than-significant level.

MM BIO-1a **Conduct Worker Environmental Awareness Training.** A qualified biologist shall conduct an education program for all persons employed on the Proposed Project prior to performing work activities. The presentation given by the qualified biologist will include a discussion of the biology and general behavior of any special-status species that may be in the area, how they may be encountered within the work area, and procedures to follow when they are encountered. The qualified biologist shall prepare and distribute handouts containing all of this information for workers to carry on site. Interpretation shall be provided for non-English speaking workers. All personnel working on the site will receive this training, and will sign a sign-in sheet showing they received the training. Any personnel joining the work crew after the training has been administered shall receive the same training before beginning work.

MM BIO-1b **Conduct Special-Status Amphibian Species Survey and Monitoring.** A pre-construction survey for Santa Cruz black salamander, California giant salamander, and California red-legged frog shall be conducted within 48 hours prior to the onset of construction activities. The survey area shall include all suitable habitat within the project site, plus a 50-foot buffer. Suitable habitat for these species in the project site consists of damp upland areas near/adjacent to existing aquatic features associated with Laguna Creek, and the wetted portion of Laguna Creek. Additionally, a qualified biologist shall be onsite daily during construction activities to ensure impacts to special-status wildlife are avoided and minimized. A daily pre-construction sweep for wildlife within all staging and work areas shall be conducted followed by construction monitoring when work is conducted within suitable habitat.

Salamanders. If any individuals of Santa Cruz black salamander or California giant salamander are observed during the pre-construction survey or subsequent monitoring, their location(s) shall be recorded and identified for avoidance. Individuals found should be allowed to move out of the area on their own. If avoidance is not feasible, they shall be moved to the nearest appropriate habitat outside of the construction footprint by a qualified biologist. Qualified biologists shall be approved by the California Department of Fish and Wildlife prior to handling/translocating individuals of these species.

California Red-Legged Frogs. Although determined to have a low potential to occur within the project site, initial ground-disturbing activities shall avoid the period when California red-legged frogs are most likely to be moving through upland areas (November 1 through March 31). When ground-disturbing activities must take place between November 1 and March 31, a qualified biologist shall monitor construction activity daily for the species to ensure avoidance. If any California red-legged frogs are observed and take authorization has been provided for the Proposed Project, relevant conservation measures from the applicable take authorization shall be implemented. If any California red-legged frogs are observed and take authorization has not been provided for the Proposed Project, the monitoring biologist shall have the authority to temporarily stop work to allow the species to move out of the work area on its own volition. The U.S. Fish and Wildlife Service shall be contacted if frogs remain in work areas and appropriate avoidance and minimization measures shall be implemented, as determined by the qualified biologist and approved by the City, to ensure protection of the frogs.

MM BIO-1c **Conduct San Francisco Dusky-Footed Woodrat Survey and Relocation.** A pre-construction survey to locate woodrat middens shall be conducted by a qualified biologists within 48 hours prior to the onset of construction activities. The survey area shall include all suitable habitat within the project site, plus a 50-foot buffer. Woodrat middens found shall be mapped and flagged with high visibility flagging tape for avoidance. If middens are found and complete avoidance is not feasible, the following measures shall be implemented:

- If construction is to occur during the breeding season (generally between January 1 and September 31), and young are suspected to be present, the existing midden shall be left undisturbed until such a time as the qualified biologist determines the young are capable of independent survival.
- A qualified biologist shall construct replacement woodrat middens for each midden that would be removed. The replacement middens shall be located in similar habitat outside the area of disturbance.
- A qualified biologist shall trap woodrats and relocate them to the constructed middens outside the area of disturbance. After trapping is complete, the biologist will disassemble the existing woodrat middens by hand to allow any remaining woodrats inside to escape unharmed.
- Prior to implementation of any disturbance of the existing woodrat middens and/or trapping/relocation, approval from the California Department of Fish and Wildlife will be obtained.

MM BIO-1d **Conduct Preconstruction Nesting Bird and Roosting Bat Survey**. Construction and tree removal activities should avoid the migratory bird nesting season (typically February 1 through August 31), to reduce any potentially significant impact to birds that may be nesting on the study area. If construction and tree removal activities must occur during the migratory bird nesting season, an avian nesting survey of the project site and contiguous habitat within 300 feet of all impact areas

must be conducted for protected migratory birds and active nests. The avian nesting survey shall be performed by a qualified wildlife biologist within 7 days prior to the start of ground or vegetation disturbance. Once construction has started, if there are breaks in ground or vegetation disturbance that exceed 14 days, then another avian nesting survey shall be conducted. If an active bird nest is found, the nest shall be flagged and mapped on the construction plans along with an appropriate no disturbance buffer, which will be determined by the biologist based on the species' sensitivity to disturbance (typically 250 feet for passerines and 500 feet for raptors and special-status species). The nest area shall be avoided until the nest is vacated and the juveniles have fledged. The nest area shall be demarcated in the field with flagging and stakes or construction fencing.

To the extent practicable, tree removal should occur outside peak bat activity timeframes when young or overwintering bats may be present, which generally occurs from March through April and August through October, to ensure protection of potentially occurring bats and their roosts on the project site. Additionally, daily restrictions on the timing of any construction activities should be limited to daylight hours to reduce disturbance to roosting (and foraging) bat species. Additionally, a visual bat survey should be conducted within 30 days of the removal of any trees. The survey should include a determination on whether active bat roosts are present on or within 50 feet of the project site. If a non-breeding and non-wintering bat colony is found, the individuals shall be evicted under the direction of a qualified biologist to ensure their protection and avoid unnecessary harm. If a maternity colony or overwintering colony is found in the control building or trees on the project site, then the qualified biologist shall establish a suitable construction-free buffer around the location. The construction-free buffer shall remain in place until the qualified biologist determines that the nursery is no longer active.

MM BIO-2 **Compensate for Impacts to Sensitive Vegetation Communities.** Direct temporary impacts to 0.14 acres of redwood forest alliance would be mitigated through on-site rehabilitation to conditions similar to those that existed prior to grading and/or ground-disturbing activities. This would consist of re-contouring temporarily impacted areas to match pre-project grade and non-native species removal and monitoring over a 3-year period to inhibit non-native species encroachment. A one-time rehabilitation effort followed by monitoring and non-native weed removal for a minimum of 3 years shall compensate for temporary direct impacts to the redwood forest alliance vegetation community.

Direct permanent impacts to 0.01 acres of redwood forest alliance vegetation community shall be mitigated through on-site enhancement activities at a 2:1 mitigation ratio.

A conceptual Habitat Mitigation and Monitoring Plan shall be prepared and implemented that includes the enhancement activities, which may include non-native species removal and revegetation followed by monitoring, for all disturbed areas. The plan shall specify the criteria and standards by which the enhancement actions will compensate for impacts of the Proposed Project on the redwood forest vegetation community and shall at a minimum include discussion of the following:

- The enhancement objectives including the type and amount of revegetation to be implemented taking into account enhanced areas where non-native invasive vegetation is removed and replanting specifications that take into account natural regeneration of species.
- The specific methods to be employed for revegetation.

- Success criteria and monitoring requirements to ensure vegetation community restoration success.
- Remedial measures to be implemented in the event that performance standards are not achieved.

MM-BIO-3 **Compensate for Impacts to Jurisdictional Non-Wetland Waters.** Direct temporary and permanent impacts to jurisdictional non-wetland waters shall be mitigated on site. On-site measures shall include rehabilitation of areas temporarily impacted (approximately 0.13 acres) and permanently impacted (approximately 0.01 acres) within jurisdictional limits at a 1:1 mitigation ratio. Areas impacted shall be returned to conditions similar to those that existed prior to grading and/or ground-disturbing activities. The conceptual Habitat Mitigation and Monitoring Plan implemented as part of MM-BIO-6 shall include enhancement activities to address impacts to jurisdictional non-wetland waters, which may include non-native species removal and revegetation followed by monitoring, for all disturbed areas. The plan shall specify the criteria and standards by which the enhancement actions will compensate for impacts of the Proposed Project on jurisdictional non-wetland waters. Direct temporary and permanent impacts to jurisdictional non-wetlands waters shall be addressed through Section 401 and Section 404 of the Clean Water Act, the Porter-Cologne Water Quality Act, and Section 1602 of the California Fish and Game Code.

4.4.4 References

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4.5 Cultural Resources and Tribal Cultural Resources

This section describes the existing conditions related to cultural resources and tribal cultural resources of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on a Cultural Resources Inventory, Evaluation, and Finding of Effect Report prepared for the Proposed Project, which is included in Appendix D.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. Comments related to cultural resources and tribal cultural resources were received from the Native American Heritage Commission (NAHC) and a representative from the Costanoan Ohlone Rumsen-Mutsen Tribe. Issues identified in the public comments related to potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or issues raised by responsible and trustee agencies are identified and addressed in this EIR.

4.5.1 Existing Conditions

Information in this section was obtained through cultural resource records searches, archival research, pedestrian surveys of the project site, historical significance evaluations, and correspondence with Native American tribes and other interested parties. The information is summarized below and described in detail in Appendix D.

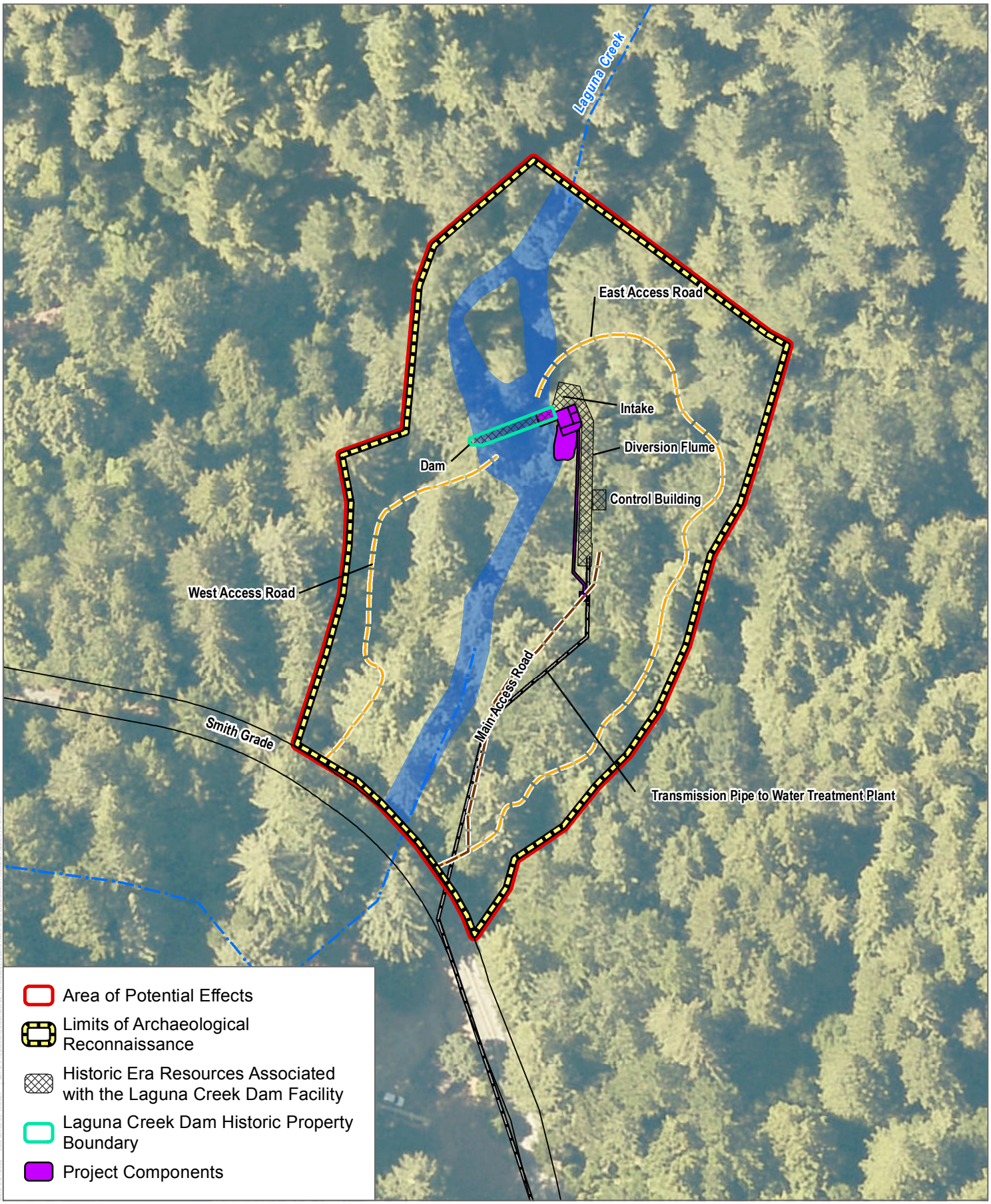
4.5.1.1 Study Area

For the purposes of the records search described below, the study area for cultural resources is the area of potential effect (APE) plus a 0.25-mile buffer. The APE is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. The determination of the APE is influenced by a project's setting, the scale and nature of the undertaking, and the different kinds of effects that may result from the undertaking (36 Code of Federal Regulations [CFR] 800.16[d]). The APE for the Proposed Project is shown on Figure 4.5-1 and includes the maximum possible area that could be affected by the Proposed Project.

4.5.1.2 Prehistoric Context

The APE lies within the territory that was occupied by the Costanoan or Ohlone people prior to European contact. The term Costanoan refers to people who spoke eight separate Penutian-stock language groups and lived in autonomous tribelet communities between the vicinities of the city of Richmond in the north to Big Sur in the south. The Awaswas tribelet occupied the Santa Cruz area at the time of European contact (Levy 1978).

The temporal framework for the prehistoric era of greater Central California coast spans a period of approximately the last 10,000 to 12,000 years, (i.e., the Holocene), and divides that span into six different periods (Jones et al. 2007). Researchers distinguish these periods by perceived changes in prehistoric settlement patterns, subsistence practices, and technological advances.



SOURCE: ESRI 2020, City of Santa Cruz 2019, USGS 2019

DUDEK

0 40 80 Feet

FIGURE 4.5-1

Cultural Resources Area of Potential Effects

Laguna Creek Diversion Retrofit Project - EIR

Paleo-Indian Period (pre-8000 BC)

The Paleo-Indian Period represents people's initial occupation of the Monterey Bay region, which was quite sparse across the region. The traditional interpretation of Paleo-Indian lifeways is that people were highly mobile hunters who focused subsistence efforts on large mammals. In contrast, Erlandson et al. (2007) proposes a "kelp highway" hypothesis for the peopling of the Americas. Proponents of this model argue that the earliest inhabitants of the region focused their economic pursuits on coastal resources. Archaeological sites that support this hypothesis are mainly from the Santa Barbara Channel Islands. Some scholars hypothesize that Paleo-Indian sites in the Bay Area/northern Central Coast region may exist, but have been inundated as a result of rising ocean levels throughout the Holocene (Jones and Jones 1992).

Millingstone Period (8000 to 3500 BC)

Settlement in the Central Coast appeared with more frequency in the Millingstone Period. Sites are often associated with shellfish remains and small mammal bone, which suggest a collecting-focused economy. Newsome et al. (2004) report that stable isotope studies on human bone indicate a diet composed of 70% to 84% marine resources. Contrary to these findings, deer remains are abundant at some Millingstone sites (cf. Jones et al. 2008), which suggests a flexible subsistence focus. Similar to the Paleo-Indian Period, archaeologists generally view people living during the Millingstone Period as highly mobile.

Early Period (3500 to 600 BC)

The Early Period corresponds with the earliest era of what Rogers (1929) called the "Hunting Culture." Early Period sites are located in more varied environmental contexts than Millingstone sites, suggesting more intensive use of the landscape than practiced previously (Jones and Waugh 1997). Early Period sites are common and often found in estuary settings along the coast or along river terraces inland and are present in both Monterey and Santa Cruz counties. Archaeologists have long debated whether the shift in site locations and artifact assemblages during this time represent either population intrusion as a result of mid-Holocene warming trends, or an in-situ adaptive shift (cf. Mikkelsen et al. 2000). The initial use of mortars and pestles during this time appears to reflect a more labor intensive economy associated with the adoption of acorn processing (cf. Basgall 1987).

Middle Period (600 BC to AD 1000)

The trend toward greater labor investment is apparent in the Middle Period. During this time, there is increased use of plant resources, more long-term occupation at habitation sites, and a greater variety of smaller "use-specific" localities. Jones et al. (2007) discuss the Middle Period in the context of Rogers' "Hunting Culture" because it is seen as a continuation of the pattern that began in the Early Period. The pattern reflects a greater emphasis on labor-intensive technologies that include projectile and plant processing. Additionally, faunal evidence highlights a shift toward prey species that are more labor intensive to capture, either by search and processing time or technological needs. These labor-intensive species include small schooling fishes, sea otters, rabbits, and plants such as acorn.

Middle-Late Transition (AD 1000-1250)

The Middle-Late Transition corresponds with the end of Rogers' "Hunting Culture." The Middle-Late Transition is a time that appears to correspond with social reorganization across the region. This era is also a period of rapid climatic change known as the Medieval Climatic Anomaly (cf. Stine 1994). The Medieval Climatic Anomaly is

proposed as an impetus for the cultural change that was a response to fluctuations between cool-wet and warm-dry conditions that characterize the event (Jones et al. 1999). Archaeological sites are rarer during this period, which may reflect a decline in regional population (Jones and Ferneau 2002).

Late Period (AD 1250-1769)

Late Period sites are found in a variety of environmental conditions and include newly occupied task sites and encampments, as well as previously occupied localities. Coastal sites dating to the Late Period tend to be resource acquisition or processing sites, while evidence for residential occupation is more common inland (Jones et al. 2007).

4.5.1.3 Historic Context

Spanish Period (1769–1822)

The earliest known European exploration of the Monterey Bay was a Spanish envoy mission in 1602 led by Sebastián Vizcaíno, who was sent by the Spanish government to survey the California coastline. Vizcaíno named the Bay "Monterey" after the Conde de Monterey, the present Viceroy in Mexico (Chapman 1920: 293-4; Hoover et al. 2002: 225-6). In 1769, Don Gaspar de Portolá, the Governor of Baja, embarked on a voyage to establish military and religious control over the area. On their quest to locate the Monterey Bay from the 160-year-old accounts of Sebastián Vizcaíno, the Portolá expedition first reached the present-day territory of Santa Cruz on October 17, 1769. After mistakenly circumventing the Monterey Bay and reaching the San Francisco Bay, the expedition backtracked to San Diego. The following year on May 31, 1770, a second expedition was organized by Portolá resulting in a successful location of the Monterey Bay. In 1791, Mission Santa Cruz was established as the twelfth mission in the California Mission system. Converted Native Americans known as neophytes were forced to build the mission church and auxiliary structures from local timber, limestone, and adobe, as well as to cultivate wheat, barley, beans, corn, and lentils for the mission Padres and soldiers. From the start, Mission Santa Cruz was plagued by substantial issues. The forced conversion of the local native population resulted in repeated rebellions, violence, desertion, and pestilence at Mission Santa Cruz.

In 1795, Spain established three self-governing Pueblos in Alta California that, unlike the Missions, would remain free from military and religious oversight. Villa de Branciforte was established in 1797 on the opposite bank of the San Lorenzo River from Mission Santa Cruz. The 40 settlers of Villa de Branciforte were not provided with the resources promised to build housing or cultivate the land, and had to make due with crude dwellings of their own design. In 1803, there were 107 inhabitants, however, because the population was made up of former soldiers, artisans, and criminals, they lacked the pertinent skill to farm and sustain themselves. Despite population growth in the initial years, the settlement was quickly deemed a failure by Spain (Lehmann 2000: 4-5). By 1817, the population of Villa de Branciforte had dwindled to 52 people.

Mexican Period (1822–1848)

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1834, the Spanish Missions across the territory were secularized. The secularization of the Missions meant that all communal mission property was placed in a trust with the intention of being returned to the local Native American population. In Santa Cruz, the land purloined by the Spanish was returned to Native Americans between 1834 and 1839, but a small pox epidemic in 1838 and reoccurring bouts of syphilis caused a massive decline in the Native population from 284 in 1837 to 71 in 1839. This meant that very few eligible recipients remained to receive it, and records indicate that only 25 Native Americans held property in the Santa Cruz area between 1834 and 1849 (Lehman 2000: 4-5).

Extensive land grants were established in the interior during this period, which covered over 150,000 acres of present-day Santa Cruz County. Several land grants covered the lower regions of the densely forested Santa Cruz Mountains. Not all regions of the Santa Cruz Mountains, however, became part of a Mexican land grant during this vast undertaking; the region encompassing the present-day communities of Bonny Doon, Ben Lomond, and Boulder Creek was never formally granted to a recipient during this period (Hoover et al. 2005: 456-8; Koch 1973: 11).

American Period (1848–Present)

The Mexican–American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period. Santa Cruz was designated as one of the 27 original counties of California on February 18, 1850, shortly before California officially became a state with the Compromise of 1850. The new state of California recognized the ownership of lands in the state distributed under the Mexican land grants of the previous several decades (Lehman 2000: 5; Koch 1973: 35).

The California Gold Rush of 1848 led to a massive influx of people seeking gold in the rural counties of California. The gold fields quickly dried up causing many new arrivals to refocus on other economic opportunities. In Santa Cruz County, insightful entrepreneurs saw the arrival of opportunity-seeking laborers as a means to harvest the abundant natural resources found throughout the area. The lumber, mining, tanning, fishing, and leisure industries formed the economic foundation of Santa Cruz County. In the central and southern areas of the County, early settlers took advantage of the fertile soil and temperate climate to establish large farms and dairies. Interest in the beauty of the Monterey Bay drew visitors to the County as early as the 1860s, causing beach tourism to emerge as another major industry in the County.

The Role of Water in the Early Development of Santa Cruz County

The Gold Rush accelerated the desirability of land across the state, and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling, or as-needed domestic use. When land in the Santa Cruz Mountains was subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in Santa Cruz County (Pisani 1984: 246-7).

Many of these powerful mountain streams and tributaries were utilized by early landowners and tenant entrepreneurs to make a profit from the natural resources that formed the early economic basis of the County. Several of these mountain creeks still bear the names of the first men who established mills or permanently settled beside them. Majors Creek was named for Joseph L. Majors who established a grist mill on the creek prior to serving as the County Treasurer between 1850 and 1853. Liddell Creek was named for George Liddell who moved to the Santa Cruz Mountains and established a sawmill on the creek in 1851. Newell Creek was named for Addison Newell who established a farm in the steep, v-shaped valley on the banks of the creek in 1867 (Koch 1973: 33–34; Clark 2008: 174, 187, 215).

For others, the streams presented pure economic opportunity. The first power sawmill in California was built on Rancho Zayante by Isaac Graham in the 1842 and was driven by the waters of Zayante Creek. Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased a portion of Rancho Cañada del Rincon in 1853 as a promising quarry site. They also utilized the falling water on the property to process local lumber into fuel for their

many kilns. The California Powder Works was established in 1865 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The Powder Works used the river to grind raw materials used in the production of the first smokeless powder manufactured on the west coast of the United States. By 1868, there were a sizable number of business and industries that relied on water from County waterways to operate, including 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation within the County (Clark 2008: 130–131; Hoover et al. 2002: 456; Koch 1973: 36–37; Brown 2011: 4).

4.5.1.4 Development of Water Infrastructure in Santa Cruz

The San Lorenzo River and the many creeks that wind through the greater Santa Cruz County area have historically been subject to seasonal droughts and floods. Coupled with the many upstream diversions and industrial uses of these waterways by settlers and purveyors in the Santa Cruz Mountains, water shortages are present in the earliest records of the County. By the 1860s, acute cyclical shortages and pollution prompted the development of private for-profit water systems by entrepreneurs.

F.A. Hihn Water Works (1864)

In 1864, Elihu Anthony and Fredrick A. Hihn implored the Board of County Supervisors to allow them to dig trenches and lay redwood pipes to transport water throughout Santa Cruz. The "wooden tubes" were chosen as an inexpensive alternative to iron pipes (Santa Cruz Weekly Sentinel 1864a: 2). The source of the water was an 8,000-gallon reservoir on Anthony's property supplied by water from Scott's Creek, and eager recipients of the water could gain access for a fee (Brown 2011: 1-2; Santa Cruz Weekly Sentinel 1864b: 2). The system became known as the F.A. Hihn Water Works, and it was the largest provider of water in the newly chartered City, with Dodero and Carbonero Creeks constituting its primary sources. The company predated the incorporation of Santa Cruz by 2 years (Koch 1973: 35; Brown and Dunlap 1956: 14; City of Santa Cruz 2020b).

The Santa Cruz Water Company (1866)

In 1866, a new, fee-based, private water supply company was founded to share in the lucrative profits of the F.A. Hihn Water Works. A man named E. Morgan acquired rights to the waters of the San Lorenzo River in 1866, just prior to the town of Santa Cruz being officially incorporated later that year. He used these rights to install a section of pipework conveying water to the area known then as the "The Flats," which comprises the modern area of Pacific Avenue and Front Street (SCWD ND: 1).

In 1876, Morgan sold his system to a wealthy man from San Francisco named H.K. Lowe. Under Lowe's guidance, the Santa Cruz Water Company incorporated in July 1876 and began construction on a pumping station on the San Lorenzo River approximately 1 mile upstream from the City, as well as a new reservoir located on High Street. H. K. Moore, company President, and E. R. Morgan, the resident engineer and superintendent, operated the Santa Cruz Water Company. By the end of 1876, the Company had also installed a diversion off Branciforte Creek to deliver water to a new reservoir located at the base of School Street. As the City continued to grow and the steam-powered pumping plant installed on the San Lorenzo River became the source of repeated water-quality concerns, the Santa Cruz Water Company acquired partial water appropriation rights to Majors (then called "Cojo") Creek in 1881. After the acquisition, the Company scrapped the San Lorenzo pumping plant for a meager $800 (Santa Cruz Weekly Sentinel 1877a: 1; 1877b: 2; SCWD ND: 1).

For the next several years, the Santa Cruz Water Company focused its attention on the construction of a pipeline to divert water from the newly acquired Majors Creek appropriations. This effort was very costly and the company the slipped into dire financial standing, eventually prompting the sale of the company in 1886.

City of Santa Cruz Water Department

During the 1880s, the rising price of the private, fee-based water systems prompted the City of Santa Cruz to explore their own, City-owned public option that would grant the citizens of Santa Cruz unlimited free water. In August of 1886, the Santa Cruz Water Company along with all of its appurtenances was purchased by the City of Santa Cruz through the sale of bonds from the Bank of Santa Cruz and the Anglo-Californian Bank. Hihn bitterly opposed the issuance of the bonds and contested their legality in court. The matter reached the Supreme Court and the election in favor of the bonds was declared invalid in 1887. By this time however, the City had already operated the system for over a year when it was re-conveyed to private owners in 1887 (Santa Cruz Weekly Sentinel 1882: 3; SCWD ND: 1; Santa Cruz Surf 1890a: 1).

The City voted again in March 1888 to put up the bonds necessary to purchase the system from the private owners. While the City was in the process of securing the bonds for the purchase, the system was covertly sold to Hihn in a private, backroom deal before the City could obtain legal ownership. Hihn quickly consolidated the Santa Cruz Water Company system with his own works and effectively severed the opportunity the City had of acquiring an established water works system (Santa Cruz Daily Surf 1888a: 3, 1888b: 2; Santa Cruz Surf 1890a: 1).

The City revised its approach and by July 1888, the Common Council had secured nearly all of the water rights to the Laguna Creek. "The Laguna," the *Santa Cruz Sentinel* reported, "is a rushing, roaring mountain stream, entirely rock bound and tree shaded above the falls where it is proposed to take the water out" (Santa Cruz Sentinel 1888:2). The creek was capable of supplying 1.4 million gallons towards a City-owned water works, and in August, it was reported that open negotiations with the sole opposing claimant, a land owner concerned with loss of access to water for his own land as a result of the pipeline, were underway and was resolved amicably. Plans for the construction of the first City-owned water works, supplied through a new pipeline by the waters of Laguna Creek, with reserve storage in a new City reservoir were finally in motion. The *Santa Cruz Surf* reported with excitement that the new project would mean open, municipal water so that each citizen of Santa Cruz could finally "…quench his thirst with free water without 'dropping a nickel in the slot.' (Santa Cruz Surf 1890a: 1)" (Santa Cruz Sentinel 1888: 2; The Santa Cruz Daily Surf 1888b: 2).

4.5.1.5 Development of the Laguna Creek Diversion Facility

With the rights to the water of Laguna Creek secured, the City of Santa Cruz set in motion plans to construct the first municipal water distribution system, known then as the City Water Works, and later as the Laguna Creek Diversion Facility (Facility).

After some difficulty, the bonds required to fund the construction of the City Water Works were secured within the following year, and in July 1889, a civil engineer named G.S. Schussler conducted a survey and inspection of the proposed dam, reservoir, and pipeline site. He produced a report in favor of the project that valued the proposed undertaking at $260,000 (Santa Cruz Surf 1889a: 3; 1889b: 3; Santa Cruz Sentinel 1889: 3).

The City of Santa Cruz made an arrangement with the New York banking group, Coffin and Stanton, who agreed to accept the money and construct the City Water Works on the condition that they would hold the mortgage to the system until the time the bonds were fully repaid. One week prior to Thanksgiving on November 20, 1889, the

Common Council introduced and adopted an ordinance authorizing the conveyance of the Laguna Creek water rights to the City, and the mortgage to the future City Water Works system to Coffin and Stanton (Santa Cruz Surf 1890a: 1).

Coffin and Stanton received the papers authorizing the construction, and work on the City Water Works system began immediately. The work would entail the construction of a dam on Laguna Creek, the excavation of a reservoir site on Henry Cowell's property, the installation of a 12-mile-long pipeline from the Laguna Creek Dam to the reservoir, and pipes connecting the reservoir with Santa Cruz households. Coffin and Stanton sublet the construction contract to the prominent San Francisco firm, Risdon Iron Works, who were known for producing the great iron pipes for steam ships. Risdon had a representative in Santa Cruz by the following week to calculate the number of iron pipes required for the project. The *Santa Cruz Surf* reported that work on the dam on Laguna Creek and the dam at the reservoir site on Henry Cowell's ranch property would be completed by the San Francisco contracting firm, Kelso and Dare (Santa Cruz Surf 1889c: 3).

By early December 1889 when work was intended to begin, the representative of Risdon Iron Works, A. Schierholz, was reportedly on-site for the duration of the project, as well as John Kelso and William Baldwin, representatives of contractor, Kelso and Dare. Although work began on a labor camp near the reservoir site on Cowell's property, work on the Laguna Creek dam was delayed for some time by inclement weather. On December 28, the first shipment of pipes arrived in Santa Cruz, and construction on the pipeline, the Laguna Creek Dam, and the reservoir site commenced over the following months. Appendix D contains illustrations of the likely shape and size of the pipeline segments for the Laguna Pipeline.

On September 30, 1890, the Santa Cruz Surf reported that the reservoir and the pipeline of the City Water Works were nearly complete. The article published an in-depth description of the new Laguna Creek Dam stating that (Santa Cruz Surf 1890b: 3):

> The dam across Laguna Creek just above the Henneuse place is one of the finest pieces of rubble stone work in the county and not to be excelled anywhere. The granite rocks used in its construction were taken from the bed of the creek, some of them weighing as much as two tons. The water will first be diverted from the Laguna at this point into a flume 3x4 feet and one hundred feet in length, also built of solid masonry. This is nearly level and terminates in a basin two feet lower, and into which the sand and sediment which may be carried in the water in a time of storm will settle. Gates are provided by means of which this basin can be cleared as often as required. From here the water will enter the 14-inch main through which it will be carried to the storage reservoir. This pipe follows the canyon of the Laguna creek as nearly as possible to the county road a distance of about three miles.

At 5.35 p.m. on October 18, 1890, the last pipe connecting the waters of Laguna Creek to the homes and businesses of Santa Cruz was put into position (Santa Cruz Surf 1890c: 3).

In 1892, Harrison's *History of Santa Cruz County, California* touted the new Santa Cruz City Water Works (Harrison 1892: 216):

> Without doubt Santa Cruz is the best watered, as well as the best lighted, town on the Pacific Coast. She owns her own water supply and electric light works. The water system especially is a matter of great local pride, and, naturally enough, those connected with it take great pleasure in exhibiting it.

The same year as the Harrison publication, the City of Santa Cruz published an overview of the recent water-related projects in the City and also a review of the new municipal system after one year of operation. This review included a small photograph of the Laguna Creek Dam that had been completed 2 years prior in 1890 (see Appendix D) (Santa Cruz Surf 1892: 2).

When the last segment of the cast-iron Laguna Pipeline was laid in October 1890, the first municipally funded water works system in the history of Santa Cruz, the Facility began to supply free water to the citizens of the City. The Facility led the way for subsequent municipal water impoundment projects for the City, which continues to rely on multiple sources in the North Coast Watershed for drinking water supply into the present. The Facility is the first example of this type of project in the City, and continues to function as a component of a now-enlarged of water capture and distribution system presently suppling drinking water to the Santa Cruz Water Department service area.

Following the completion of the Facility, the City implemented a measure in 1891 to increase the water flow diverted through the pipeline. A 965-foot-long flume was completed connecting the west branch of Laguna Creek, now called Reggiardo Creek, to the main Laguna Creek by emptying out water to the north of the dam. The new flume was intended to help supplement the municipal supply from Laguna Creek, as the year-old Laguna Creek Dam was quickly inundated with sediment, and not enough water was being captured by the system overall (Santa Cruz Surf 1892: 2).

In 1912, R.S. Tait, the water superintendent, announced that a dam had been completed on Reggiardo Creek in order to aid in the supply of daily drinking water sourced from Laguna Creek. The level of Laguna Creek had been significantly reduced by a lack of rainfall in the watershed area, causing the supply of water in the impoundment to drop below sufficient levels to support the community. The concrete dam on Reggiardo Creek impounded water and conveyed it through a corresponding iron pipeline to the creek approximately 850 feet upstream from the Laguna Creek Dam. This measure was strictly intended to supplement the water flow distributed through the pipeline leading from the Facility. Although a portion of the Reggiardo Creek Pipeline, a 10-inch blow off pipe, is located along the west edge of the Laguna Creek Dam and feeds into the creek, it is not a component of the Facility as it is not physically connected and merely changes the volume and flow of water through Laguna Creek (Santa Cruz Evening News 1912: 2).

Today, the Laguna Creek Dam structure continues to convey the physical defining features and engineering methods of a diversion facility from the late 19th century, and offers a glance into the earliest efforts by the City to supply water to its residents.

Engineer: Risdon Iron Works

As described above, the Risdon Iron Works iron foundry was responsible for the design of the Facility system in 1889. John Nelson Risdon was born on July 10, 1822 in LeRoy, New York. John was the third of seven children born to Orange and Sally Risdon. Orange Risdon was a notable surveyor and a tenacious entrepreneur who was known for founding the City of Saline, Michigan in 1832 (Dikeman 2004).

J. N. Risdon departed for El Dorado during the early 1850s, joining the many tradespeople who flocked to the California during the Gold Rush to support the rapid economic and industrial growth there. He made his way via the Isthmus of Panama, and remained there with his young wife for over a year running a store. After leaving Panama, they changed their plans to go to El Dorado, and instead decided to settle in San Francisco (Dikeman 2004; Jensen 2006: 7; Oakland Tribune 1887: 2).

John received employment at a small foundry and boilermaker under the ownership of John Snow, and it was here that he began to see the economic prospects in iron works and boiler making. In 1853, he formed a partnership with the present foreman of the foundry, James Coffey, and together they purchased Snow's interests in the business. Together, Coffey and Risdon expanded the capacity of Snow's foundry, rebranding the business, Coffey & Risdon's Steam Boiler Works. Coffey and Risdon claimed to be "the only exclusively Boiler Making Establishment on the Pacific Coast" (Daily National Democrat 1858:4) and the company became reasonably well known during its time in operation until 1868 (Dikeman 2004; Jensen 2006: 7; Oakland Tribune 1887: 2).

Like his father, John Risdon was a determined entrepreneur. When Coffey and Risdon experienced considerable success, Risdon decided to also open his own foundry in 1864. Four years later in April 1868, the Risdon Iron and Locomotive Works filed for a certificate of incorporation. The company name was colloquially shortened to Risdon Iron Works (Oakland Tribune 1887: 2; San Francisco Examiner 1868: 3).

The Risdon Iron and Locomotive Works manufactured engines and machinery for mills, sugar refinement, mining, agriculture, locomotives, and steam ships. The company also produced cast iron pipes to specification, and cast iron architectural components. The company continued to function under the Risdon name following John Risdon's death in 1887. In fact, some of the most prestigious projects undertaken by Risdon Iron Works took place after the time Risdon was involved in the operation of the company (Oakland Tribune 1887: 2).

Contractor: Kelso and Dare

The contracting company Kelso and Dare was owned and operated by John Kelso and John Dare. The company specialized in grading activities for railroad lines and was active during the late 1880s and early 1890s in the San Francisco Bay Area (Poor's Railroad Manual 1893: 471).

4.5.1.6 Cultural Resources

Records Search

To identify previously recorded cultural resources and reports near the APE, a records search of the APE and 0.25-mile buffer was conducted at the Northwest Information Center of the California Historical Resources Information System (CHRIS) in December 2019. The CHRIS search included a review of the NRHP, CRHR, California Inventory of Historic Resources, historical maps, and local inventories. Based on the results of the CHRIS search, no previously recorded cultural resources are located within the study area.

Historical Resources

The Facility contains four historic-era built environment structures: the Laguna Creek Dam (1890), the diversion flume/intake structure (1890), the transmission pipeline (1890) and the chlorination station (1965). In order to assess the property's historical significance and integrity, the Facility was recorded and evaluated in consideration of National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and County of Santa Cruz (County) Historic Resources Inventory (HRI) designation criteria and integrity requirements. These criteria are listed as follows and further described in Section 4.5.2, Regulatory Framework:

- NRHP Criteria:
    A. Are associated with events that have made a significant contribution to the broad patterns of our history.
    B. Are associated with the lives of persons significant in our past.
    C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
    D. Have yielded, or may be likely to yield, information important in prehistory or history.
- CRHR Criteria:
    1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
    2. Is associated with the lives of persons important in our past.
    3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
    4. Has yielded, or may be likely to yield, information important in prehistory or history.
- County of Santa Cruz HRI Criteria:
    1. The resource is associated with a person of local, state, or national historical significance.
    2. The resource is associated with an historic event or thematic activity of local, state, or national importance.
    3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.
    4. The resource has yielded, or may likely yield, information important to history.

A detailed full evaluation for the Laguna Creek Dam under all applicable criteria and integrity considerations is presented in Appendix D. A summary of the eligibility findings presented in the technical report is summarized below.

The Laguna Creek Dam appears eligible for listing in the NRHP and CRHR under Criterion A/1 and County HRI Criterion 2. The Laguna Creek Dam is a well-preserved masonry water management structure dating to 1890. It is a physical example of pioneering water management infrastructure in California. As such the dam appears individually eligible for listing in the NRHP and the CRHR under Criterion A/1 for its association with early advances in water management in California specifically through creation of the City of Santa Cruz's first municipal water distribution system that resulted in supplying the community of Santa Cruz with municipal water services and led to subsequent expansion of water infrastructure in the region.

Other elements of the Facility have been replaced, added, or altered since the period of significance including the diversion flume/intake structure, transmission pipeline, and the chlorination station. As such, they are not considered contributing features of the Laguna Creek Dam historic property. The contemporary infrastructural elements on the site, including lighting, utilities, modern valves and housings, also do not date to the 1890 period of significance, and as such, they are considered non-contributing elements to the dam.

The other historic-era ancillary structures at the Facility were determined to have either been modified to the extent that they no longer retain historic integrity and cannot convey significance to their period of significance, 1890, or

were added later; therefore, the ancillary structures are not considered contributing elements of the Laguna Creek Dam. Thus, the historic property boundary for the Laguna Creek Dam is limited to the dam structure footprint.

Therefore, for the reasons discussed, the Laguna Creek Dam is considered a historic property under Section 106 of the National Historic Preservation Act (NHPA) and a historical resource under CEQA. The period of significance for the dam is 1890, the year it was initially constructed. The historic property boundary for the Laguna Creek Dam is limited to the dam structure footprint. The character defining features associated with this dam, are limited to its location, setting, alignment, native stone or limestone masonry construction materials, the Risdon Iron Works plaque on the face of the Laguna Creek Dam, and its continued use as a water management structure.

Archaeological Resources

A pedestrian survey of the APE consisting of an archaeological surface reconnaissance was conducted in January 2020. The site reconnaissance found no archaeological resources within the APE. Therefore, based on the records search described above and the site reconnaissance, no known archaeological resources are located within the APE.

Tribal Cultural Resources

A search of the NAHC Sacred Lands File, which is a list of properties important to Native American tribes, was conducted in February 2020 for the vicinity of the APE. No known sacred lands were identified from the Sacred Lands File search. The NAHC also provided a list of five Native American contacts who might have local knowledge of cultural and tribal cultural resources near the APE. The City sent outreach letters via mail and email to the Native American contacts provided by the NAHC in March 2020. The Costanoan Ohlone Rumsen-Mutsen Tribe responded and indicated that they are aware of five Native American sites in the area and asked that these sites not be disturbed. These five specific prehistoric resources are associated with lower Laguna Creek, and are located outside of the APE. No other Native American contacts have responded to the letters to date. See Appendix D for further details and a complete record of the Native American outreach effort. The U.S. Army Corps of Engineers (USACE), as the federal lead agency for compliance with NHPA Section 106 regulations (described below in Section 4.5.2, Regulatory Framework), also conducted a Sacred Lands File search and the required Section 106 Native American consultation through the NAHC directly from the USACE District office in San Francisco.

In addition, as described above, the CHRIS records search did not identify any known archaeological resources within the APE and the surface reconnaissance was negative for evidence of previously unknown archaeological resources. Therefore, no known tribal cultural resources are located within the APE.

4.5.2 Regulatory Framework

4.5.2.1 Federal

National Historic Preservation Act

The NHPA established the NRHP and the President's Advisory Council on Historic Preservation (ACHP), and provided that states may establish State Historic Preservation Officers to carry out some of the functions of the NHPA. Most significantly for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that:

> [t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP.

Section 106 also affords the ACHP a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

36 CFR Part 800 implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be adversely affected by a proposed undertaking; and the process for eliminating, reducing, or mitigating the adverse effects.

The content of 36 CFR 60.4 defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historic significance in consultation with the ACHP and the California State Historic Preservation Officer to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if they possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Regarding criteria A through D of Section 106, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, cultural resources, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (36 CFR 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or
B. Are associated with the lives of persons significant in our past; or
C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. Have yielded, or may be likely to yield, information important in prehistory or history.

The 1992 amendments to the NHPA enhance the recognition of tribal governments' roles in the national historic preservation program, including adding a member of an Indian tribe or Native Hawaiian organization to the ACHP.

The NHPA amendments:

- Clarify that properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register
- Reinforce the provisions of the Council's regulations that require the federal agency to consult on properties of religious and cultural importance.

The 1992 amendments also specify that the ACHP can enter into agreement with tribes that permit undertakings on tribal land and that are reviewed under tribal regulations governing Section 106. Regulations implementing the NHPA state that a federal agency must consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking.

4.5.2.2 State

California Register of Historical Resources

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (Public Resources Code [PRC] Section 5020.1[j]). In 1992, the California legislature established the CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP, enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 California Code of Regulations Section 4852[d][2]).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC Section 21083.2(g) defines "unique archaeological resource."
- PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) define "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource." It also defines the circumstances when a project would materially impair the significance of an historical resource.
- PRC Section 21074(a) defines "tribal cultural resources."
- PRC Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC Sections 21083.2(b)-(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (PRC Section 21084.1; CEQA Guidelines Section 15064.5[b]). If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1[q]), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA (PRC Section 21084.1; CEQA Guidelines Section 15064.5[a]). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (PRC Section 21084.1; CEQA Guidelines Section 15064.5[a]).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); PRC Section 5020.1[q]). In turn, CEQA Guidelines section 15064.5(b)(2) states the significance of an historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a], [b], and [c]).

PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (PRC Section 21083.2[a]; CEQA Guidelines Section 15064.5[c][4]). However, if a non-unique archaeological resource qualifies as tribal cultural resource (PRC Section 21074[c], 21083.2[h]), further consideration of significant impacts is required. CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in PRC Section 5097.98.

California Environmental Quality Act Assembly Bill 52 Consultation

The CEQA lead agency for consultation with local Native American tribes is the City of Santa Cruz. At the time of the report, the City has not received any Assembly Bill 52 requests from local tribes. The agency regulatory contact for the consultation is Ms. Jessica Martinez-McKinney, Santa Cruz Water Department, 212 Locust Street, Suite C, Santa Cruz, CA 95060, (831) 420-5327; jmartinezmckinney@cityofsantacruz.com.

4.5.2.3 Local

Santa Cruz County Code

Native American Cultural Sites

Chapter 16.40 (Native American Cultural Sites) of the Santa Cruz County Code (SCCC) outlines methods and regulations for the identification and treatment of cultural resources within the County.

Historic Resources Inventory

Cultural Landmarks in the County of Santa Cruz are termed Historic Resources and are under the aegis of the Planning Department, County of Santa Cruz. A list of Historic Resources is maintained in the County's Historic Resources Inventory, which identifies those Historic Resources located in the unincorporated areas of the County.

Historic Resource is defined in Chapter 16:42 Historic Preservation within Title 16: Environmental and Resource Protection as follows (County Code 16.42.030 (I) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008]):

> … means any structure, object, site, property, or district which has a special historical, archaeological, cultural or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the County, State, or nation, and which either has been referenced in the County General Plan, or has been listed in the historic resources inventory adopted pursuant to SCCC 16.42.050 and has a rating of significance of NR-1, NR-2, NR-3, NR-4, or NR-5.

In order to be placed on the County Historic Resources Inventory, a property must first be evaluated for its ability to meet one or more of the following criteria: (County Code 16.42.050 Historic Resource Designation [Ord. 4922 § 1, 2008]).

1. The resource is associated with a person of local, state or national historical significance.
2. The resource is associated with an historic event or thematic activity of local, State or national importance.
3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.
4. The resource has yielded, or may likely yield, information important to history.

Santa Cruz County Historic Districts

The County of Santa Cruz defines Historic District as (County Code 16.42.030 (E) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008]):

1. Have character of special historic or aesthetic interest or value; and
2. Represent one or more periods or styles of architecture typical of one or more eras in the history of the County; and
3. Cause such area, by reason of these factors, to constitute a geographically definable area possessing a significant concentration or continuity of sites, buildings, structures, or objects that are unified by past events, or aesthetically by plan or physical development.

4.5.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to cultural resources and tribal cultural resources. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.5.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to cultural resources and tribal cultural resources are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
B. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
C. Disturb any human remains, including those interred outside of formal cemeteries.
D. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC 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:
    - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k).
    - 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 PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

4.5.3.2 Analytical Methods

Records Search

As described above, a records search of the APE and 0.25-mile buffer was conducted at the Northwest Information Center of the California Historical Resources Information System (CHRIS) in December 2019. The CHRIS search included a review of the NRHP, CRHR, California Inventory of Historic Resources, historical maps, and local inventories.

Surveys

Pedestrian surveys of the project site and APE were conducted on January 14, 2020. An archaeological reconnaissance of the APE was conducted by a qualified archaeologist using standard archaeological procedures and techniques. All field practices met the Secretary of Interior's standards and guidelines for a cultural resources inventory. The land area was surveyed in pedestrian transects with approximately 5-meter spacing. A qualified architectural historian also conducted a pedestrian survey of the APE. The survey entailed walking all accessible portions of the Facility and surrounding portion of the APE and documenting the structure on site with notes and photographs, specifically noting character-defining features, spatial relationships, and observed alterations, and examining any historic landscape features on the property. (See Appendix D for further details on survey methods.)

Historical Resources

Significant impacts to historical resources may result from demolition or physical alteration of structures, or alteration of the setting of a historical resource by the introduction of incompatible elements, in cases where the property retains integrity of setting and the setting of the resource contributes to its significance.

As described above, the Laguna Creek Dam is a well-preserved masonry water management structure dating to 1890 located within the APE. It is a physical example of early water management infrastructure in California. As such, the dam appears individually eligible for listing in the NRHP Criterion A, CRHR Criterion 1, and Santa Cruz County HRI Criterion 2 for its association with pioneering advances in water management in California specifically through creation of the City of Santa Cruz's first municipal water distribution system that supplied the community of Santa

Cruz with municipal water services and led to subsequent expansion of water infrastructure in the region. The period of significance for the dam is 1890, the year it was initially constructed. The character-defining features associated with this dam are limited to its location, setting, alignment, native stone or limestone masonry construction materials, the Risdon Iron Works plaque on the face of the dam, and its continued use as a water management structure. The historic property boundary for the Laguna Creek Dam is limited to the dam structure footprint.

Archaeological Resources

Archaeological sites are usually adversely affected only by physical destruction or damage that can be caused by grading and excavation, trenching, weather-induced erosion, etc. Impacts to archaeological resources and human remains most often occur as the result of excavation or grading within the vertical or horizontal boundaries of a significant archaeological site. Archaeological resources may also suffer impacts as the result of project activity that increases erosion, or increases the accessibility of a surface resource, and thus increases the potential for vandalism or illicit collection. Because archaeological resources often are buried, or cannot be fully defined or assessed on the basis of surface manifestations, substantial ground-disturbing work may have the potential to uncover previously unidentified resources, including archaeological deposits, human remains, and tribal cultural resources. As described above, no known archaeological resources are located within the APE.

4.5.3.3 Project Impact Analysis

This section provides a detailed evaluation of cultural resources and tribal cultural resources impacts associated with the Proposed Project.

Impact CUL-1: Historical Resources (Significance Standard A). The Proposed Project could cause a substantial adverse change in the significance of the Laguna Creek Dam, which is a historical resource due to modifications of the Facility that would occur during construction. ***(Less than Significant with Mitigation)***

As described above, the Laguna Creek Dam appears eligible for listing in the NRHP and CRHR under Criterion A/1 and County HRI Criterion 2, and as such is considered a historical resource under CEQA. Project activities that could impact the dam would include the preparation of the dam for construction including excavation of sediment along the dam, cleaning of the surface of the dam, notching the dam; installation of the new Coanda screen intake structure; removal of the exiting non-contributing east and west sediment bypass valves located on the face of the dam; and the modified aesthetics of the dam due to installation of the new Coanda screen (i.e. appearance of the dam after construction is complete). These are discussed further below.

Construction

Installing the new Coanda screen intake structure would entail cutting a notch in the dam crest. This work would be done by saw cutting approximately 16 inches deep into the dam crest to score neat lines for stone masonry removal. Use of a wire saw would avoid excess material removal and would prevent unraveling of stone masonry beyond the limits of the new intake structure. Overall, these dam modifications would be done using hand tools. However, given the strength and hardness of the dam (as confirmed during the condition assessment [B&V 2018]), the cut may first be initiated using chisel hammers to remove materials as necessary.

As described in Chapter 3, Project Description, after removal of the notch is complete, portions of the dam would be pressure washed with water to remove loose material and organics such as dirt and moss. Pressure washing methods would depend on effectiveness of material removal without eroding mortar. Surface cleaning of the substrate would be performed to reasonably achieve good bonding of fresh concrete but would not be critical as the new structure would be designed to be self-stable. As described in Section 3.6.3, Standard Construction Practices, the contractor would be required to test the method of dam cleaning with the gentlest and least invasive method and, if necessary, more complicated methods (Standard Construction Practice #30). The contractor would also start with a low-pressure water wash, and if unsuccessful, water of slightly higher pressure. As possible, the test would be conducted in an inconspicuous location. Pressure washing would be limited to the area in which the new intake concrete would be cast against, within a 1-foot buffer. A bonding agent such as a high-solids, water-based emulsion admixture suitable for modifying Portland cement compositions would be spray applied to the dam face within the limits of the new concrete formwork for the new intake structure. These measures would avoid damage to the structure's masonry material. In addition, as part of the Proposed Project, the City would develop interpretative text and content to document the historical resource and publish it on the City's website and other locations (Standard Construction Practice #31).

Additional potential impacts to the dam during pre-construction include the temporary timber formwork and epoxy that would be used for forming new concrete surfaces. The formwork would be temporary and would not have a permanent visual impact. Rebar anchors secured with epoxy would be installed on the dam's exposed surfaces and within the bedrock for the Coanda screen intake structure foundation. The anchors would ultimately be covered by the new intake structure.

In preparing the dam for construction, impounded materials upstream of the dam would be temporarily excavated approximately 3 feet at its deepest point and along the portion of the dam and existing intake as needed to enable construction of the Coanda screen intake and to abandon the existing intake in place. A mini-excavator or similar equipment would be used to pull material away from the structures at safe temporary cut slopes. In addition, hauling equipment would be utilized. This work and equipment would be conducted a distance from the dam. The Proposed Project would not use equipment known to cause vibration damage to structures including pile driving equipment, vibratory drum compactors, or drilling and blasting.

The condition assessment report prepared in 2018 (B&V 2018) noted that the dam is constructed on bedrock and was found to be in satisfactory condition with no signs of distress or major deterioration that would jeopardize its function. In consideration of the dam's bedrock foundation, liquefaction would not be an issue regardless of potential vibration impacts. Testing indicates the materials for the dam structure are in good condition with no evidence of fatigue, delamination, or weakening and has adequate material strengths for continued service. While the analysis concluded that the overall condition of the dam was favorable for continued use and was in line with modern design parameters for masonry structures, it did not directly identify sensitivity of the dam to vibration (B&V 2018).

As described in Section 4.12, Noise, the dam may be susceptible to damage from vibration associated with construction of the Proposed Project. If construction vibration were to damage the dam, it could result in a substantial adverse change in the significance of the Laguna Creek Dam, resulting in significant impacts to the historic resource. MM NOI-2 in Section 4.12.3.5, Mitigation Measures, requires that an appropriate threshold be developed to prevent vibration impacts to the dam and monitoring of construction activities to ensure compliance. With implementation of MM NOI-2, the potential for construction-related vibration impacts to the historical dam structure would be reduced to a less-than-significant level.

Operation

Upon completion of construction, the Proposed Project would result in aesthetic changes to the dam. The Proposed Project would result in the permanent removal of a small portion of the dam's masonry materials and covering a portion of the face of the dam with the new intake structure. The new intake structure would be approximately 12 feet wide (along the face of the dam), 12 feet tall, and 10 feet long (as it projects downstream from the dam). Considering that the dam is approximately 60 feet in length, the area that would be obscured by the intake structure is a relatively small portion of the face of the dam. The new construction would be differentiated from the dam's historic materials, as modern concrete and metal materials would be used. Additionally, it is likely that during higher creek flows, where water would pass over the screen as well as cascade over the dam crest, the new intake structure would mostly be obscured and the dam would appear much as it does currently. Considering that the purpose of the new intake structure would be to aid in the functionality of the Facility, the dam would continue to function as a water management structure, and the historic property would retain the majority of its character-defining features that allow it to convey significance under NRHP Criterion A and CRHR Criterion 1, the impact related to these modifications would be less than significant.

Furthermore, abandoning and capping of the existing control valves located in and on the face of the dam would not result in damage or destruction of the dam and its character-defining features. At the dam's right/west sediment control bypass valve (from the vantage point of looking downstream), the existing gate, all metal/electrical, and cable components above the pipe and actuator and its hood would be removed. A blind flange would be installed on the end of the bypass pipe on the face of the dam. The dam's left/east sediment control bypass valve is at the location where the new intake structure would be installed. Prior to installation of the intake structure, the piece of the bypass pipe that protrudes from the dam, the actuator, protective hood, and electrical conduits would be removed and the pipe would be backfilled with concrete. This sediment control valve location would be ultimately obscured by the new intake structure. Removal of these 1980s non-contributing valves located on the dam would not damage or destroy the dam. The blind flange would cover the valve and would not obscure other features of the dam. As these valves are not character-defining features and no damage or destruction would be done to the dam by these changes, the impact related to these modifications would be less than significant.

Overall, the Proposed Project appears to be consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68), and applicable guidelines and the Proposed Project would not constitute a significant adverse change to the Laguna Creek Dam which is a historical resource. The operations-related impacts of the Proposed Project would be less than significant.

Impact CUL-2: Archaeological Resources (Significance Standard B). The Proposed Project could cause a substantial adverse change in the significance of an archaeological resource during construction. ***(Less than Significant with Mitigation)***

As described above, no known archaeological resources are located within the project site. The results of the records searches, field reconnaissance, and correspondence also suggest that there is low potential for encountering any unknown archaeological resources during project construction. Specifically, the records search did not identify any known archaeological resources within the APE and the surface reconnaissance was negative for evidence of previously unknown archaeological resources. The Costanoan Ohlone Rumsen-Mutsen Tribe noted concern for five specific prehistoric resources associated with lower Laguna Creek, all of which are located outside of the APE.

Nevertheless, it is possible that intact, buried archaeological deposits may be uncovered during ground-disturbing construction activities. The Proposed Project would include excavation and grading that would have the potential to uncover, displace, and destroy previously unknown archaeological resources, which would be a potentially significant impact.

Implementation of MM CUL-2, which includes protocols related to the inadvertent discovery of archaeological resources, would reduce the potentially significant impact to a less-than-significant level by ensuring that the archaeological resources, if discovered during construction, would remain protected. See Section 4.5.3.5, Mitigation Measures, for details.

Impact CUL-3: Human Remains (Significance Standard C). The Proposed Project could inadvertently disturb human remains during construction. ***(Less than Significant with Mitigation)***

No known human remains are located on the project site. Nevertheless, the Proposed Project would include excavation and grading that would have the potential to uncover, displace, and destroy previously unknown human remains, which would be a potentially significant impact.

Implementation of MM CUL-3, which includes protocols related to the inadvertent discovery of human remains, would reduce the potentially significant impact to a less-than-significant level by ensuring proper handling of human remains, if discovered during construction. See Section 4.5.3.5, Mitigation Measures, for details.

Impact CUL-4: Tribal Cultural Resources (Significance Standard D). The Proposed Project could cause a substantial adverse change in the significance of a tribal cultural resource during construction. ***(Less than Significant with Mitigation)***

As described above, no tribal cultural resources have been identified on the project site or within the APE. The NAHC Sacred Lands File search was negative. The Costanoan Ohlone Rumsen-Mutsen Tribe, noted concern for five specific prehistoric resources associated with lower Laguna Creek that are not within or near the APE. The Tribe did not discuss the presence of tribal cultural resources within or near the APE or address the need for Native American monitoring. Nevertheless, the Proposed Project would include excavation and grading that would have the potential to uncover, displace, and destroy previously unknown tribal cultural resources, which could include archaeological resources and human remains, which would be a potentially significant impact.

Implementation of MM CUL-2 and MM CUL-3, which include protocols related to the inadvertent discovery of archaeological resources and human remains that could include tribal cultural resources, would reduce the potentially significant impact to a less-than-significant level by ensuring the protection and proper treatment of any previously unknown tribal cultural resources, if discovered during construction. See Section 4.5.3.5, Mitigation Measures, for details.

4.5.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative cultural resources and tribal cultural resources impacts associated with the Proposed Project and other reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area of analysis for cumulative impacts to cultural resources and tribal cultural resources is the Laguna Watershed.

Impact CUL-5: Cumulative Cultural Resources and Tribal Cultural Resources Impacts (Significance Standards A, B, C, and D). The Proposed Project, in combination with other reasonably foreseeable future development, would not result in a significant cumulative impact related to cultural resources and tribal cultural resources. ***(Less than Significant)***

The known cumulative projects planned within the Laguna Watershed include the Santa Cruz Water Rights Project (SCWRP), the Laguna Pipeline portion of the North Coast System Repair and Replacement Project, and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan. No construction or development within the Laguna Watershed is proposed as part of the SCWRP and therefore this project would not contribute to cumulative construction impacts in the watershed. The Laguna Pipeline and the Reggiardo Diversion upgrade, which would be constructed after completion of construction for the Proposed Project, are anticipated to result in construction impacts that can be reduced to a less-than-significant level with standard mitigation measures similar to those identified in this EIR.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects in the Laguna Watershed that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts to cultural resources and tribal cultural resources. As described above, implementation of the Proposed Project would result in impacts to areas immediately surrounding the Facility during project construction. Post construction, the project site would be operated and maintained similar to existing conditions. Mitigation measures listed in Section 4.5.3.5, Mitigation Measures, have been identified to reduce potentially significant impacts to cultural resources and tribal cultural resources to less-than-significant levels. Similar standard mitigation measures would be implemented for the other two construction projects in the Laguna Watershed. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the Laguna Watershed would result in less-than-significant cumulative impacts to cultural resources and tribal cultural resources and no further mitigation measures are required.

4.5.3.5 Mitigation Measures

Implementation of the following mitigation measures as well as MM NOI-2 in Section 4.12.3.5, Mitigation Measures (Noise), would reduce potentially significant cultural resources and tribal cultural resources impacts of the Proposed Project related to unanticipated discovery of cultural resources during ground-disturbing activities, as described in the sections above, to a less-than-significant level.

MM CUL-2: Unanticipated Discovery of Archaeological Resources. In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the Proposed Project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted. Depending upon the significance of the find under the California Environmental Quality Act (CEQA) (14 California Code of Regulations Section 15064.5[f]; Public Resources Code Section 21082), the archaeologist may record the find to appropriate standards (thereby addressing any data potential) and allow work to continue. If the archaeologist observes the discovery to be potentially significant under CEQA, additional treatment may be required.

MM CUL-3: **Unanticipated Discovery of Human Remains.** In accordance with California Health and Safety Code Section 7050.5, if potential human remains are found, the lead agency staff and the County Coroner must be immediately notified of the discovery. The coroner would provide a determination within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made. If the County Coroner determines that the remains are, or are believed to be, Native American, the coroner would notify the Native American Heritage Commission within 24 hours. In accordance with Public Resources Code Section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American. Within 48 hours of this notification, the MLD would recommend to the lead agency her/his preferred treatment of the remains and associated grave goods. Further, federal regulations require that Native American human remains, funerary objects, and object of cultural patrimony are handled consistent with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA) for all discovery situations in accordance with 43 Code of Federal Regulations Part 10.

4.5.4 References

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4.6 Energy

This section describes the existing energy conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on energy consumption modeling conducted for the Proposed Project as part of the preparation of this environmental impact report (EIR). The results of the modeling are summarized in this section, and are included in Appendix B.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to energy.

4.6.1 Existing Conditions

4.6.1.1 Electricity

According to the U.S. Energy Information Administration (EIA), California used approximately 255,224 gigawatt hours of electricity in 2018 (EIA 2020a). Electricity usage in California for different land uses varies substantially by the types of uses in a building, type of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building. Due to the state's energy efficiency building standards and efficiency and conservation programs, California's electricity use per capita in the residential sector is lower than any other state except Hawaii (EIA 2020b).

Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to the City of Santa Cruz (City and County of Santa Cruz (County). Incorporated in California in 1905, PG&E is one of the largest combination natural gas and electric utilities in the United States. It currently provides service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. The service area includes 106,681 circuit miles of electric distribution lines, 18,466 circuit miles of interconnected transmission lines, 42,141 miles of natural gas distribution pipelines, and 6,438 miles of transportation pipelines. PG&E and other utilities in the state are regulated by the California Public Utilities Commission (CPUC) (PG&E 2018).

The California Renewables Portfolio Standard (RPS) Program establishes a goal for California to increase the amount of electricity generated from renewable energy resources to 20% by 2010 and to 33% by 2020. Recent legislation revised the current RPS target for California to obtain 50% of total retail electricity sales from renewable sources by 2030, with interim targets of 40% by 2024, and 45% by 2027 (CPUC 2016). PG&E receives electric power from a variety of sources. According to PG&E's power content label for 2018, 39% of PG&E power came from eligible renewable energy sources in 2017, including biomass/waste, geothermal, small hydroelectric, solar, and wind sources (PG&E 2019).

Monterey Bay Community Power (MBCP) was formed in March 2017 as a joint powers authority to provide locally controlled, 100% carbon-free electricity to residents and businesses in Monterey, San Benito, and Santa Cruz counties through the Community Choice Energy (CCE) model established by the State of California. The CCE model enables communities to choose clean-source power at a cost equivalent to PG&E while retaining PG&E's role in maintaining power lines and providing customer service. The CCE model helps ensure local economic vitality because surplus revenues that would normally flow to PG&E will stay in the community. Current PG&E customers were automatically enrolled in MBCP. All "exit fees" charged by PG&E will be absorbed by MBCP at the time of enrollment. Currently available PG&E programs, such as energy efficiency programs and California Alternate Rates for Energy (CARE), will continue to be accessible by MBCP customers (MBCP 2017).

PG&E customers consumed a total of 80,369 million of kilowatt hours (kWh) of electricity in 2018 (CEC 2020a). In Santa Cruz County, PG&E reported an annual electrical consumption of approximately 1,213 million kWh in 2018, with 667 million kWh for non-residential use and 546 million kWh for residential use (CEC 2020b).

4.6.1.2 Natural Gas

According to the EIA, California used approximately 2,136.907 million cubic feet of natural gas in 2018 (EIA 2020b). The majority of California's natural gas customers are residential and small commercial customers (core customers). These customers accounted for approximately 35% of the natural gas delivered by California utilities (CPUC 2020). Large consumers, such as electric generators and industrial customers (noncore customers), accounted for approximately 65% of the natural gas delivered by California utilities (CPUC 2020). CPUC regulates California natural gas rates and natural gas services, including in-state transportation over transmission and distribution pipeline systems, storage, procurement, metering, and billing. Most of the natural gas used in California comes from out-of-state natural gas basins. California gas utilities may soon also begin receiving biogas into their pipeline systems (CPUC 2020).

PG&E customers consumed approximately 479.286 million cubic feet of natural gas in 2018 (CEC 2020c). PG&E had delivered approximately 5,199 million cubic feet to Santa Cruz County, with 2,100 million cubic feet for non-residential use and 3,100 million cubic feet for residential use (CEC 2020d).

4.6.1.3 Transportation-Related Energy Consumption

According to the EIA, California used approximately a total of 681 million barrels of petroleum in 2018, with the majority (585 million barrels) used for the transportation sector (EIA 2020c). This total annual consumption equates to a daily use of approximately 1.9 million barrels of petroleum.[1] California consumes approximately 78.6 million gallons of petroleum per day, which adds up to an annual consumption of 28.7 billion gallons of petroleum. In California, petroleum fuels refined from crude oil are the dominant source of energy for transportation sources. Petroleum usage in California includes petroleum products such as motor gasoline, distillate fuel, liquefied petroleum gases, and jet fuel. California has implemented policies to improve vehicle efficiency and to support use of alternative transportation. As such, the California Energy Commission (CEC) anticipates an overall decrease of gasoline demand in the state over the next decade.

[1] There are 42 U.S. gallons in a barrel.

4.6.2 Regulatory Framework

4.6.2.1 Federal

Federal Energy Policy and Conservation Act

In 1975, Congress enacted the Federal Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the act, the National Highway Traffic Safety Administration is responsible for establishing additional vehicle standards. In 2012, new fuel economy standards for passenger cars and light trucks were approved for model years 2017 through 2021 (77 FR 62624–63200). Fuel economy is determined based on each manufacturer's average fuel economy for the fleet of vehicles available for sale in the United States.

Energy Independence and Security Act

On December 19, 2007, the Energy Independence and Security Act (EISA) of 2007 was signed into law. In addition to setting increased Corporate Average Fuel Economy standards for motor vehicles, the EISA includes the following other provisions related to energy efficiency:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Sections 301–325)
- Building Energy Efficiency (Sections 411–441)

This federal legislation requires ever-increasing levels of renewable fuels to replace petroleum (EPA 2017). The U.S. Environmental Protection Agency (EPA) is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

The RFS program was created under the Energy Policy Act of 2005 and established the first renewable fuel volume mandate in the United States. As required under the act, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the EISA, the RFS program was expanded in several key ways that lay the foundation for achieving significant reductions in greenhouse gas (GHG) emissions from the use of renewable fuels, reducing imported petroleum, and encouraging the development and expansion of the renewable fuels sector in the United States. The updated program is referred to as RFS2 and includes the following:

- EISA expanded the RFS program to include diesel in addition to gasoline.
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.
- EISA established new categories of renewable fuel and set separate volume requirements for each one.
- EISA required the EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green" jobs.

4.6.2.2 State

Warren-Alquist Act

The California legislature passed the Warren-Alquist Act in 1974. The Warren-Alquist Act created the CEC. The legislation also incorporated the following three key provisions designed to address energy demand:

- It directed the CEC to formulate and adopt the nation's first energy conservation standards for buildings constructed and appliances sold in California.
- The act removed the responsibility of electricity demand forecasting from the utilities, which had a financial interest in high-demand projections, and transferred it to a more impartial CEC.
- The CEC was directed to embark on an ambitious research and development program, with a particular focus on fostering what were characterized as non-conventional energy sources.

State of California Energy Action Plan

The CEC and CPUC approved the first State of California Energy Action Plan in 2003. The plan established shared goals and specific actions to ensure that adequate, reliable, and reasonably priced electrical power and natural gas supplies are provided, and identified policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers. In 2005, a second Energy Action Plan was adopted by the CEC and CPUC to reflect various policy changes and actions of the prior 2 years.

At the beginning of 2008, the CEC and CPUC determined that it was not necessary or productive to prepare a new energy action plan. This determination was based, in part, on a finding that the state's energy policies have been significantly influenced by the passage of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006 (discussed below). Rather than produce a new energy action plan, the CEC and CPUC prepared an update that examines the state's ongoing actions in the context of global climate change.

Senate Bills 1078 (2002), 107 (2006), X1-2 (2011), 350 (2015) and 100 (2018)

Senate Bill (SB) 1078 established the California RPS Program and required that a retail seller of electricity purchase a specified minimum percentage of electricity generated by eligible renewable energy resources as defined in any given year, culminating in a 20% standard by December 31, 2017. These retail sellers include electrical corporations, community choice aggregators, and electric service providers. The bill relatedly required the CEC to certify eligible renewable energy resources, design and implement an accounting system to verify compliance with the RPS by retail sellers, and allocate and award supplemental energy payments to cover above-market costs of renewable energy.

SB 107 (2006) accelerated the RPS established by SB 1078 by requiring that 20% of electricity retail sales be served by renewable energy resources by 2010 (not 2017). Additionally, SB X1-2 (2011) required all California utilities to generate 33% of their electricity from eligible renewable energy resources by 2020. Specifically, SB X1-2 sets a three-stage compliance period: by December 31, 2013, 20% of electricity had to come from renewables; by December 31, 2016, 25% of electricity had to come from renewables; and by December 31, 2020, 33% will be required to come from renewables.

SB 350 (2015) expanded the RPS by requiring retail seller and publicly owned utilities to procure 50% of their electricity from eligible renewable energy resources by 2030, with interim goals of 40% by 2024 and 45% by 2027.

SB 100 (2018) accelerated and expanded the standards set forth in SB 350 by establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030 be secured from qualifying renewable energy sources. SB 100 also states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity does not increase carbon emissions elsewhere in the western grid. Additionally, 100% zero-carbon electricity cannot be achieved through resource shuffling.

Consequently, utility energy generation from non-renewable resources is expected to be reduced based on implementation of the RPS requirements described above. The Proposed Project's reliance on non-renewable energy sources would be reduced accordingly.

Assembly Bill 32 (2006) and Senate Bill 32 (2016)

In 2006, the state legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. In 2016, the Legislature enacted SB 32, which extended the horizon year of the state's codified GHG reduction planning targets from 2020 to 2030, requiring California to reduce its GHG emissions to 40% below 1990 levels by 2030. In accordance with AB 32 and SB 32, California Air Resources Board (CARB) prepares scoping plans to guide the development of statewide policies and regulations for the reduction of GHG emissions. Many of the policy and regulatory concepts identified in the scoping plans focused on increasing energy efficiencies, using renewable resources, and reducing the consumption of petroleum-based fuels (such as gasoline and diesel). As such, the state's GHG emissions reduction planning framework creates co-benefits for energy-related resources.

California Building Standards

Part 6 of Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. Part 6 establishes energy efficiency standards for residential and non-residential buildings constructed in California to reduce energy demand and consumption. Part 6 is updated periodically to incorporate and consider new energy efficiency technologies and methodologies. The current Title 24 standards are the 2019 Title 24 Building Energy Efficiency Standards, which became effective January 1, 2020. In general, single-family residences built to the 2019 standards are anticipated to use approximately 7% less energy (due to energy efficiency measures) than those built to the 2016 standards; if rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53% less energy than those under the 2016 standards (CEC 2018). Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30% less energy than those built to the 2016 standards (CEC 2018).

Title 24 also includes Part 11, California's Green Building Standards (CALGreen). CALGreen establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The 2019 CALGreen standards are the current applicable standards. For nonresidential projects, some of the key mandatory CALGreen 2019 standards involve requirements related to bicycle parking, designated parking for clean air vehicles, electric vehicle (EV) charging stations, shade trees, water conserving plumbing fixtures and fittings, outdoor potable water use in landscaped areas, recycled water supply

systems, construction waste management, excavated soil and land clearing debris, and commissioning (24 CCR Part 11).

State Vehicle Standards

In response to the transportation sector accounting for more than 1/2 of California's carbon dioxide (CO_2) emissions, AB 1493 was enacted in 2002. AB 1493 required CARB to set GHG emissions standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set GHG emissions standards for motor vehicles manufactured in 2009 and all subsequent model years. The 2009 to 2012 standards resulted in a reduction in approximately 22% of GHG emissions compared to emissions from the 2002 fleet, and the 2013 to 2016 standards resulted in a reduction of approximately 30% compared to the 2002 fleet.

In 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global-warming gases with requirements for greater numbers of zero-emissions vehicles into a single package of standards called Advanced Clean Cars. By 2025, when the rules would be fully implemented, new automobiles would emit 40% fewer global-warming gases and 75% fewer smog-forming emissions (CARB 2020a). However, in 2018, the EPA and National Highway Traffic Safety Administration published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, which revoked California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. California and 22 other states, as well as the District of Columbia and four cities, filed suit against the EPA. Since a petition for reconsideration of the rule is pending ongoing litigation, the effect of the SAFE Vehicles Rule on the Advanced Clean Cars program is yet to be determined.

Although the primary focus of the state's vehicle standards is on the reduction of air pollutants and GHG emissions, the reduction in demand for petroleum-based fuels is also a benefit of these standards.

4.6.2.3 Local

As described in Section 4.8, Greenhouse Gas Emissions, the City has adopted a climate action plan and the County has approved a climate action strategy, which include energy-consumption-reduction measures. See Section 4.8 for summaries of these local plans.

4.6.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to energy. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.6.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to energy are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

B. Result in conflicts with or obstruct a state or local plan for renewable energy or energy efficiency.

4.6.3.2 Analytical Methods

Construction

Electricity

The amount of electricity used during construction of the Proposed Project would be minimal because demand generally would be generated from use of electrically powered hand tools. As such, construction electricity demand is qualitatively addressed.

Natural Gas

Natural gas is not anticipated to be required during construction of the Proposed Project; therefore, construction natural gas demand is qualitatively addressed.

Petroleum

Potential impacts were assessed for off-road equipment and on-road vehicle trips during construction based on the CalEEMod outputs (see Appendix B). Fuel consumption from construction equipment and vehicle trips was estimated by converting the total CO_2 emissions anticipated to be generated during construction to gallons of gasoline or diesel based on conversion factors. The conversion factor for gasoline is 8.78 kilograms per metric ton CO_2 per gallon, and the conversion factor for diesel is 10.21 kilograms per metric ton CO_2 per gallon (The Climate Registry 2018). Heavy-duty construction equipment associated with construction activities, vendor trucks, and haul trucks are assumed to use diesel fuel. Worker vehicles are assumed to be gasoline fueled. The details for construction criteria air pollutant emissions modeling discussed in the air quality section apply to the energy analysis as well; see Section 4.3.3.2, Analytical Methods, for air quality.

Operation

The Proposed Project would retrofit existing facilities that are currently subject to ongoing operations and maintenance activities. Under the Proposed Project, operations and maintenance activities would occur with a similar frequency and intensity to existing operations and maintenance activities. Limited use of electricity and use of propane for operation of the emergency backup generator would continue at the site. Overall, demand for energy would not substantially increase over existing conditions. Therefore, potential operational energy consumption is qualitatively evaluated.

4.6.3.3 Project Impact Analysis

This section provides a detailed evaluation of energy impacts associated with the Proposed Project.

Impact ENE-1: Result in Wasteful, Inefficient or Unnecessary Consumption of Energy Resources (Significance Standard A). The Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. ***(Less than Significant)***

Construction

As described in Chapter 3, Project Description, construction activities for the Proposed Project would occur over approximately 3 months in 2021 and would involve the retrofit of an existing creek diversion facility. Detailed assumptions for equipment usage and vehicle trips are provided in Appendix B.

Electricity. Temporary electric power for as-necessary lighting and electronic equipment would be provided by the existing PG&E service on-site. The amount of electricity used during construction would be minimal as typical demand would be generated primarily from electrically powered hand tools. The electricity used for construction activities would be temporary and minimal, and construction of the Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of electricity.

Natural Gas. Natural gas is not anticipated to be required during construction of the Proposed Project. Fuels used for construction would primarily consist of diesel and gasoline, which are discussed below. Any minor amounts of natural gas that may be consumed as a result of construction would be temporary and negligible, and construction of the Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of natural gas.

Petroleum. Heavy-duty equipment associated with construction would rely on diesel fuel, as would vendor trucks involved in delivery of materials to the project site, and haul trucks exporting demolition material or other materials off site. Construction workers would travel to and from the project site throughout the duration of construction. This analysis assumes that construction workers would travel in gasoline-powered light-duty vehicles.

As described above, fuel consumption from construction equipment was estimated by converting the total CO_2 emissions from each construction phase to gallons of gasoline or diesel based on conversion factors. The estimated diesel fuel usage from construction equipment, haul trucks, and vendor trucks, as well as estimated gasoline fuel usage from worker vehicles, is shown in Table 4.6-1.

In summary, construction of the Proposed Project over the 3-month construction period is conservatively anticipated to consume 658 gallons of gasoline and 8,605 gallons of diesel. By comparison, California as a whole consumes approximately 29 billion gallons of petroleum per year. On a regional scale, Santa Cruz County's petroleum use by on-road vehicles only (i.e., not including off-road construction equipment) is expected to be 91.8 million gallons per year in 2021 (CARB 2020b). Based on these assumptions, the Proposed Project would require a fraction of the petroleum that would be consumed in California and countywide over the course of the construction period. Therefore, impacts to energy resources during construction would be less than significant.

Table 4.6-1. Construction Petroleum Demand for the Proposed Project

Project Component	Off-Road Equipment (diesel)	Haul Trucks (diesel)	Vendor Trucks (diesel)	Worker Vehicles (gasoline)
	gallons			
Access Road Improvements, Site Preparation, and Mobilization				
Site Preparation	171.40	14.69	0	37.59
Access Road Grading	171.40	52.89	0	79.73
Cofferdam and Temporary Stream Bypass System				
Cofferdams Installation	120.47	22.53	0	56.95
Pipe Installation	763.96	0.00	0	103.34
Installation of Dewatering and Leakage Control Pump Control Systems	945.15	0.00	0	6.83
New Coanda Screen Intake and Valve Vault Structures				
Excavation	287.95	30.36	0	10.25
Doweling and Anchorage	328.11	22.53	0	10.25
Concrete Pour	420.18	74.44	0	50.11
Installation Coanda Screen and Valve Vault	152.79	7.84	0	4.56
Diversion Pipeline	2,030.36	0.00	0	105.92
Modifications to Existing Intake and Sediment Control Values				
Pipe Installation	435.85	0.00	0	17.08
Backfill Structure	229.19	45.05	0	29.61
Electrical Installations				
Electrical conduit	1,256.61	0.00	32.32	15.95
Access Stairs and Riprap Bank Stabilization				
Access Stairs	36.24	14.69	39.18	7.97
Install Riprap	188.05	22.53	34.28	70.62
Startup and Testing, Site Restoration, and Construction Closeout				
Startup, Testing and Site Restoration	654.26	0.00	0	45.56
Total	**8,191.97**	**307.40**	**105.78**	**658.31**

Source: B&V and SCWD 2020; see Appendix B.

Operation

As described above, once construction is complete, operation and maintenance activities would generally remain similar to existing operations and maintenance activities. The Proposed Project would not require substantial additional routine daily equipment operation or vehicle trips beyond those occurring for operation of the Facility under existing conditions. Because the Proposed Project would not result in any long-term operational increases in energy demand beyond what is required under existing conditions, the Proposed Project would have no energy impacts associated with operations.

Therefore, overall the Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation and would have less-than-significant energy-related impacts.

Impact ENE-2: Conflict with an Applicable Plan (Significance Standard B). The Proposed Project would not result in conflicts with or otherwise obstruct a state or local plan for renewable energy or energy efficiency. ***(Less than Significant)***

Part 6 of Title 24 of the California Code of Regulations establishes energy efficiency standards for residential and non-residential buildings constructed in California to reduce energy demand and consumption. Part 6 is updated periodically (every 3 years) to incorporate and consider new energy efficiency technologies and methodologies. Title 24 also includes Part 11, the California Green Building Standards Code (CALGreen). CALGreen institutes mandatory minimum environmental performance standards for all ground-up, new construction of commercial and state-owned buildings. The components of the Proposed Project that include replacement structures would meet all applicable Title 24 and CALGreen standards to reduce energy demand and increase energy efficiency, including construction waste reduction, disposal and recycling measures.

Additionally, as discussed in Section 4.8, the Proposed Project would not conflict with the various state and local plans that mandate reduced energy use. Therefore, the Proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and would have less-than-significant impacts related to conflicts with applicable plans.

4.6.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative energy impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area considered for the analysis of cumulative energy impacts is Santa Cruz County.

Impact ENE-3: Cumulative Energy Impacts (Significance Standards A and B). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy. ***(Less than Significant)***

Potential cumulative impacts on energy would result if the Proposed Project, in combination with past, present, and future projects, would result in the wasteful or inefficient use of energy. Significant energy impacts could result from development that would not incorporate sufficient building energy efficiency features, achieve building energy efficiency standards, or if projects result in the unnecessary use of energy during construction or operation.

As discussed in Impact ENE-1 and Impact ENE-2, the Proposed Project would not result in wasteful, inefficient, or unnecessary use of energy during construction and would not result in a net increase in operational energy use nor would it conflict with an applicable plan. The majority of the cumulative projects listed in Table 4.1-1 consist of capital improvement projects to the City's water supply infrastructure. Each project would have a construction period during which electricity, natural gas and petroleum would be used; however, it is expected that such usage would be temporary and would not constitute a wasteful, inefficient, or unnecessary consumption of energy. Additionally, while some of these capital improvement projects could result in increases in energy consumption during their operation, the Proposed Project would not result in an increase in net energy consumption compared to existing conditions and would therefore not contribute to any potential cumulative energy impacts related to operation of other capital improvement projects. Furthermore, any commercial and residential cumulative projects that may take place in the County that include long-term energy demand would be subject to CALGreen, which provides energy efficiency standards. In addition, cumulative projects would be required to meet or exceed the Title 24 building standards, as applicable, further reducing the inefficient use of energy. Future development would also

be required to meet even more stringent requirements, including the objectives set forth in the AB 32 Scoping Plan, which seek to make all newly constructed residential homes produce a sustainable amount of renewable energy through the use of on-site photovoltaic solar systems. Furthermore, various federal and state regulations, including the Low Carbon Fuel Standard, Pavley Clean Car Standards, and Low Emission Vehicle Program, would serve to reduce the transportation fuel demand of cumulative projects.

For the reasons above, the Proposed Project, together with the cumulative projects would not result in wasteful, inefficient, or unnecessary use of energy or conflicts with applicable plans. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy.

4.6.3.5 Mitigation Measures

As described above, the Proposed Project would not result in significant energy impacts, and therefore, no mitigation measures are required.

4.6.4 References

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4.7 Geology and Soils

This section describes the existing geology and soils conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based in part on a vertebrate paleontological records check for paleontological resources from the Natural History Museum of Los Angeles County (LACM) conducted for the Proposed Project.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to geology and soils.

4.7.1 Existing Conditions

4.7.1.1 Regional Geologic Setting

The Laguna Creek Diversion Facility (Facility) is located along the western side of the Santa Cruz Mountains, in the central portion of the Coast Ranges Physiographic Province of California. This province consists of a series of coastal mountain chains paralleling the pronounced northwest-southeast structural grain of central California geology between Point Arguello, in Santa Barbara County, and the California/Oregon border. The project site and surrounding region are underlain by Miocene age sedimentary strata, which in turn is underlain by granitic and metamorphic rocks of the Salinian Block. This suite of basement rocks is separated from contrasting basement rock of the Franciscan Formation to the northeast by the San Andreas fault system. While the core of the mountain range is dominated by gneiss, schist, limestone, quartzite, and granite, Cretaceous through Holocene sedimentary rocks and lesser amounts of Tertiary volcanic rocks overlie much of the region (AECOM 2018; USGS 1981, 1997).

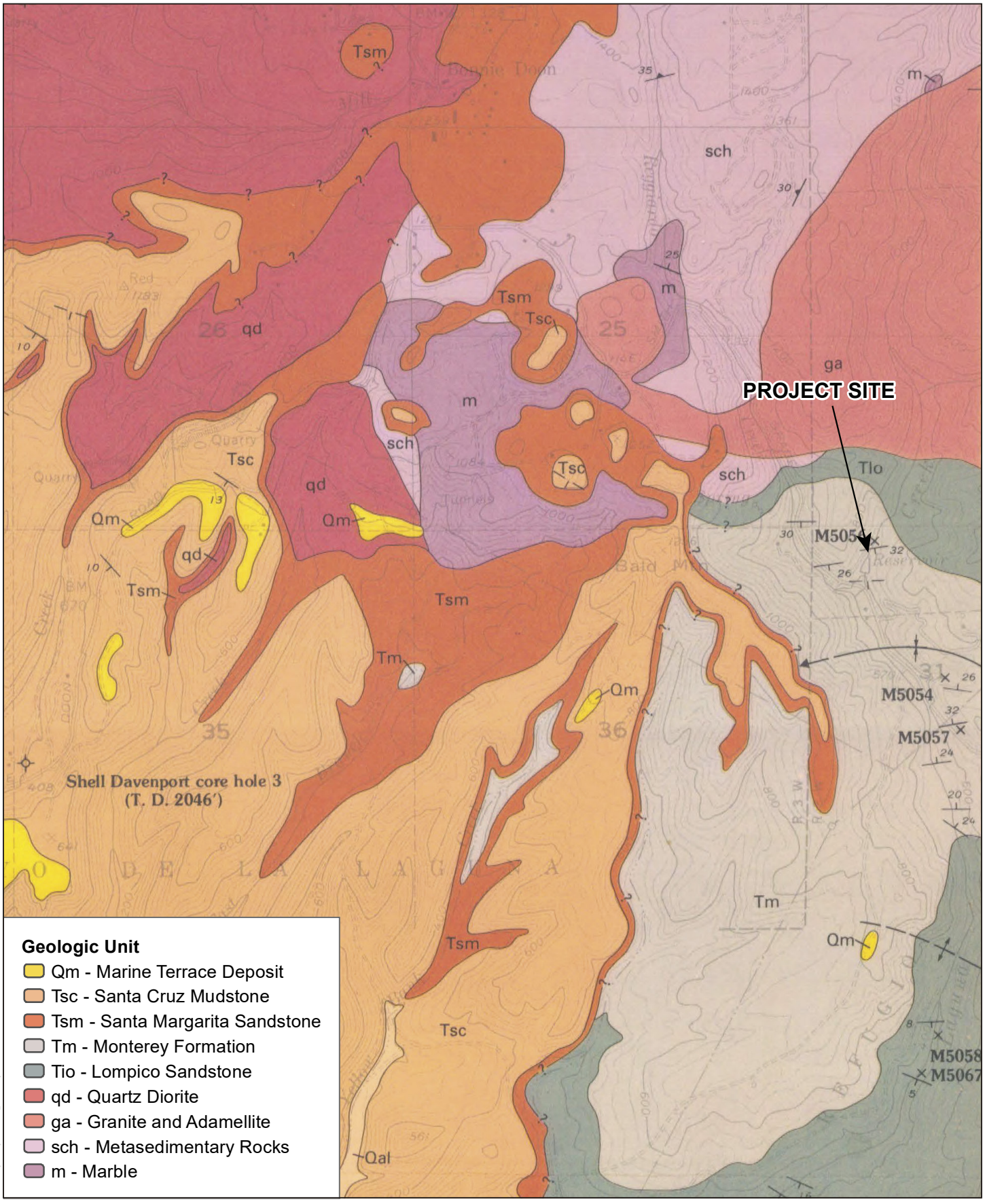
4.7.1.2 Site Geology and Stratigraphy

The project site is underlain by middle- to late-Miocene Monterey Formation (or Monterey Shale) bedrock, consisting of medium- to thick-bedded and laminated, olive-gray to light gray mudstone and sandy siltstone, including a few thick dolomite interbeds (see Figure 4.7-1). The bedrock beds dip about 26 degrees to the south-southeast. North of the project site, the Tertiary Lompico Sandstone underlies Laguna Creek (USGS 1981, 1997).

Sediments within the creek bed on the upstream side of the dam generally consist of cobbles, gravel, sand, and silt. Sediments within the creek bed on the downstream side of the dam consist of well-graded gravel, with sand and cobbles. Bedrock exposed at the right/west and left/east dam abutments consists of moderately weathered, fine-grained, interbedded silty sandstone and mudstone of the Monterey Formation. The mudstone is weaker and more erodible than the sandstone (B&V 2018).

Surficial Soils

Based on mapping by the U.S. Department of Agriculture Soil Conservation Service, the surficial soils underlying the project site consist of the Lompico-Felton soil complex, which consists of moderately deep, well-drained soils on mountains. These soils formed in residuum derived from sandstone, shale, siltstone, or mudstone, on 30% to 50% slopes, and have a high to very high erosion potential (see Figure 4.7-2) (USDA Soil Conservation Service 1980, 2020).



SOURCE: USGS 1981, 1997

FIGURE 4.7-1

Project Area Geology

Laguna Creek Diversion Retrofit Project - EIR

DUDEK

0 800 1,600 Feet

SOURCE: Bing Maps 2020, USDA 2020

DUDEK

0 50 100 Feet

FIGURE 4.7-2

Project Area Soils

Laguna Creek Diversion Retrofit Project - EIR

Kast Terrain

Karst terrain is present in the vicinity of the project site but does not underlie the site. Karst terrain is formed from the dissolution of soluble rocks, such as limestone, dolomite, and gypsum. Karst has also been documented for more weather-resistant rocks, such as quartzite, given the proper conditions. Karst is characterized by underground drainage systems with sinkholes and caves, which can be susceptible to collapse. These sinkholes create topography that is characterized by the absence of an integrated surface drainage system, as the sinkholes form closed depressions. Approximately 0.25 miles upstream from the Facility, the creek crosses the contact between sedimentary rocks of the Lompico Sandstone/Monterey Shale and older metamorphic rocks of schist and marble, which are also intruded by granitic rock, as shown on Figure 4.7-1. Based on visual observations, marble bedrock and karst terrain are present in this older metamorphic rock, located 1,400 feet north of the Facility at the closest point (USGS 1981; Zinn 2020).

Slope Stability

The right/west dam abutment is built into the base of an approximate 10- to 15-foot-high, gentle to moderately steep slope (B&V 2020b). Similarly, the left/east abutment is built into the base of an approximate 15-foot-high gentle slope. No significant slope instability is present in the immediate vicinity of the Facility. The existing Facility is founded on bedrock. The bedrock orientation was neither adverse nor favorable with respect to slope stability (B&V 2018), indicating the bedrock is grossly stable.

The California Geological Survey (CGS) has completed Seismic Hazard Zone maps, which include seismically induced landslide zones, for select U.S. Geological Survey (USGS) 7.5-minute quadrangle maps in California. The project site is located in the USGS Davenport Quadrangle map. A Seismic Hazard Zone map has not been completed for this quadrangle (CGS 2020).

Subsidence

Subsidence occurs when a large portion of land is vertically displaced, usually due to the withdrawal of groundwater, oil, or natural gas, or as a result of decomposition of natural organic materials. Soils that are particularly subject to subsidence include those with high silt or clay content and/or high organic content. The effects of subsidence include damage to buildings and infrastructure, increased flood risk in low-lying areas, and lasting damage to groundwater aquifers and aquatic systems. The project site is not located in an area of historic or recent subsidence due to groundwater extraction (Luhdorff & Scalmanini Consulting Engineers, Inc. and California Water Foundation 2020). In addition, the project site does not overlie an oil and gas field (CalGEM 2001); therefore, the potential for subsidence due to oil and gas extraction is low. As described above, the project site is underlain by Monterey Shale bedrock, with overlying sediments in the creek bed consisting of cobbles, gravel, sand, and silt. These deposits are not high in silt, clay, or organic content and therefore would not be susceptible to subsidence due to high organic content.

Expansive Soils

Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water and shrink when dried. Expansive soils can cause structural foundations to rise during the rainy season and fall during the dry season. If this expansive movement varies underneath different parts of the structure, foundations may crack and portions of the structure may be distorted. The potential for soil to undergo shrink and swell is greatly enhanced by the presence of a fluctuating, shallow groundwater table. Changes in the volume of expansive soils can result in the consolidation of soft clays after the lowering of the water table or the placement of fill. As previously discussed, the

project site is underlain by Monterey Shale bedrock, with overlying sediments in the creek bed consisting of cobbles, gravel, sand, and silt. These deposits are not high in clay content and therefore would not be susceptible to soil expansion. Similarly, surficial soils underlying the hillsides adjacent to the creek bed consist of the Lompico-Felton soil complex, which consists of moderately deep, well-drained soils, which are generally sandy and permeable. These deposits are not high in clay content and therefore would not be susceptible to soil expansion.

4.7.1.3 Regional Seismicity and Seismic Hazards

The project site is located in a seismically active region of California, between two major Holocene-active faults, including the San Andreas Fault, located approximately 12 miles to the northeast, and the San Gregorio Fault, located approximately 6 miles to the southwest, as shown on Figure 4.7-3. Historical earthquakes along the San Andreas Fault and its branches have caused substantial seismic shaking in Santa Cruz County in historical times. The two largest historical earthquakes to affect the area were the moment magnitude (Mw) 7.9 San Francisco earthquake of April 18, 1906, and the Mw 6.9 Loma Prieta earthquake of October 17, 1989 (corresponding to Richter magnitudes of 8.3 and 7.1, respectively) (City of Santa Cruz 2012). The Facility, originally constructed in 1890, endured both of these large earthquakes.

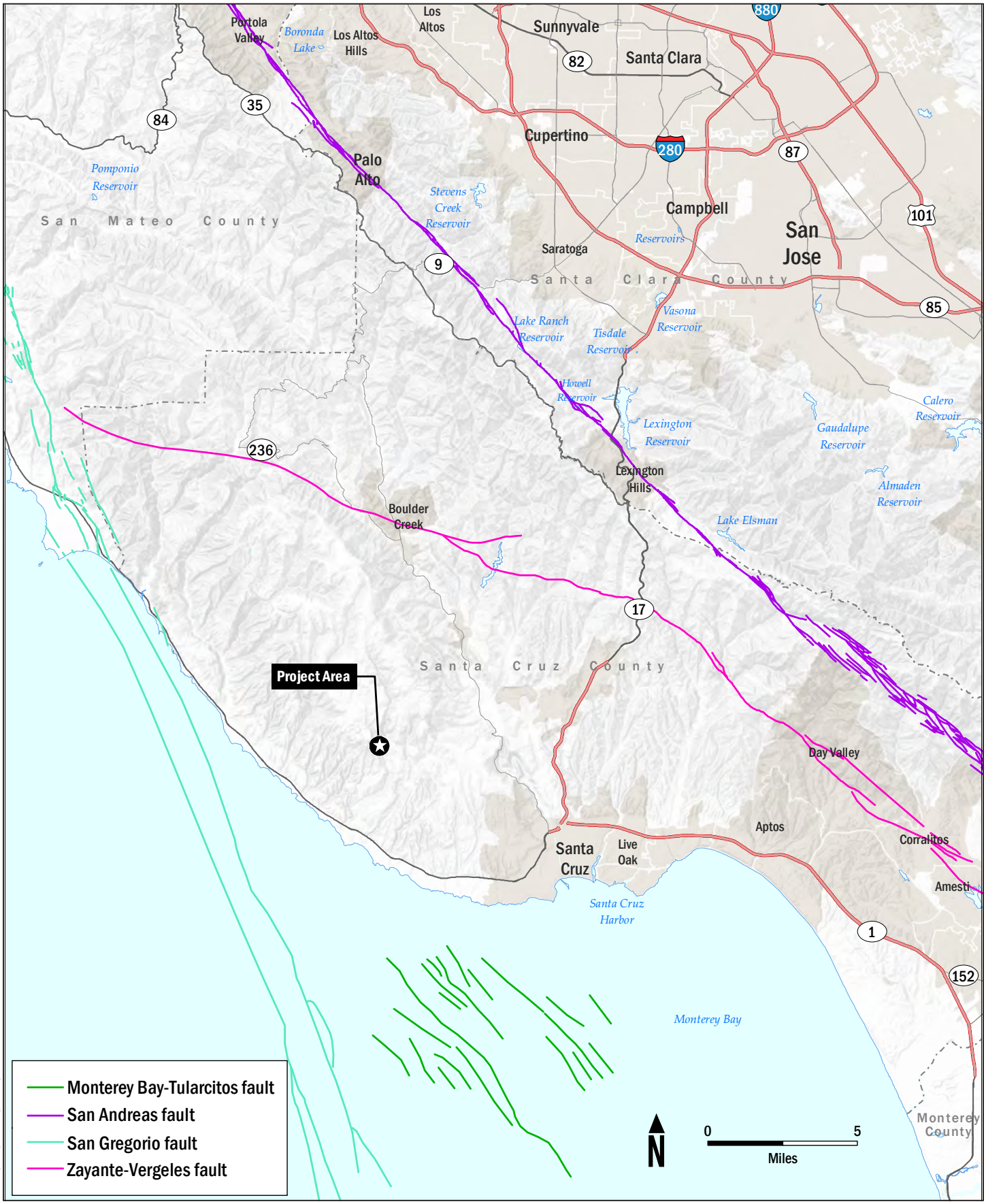
The San Francisco earthquake caused severe seismic shaking and structural damage to many buildings in the Santa Cruz Mountains. The Loma Prieta earthquake may have caused more intense seismic shaking than the 1906 event in localized areas of the Santa Cruz Mountains, although its regional effects were not as extensive. Based on a seismometer located at the University of California Santa Cruz (UCSC) campus, approximately 4.5 miles from the project site, peak ground accelerations during the Loma Prieta earthquake were approximately 0.5 g (percent of gravity). There were also major earthquakes in northern California along or near the San Andreas Fault in 1838, 1865, and possibly 1890 (AECOM 2018; City of Santa Cruz 2012).

Regional Faulting

As previously discussed, Santa Cruz County is located in a portion of California that is crossed by a number of faults. The CGS classifies faults as:

- Holocene-active faults, which are faults that have moved during the past approximate 11,700 years. These faults are capable of surface rupture.
- Pre-Holocene faults, which are faults that have not moved in the past 11,700 years. This class of fault may be capable of surface rupture, but is not regulated under the Alquist-Priolo Earthquake Fault Zoning Act of 1972.
- Age-undetermined faults, which are faults where the recency of fault movement has not been determined (CGS 2018).

This fault classification is consistent with criteria of the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (see Section 4.7.2, Regulatory Framework, for information about this act). Distances to regional faults, maximum probable earthquake magnitudes, and recurrence intervals are shown in Table 4.7-1.



SOURCE: AECOM 2018

FIGURE 4.7-3

Fault Map

Laguna Creek Diversion Retrofit Project - EIR

DUDEK

Table 4.7-1. Distances to Local Faults

Fault	Distance from Project Site (miles)	Maximum Probable Earthquake Magnitude (moment magnitude)	Approximate Time Between Major Earthquakes (years)
San Gregorio	6	7.5	400
Zayante-Vergeles	7	7.5	8,821
Monterey Bay-Tularcitos	8	6.5	2,841
San Andreas	12	7.8	210

Sources: AECOM 2018; City of Santa Cruz 2012; USGS 2017a, 2017b, 2017c, 2020.

The project site is located approximately 7 miles southwest of the Zayante-Vergeles Fault (see Figure 4.7-3) (USGS 2020), which is mapped by the USGS as a late Pleistocene to possibly Holocene fault active within the past 15,000 years (i.e., Holocene-active to pre-Holocene fault). The Zayante-Vergeles Fault is marked by a zone of relatively parallel fault traces that extend from the vicinity of West Waddell Creek, southeast through the Santa Cruz Mountains, beneath Quaternary alluvium of the Pajaro River, and across the northern Gabilan Range, where the fault has a complex junction with the San Andreas Fault, approximately 5 miles southeast of Hollister (USGS 2000). For planning purposes, the maximum probable earthquake associated with the Zayante-Vergeles Fault is Mw 7.5 (USGS 2017a).

The project site is located approximately 12 miles southwest of the San Andreas Fault (see Figure 4.7-3) (USGS 2020), which is a 680-mile network of Holocene-active faults that collectively accommodate the majority of the north-south motion between the North American and Pacific tectonic plates. The San Andreas Fault Zone is considered to be a Holocene-active and historically active strike-slip fault that extends along most of coastal California, from its complex junction with the Mendocino Fault Zone on the north, southeast to the northern Transverse Range, and inland to the Salton Sea, where a well-defined zone of seismicity (i.e., the Brawley Seismic Zone) transfers slip to the Imperial Fault. Two major surface-rupturing earthquakes have occurred in historic time, including the 1857 Fort Tejon earthquake and the 1906 San Francisco earthquake (USGS 2002). For planning purposes, the maximum probable earthquake associated with the San Andreas Fault is Mw 7.8 (USGS 2017b).

The project site is located approximately 6 miles east-northeast of the San Gregorio Fault (see Figure 4.7-3) (USGS 2020), which is a Holocene-active (past 11,700 years), structurally complex fault zone as much as 3 miles wide. The fault zone is primarily located offshore, west of San Francisco Bay and Monterey Bay, with onshore locations at promontories, such as Moss Beach, Pillar Point, Pescadero Point, and Point Año Nuevo. The San Gregorio Fault is a complex fault zone consisting of several named faults, including the Seal Cove, Frijoles, Coastways, Greyhound Rock, Carmel Canyon, Denniston Creek, and Año Nuevo Faults. This fault zone extends from Bolinas Lagoon south to the Point Sur region (USGS 1999). For planning purposes, the maximum probable earthquake associated with the San Gregorio Fault is Mw 7.5 (USGS 2017c).

The project site is located approximately 8 miles north of the Monterey Bay-Tularcitos Fault Zone (see Figure 4.7-3), which is generally considered late Quaternary (past 15,000 years) (USGS 2020); however, portions of this fault are considered Holocene-active (past 11,700 years). This offshore fault zone is a complex, generally northwest-trending zone up to 9 miles wide, consisting primarily of right-lateral, reverse/thrust faults, extending across Monterey Bay southeast to the Monterey Peninsula, to near the crest of the Sierra de Salinas (USGS 2001). For planning purposes, the maximum probable earthquake associated with the Monterey Bay-Tularcitos Fault Zone is Mw 7.3 (USGS 2017d).

In addition, the project site is located approximately 4 miles west-southwest of the Ben Lomond Fault, which has been mapped generally along the San Lorenzo River from Boulder Creek to Felton, as well as within west Santa Cruz, traversing the coastline just east of Mitchell's Cove. This late Quaternary fault (past 130,000 years) is not well-located throughout much of the area east of the project site and therefore is not included on Figure 4.7-3 (USGS 1981, 2020).

Surface Rupture

Surface rupture involves the displacement and cracking of the ground surface along a fault trace. Surface ruptures are visible instances of horizontal or vertical displacement, or a combination of the two, typically confined to a narrow zone along the fault. Surface rupture is more likely to occur in conjunction with Holocene-active fault segments, where earthquakes are large, or where the location of the movement (earthquake hypocenter) is shallow.

As discussed in Section 4.7.2, Regulatory Framework, the Alquist-Priolo Earthquake Fault Zoning Act of 1972 regulates development near Holocene-active faults to mitigate the hazard of surface fault rupture. This Act requires the State Geologist to establish regulatory zones (known as Alquist-Priolo Earthquake Fault Zones) around the surface traces of Holocene-active faults and to issue appropriate maps. Local agencies must regulate most development projects within the zones. The CGS has completed Seismic Hazard Zone maps, which include Alquist-Priolo Earthquake Fault Zones, for select USGS quadrangle maps in California. The project site is located in the USGS 7.5-minute Davenport Quadrangle map. As stated above, a Seismic Hazard Zone map has not been completed for this quadrangle (CGS 2020). The Alquist-Priolo Earthquake Fault Zone located closest to the project site is associated with the onshore portion of the San Gregorio Fault, located approximately 10 miles west-northwest of the project site (CGS 2020; CDMG 1982). Therefore, the project site is not subject to fault rupture.

Liquefaction

The CGS has completed Seismic Hazard Zone maps, which include liquefaction zones, for select USGS quadrangle maps in California. As stated above, the project site is located in the USGS 7.5-minute Davenport Quadrangle map and a Seismic Hazard Zone map has not been completed for this quadrangle (CGS 2020). However, the loose, unconsolidated alluvial materials within the creek bed, upstream and downstream of the Facility, may be susceptible to liquefaction and associated lateral spreading (B&V 2018).

4.7.1.4 Paleontological Resources

Paleontological resources are the fossilized remains, traces, and associated data of plants and animals, preserved in earth's crust, and are generally considered to be older than middle Holocene (approximately 5,000 years before present) (SVP 2010). Body fossils include bones, teeth, shells, leaves, and wood, while trace fossils include trails, trackways, footprints, and burrows. With the exception of fossils found in low-grade metasedimentary rocks, significant paleontological resources are found in sedimentary rock units that are old enough to preserve the remains or traces of plants and animals. To determine paleontological sensitivity of individual rock units present within the project site, a paleontological records search was requested from the LACM on May 7, 2020 and desktop geological and paleontological research were conducted.

According to surficial geological mapping at 1:62,500 scale and the LACM records search results received on May 21, 2020 the project site is underlain by the middle- to late-Miocene (approximately 17 million years ago to 5 million years ago), marine, Monterey Formation (identified as Monterey Shale by some authors) (Brabb [USGS] 1997; McLeod 2020). The LACM reported no paleontological localities within project site boundaries, but

indicated they have a fossil locality (LACM [CIT] 384) located south-southeast of the project site in the mountainous area on the north side of Carmel Valley. This locality yielded a fossil specimen of snake mackerel (*Thyrsocles kriegeri*).

Named after the type section near the City of Monterey, the Monterey Formation is an abundantly fossiliferous, widespread geological unit extending from Orange County in the south to north of San Francisco Bay. Throughout its extent, the Monterey Formation has produced thousands of fossil traces, invertebrates, and vertebrates. Vertebrate taxa include sharks, bony fish, reptiles, and marine mammals (Koch et al. 2004). Dozens of bony fish species from multiple localities were reported from the Monterey Formation in a catalog of Neogene bony fishes from California (Fierstine et al. 2012). Furthermore, a new genus and species of eared seal was reported from the Monterey Formation of Los Angeles County (Downs 1956). In addition to vertebrate fossils recovered from the Monterey Formation, numerous Monterey Formation fossil invertebrates have been described in the scientific literature including two new stomatopod crustacean species (Hof and Schram 1998). Finally, a small, Monterey Formation invertebrate fauna was published in the literature, which consisted of bivalves, gastropods, and an echinoid that were collected during excavations for a housing development in south Orange County (Rugh 2018). Overall, the Monterey Formation has produced scientifically significant fossils and is considered to have high paleontological resources sensitivity (SVP 2010).

4.7.2 Regulatory Framework

4.7.2.1 Federal

There are no federal regulations directly applicable to geology and soils at the project site.

4.7.2.2 State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (Public Resources Code [PRC] Sections 2621 through 2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. A structure for human occupancy is defined as any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a structure for human occupancy can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, the local agency must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (PRC Sections 2690 through 2699.6 et seq.), passed by the California State Legislature in 1990, addresses earthquake hazards from non-surface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, strong ground shaking, or other earthquake and geologic hazards.

California Building Standards Code

The state regulations protecting structures from geo-seismic hazards are contained in the California Building Standards Code (24 California Code of Regulations Part 2) (the California Building Code), which is updated every 3 years. These regulations apply to public and private buildings in the state. Until January 1, 2008, the California Building Code was based on the then-current Uniform Building Code and contained additions, amendments, and repeals specific to building conditions and structural requirements of the State of California. The 2019 California Building Code, effective January 1, 2020, is based on the current (2018) International Building Code and enhances the sections dealing with existing structures. Seismic-resistant construction design is required to meet more stringent technical standards than those set by previous versions of the California Building Code. Construction activities are also subject to Chapter 33 of the California Building Code.

California Division of Occupational Safety and Health

Construction activities are subject to occupational safety standards for excavation and trenching, as specified in California Division of Occupational Safety and Health (also known as Cal/OSHA) regulations (Title 8 of the California Code of Regulations),. These regulations specify the measures to be used for excavation and trench work where workers could be exposed to unstable soil conditions. The Proposed Project would be required to employ these safety measures during excavation and trenching.

State Earthquake Protection Law

The State Earthquake Protection Law (Health and Safety Code Section 19100 et seq.) requires that structures be designed and constructed to resist stresses produced by lateral forces caused by wind and earthquakes, as provided in the California Building Code. Chapter 16 of the California Building Code sets forth specific minimum seismic safety and structural design requirements, requires a site-specific geotechnical study to address seismic issues, and identifies seismic factors that must be considered in structural design. Because the project site is not located within an Alquist-Priolo Earthquake Fault Zone, as noted above, no special provisions would be required for the Proposed Project related to fault rupture.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental damage, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these state guidelines. This analysis satisfies project requirements in accordance with CEQA (13 PRC Section 21000 et seq.) and PRC Section 5097.5 (Stats 1965, c. 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by the Society of Vertebrate Paleontology (SVP) (SVP 2010).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the "Environmental Checklist Form," which addresses the potential for adverse impacts to "unique paleontological resource[s] or site[s] or … unique geological feature[s]." This provision covers fossils of signal importance—remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group—as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth. Further, CEQA provides that generally, a resource shall be considered "historically significant" if it has yielded or may be likely to yield information important in prehistory (PRC Section 15064.5[a][3][D]).

Paleontological resources would fall within this category. Chapter 1.7, Sections 5097.5 and 30244 of the PRC defines unauthorized removal of fossil resources as a misdemeanor and requires mitigation of disturbed sites.

4.7.2.3 Local

County of Santa Cruz General Plan and Local Coastal Program

The Conservation and Open Space Chapter of the Santa Cruz County General Plan outlines policies and programs for the protection of hydrological, geological, and paleontological features (County of Santa Cruz 2020). Table 4.11-1 in Section 4.11, Land Use and Planning, discusses applicable General Plan/Local Coastal Program policies related to geology and soils.

Chapter 16.44 (Paleontological Resource Protection) of the Santa Cruz County Code outline methods and regulations for the identification and treatment of paleontological resources within the County.

City of Santa Cruz General Plan and Local Coastal Program

The project site is located in unincorporated Santa Cruz County, and therefore, the City of Santa Cruz General Plan and Local Coastal Program do not apply to the Proposed Project. Therefore, the policies of these plans are not summarized or further evaluated in this section.

4.7.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to geology and soils. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.7.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to geology and soils are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

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.
   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, as defined in the 2019 California Building Code, 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.

4.7.3.2 Analytical Methods

The following analysis considers whether the Proposed Project would directly or indirectly cause geologic and soils impacts, taking into account state-mandated construction methods, as specified in the California Safety and Health Administration regulations (Title 8 of the California Code of Regulations) and in Chapter 33 of the California Building Code. Moreover, the analysis considers whether a unique paleontological resource, site, or unique geologic feature would be directly or indirectly destroyed as a results of the Proposed Project.

4.7.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following standards of significance for the following reasons:

- **Earthquake Fault Rupture (Significance Standard A-i)**. The Proposed Project would not have the potential to directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault because the site is not located within an Alquist-Priolo Earthquake Fault Zone or underlain by any Holocene-active or pre-Holocene faults.
- **Septic Tanks/Alternative Wastewater Disposal (Significance Standard E)**. The Proposed Project would not entail wastewater disposal. During construction, temporary portable toilets would be installed for construction workers. Waste from the portable toilets would be transported off-site in vacuum trucks for disposal at the City's wastewater treatment facility. Therefore, the Proposed Project would have no impacts related to soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems.

Impacts

This section provides a detailed evaluation of geology and soils impacts associated with the Proposed Project. Construction-related impacts associated with soil erosion/loss of topsoil (Significance Standard B) and potential sedimentation of downstream Laguna Creek is addressed in Section 4.10, Hydrology and Water Quality.

Impact GEO-1: Seismic Hazards (Significance Standards A-ii and A-iii). The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death resulting from seismic ground shaking or seismic-related ground failure, including liquefaction. ***(Less than Significant)***

As discussed above, the project site is located in a seismically active region of California between two major Holocene-active faults: the San Andreas Fault, located approximately 12 miles to the northeast, and the San Gregorio Fault, located approximately 6 miles to the southwest (see Figure 4.7-3). In addition, the project site is located approximately 7 miles southwest of the Zayante-Vergeles Fault, which is mapped by the USGS as a late Pleistocene to possibly Holocene fault (past 15,000 years). Loose, unconsolidated alluvial materials within the creek bed, upstream and downstream of the Facility, may be susceptible to liquefaction and associated lateral spreading in the event of strong seismically induced ground shaking. However, because the Facility is constructed on bedrock and the abutments are bedrock, it is unlikely that soil liquefaction would have a significant adverse effect on the stability of the structure (B&V 2018). In addition, the Proposed Project has been designed in accordance with geotechnical design data of the 2018 Conditions Assessment Report (B&V 2018) and engineered design plans of the 2020 Draft Basis of Design (B&V 2020a). Proposed Project facilities would be constructed in accordance with provisions of the California Building Code under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. In addition, construction and operation of Proposed Project facilities would not increase the potential for earthquakes or seismically induced ground failure to occur. Therefore, the Proposed Project would have a less-than-significant impact related to seismic hazards.

Impact GEO-2: Unstable Geologic Unit or Soils (Significance Standards A-iv and C). The Proposed Project would not cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse. ***(Less than Significant)***

The new Coanda screen intake structure would require excavation of creek materials upstream and downstream of the dam to allow the dam to be notched and the bedrock to be exposed; anchoring of the structure's foundation to the bedrock and dam; installation of rebar and pouring concrete for the structure; and placement of the Coanda screen and other intake components. The downstream side of the dam would be excavated to the bedrock for the Coanda screen concrete structure and foundation for the new valve fault. Excavation activities would result in temporary slopes that, if not constructed properly, could be prone to failure, which in turn could result in safety impacts to construction personnel and damage to infrastructure. However, these temporary slopes would be designed in accordance with engineered design plans of the 2020 Draft Basis of Design (B&V 2020a) and would be constructed in accordance with provisions of the California Building Codeand Cal/OSHA, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist, thereby minimizing the potential for slope failure. In addition, riprap would be placed in areas where creek bank protection is required. Any riprap slopes greater than 1:1 would be locked in place with grout, thus eliminating the potential for slope failure during operations.

Three private, unpaved roads may be improved to allow access to the site by construction equipment, which would entail limited road widening, grading, compaction, and placement of aggregate. Minor cut-and-fill grading would be required and may include alterations of existing, small (i.e., generally 15 feet high or less) moderately steep slopes. Such slope alterations could result in temporary oversteepening and slope failure, if not completed properly. However, slope modifications would be designed in accordance with final engineered design plans and would be constructed in accordance with provisions of the California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. In addition, the City has identified Standard Construction Practices that would be implemented by the City and its contractors during construction activities

associated with the Proposed Project. As described in in Section 3.6.3, Standard Construction Practices, finished slopes would be covered in non-toxic soil binders and/or hydroseed (Standard Construction Practice #4), which would encourage plant growth, thus further stabilizing the slopes. In addition, all temporarily disturbed areas would be replanted with native vegetation (Standard Construction Practice #14), thus contributing to long-term slope stability.

As previously discussed, the project site is not located in an area prone to subsidence due to groundwater withdrawal, oil and gas extraction, or peat deposits. In addition, the project site is not located on karst topography. The closest karst topography is located approximately 1,400 feet north of the dam. Therefore, ground settling and collapse is not expected in association with the Proposed Project.

As discussed above, the Proposed Project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse. Therefore, the Proposed Project would have less-than-significant impacts related to unstable geologic units or soils.

Impact GEO-3: **Expansive Soils (Significance Standard D).** The Proposed Project would not be located on expansive soil, as defined in the 2019 California Building Code. ***(Less than Significant)***

As previously discussed, the project site is underlain by middle Monterey Shale bedrock, with overlying sediments within the creek bed consisting of cobbles, gravel, sand, and silt. Surficial soils on adjacent slopes consist of the Lompico-Felton soil complex, which consists of moderately deep, well-drained soils, which are generally sandy and permeable. These deposits are not high in clay content and therefore would not be susceptible to soil expansion. As a result, the Proposed Project would not be located on expansive soil, as defined in the 2019 California Building Code, and would not create substantial direct or indirect risks to life or property that can be associated with such soils. Therefore, the Proposed Project would have less-than-significant impacts related to expansive soils.

Impact GEO-4: **Paleontological Resources (Significance Standard F).** The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature. ***(Less than Significant with Mitigation)***

As discussed above, the project site is underlain by the middle to late Miocene Monterey Formation and is not anticipated to be underlain by a unique geological feature. However, the Monterey Formation has produced scientifically significant fossils and is considered to have high paleontological resources sensitivity per the SVP (2010) mitigation guidelines. The LACM did not report any vertebrate fossil localities from within the project site but did have a locality in the vicinity, south-southeast of the project site, which consisted of a snake mackerel (*Thyrsocles kriegeri*). In addition, a review of the paleontological literature indicated the Monterey Formation has yielded abundant invertebrate and vertebrate remains in California. Any significant grading, excavations, trenching, or augering that is below the depth of topsoil, if present, could potentially result in disturbance of paleontological resources. Such disturbance of paleontological resources during construction of the Proposed Project could result in significant impacts.

The LACM recommended paleontological monitoring of all excavations within the project site with the potential to impact the Monterey Formation (McLeod 2020). MM GEO-4 in Section 4.7.3.5, Mitigation Measures, consists of preparation of a Paleontological Resources Impact Mitigation Program, which includes requirements for Worker Environmental Awareness Training and paleontological monitoring. With implementation of MM GEO-4, the Proposed Project's potential impacts on paleontological resources would be reduced to a less-than-significant level by ensuring proper treatment of paleontological resources exposed during project excavations.

4.7.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative geology and soils impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area considered in the cumulative analysis for geology and soils is generally the vicinity of the project site. The geographic area of analysis for cumulative impacts to paleontological resources is the Laguna Watershed.

The Proposed Project would not contribute to cumulative impacts related to earthquake fault rupture (Significance Standard A-i) or septic tanks/alternative wastewater disposal (Significance Standard E) because it would have no impacts related to these standards as described above. Therefore, these significance standards are not further evaluated. Erosion-related cumulative impacts (Significance Standard B) are addressed in Section 4.10, Hydrology and Water Quality.

Impact GEO-5: Cumulative Geologic Hazards (Significance Standards A-ii, A-iii, A-iv, C, and D). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to geology and soils. ***(Less than Significant)***

Known cumulative projects planned within the vicinity of the project site include the Santa Cruz Water Rights Project (SCWRP), the Laguna Pipeline portion of the North Coast System Repair and Replacement Project, and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan. No construction or development within the Laguna Watershed is proposed as part of the SCWRP, and therefore this project would not contribute to cumulative construction impacts in the watershed. The Laguna Pipeline and the Reggiardo Diversion upgrade would be constructed after the Proposed Project is constructed and impacts associate with these projects are anticipated to be reduced to a less-than-significant level with standard mitigation measures similar to those identified in this EIR.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects in the project vicinity that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts to geology and soils. Furthermore, potential cumulative impacts on geological, seismic, and soil conditions would be reduced on a site-by-site basis by modern construction methods and compliance with California Building Code regulatory requirements that ensure building safety. Additionally, cumulative projects would be required to prepare and submit a site-specific geotechnical report for review and approval prior to the issuance of grading or building permits. As described in the analysis above, the Proposed Project would not result in construction (including grading/excavation) or design features which could directly or indirectly contribute to an increase in a cumulative geological hazard. The Proposed Project would not cumulatively alter geological conditions or features.

Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the project vicinity, would result in less-than-significant cumulative impacts related to geological hazards, and no further mitigation measures are required.

Impact GEO-6: Cumulative Paleontological Resources Impacts (Significance Standard F). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to paleontological resources. ***(Less than Significant)***

Known cumulative projects planned within the Laguna Watershed are described above. Potential cumulative impacts on paleontological resources could result from these or other projects that combine to create an environment where fossils, exposed on the surface, are vulnerable to destruction by earthmoving equipment, looting by the public, and natural causes such as weathering and erosion. The majority of impacts to paleontological resources are site-specific and are therefore generally mitigated on a project-by-project basis. Additionally, as needed, projects would incorporate individual mitigation for site-specific geological units present on each individual project site. Furthermore, the mitigation measure provided in this analysis are prescribed to preserve significant paleontological resources uncovered during project excavations by properly analyzing and salvaging by the on-site paleontological monitor. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the project vicinity, would result in less-than-significant cumulative impacts to paleontological resources, and no further mitigation measures are required.

4.7.3.5 Mitigation Measures

Implementation of the following mitigation measure would reduce potentially significant geology and soil impacts of the Proposed Project related to paleontological resources, identified in Impact GEO-4 above, to a less-than-significant level.

MM GEO-4: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring. Prior to commencement of any grading activity on site, the applicant shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (SVP) (2010) guidelines. The paleontologist shall prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the Proposed Project. The PRIMP shall be consistent with the SVP (2010) guidelines and outline requirements for preconstruction meeting attendance and worker environmental awareness training, where paleontological monitoring is required within the project site based on construction plans and/or geotechnical reports, procedures for adequate paleontological monitoring and discoveries treatment, and paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils), reporting, and collections management. The qualified paleontologist shall attend the preconstruction meeting and a qualified paleontological monitor shall be on site during all rough grading and other significant ground-disturbing activities (including augering) in previously undisturbed, Monterey Formation deposits, as defined by the PRIMP. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.

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4.8 Greenhouse Gas Emissions

This section describes the existing conditions of the project site and vicinity pertaining to greenhouse gas (GHG) emissions, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on GHG modeling conducted for the Proposed Project as part of the preparation of this environmental impact report (EIR). The results of the GHG modeling are summarized in this section and are included in Appendix B.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to GHG emissions.

4.8.1 Existing Conditions

4.8.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate—such as temperature, precipitation, or wind patterns—lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017).

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. However, recent climate changes, in particular the warming observed over the past century, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of warming since the mid-twentieth century and are the most significant driver of observed climate change (IPCC 2013; EPA 2017). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system.

4.8.1.2 Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g), for purposes of administering many of the State's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (see also 14 California Code of Regulations [CCR] Section 15364.5).[1] Some GHGs, such as CO_2, CH_4, and

[1] Climate-forcing substances include GHGs and other substances such as black carbon and aerosols.

N_2O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are the predominant GHGs emitted from human activities. The following paragraphs provide a summary of the GHGs associated with the Proposed Project and their sources.[2]

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities; it is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 include the combustion of fuels such as coal, oil, natural gas, and wood, and changes in land use.

Methane. CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. CH_4 is produced through anaerobic (i.e., without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (such as in rockets, racecars, and aerosol sprays)

Black Carbon. Black carbon is a component of fine particulate matter ($PM_{2.5}$), which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation; influences cloud formation; and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived substance that varies spatially, which makes it difficult to quantify its global warming potential (GWP). Diesel particulate matter emissions are a major source of black carbon and are toxic air contaminants that have been regulated and controlled in California for several decades to protect public health. In relation to declining diesel particulate matter as a result of the California Air Resources Board's (CARB's) regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California have decreased by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

4.8.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo; EPA

[2] The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (2007), CARB's "Glossary of Terms Used in GHG Inventories" (2018a), and EPA's "Climate Change" (2017).

2017). The Intergovernmental Panel on Climate Change (IPCC) developed the GWP concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2e).

Notably, for purposes of this analysis, the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2) and the GWP for N_2O is 298, based on the IPCC's Fourth Assessment Report (IPCC 2007).

4.8.1.4 Greenhouse Gas Inventories and Climate Change Conditions

National and State Inventories. Per the 2020 U.S. Environmental Protection Agency (EPA) Inventory of U.S. GHG Emissions and Sinks: 1990 to 2018, total U.S. GHG emissions were approximately 6,676.6 MMT CO_2e in 2018 (EPA 2020). The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 81.6% of total GHG emissions (6,457 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.2% of CO_2 emissions in 2018 (4,912.0 MMT CO_2e). Relative to the 1990 emissions level, gross U.S. GHG emissions in 2018 were 3.7% higher; however, the gross emissions were down from a high of 15.2% above the 1990 level that occurred in 2007. GHG emissions increased from 2017 to 2018by 2.9% (188.4 MMT CO_2e) and, overall, net emissions in 2018 were 10.2% below 2005 levels (EPA 2020).

According to California's 2000 to 2017 GHG emissions inventory (2019 edition), California emitted 424.1 MMT CO_2e in 2017, including emissions resulting from out-of-state electrical generation (CARB 2019). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high-GWP substances, and recycling and waste. Table 4.8-1 presents California GHG emission source categories (as defined in CARB's 2008 Scoping Plan) and their relative contributions to the emissions inventory in 2017.

Table 4.8-1. Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total[a]
Transportation	169.86	40%
Industrial uses	89.40	21%
Electricity generation[b]	62.39	15%
Residential	26.00	6%
Commercial	15.14	4%
Agriculture	32.42	8%
High-GWP substances	19.99	5%
Recycling and waste	8.89	2%
Totals	**424.10**	**100%**

Source: CARB 2019.
Notes: GHG = greenhouse gas; MMT CO_2e = million metric tons of carbon dioxide equivalent; GWP = global warming potential. Emissions reflect 2017 California GHG inventory.
[a] Percentage of total has been rounded, and total does not sum due to rounding.
[b] Includes emissions associated with imported electricity, which account for 23.94 MMT CO_2e.

Between 2000 and 2017, per-capita GHG emissions in California dropped from a peak of 14.0 MT per person in 2001 to 10.8 MT per person in 2016, representing a 23% decrease. In addition, total GHG emissions in 2017 were approximately 12 MMT CO_2e less than 2016 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California will continue to reduce emissions below the 2020 target of 431 MT CO_2e and is headed toward the 2030 target of 260 MT CO_2e (CARB 2019).

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. Although climate change is driven by global atmospheric conditions, climate change impacts are experienced locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights. Shifts in the water cycle have been observed, with less winter precipitation falling as snow and earlier spring runoff. Sea levels have risen, and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra Nevada snowpack, which accounts for approximately 1/2 of the surface water storage in California, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late twenty-first century in central and southern California. By the late century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

A summary of current and future climate change impacts to resource areas in California, as discussed in the *Safeguarding California: Reducing Climate Risk* (CNRA 2014), is provided below.

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to extreme drought, to destructive storm events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift and novel combinations of species; pathogens, parasites, and disease;

invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurs).

Energy. Specific climate change challenges for the energy sector include increasing temperatures, fluctuating precipitation patterns, increasing extreme weather events, and sea-level rise.

Forestry. The most significant risk to forests related to climate change is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and, combined with increasing temperatures, have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions.

Ocean and Coastal Ecosystems and Resources. Sea-level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea-level rise and more frequent and severe coastal storms and erosion are threatening vital infrastructure such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities; they are also negatively impacting coastal recreational assets, such as beaches and tidal wetlands.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the twenty-first century. Changes in precipitation patterns affect public health, primarily through the potential for altered water supplies, and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves are likely to increase the risk of mortality due to heat-related illness, as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies.

Transportation. While the transportation industry is a source of GHG emissions, it is also vulnerable to climate change risks. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand, which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of people and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Climate change could seriously impact the timing, form, and amount of precipitation; runoff patterns; and the frequency and severity of precipitation events. Higher temperatures reduce the proportion of precipitation falling as snow relative to rain and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively impact groundwater reserves and result in increased overdraft and subsidence. More frequent or severe wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality.

In March 2016, the California Natural Resources Agency (CNRA) released *Safeguarding California: Implementation Action Plans*, a document that shows how California is acting to convert the recommendations contained in the 2014 *Safeguarding California* plan into action (CNRA 2016). Additionally, in January 2018, the CNRA released *Safeguarding California Plan: 2018 Update*, which provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 Update includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018). As with previous state adaptation plans, the 2018 Update addresses the following: acceleration of warming across the state; more intense and frequent heat waves; greater riverine flows; accelerating sea-level rise; more intense and frequent drought; more severe and frequent wildfires; more severe storms and extreme weather events; shrinking snowpack and less overall precipitation; and ocean acidification, hypoxia, and warming.

4.8.2 Regulatory Framework

4.8.2.1 Federal

Energy Independence and Security Act

To aid in the reduction of national GHG emissions, the Energy Independence and Security Act of 2007 (Public Law 110-140), among other key measures, would do the following:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards

In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under section 202(a) of the federal Clean Air Act:

- The administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is the "endangerment finding."
- The administrator further found that the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the "cause or contribute finding."

These two findings were necessary to establish the foundation for federal regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act (42 United States Code Section 7401).

In 2007, in response to the *Massachusetts v. EPA* U.S. Supreme Court ruling, the Bush Administration issued Executive Order (EO) 13432 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012 through 2016 (75 Federal Register [FR] 25324–25728).

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017 through 2025 light-duty vehicles. The proposed standards projected to achieve 163 grams/mile of CO_2 in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017 through 2021 (77 FR 62624–63200), and NHTSA intends to set standards for model years 2022 through 2025 in a future rulemaking.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014 through 2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6 to 23% over the 2010 baselines (76 FR 57106–57513).

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

On April 2, 2018, the EPA, under administrator Scott Pruitt, reconsidered the final determination for light-duty vehicles and withdrew its previous 2017 determination, stating that the current standards may be too stringent and therefore should be revised as appropriate (EPA 2019).

In August 2018, EPA and NHTSA proposed the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule to amend certain fuel economy and GHG standards for passenger cars and light trucks and establish new standards for model years 2021 through 2026. The proposed standards are 43.7 miles-per gallon (mpg) for passenger cars and 31.3 mpg for light trucks, projecting an overall industry average of 37 mpg in model years 2021 through 2026, as compared to a 46.7-mpg requirement in model year 2025 under the standards issued in 2012. The SAFE Vehicles Rule would also exclude CO_2-equivalent emission improvements associated with air conditioning refrigerants and leakage (and, optionally, offsets for N_2O and CH_4 emissions) after model year 2020. Compared to maintaining the post-2020 standards now in place, the 2018 proposal would increase U.S. fuel consumption by about half a million barrels per day (2% to 3% of total daily consumption, according to the Energy Information Administration) and would impact the global climate by 3/1000th of 1°C by 2100 (EPA and NHTSA 2018). California and other states have stated

their intent to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives.

On September 27, 2019, the EPA and NHTSA published the SAFE Vehicles Rule Part One: One National Program (84 FR 51310), which became effective November 26, 2019. The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. On March 31, 2020, the EPA and NHTSA issued the Part Two Rule, which will go into effect 60 days after being published in the Federal Register. The Part Two Rule sets CO_2 emissions standards and corporate average fuel economy standards for passenger vehicles and light-duty trucks for model years 2021 through 2026. This issue is evolving as California and 22 other states, as well as the District of Columbia and four cities, filed suit against the EPA and a petition for reconsideration of the rule on November 26, 2019. As of June 2020, the litigation is pending resolution.

4.8.2.2 State

The statewide GHG emissions regulatory framework is summarized in this subsection by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, water, solid waste, and other state actions. The following text describes EOs, Assembly Bills (ABs), Senate Bills (SBs), and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

The state has taken a number of actions to address climate change. These actions are summarized below, and include EOs, legislation, and CARB plans and requirements.

EO S-3-05. EO S-3-05 (June 2005) established California's GHG emissions-reduction targets and laid out responsibilities among the state agencies for implementing the EO and for reporting on progress toward the targets. This EO established the following targets:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80% below 1990 levels

EO S-3-05 also directed the California Environmental Protection Agency to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed in response to EO S-3-05, which subsequently issued reports to the Governor and California State Legislature (Legislature) from 2006 to 2010 (CAT 2016).

AB 32. In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32, the California Global Warming Solutions Act of 2006 (California Health and Safety Code Sections 38500-38599 et seq.). AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020, and initiate the transformations required to achieve the state's long-range climate objectives.

In 2007, and in accordance their AB 32 responsibilities, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO_2e), in accordance with California Health and Safety Code Section 38550.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions-reduction goal of EO B-30-15 (discussed further below) by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to the Board as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emission-reduction measures when updating the scoping plan.

CARB's Climate Change Scoping Plan. One specific requirement of AB 32 is for CARB to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (California Health and Safety Code Section 38561[a]), and to update the plan at least once every 5 years. In 2008, CARB approved the first scoping plan: *Climate Change Scoping Plan: A Framework for Change* (2008 Scoping Plan). The 2008 Scoping Plan included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission-reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives. The key elements of the 2008 Scoping Plan include the following (CARB 2008):

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33%
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (17 CCR Section 95480 et seq.)
- Creating targeted fees, including a public goods charge on water use, fees on high-GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation

In December 2017, CARB adopted *California's 2017 Climate Change Scoping Plan Update* (2017 Scoping Plan) (CARB 2017a). The 2017 Scoping Plan builds on the successful framework established in the 2008 Scoping Plan and First Update, while identifying new technologically feasible and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies' "known commitments" include implementing renewable energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, the 2017 Scoping Plan also recommends continuing the Cap-and-Trade Program.

For local governments, the 2017 Scoping Plan replaced the 2008 Scoping Plan's 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO_2e per capita by 2030 and no more than 2 MT CO_2e per capita by 2050, which are developed around the scientifically based levels necessary to limit global

warming below 2°C. The 2017 Scoping Plan Update recognized the benefits of local government GHG planning (e.g., through climate action plans [CAPs]) and provide more information regarding tools CARB is working on to support those efforts. It also recognizes the CEQA streamlining provisions for project-level review where there is a legally adequate CAP. The 2017 Scoping Plan was approved by CARB's Governing Board on December 14, 2017.

The 2017 Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB 32, and the EOs; it also establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and EOs if it would meet the general policies in reducing GHG emissions in order to facilitate the achievement of the state's goals and would not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with each and every planning policy or goal to be consistent. A project would be consistent if it would further the objectives and not obstruct their attainment.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG-reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050, as set forth in S-3-05. To facilitate achieving this goal, EO B-30-15 called for CARB to update the Scoping Plan to express the 2030 target in terms of MMT CO_2e. The EO also called for state agencies to continue to develop and implement GHG emission-reduction programs in support of the reduction targets. See the discussion of "SB 32 and AB 197" above for related information.

Building Energy

California Code of Regulations, Title 24, Part 6. The California Building Standards Code was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure that new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC), and revised if necessary (PRC Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, in order to "reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (PRC Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (PRC Section 25402[d]) and cost effectiveness (PRC Section 25402[b][2–3]). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment. The current Title 24 standards are the 2019 Title 24 building energy standards which became effective January 1, 2020.

California Code of Regulations, Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code is commonly referred to as CALGreen, and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The 2019 CALGreen standards are the current applicable standards. For nonresidential projects, some of the key mandatory CALGreen 2019 standards involve requirements related to bicycle parking, designated parking for clean air vehicles, electric vehicle (EV) charging stations, shade trees, water conserving plumbing fixtures and fittings, outdoor potable water use in landscaped areas, recycled water supply systems, construction waste management, excavated soil and land clearing debris, and commissioning (24 CCR Part 11).

Mobile Sources

AB 1493. AB 1493 (2002) was enacted in response to the transportation sector accounting for more than half of California's CO_2 emissions (California Health and Safety Code Sections 43018.5 and 42823 amendments). AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards were projected to result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30%.

Heavy-Duty Diesel. CARB adopted the final Heavy-Duty Truck and Bus Regulation on December 31, 2014 to reduce diesel particulate matter, a major source of black carbon, and oxides of nitrogen emissions from heavy-duty diesel vehicles (13 CCR Section 2025). The rule requires diesel particulate matter filters be applied to newer heavier trucks and buses by January 1, 2012, with older vehicles required to comply by January 1, 2015. The rule requires nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an Airborne Toxic Control Measure to limit idling of diesel-fueled commercial vehicles on December 12, 2013. This rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than 5 minutes at any location (13 CCR Section 2485).

EO S-1-07. EO S-1-07 (January 2007, implementing regulation adopted in April 2009) sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR Section 95480 et seq.). The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel—including extraction/feedstock production, processing, transportation, and final consumption—per unit of energy delivered.

SB 375. SB 375 (California Government Code Section 65080) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG-reduction targets for the automobile and light-truck sector for 2020 and 2035, and to update those targets every 8 years. SB 375 requires the state's 18 regional metropolitan planning organizations (MPOs) to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan that will achieve the GHG-reduction targets set by CARB. If an MPO is unable to devise an SCS to achieve the GHG-reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG-reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

A SCS does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it (California Government Code Section 65080[b][2][K]). Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process. The implementation of SB 375 in the Monterey Bay Area is discussed below.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program. The Advanced Clean Cars program (January 2012) is an emission-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for

clean cars (CARB 2012). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025, cars will emit 75% less smog-forming pollution than the average new car sold today. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The zero-emission vehicle program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of zero-emission vehicles and plug-in hybrid EVs in the 2018 to 2025 model years. However, as detailed previously, EPA and NHTSA published the SAFE Vehicles Rule, which revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. Since California and 22 other states, as well as the District of Columbia and four cities, filed suit against the EPA and a petition for reconsideration of the rule, the effect of the SAFE Rule on the Advanced Clean Cars program is still to be determined pending the ruling of ongoing litigation.

EO B-16-12. EO B-16-12 (March 2012) required that state entities under the Governor's direction and control support and facilitate the rapid commercialization of zero-emission vehicles. It ordered CARB, CEC, CPUC, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve benchmark goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80% less than 1990 levels by 2050. This directive did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

Water

SB X7-7. SB X7-7, or the Water Conservation Act of 2009, requires that all water suppliers increase their water use efficiency with an overall goal of reducing per capita urban water use by 20% by December 31, 2020. Each urban water supplier shall develop water use targets to meet this goal.

Solid Waste

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by the year 2020, and annually thereafter. In addition, AB 341 required CalRecycle to develop strategies to achieve the state's policy goal. CalRecycle has conducted multiple workshops and published documents that identify priority strategies that it believes would assist the state in reaching the 75% goal by 2020.

Other State Actions

CEQA and Senate Bill 97. SB 97 (2007) directed the Governor's Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Governor's Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRA adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR Section 15064.4[a]). The CEQA Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR Section 15064.4[b]). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009a).

With respect to GHG emissions, CEQA Guidelines Section 15064.4(a) states that lead agencies "should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or performance based standards" (14 CCR Section 15064.4[a]). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR Section 15064.4[b]).

EO S-13-08. EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final *2009 California Climate Adaptation Strategy* report was issued in December 2009 (CNRA 2009b), and an update, *Safeguarding California: Reducing Climate Risk*, followed in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the following areas: Agriculture, Biodiversity and Habitat, Emergency Management, Energy, Forestry, Ocean and Coastal Ecosystems and Resources, Public Health, Transportation, and Water. Issuance of the *Safeguarding California: Implementation Action Plans* followed in March 2016 (CNRA 2016). In January 2018, the CNRA released the *Safeguarding California Plan: 2018 Update,* which communicates current and needed actions that state government should take to build climate change resiliency (CNRA 2018).

4.8.2.3 Regional

Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) is the designated MPO for the Monterey Bay region. The AMBAG region includes Monterey, San Benito, and Santa Cruz counties. As of 2009, many of the cities and counties in the AMBAG jurisdiction had not quantified their baseline GHG inventories, due to lack of staff and funding. The AMBAG Energy Watch designed a program to assist member jurisdictions in a variety of climate action planning support services. Additionally, in 2008, AMBAG adopted the *Monterey Bay Regional Energy Plan* (Regional Energy Plan; AMBAG 2008). The Regional Energy Plan provides a framework that local cities and counties can adopt or use as guidelines to reduce energy use.

Additionally, CARB set SB 375 GHG-reduction targets for the Monterey Bay Area at 0% increase from 2005 per capita emissions by 2020, and 5% below 2005 per capita emissions by 2035. In June 2014, AMBAG adopted the *Moving Forward 2035 Monterey Bay – Metropolitan Transportation Plan/Sustainable Communities Strategy* (2035 MTP/SCS) (AMBAG 2014). The 2035 MTP/SCS demonstrates that, if implemented, the region will achieve over a 3%-per-capita GHG reduction in passenger vehicle emissions in 2020, and an approximately 6% reduction in 2035. These reductions meet the GHG targets for AMBAG, as discussed above.

In March 2018, CARB updated the GHG reduction targets for the Monterey Bay Area for 2020 and 2035 at 3% and 6% below 2005 per capita emissions, respectively. In June 2018, AMBAG adopted an update to the 2035 MTP/SCS, *Moving Forward Monterey Bay 2040* (2040 MTP/SCS), the implementation of which is anticipated to achieve a 4%-per-capita reduction and nearly 7%-per-capita reduction in GHG emissions from passenger vehicles by 2020 and 2035, respectively (AMBAG 2018). The 2040 MTP/SCS outlines the region's proposed transportation network, emphasizing multimodal system enhancements, system preservation, and improved access to high quality transit, as well as land use development that complements this transportation network (AMBAG 2018).

Monterey Bay Air Resources District

California has 35 Air Pollution Control Districts and Air Quality Management Districts, many of which are currently addressing climate change issues by developing significance thresholds, performance standards, and mitigation measures. The Monterey Bay Air Resources District (MBARD) is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the North Central Coast Air Basin. In February 2016, the MBARD adopted the staff-recommended significance threshold of 10,000 MT of CO_2e for stationary source projects (MBARD 2016). MBARD has not adopted GHG significance thresholds for land use projects or non-stationary projects. For land use projects, MBARD has recommended using the adopted San Luis Obispo Air Pollution Control District (SLOAPCD) thresholds. The SLOAPCD has adopted a quantitative GHG threshold of 1,150 MT CO_2e per year (SLOAPCD 2012).

4.8.2.4 Local

City of Santa Cruz

In October 2012, the City adopted a CAP that outlines the actions the City will take over the next 10 years to reduce GHGs by 30% and to implement the policies and actions identified in the *General Plan 2030*. The CAP addresses citywide GHG reduction strategies. The CAP provides City emissions inventories, identifies an emissions reduction target for the year 2020, and includes measures to reduce energy use, reduce vehicle trips, implement water conservation programs, reduce emissions from waste collection, increase use of solar systems, and develop public partnerships to aide sustainable practices. Measures are outlined for the following sectors: municipal, residential, commercial, and community programs. None of the recommended measures are applicable to the Proposed Project.

County of Santa Cruz

The County of Santa Cruz Board of Supervisors approved the Climate Action Strategy (CAS) on February 26, 2013. The CAS reports the results of the GHG emissions inventory for Santa Cruz County, proposes targets for GHG reduction, outlines strategies and implementing actions to achieve the targets, and provides a vulnerability assessment and strategies for adapting to the types of impacts that are likely to occur in Santa Cruz County. Eight "climate adaptation goals" are articulated as a guide for evaluating adaptation strategies. Specific adaptation strategies are proposed that include new actions as well as acknowledgement of existing plans and programs,

which, while not explicitly about climate change, address the salient issues. There are no goals, strategies or recommendations applicable to the Proposed Project.

4.8.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to GHG emissions. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.8.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to GHG emissions are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

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.

As described in Section 4.3, Air Quality, the project site is located within the North Central Coast Air Basin under the jurisdiction of the MBARD, which, to date, has not adopted significance criteria or thresholds for land use projects. The MBARD-adopted significance threshold of 10,000 MT of CO_2e for stationary source projects (MBARD 2016), does not apply to the Proposed Project, as no new stationary sources of GHG emissions are proposed. Since the MBARD has not adopted GHG significance thresholds for land use projects or non-stationary projects, MBARD has recommended using the adopted SLOAPCD thresholds. The SLOAPCD has adopted a quantitative GHG threshold of 1,150 MT CO_2e per year (SLOAPCD 2012). This impact analysis adds amortized construction emissions over the life of the Project (50 years as recommended by the SLOAPCD) then compares GHG emissions to the recommended threshold of 1,150 MT CO_2e per year (SLOAPCD 2012).

4.8.3.2 Analytical Methods

Construction

Emissions from the construction phase of the Proposed Project were estimated using California Emissions Estimator Model (CalEEMod) Version 2016.3.2. Construction of the Proposed Project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. The analysis of GHG emissions used the same methodology and modeling inputs assumptions used for the analysis of air quality impacts; see Section 4.3.3.2, Analytical Methods, for air quality.

Operation

Operational activities would be limited to scheduled maintenance and repair. Maintenance activities would be minimal and would be generally similar to those that occur under existing conditions. Maintenance includes exercising valves and replacing or repairing worn appurtenances to ensure proper performance over the life of the facilities. No permanent workers would be required to operate or maintain the Proposed Project. Activities associated with long-term operations and maintenance would, therefore, be minimal (no routine daily equipment operation or vehicle trips would be required beyond existing conditions).

4.8.3.3 Project Impact Analysis

This section provides a detailed evaluation of GHG impacts associated with the Proposed Project.

Impact GHG-1: GHG Emissions (Significance Standard A). The Proposed Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. ***(Less than Significant)***

Construction of the Proposed Project is estimated to last a total of approximately 3 months, planned to occur during the timeframe of June to October. On-site sources of GHG emissions would include off-road equipment and off-site sources would include haul trucks, vendor trucks, and worker vehicles. Table 4.8-2 presents construction emissions for the Proposed Project from on-site and off-site emission sources.

Table 4.8-2. Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2021	91.80	0.02	0.00	92.23
			Total Amortized	**1.84**

Source: Appendix B.
Notes: GHG = greenhouse gas; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

As shown in Table 4.8-2, 0ver the 3-month construction period, it is estimated that Proposed Project construction would result in approximately 92 MT CO_2e. Estimated project-generated construction emissions amortized over 50 years would be approximately 2 MT CO_2e per year.

With regard to long-term operations, as discussed in Section 4.8.3.2, Analytical Methods, once Proposed Project construction is complete, no operational activities associated with the Proposed Project would occur (no routine daily equipment operation or vehicle trips would be required beyond existing conditions). Because the Proposed Project would not result in an increase in long-term operational activities over existing conditions, there would be no potential GHG emissions impacts associated with operational GHG emissions. As such, only amortized project-generated construction emissions are compared to the GHG threshold. The 2 MT CO_2e per year of amortized construction GHGs would not exceed the 1,150 MT CO_2e threshold. Therefore, GHG emissions impacts would be less than significant.

Impact GHG-2: Conflict with an Applicable GHG Reduction Plan (Significance Standard B). The Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. ***(Less than Significant)***

Consistency with the Association of Monterey Bay Area Governments' Metropolitan Transportation Plan/ Sustainable Communities Strategy

AMBAG's 2040 MTP/SCS is a regional growth-management strategy that targets per-capita GHG reduction from passenger vehicles and light-duty trucks within the Monterey Bay Area, including Santa Cruz County. The 2040 MTP/SCS incorporates local land use projections and circulation networks in city and county general plans. Typically, a project would be consistent with the MTP/SCS if the project does not exceed the underlying growth parameters within the MTP/SCS. As discussed in Section 4.2.4, Population and Housing, the Proposed Project would generate a limited number of temporary construction jobs that could be accommodated within the regional workforce and it would not result in population growth. Therefore, the Proposed Project would not result in substantial population or employment growth that would exceed AMBAG growth projections for the County. Furthermore, as described in Table 4.8-3, the Proposed Project would not conflict with the major goals of the 2040 MTP/SCS.

Table 4.8-3. Review of Association of Monterey Bay Area Governments' 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy Goals and Proposed Project

MTP/SCS Goal	Potential for Proposed Project to Conflict
Provide convenient, accessible, and reliable travel options while maximizing productivity for all people and goods in the region.	*No conflict.* The Proposed Project would not inhibit AMBAG from strengthening the regional transportation network for goods movement.
Raise the region's standard of living by enhancing the performance of the transportation system.	*No conflict.* The Proposed Project would not inhibit AMBAG from enhancing the performance of the transportation system.
Promote environmental sustainability and protect the natural environment.	*No conflict.* The Proposed Project would not inhibit AMBAG from promoting sustainability within the Monterey Bay Area region.
Protect the health of our residents; foster efficient development patterns that optimize travel, housing, and employment choices and encourage active transportation.	*No conflict.* The Proposed Project would not inhibit AMBAG from protecting the health of residents, fostering efficient development patterns, and encouraging active transportation.
Provide an equitable level of transportation services to all segments of the population.	*No conflict.* The Proposed Project would not inhibit AMBAG from strengthening the regional transportation network for all segments of the population.
Preserve and ensure a sustainable and safe regional transportation system.	*No conflict.* The Proposed Project would not inhibit AMBAG from providing a sustainable and safe transportation system.

Source: AMBAG 2018.
Notes: AMBAG = Association of Monterey Bay Area Governments.

Consistency with the California Air Resources Board's Scoping Plan

The Scoping Plan, approved by CARB on December 12, 2008 and updated in 2014 and 2017, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. Since the Scoping Plan is a statewide implementation plan not all goals, regulations and reduction measures outlined in the Plan are directly applicable to specific projects. Relatedly, in the Final Statement of Reasons for the Amendments to the State CEQA Guidelines, the CNRA

observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009a). However, under the Scoping Plan, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. To the extent that these regulations are applicable to the Proposed Project, the Proposed Project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law.

Regarding consistency with SB 32, which has a goal of reducing GHG emissions to 40% below 1990 levels by 2030, and EO S-3-05 which has a goal of reducing GHG emissions to 80% below 1990 levels by 2050, there are no established protocols or thresholds of significance for those future-year analyses. However, CARB anticipates meeting both the 2030 and 2050 goals. CARB announced in 2018 that the state had met near-term 2020 GHG emissions reduction goals (CARB 2018b). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the *First Update to the Climate Change Scoping Plan* states the following (CARB 2014):

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under Assembly Bill 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 [percent] below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB believes that California is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05. This is confirmed in the 2017 Scoping Plan, which states, "This Plan draws from the experiences in developing and implementing previous plans to present a path to reaching California's 2030 GHG reduction target. The Plan is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state" (CARB 2017a). The 2017 Scoping Plan also states that although "the Scoping Plan charts the path to achieving the 2030 GHG emissions reduction target, we also need momentum to propel us to the 2050 statewide GHG target (80 [percent] below 1990 levels). In developing this Scoping Plan, we considered what policies are needed to meet our mid-term and long-term goals" (CARB 2017a).

With regard to EO B-55-18 (statewide goal of carbon neutrality by no later than 2045), which is a more aggressive statewide goal than EO S-3-05, the EO notes that CARB will work with relevant state agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. With respect to future GHG targets under SB 32 and EO B-55-18, CARB has made clear its legal interpretation that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet the long-term statewide goals; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets.

As described in Impact GHG-1, the Proposed Project would result in minimal GHG emissions during construction and would not exceed the SLOAPCD threshold of 1,150 MT CO_2e per year, which was established based on the goal of AB 32 to reduce statewide emissions to 1990 levels by 2020. Therefore, the Project would also be considered consistent with implementation of any of the above-described GHG-reduction goals for 2030 and beyond.

Based on the above considerations, the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. This impact would be less than significant.

4.8.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative GHG impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area for the analysis of cumulative impacts resulting from GHG emissions is the Earth as GHG emission are a global concern.

Impact GHG-3: Cumulative GHG Impacts (Significance Standards A and B). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to GHG emissions. However, the Proposed Project's contribution would not be cumulatively considerable. ***(Less than Significant)***

Cumulative development throughout the North Central Coast Air Basin and beyond would generate GHG emissions that could have a significant cumulative impact on the environment. Accordingly, the analysis above takes into account the potential for the Proposed Project to contribute to a cumulative impact of global climate change. As shown in Table 4.8-2, the Proposed Project would result in minimal GHG emissions and would not exceed the threshold of 1,150 MT CO_2e per year, adopted by the SLOAPCD and recommended by MBARD. In addition, as described in Impact GHG-2 above, the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted in order to reduce GHG emissions. Therefore, the Proposed Project's contribution to significant cumulative GHG impacts would not be cumulatively considerable and would be less than significant.

4.8.3.5 Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to GHG emissions, and therefore, no mitigation measures are required.

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4.9 Hazards and Hazardous Materials

This section describes the existing hazards and hazardous material conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). This analysis is based on a review of online hazardous material site databases and fire hazard severity zone maps.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. Comments related to wildfire protection (i.e., defensible space) were received from the California Department of Forestry and Fire Protection (CAL FIRE). Issues identified in the public comments related to potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or issues raised by responsible and trustee agencies are identified and addressed in this EIR.

4.9.1 Existing Conditions

4.9.1.1 Hazardous Materials

Definitions and Overview

As defined in the California Health and Safety Code Section 25501, "hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant hazard to human health and safety, or to the environment, if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing would be injurious to the health and safety of persons, or harmful to the environment if released into the workplace or the environment. Hazardous wastes are hazardous substances that no longer have a practical use, such as material that has been abandoned, discarded, spilled, or contaminated, or is being stored prior to proper disposal.

California Code of Regulations (CCR), Title 22, Chapter 11, Article 2, Section 66261.10 provides the following definition for hazardous waste:

> [A] waste that exhibits the characteristics may: (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed or otherwise managed.

According to CCR Title 22, substances having a characteristic of toxicity, ignitability, corrosivity, or reactivity are considered hazardous waste. Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability or death. For example, toxic substances can cause eye or skin irritation, disorientation, headache, nausea, allergic reactions, acute poisoning, chronic illness, or other adverse health effects if human exposure exceeds certain levels (levels depend on the substance involved). Carcinogens, substances known to cause cancer, are a special class of toxic substances. Examples of toxic substances include most heavy metals, pesticides, and benzene (a carcinogenic component of gasoline). Ignitable substances, such as gasoline, hexane, and natural gas, are hazardous because of their flammable properties. Corrosive substances

(e.g., strong acids and bases such as sulfuric (battery acid or lye) are chemically active and can damage other materials or cause severe burns upon contact. Reactive substances (e.g., explosives, pressurized canisters, and pure sodium metal, which react violently with water) may cause explosions or generate gases or fumes.

Regulatory Records Review

Government Code Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to compile a list of hazardous waste and substances sites (Cortese List). While the Cortese List is no longer maintained as a single list, the following databases provide information that meet the Cortese List requirements:

- List of hazardous waste and substance sites from the Department of Toxic Substances Control's (DTSC's) EnviroStor database (Health and Safety Codes 25220, 25242, 25356, and 116395).
- List of leaking underground storage tank (LUST) sites from the State Water Resources Control Board (SWRCB) GeoTracker database (Health and Safety Code 25295).
- List of solid waste disposal sites identified by SWRCB with waste constituents higher than hazardous waste levels outside the waste management unit (Water Code Section 13273 subdivision [e] and 14 CCR Section 18051).
- List of cease and desist orders and cleanup and abatement orders from SWRCB (Water Code Sections 13301 and 13304).
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the California Health and Safety Code, as identified by DTSC.

A search of hazardous material sites databases was conducted on May 12, 2020, to identify any sites located within 1 mile of the project site that are on the Cortese List compiled pursuant to Section 65962.5 of the California Government Code. Based on this search, no Cortese List sites have been identified within 1 mile of the project site.

Project Site Conditions

The project site has been used as a water diversion facility since its construction in 1890. A chlorination station was constructed in 1965, but chlorine is no longer used to treat the water at the project site, and the building, now referred to as the control building, currently houses the various controls for the sediment release valves. Propane for the emergency backup generator is stored on the site in a 250-gallon aboveground tank. No other fuels, gas, oil, solvents, petroleum products, etc., are stored on site.

Non-Cortese List Sites

EnviroStor and GeoTracker databases were searched to identify cleanup sites within 1 mile of the project site. These sites do not meet the definition of a Cortese List site, as described above, but have environmental contamination that may impact the Proposed Project. Examples of cleanup sites include voluntary cleanup sites or hazardous waste corrective action sites. Dudek conducted this database search on May 12, 2020. No hazardous material sites were identified within 1 mile of the project site.

4.9.1.2 Other Hazards

Aircraft Hazards

There are no airports located within 2 miles of the project site, nor does the project site lie within an airport land use plan.

Fire Hazards and Emergency Response

The project site is located within a high fire hazard severity zone, also within a state responsibility area (CAL FIRE 2007). CAL FIRE is responsible for fire response at the project site. In addition to CAL FIRE, the Bonny Doon Volunteer Fire and Rescue is an all-volunteer first-responder unit of the Santa Cruz County Fire Department. Bonny Doon Fire and Rescue respond alongside CAL FIRE from the Fall Creek Station on Empire Grade, located approximately 2.4 miles (straight-line distance) north of the project site.

4.9.1.3 Sensitive Receptors

Scattered residences are located within 0.25 miles of the project site, with the nearest residence located approximately 100 feet south of the project site across Smith Grade. There are no current or proposed schools located within 0.25 miles of the project site (CDE 2020; CSCD 2020). The nearest schools are Bonny Doon Elementary, 1492 Pine Flat Road, which is located approximately 2.7 miles north-northwest of the project site, and University of California, Santa Cruz, which is located approximately 3.8 miles east-southeast of the project site (CSCD 2020).

4.9.2 Regulatory Framework

4.9.2.1 Federal

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 provides the U.S. Environmental Protection Agency (EPA) with the authority to require reporting, record-keeping, and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from the Toxic Substances Control Act, including food, drugs, cosmetics, and pesticides.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," was enacted by Congress in 1980. CERCLA provides a federal "Superfund" to clean up uncontrolled or abandoned hazardous waste sites, as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through CERCLA, EPA was given power to seek out those parties responsible for any release and ensure their cooperation in the cleanup.

Emergency Planning and Community Right-To-Know Act

Authorized by Title III of the Superfund Amendments and Reauthorization Act (SARA), the Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted by Congress in 1986 as the national legislation on community safety. This law is designed to help local communities protect public health, safety, and the environment from chemical

hazards. To implement EPCRA, Congress requires each state to appoint a State Emergency Response Commission (SERC). The SERCs are required to divide their states into Emergency Planning Districts and to name a Local Emergency Planning Committee for each district. The project site is located in Administrative, Mutual Aid, and Local Emergency Planning Committee Region II, Coastal (California Governor's Office of Emergency Services 2014). Broad representation by fire fighters, health officials, government and media representatives, community groups, industrial facilities, and emergency managers ensures that all necessary elements of the planning process are represented.

Hazardous Materials Transportation Act

Transportation of hazardous materials is regulated by the U.S. Department of Transportation's Office of Hazardous Materials Safety. The office formulates, issues, and revises hazardous materials regulations under the Federal Hazardous Materials Transportation Law. The hazardous materials regulations cover hazardous materials definitions and classifications, hazard communications, shipper and carrier operations, training and security requirements, and packaging and container specifications. The hazardous materials transportation regulations are codified in the Code of Federal Regulations (CFR), Title 49, Parts 100 through 185.

The hazardous materials transportation regulations require carriers transporting hazardous materials to receive training in the handling and transportation of hazardous materials. Training requirements include pre-trip safety inspections, use of vehicle controls and equipment including emergency equipment, procedures for safe operation of the transport vehicle, training on the properties of the hazardous material being transported, and loading and unloading procedures. All drivers must possess a commercial driver's license as required by 49 CFR Part 383. Vehicles transporting hazardous materials must be properly placarded. In addition, the carrier is responsible for the safe unloading of hazardous materials at the site, and operators must follow specific procedures during unloading to minimize the potential for an accidental release of hazardous materials.

Transportation by rail is regulated per 49 CFR Part 174, Subpart C, which includes requirements for marking and placarding of rail cars and the segregation of hazardous materials. Subpart D covers the requirements for handling of placarded rail cars, including position in the train and maximum allowable speed (50 miles per hour for most hazards substances). Subparts E, F, G, J, and K include requirements for transportation of explosives, gases, flammable liquids, poisonous materials, and radioactive materials, respectively. Safety requirements include inspections at every stop, specific training, and train crew knowledge of the rail car contents and location.

Occupational Safety and Health Act

The Occupational Safety and Health Administration (OSHA) was established in 1971 is responsible at the federal level for ensuring worker safety. All OSHA standards are regulated under 29 CFR Parts 1900 through 1990, Parts 2200 through 2205, and Part 2400. Occupational Safety and Health Standards are regulated under 29 CFR Part 1910. OSHA sets federal standards for implementing workplace training, exposure limits, and safety procedures for the handling of hazardous substances and hazardous materials (as well as other hazards). OSHA also establishes criteria by which each state can implement its own health and safety program.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous waste from "cradle-to-grave." This regulation, which was enacted in 1976, includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The Federal Hazardous and Solid Waste Amendments of 1984 focused on waste minimization and

phasing out land disposal of hazardous waste, as well as corrective action for releases. Amendments in 1986 enabled the EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive UST program.

U.S. Department of Transportation

The Department of Transportation established standards for the transport of hazardous materials and hazardous wastes (49 United States Code, Part 172, Subchapter C – Shipping Papers). The standards include requirements for labeling, packaging, and shipping hazardous materials and hazardous wastes, as well as training requirements for personnel responsible for shipping papers and manifests.

4.9.2.2 State

Certified Unified Program

CalEPA implements and enforces a statewide hazardous materials program known as the Certified Unified Program, established by Senate Bill 1082 in 1993 to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for the following environmental and emergency management programs for hazardous materials:

- Hazardous Materials Release Response Plans and Inventories (Hazardous Materials Business Plans, or HMBPs)
- California Accidental Release Prevention Program
- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Requirements for Spill Prevention, Control, and Countermeasure Plans
- Hazardous Waste Generator and On-Site Hazardous Waste Treatment Programs
- California Uniform Fire Code, Hazardous Materials Management Plans (HMMPs), and Hazardous Material Inventory Statements

CalEPA certifies local government agencies as Certified Unified Program Agencies (CUPAs) to implement hazardous waste and materials standards. Santa Cruz County Environmental Health is designated as the local CUPA in Santa Cruz County.

California Hazardous Waste Control Law

California Health and Safety Code Division 20, Chapter 6.5 establishes regulations to protect the public health and the environment by assisting generators of hazardous waste in meeting the responsibility for the safe disposal of hazardous waste. The California Hazardous Waste Control Law is administered by the CalEPA and pertains to administering a state hazardous waste program in lieu of the federal RCRA program, pursuant to Section 3006 of Public Law 94-580, as amended. The Hazardous Waste Control Law lists 791 chemicals and approximately 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Accidental Release Prevention Program

Similar to the Federal Risk Management Program, the California Accidental Release Prevention Program includes additional state requirements and an additional list of regulated substances and thresholds. The regulations of the program are contained in CCR Title 19, Division 2, Chapter 4.5. The intent of the California Accidental Release Prevention Program is to provide first responders with basic information necessary to prevent or mitigate damage to public health, safety, and the environment from the release or threatened release of hazardous materials.

California Department of Toxic Substances Control and California Highway Patrol Hazard Transportation Program

The California DTSC administers the transportation of hazardous materials throughout the state. Regulations applicable to the transportation of hazardous waste include Title 22, Division 4.5, Chapter 13 and Chapter 29 of the CCR, as well as Division 20, Chapter 6.5, Articles 6.5, 6.6, and 13 of the California Health and Safety Code. The DTSC requires that drivers transporting hazardous wastes obtain a certificate of driver training that shows the driver has met the minimum requirements concerning the transport of hazardous materials, including proper labeling and marking procedures, loading/handling processes, incident reporting and emergency procedures, and appropriate driving and parking rules. The California Highway Patrol also requires shippers and carriers to complete hazardous materials employee training before transporting hazardous materials.

California Health and Safety Code

The handling and storage of hazardous materials is regulated by Division 20, Chapter 6.95 of the California Health and Safety Code. Under Sections 25500–25543.3, facilities handling hazardous materials are required to prepare a HMBP, which contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the state.

Chapter 6.95 of the Health and Safety Code establishes minimum statewide standards for HMBPs. Each business shall prepare a HMBP if that business uses, handles, or stores a hazardous material (including hazardous waste) or an extremely hazardous material in quantities greater than or equal to 500 pounds of a solid substance, 55 gallons of a liquid, 200 cubic feet of compressed gas, a hazardous compressed gas in any amount (highly toxic with a Threshold Limit Value of 10 parts per million or less), or extremely hazardous substances in threshold planning quantities. In addition, in the event that a facility stores quantities of specific acutely hazardous materials above the thresholds set forth by California code, facilities are also required to prepare a Risk Management Plan and California Accidental Release Plan.

California Division of Occupational Safety and Health Hazard Handling Procedures

The California Division of Occupational Safety and Health (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the work place. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337 through 340). The regulations specify requirements for employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings.

Protection of Forest, Range, and Forage Lands/Defensible Space

Public Resources Code (PRC) Section 4291 requires the creation of a 100-foot fire break or fire protection area around and adjacent to habitable buildings or structures. These requirements indicate that a person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material, shall maintain defensible space of 100 feet from each side and from the front and rear of the structure. The amount of fuel modification necessary shall take into account the flammability of the structure as affected by building material, building standards, location, and type of vegetation. Fuels shall be maintained in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure. This paragraph does not apply to single specimens of trees or other vegetation that are well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a structure or from a structure to other nearby vegetation. The intensity of fuels management may vary within the 100-foot perimeter of the structure, the most intense being within the first 30 feet around the structure. "Fuel" means any combustible material, including petroleum-based products and wildland fuels.

A letter received from CAL FIRE during the scoping period (see Appendix A) acknowledges that the Proposed Project does not include construction of habitable buildings or structures and thus is not required to incorporate defensible space per PRC Section 4291. However, CAL FIRE recommends creation of 100 feet of fire protection area around infrastructure associated with the diversion dam in order to provide protection of important infrastructure during wildfire.

4.9.2.3 Local

County of Santa Cruz Environmental Health

As previously discussed, Santa Cruz County Environmental Health is designated by CalEPA as the CUPA within the geographic boundaries of the County and is responsible for enforcing the local ordinance and state laws pertaining to use and storage of hazardous materials, including the issuance and administration of HMMPs. The City's Fire Department works in conjunction with County Environmental Health in responding to reports of hazardous materials spills and accidents, enforcing hazardous materials regulations, and enforcing the City's fire code as it relates to the use and storage of hazardous materials.

County of Santa Cruz General Plan and Local Coastal Plan – Chapter 6: Public Safety

California Government Code Section 65302(g) requires the development of Safety Elements. The County of Santa Cruz General Plan and Local Coastal Plan Safety Element (County of Santa Cruz 2020) provides policies that meet the General Plan objectives. The following policies relate specifically to hazards and hazardous materials and may apply to the Proposed Project.

- Policy 6.5.1 requires access standards for new construction to allow emergency vehicle access.
- Policy 6.5.3 sets conditions for project approval, including adequate water availability, flammable vegetation clearance, smoke detection devices, fire retardant roofs, and adequate disposal of refuse.
- Policy 6.5.4 sets fire protection standards for building sites outside urban services line, including access requirements, building requirements for those located inside critical fire hazard areas, flammable vegetation control, and water availability.

- Policies 6.6.1 through 6.6.3 provide standards for use, maintenance, and control of hazardous material use and storage. Hazardous material users are obligated to minimize or eliminate hazardous material use wherever possible. The County will maintain standards which are at least equal in protection for the environment and community as those imposed by other local governments within Santa Cruz County, and in adjoining counties.

4.9.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to hazards and hazardous materials. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.9.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to hazards and hazardous materials are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

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 0.25 miles 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. Result in a safety hazard or excessive noise for people residing or working in the project area, for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport.

F. Impair implementation of or physically interfere with an adopted emergency evacuation plan.

G. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

4.9.3.2 Analytical Methods

This impact analysis assumes that the Proposed Project would be constructed and operated in compliance with the policies and regulations applicable to hazards and hazardous materials, as described above in Section 4.9.2, Regulatory Framework. A review of applicable regulatory records was conducted to characterize the existing environmental setting in the study area, as described above in Section 4.9.1, Existing Conditions, and to identify any existing hazardous waste and substances sites on or near the project site that could affect construction or operation of the Proposed Project.

4.9.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following standards of significance as described below:

- **Hazardous Materials near Schools (Significance Standard C).** There are no schools located within 0.25 miles of the project site, and the Proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials within 0.25 miles of an existing or proposed school. Therefore, the Proposed Project would have no impact.
- **Cortese List Hazards (Significance Standard D).** The Proposed Project would not create a significant hazard to the public or the environment related to hazardous materials sites because it is not located on or within 1 mile of a hazardous material site that is included on a list compiled pursuant to Government Code Section 65962.5, as described in Section 4.9-1, Existing Conditions, above. Therefore, the Proposed Project would have no impact.
- **Airport Hazards (Significance Standard E).** The Proposed Project would not result in a safety hazard or excessive noise for people working or residing in the project area due to airports because the project site is not located within 2 miles of a public use airport nor is it located within an airport land use plan. Therefore, the Proposed Project would have no impact.
- **Emergency Evacuation Hazards (Significance Standard F).** As discussed in Section 4.13, Transportation, the Proposed Project would not result in impacts to traffic, including obstruction to evacuation routes. Therefore, the Proposed Project would not impair implementation of or physically interfere with an adopted emergency evacuation plan because the Proposed Project would not impact evacuation routes, change public roadways or access, or increase the need for emergency response at the project site. Therefore, the Proposed Project would have no impact.

Impacts

This section provides a detailed evaluation of hazards and hazardous materials impacts associated with the Proposed Project.

Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials (Significance Standard A). The Proposed Project would require use and transportation of petroleum products and small quantities of hazardous materials, but would not result in a significant hazard to the public or environment. ***(Less than Significant)***

Relatively small amounts of commonly used hazardous substances such as gasoline, diesel fuel, lubricating oil, adhesive materials, grease, solvents, and architectural coatings would be used during construction. These materials are not considered extremely hazardous and are used routinely for both construction projects and structural improvements. These materials would be transported and handled in accordance with all federal, state, and local laws regulating the management and use of hazardous materials, and would be managed in accordance with the City's Standard Construction Practices as described in Section 3.6.3, Standard Construction Practices. The following practices would further reduce the risk of use, transportation, and disposal of hazardous materials:

- Stabilize spoil disposal sites and other debris areas and include sediment control measures so that it is not conveyed to waterways (Standard Construction Practice #5).
- Equipment and fueling areas would not be within 65 feet of the stream channel (Standard Construction Practice #6).
- Hazardous substances would be stored within established containment areas in water-tight containers and spill kits would be available. Equipment and vehicles would be checked for leaks and would maintained to prevent leaks (Standard Construction Practice #7 and #8).
- Waste and trash would be managed (Standard Construction Practice #9).

Consequently, use of these materials for their intended purpose would not pose a significant risk to the public or environment. Once construction has been completed, fuels and other hazardous materials would no longer remain within the work area. Propane for the emergency backup generator would continue to be stored on the site (250-gallon aboveground tank). No other fuels, gas, oil, solvents, petroleum products, etc., would be stored on site. Use, transportation, and disposal of hazardous materials during routine operation and maintenance activities would be done in accordance with the manufacturer's recommendations and federal, state, and local laws and regulations. Therefore, the Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would be less than significant.

Impact HAZ-2: Reasonably Foreseeable Upset or Accident Conditions (Significance Standard B). The Proposed Project would not 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. ***(Less than Significant)***

As discussed under Impact HAZ-1, relatively small amounts of commonly used hazardous materials would be used for construction and operation of the Proposed Project, and these materials would be handled, stored, transported, and disposed of in accordance with the manufacturer's recommendations and federal, state, and local laws and regulations. During operation and maintenance of the Proposed Project, the hazardous materials stored on site would be a 250-gallon aboveground storage tank of propane, similar to existing conditions. As described above, should additional hazardous materials be required to be stored on site, depending on the quantity, the City would be required to submit a HMBP to Santa Cruz County Environmental Health, the local CUPA agency for the project site. In addition to the HMBP, the County health officer may request additional information deemed necessary to protect the public health. Use, transportation, and disposal of these materials during routine operation and maintenance activities would be done in accordance manufacturer's recommendations and federal, state, and local laws and regulations. While the probability for a release of hazardous materials to the environment would be low, accidental spills, leaks, or other releases of hazardous materials could directly enter Laguna Creek.

As discussed in Section 4.10, Hydrology and Water Quality, construction activities would disturb less than 1 acre; therefore, the Proposed Project is exempt from the Construction General Permit, including preparation of a Stormwater Pollution Prevention Plan (SWPPP) and best management practices (BMPs). However, the City's Standard Construction Practices, as described in Section 3.6.3, Standard Construction Practices, would be employed to ensure water quality protection. These are summarized as follows:

- Locate and stabilize spoil disposal and debris areas with sediment control measures so debris and sediments are not conveyed into waterways (Standard Construction Practice #5).
- Equipment and fueling areas will include implementation of spill prevention methods, such as secondary containment (Standard Construction Practice #6).
- Hazardous materials, such as gas and oil, will be stored within an established containment area. Vehicles and equipment will have spill kits, will be checked daily for leaks, and will be properly maintained to prevent contamination. Hazardous materials, including petroleum products, will be stored in water-tight containers within secondary containment. Emergency spill kits will be available at all times (Standard Construction Practice #7).
- Equipment will be inspected regularly for leaks (Standard Construction Practice #8).

With implementation of these Standard Construction Practices, the potential for an accidental releases to enter Laguna Creek or to be released to the soil would be reduced. Therefore, the Proposed Project would not 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 and impacts would be less than significant.

Impact HAZ-3: Wildfire Hazards (Significance Standard G). The Proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. ***(Less than Significant)***

As discussed in Section 4.2, Impacts Not Found to be Significant, construction and operation of the Proposed Project would not exacerbate wildfire risks or include habitable structures that could expose people or structures to wildfire. Construction could include the use of welding equipment, torching, generators, chainsaws, and chippers, all of which could produce sparks. However, the City's Standard Construction Practices, as described in Section 3.6.3, Standard Construction Practices, include fire safety measures that would be implemented during construction, specifically during use of such equipment (Standard Construction Practice #32). Spark arrestors would be required for internal combustion engine equipment, fire suppression equipment would be required on site during use of such mechanical equipment, and construction activities would not be conducted during high fire hazard periods (i.e., red flag warnings).[1] Fire suppression equipment would include items such as fire extinguishers and shovels. Therefore, the Proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires, and impacts would be less than significant.

A letter received from CAL FIRE during the scoping period acknowledges that the Proposed Project does not include construction of habitable buildings or structures and thus is not required to incorporate defensible space per PRC Section 4291. However, in the letter CAL FIRE recommends creation of 100 feet of fire protection area around infrastructure associated with the diversion dam in order to provide protection of important infrastructure during wildfire. The City will consider the need to implement vegetation/fuels management at this and other facilities to protect such infrastructure during wildfire; however, such management, if warranted, would not be conducted as part of the Proposed Project given that the Proposed Project would not include habitable structures and would not increase wildland fire risk hazards at the project site.

[1] Red flag warnings and fire weather watches are issued by CAL FIRE based on weather patterns (low humidity, strong winds, dry fuels, etc.) and listed on their website (https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/).

4.9.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative hazards and hazardous materials impacts associated with the Proposed Project and other reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area for the analysis of cumulative impacts related to hazards and hazardous materials consists of the project site and areas immediately adjacent to, upstream, and downstream of the site along Laguna Creek because impacts related to hazards and hazardous materials depend on the specific conditions on the particular project site and its immediate vicinity. Generally, these site-specific impacts would not combine with one another to create cumulative impacts, unless the cumulative development sites overlapped or were immediately adjacent to one another.

The Proposed Project would not contribute to cumulative impacts related to hazardous emissions or materials within 0.25 miles of an existing or proposed school (Significance Standard C), hazardous material sites on the Cortese List (Significance Standard D), aircraft hazards (Significance Standard E), or interference with an adopted emergency evacuation plan (Significance Standard F) because it would have no impacts related to these standards, as described above. Therefore, these significance standards are not further evaluated.

Impact HAZ-4: Cumulative Hazard Impacts (Significance Standards A, B, and G). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to routine transport, use, disposal, or accidental release of hazardous materials, or related to significant risk of loss, injury, or death involving wildland fires. ***(Less than Significant)***

The known cumulative projects planned within the geographic area of analysis for cumulative impacts related to hazards and hazardous materials, which is project site and immediate vicinity, include the Laguna Pipeline portion of the North Coast System Repair and Replacement Project. The Santa Cruz Water Rights Project (SCWRP) and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan do not overlap with and are not in the immediate vicinity of the project site. Although the Laguna Pipeline would entail limited construction within the project vicinity, it would occur several years after construction of the Proposed Project and therefore would not result in significant cumulative impacts due to the combined effect of both projects.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects that would overlap with or be located in the immediate vicinity of the Facility that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts related to hazards and hazardous materials. Additionally, the cumulative projects would be required to comply with all federal, state, and local laws and regulations regarding the use, transport, handling, storage, disposal, and release of hazardous materials, and include project-specific BMPs as applicable, which would reduce the potential for a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset or accident conditions. Similarly, cumulative projects would be required to address potential risks to wildland fire and incorporate BMPs that would reduce such risks. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would result in less-than-significant cumulative impacts related to hazards, hazardous materials, and wildland fires.

4.9.3.5 Mitigation Measures

As described above, the Proposed Project would not result in any significant impacts related to hazards and hazardous materials, and therefore, no mitigation measures are required.

4.9.4 References

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CAL FIRE (California Department of Forestry and Fire Protection). 2007. *Santa Cruz County Fire Hazard Severity Zones in SRA*. November 7, 2007. Accessed April 23, 2020 at https://osfm.fire.ca.gov/media/6768/fhszs_map44.pdf.

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County of Santa Cruz. 2020. *1994 General Plan and Local Coastal Program for the County of Santa Cruz, California*. Chapter 6, Public Safety. Effective December 19, 1994; updated February 18, 2020.

CSCD (California School Campus Database). 2020. GIS dataset of lands used by public schools for educational purposes. Accessed May 12, 2020 at http://www.californiaschoolcampusdatabase.org/.

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4.10 Hydrology and Water Quality

This section describes the existing hydrology and water quality conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on technical studies and data that describe the flow pattern and turbidity in Laguna Creek; and other relevant documents, data, and web map viewers that describe the hydrology and water quality in the project area.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to hydrology and water quality.

4.10.1 Existing Conditions

The project site is near the community of Bonny Doon, California, in unincorporated Santa Cruz County, approximately 7 miles northwest of downtown Santa Cruz (straight-line distance). The elevation of the site ranges from approximately 605 feet above mean sea level (amsl) at the downstream end of the proposed work area within Laguna Creek to approximately 660 feet amsl at the highest point along the east construction access road. The limits of the construction zone for the Proposed Project encompass approximately 2.1 acres, including the Laguna Creek Diversion Facility (Facility), 200 to 300 feet of the upstream and downstream reaches of Laguna Creek, and three access roads from Smith Grade. Smith Grade marks the site's southern boundary. The temporary disturbance footprint within the 2.1-acre project site is estimated to be 0.44 acres, which includes both in-stream and land-based construction disturbances (staging areas, access roads, dewatered creek bed, and structural work). The permanent footprint consists of the new intake structure and Coanda screen, valve vault, diversion pipeline, access stairway, and grouted riprap bank protection and is estimated to be 0.01 acres. The following section summarizes the existing hydrological and water quality conditions of the project site and the current flow pattern in Laguna Creek.

4.10.1.1 Surface Water Resources

Regional Watersheds

The U.S. Geological Survey (USGS) Watershed Boundary Dataset identifies watersheds within the project vicinity and delineates watersheds according to hydrologic units (HUs), identified by name and by hydrologic unit code (HUC) (USGS 2020). At a statewide scale, HUs consist of large regions and subregions draining to a common outlet. At this scale, the project site is within the 674-square-mile San Francisco Coastal South Subbasin (HUC 18050006), which includes all watersheds on the coastal side of the San Francisco peninsula. At the most detailed level available from the USGS (2020a), the project site is located in the San Vicente Creek-Frontal Pacific Ocean subwatershed, which includes a 93-square-mile area that encompasses the coastal streams of southwestern Santa Cruz County from Molino Creek to the north to Wilder Creek to the south (USGS 2020). These watershed areas are listed in Table 4.10-1.

Table 4.10-1. Watershed Designations by Agency

Agency	Hydrologic Unit Code/Basin Number	Agency Analysis Scale	Name	Size (square miles)
USGS Watershed Boundary Dataset	180500	Basin (4-digit HU)	San Francisco Bay	5,371
	18050006	Subbasin (6-digit HU)	San Francisco Coastal South	674
	1805000603	Watershed (8-digit HU)	Waddell Creek-Frontal Año Nuevo Bay	273
	180101100602	Subwatershed (12-digit HU)	San Vicente Creek-Frontal Pacific Ocean	93
Central Coast RWQCB	304	Hydrologic Unit	Big Basin HU	276
	304.1	Hydrologic Area	Santa Cruz HA	246
	304.11	Hydrologic Subarea	Davenport HSA	96
City of Santa Cruz	N/A	Watershed	Laguna	7.8

Source: USGS 2020, Central Coast RWQCB 2019, SCWD 2020
Notes: HA = hydrologic area; HSA = hydrologic subarea; HU = hydrologic unit; RWQCB = Regional Water Quality Control Board; USGS = U.S. Geological Survey.

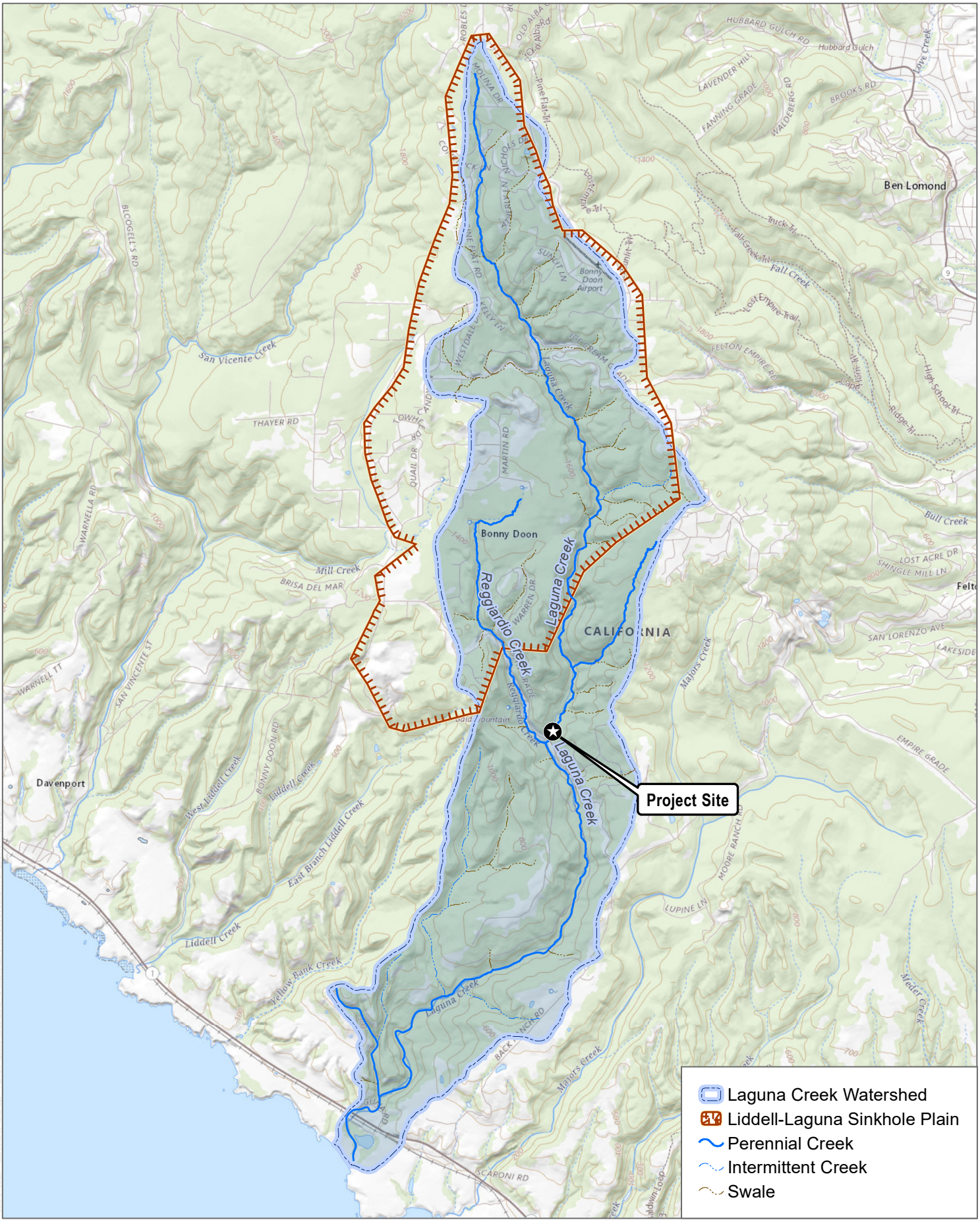
Although the State Water Resources Control Board (SWRCB) classifies watersheds in a hierarchical system similar to the USGS Watershed Boundary Dataset, it uses watershed names and boundaries that are designated by the California Department of Water Resources (DWR). These geographic boundaries are likewise watershed based, but are typically referred to as hydrologic basins and are defined in the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan) (Central Coast RWQCB 2019).[1] These generally constitute the geographic basis around which many surface water quality problems and goals/objectives are defined, and consist of surface water HUs, hydrologic areas (HA), and hydrologic subareas (HSA). As shown in Table 4.10-1, the project site is within the Big Basin HU (No. 304), the Santa Cruz HA (No. 304.1), and the Davenport HSA (No. 304.11) (Central Coast RWQCB 2019).

The five watersheds that serve as drinking water sources for the Santa Cruz Water Department (SCWD) are as follows: Laguna, Liddell, Majors, Newell, and San Lorenzo. The Laguna Watershed, as delineated by the City for water resource assessment and planning purposes, is approximately 7.8 square miles (4,992 acres). The Laguna Watershed is the most detailed and appropriate watershed area to use as the surface water study area for the Proposed Project, and is shown in Figure 4.10-1 and listed in Table 4.10-1.

Laguna Creek and Watershed

The project site is within the middle reach of Laguna Creek, an 8.5-mile-long perennial stream that flows southwest and originates on the southern flank of Ben Lomond Mountain in the Santa Cruz Mountains. Reggiardo Creek (a perennial stream) is the largest tributary and has a confluence with Laguna Creek approximately 204 feet downstream of the project site, south of Smith Grade as shown in Figure 4.10-1 (USGS 2020). Numerous other unnamed ephemeral and intermittent tributaries and swales confluence with Laguna Creek along its entire length. The mouth of Laguna Creek discharges into a lagoon before ultimately draining into the Pacific Ocean along the Santa Cruz County coastline.

[1] The Basin Plan for each region serves as the regulatory reference for meeting both state and federal requirements for water quality control. It designates beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving those objectives.



SOURCE: Bing Maps 2020, USGS 2020 (Watershed Boundary Dataset), City of Santa Cruz 2020

DUDEK

FIGURE 4.10-1

Laguna Creek Watershed

Laguna Creek Diversion Retrofit Project - EIR

The elevation of the watershed ranges from 0 feet at the mouth to approximately 2,420 feet at its headwaters near Empire Grade. It is underlain largely by mid- to late-Tertiary sedimentary rocks with the exception of granitic, metasedimentary rocks, limestone, and marble outcroppings (commonly known as karst topography) in the upper reaches of the watershed. The karst topography has a significant influence on streamflow and summer baseflow by producing multiple springs within the watershed (SCWD 2005). Figure 4.10-1 shows the Liddell-Laguna sinkhole plain where permeability between the two watersheds exists due to the karst topography. Tracer studies suggest that the marble deposits are interconnected into a single karst groundwater system. The marble may be more extensive at depth (i.e., than at the surface) and/or the individual bodies may be interconnected by fractures and marble interbeds within the metamorphic rocks. Based on calcareous cementation in the Lompico Sandstone in Laguna Creek, downstream of Smith Grade Road, the sandstone is locally underlain by marble. Marble has little primary porosity and very low permeability where unfractured and unweathered. Dissolution of the marble by slightly acidic percolating soil water and flowing groundwater results in substantial secondary porosity, including macropores, such as caverns and conduits. In addition, swallow holes tend to form where streams flow across marble outcrops, forming sinking stream reaches, including along Laguna Creek upstream of the project site. This sinking stream reach along Laguna Creek intersects fracture zones leading to the Liddell Creek Watershed. As a result, stream water losses occur where Laguna Creek traverses karst topography upstream of the Facility (County of Santa Cruz 2007; Nolan Associates 2016; City of Santa Cruz 2020).

The karst topography is also more resistant to erosion than other material in nearby watersheds, resulting in reduced fine sediment loads. The Laguna Watershed also has granitic formations that provide a source of gravel and cobble, evident in the reaches downstream of the Facility where large cobble and gravel dominate the streambed substrate. The Laguna Creek channel gradient from the diversion to the mouth is approximately 3%, and the channel gradient upstream of the diversion to the headwaters is approximately 6% (SCWD 2005).

The watershed is characteristic of many of the watersheds draining the coastal side of the Santa Cruz Mountains, consisting of rugged, ridge-and-valley terrain, including narrow-crested, steep-sided ridges and deeply incised, v-shaped valleys. Streams within the watershed are dominated by riffle and pool sequences, with boulder-cobble-sand substrates. Little floodplain storage exists in the narrow, steep valleys of the Santa Cruz Mountains. Thus, downcutting of stream valleys has created channel banks that are typically steeper than the adjacent hill slopes (SCWD 2013).

Developed land use within the Laguna Watershed primarily consists of rural residential and rangeland, though the majority of the watershed is undeveloped open space consisting of redwood forest. A large portion of the watershed consists of public lands managed by California State Parks, CDFW (Bonny Doon Ecological Preserve), Bureau of Land Management, the Living Landscape Initiative (San Vicente Redwoods), and the City.

Streamflow and Diversions

Rainy winter periods and dry summer months are typical of the Mediterranean climate in the central coastal areas of California, including the Santa Cruz Mountains. The coastal range enhances precipitation generated by Pacific frontal storms by forcing the upward movement of air currents, leading to some of the highest rainfall amounts in the broader region. About 85% of the total annual rainfall typically occurs during the wet season, generally between November and March (SCWD 2005). In the summer months, with low precipitation, groundwater acts as the source of baseflow. The last 12 years of precipitation data for the City, from 2007 to 2019, show that the average monthly precipitation ranged between nearly 0 inches in July and August to nearly 5 inches in January; the wettest months, between November and March, had an average of 2 inches of rainfall per month (Weather Cat 2020). The City's Liddell Spring rain gage is the

most representative of precipitation at the project site. Based on 19 years of rainfall measurements, the average rainfall at the Project site is approximately 32 inches per year (Balance Hydrologics 2019a).

Laguna Creek streamflow data is available from a former USGS gage located approximately 800 feet upstream from the Facility (City of Santa Cruz 2019); this gaging station is referred to herein as the USGS Laguna Creek Stream Gage (USGS Gage #11161590). Average (or mean) daily streamflow flow records are available from this station from October 1969 to October 1976. Laguna Creek is not regulated (i.e., no dams or diversions) upstream of this gaging station; therefore, this streamflow data is representative of natural streamflow conditions at the Facility. The average streamflow at this gaging station for this time period is 5.0 cubic feet per second (cfs) (see Table 4.10-2). This flow was derived from the contributing watershed above the City's diversion structure.

The City installed a new Laguna Creek gaging station in February 2003, referred to herein as Upper Laguna Creek Gaging Station, which is approximately 300 feet upstream of the Facility (Balance Hydrologics 2019a). This streamflow gauge similarly is representative of natural, unimpeded streamflow conditions at the Facility. Based on streamflow data from October 2003 to September 2019, the average annual flow is 5.05 cfs (see Table 4.10-2).

Streamflow data is also available from two gages located downstream of the Facility. The City's Lower Laguna Creek Gaging Station, currently located within the concrete culvert beneath Smith Grade approximately 300 feet downstream of the Facility (and previously located immediately downstream of that in the culvert plunge pool), had an average streamflow of 3.46 cfs from October 2003 to September 2019 (Balance Hydrologics 2019b) (see Table 4.10-2). Further south, the City's Anadromous Laguna Creek Gaging Station, currently located approximately 750 feet upstream of the State Route 1 culvert (and previously located approximately 100 feet upstream of the culvert), had an average streamflow of 6.04 cfs from October 2003 to September 2019 (Balance Hydrologics 2019c).

Table 4.10-2. Summarized Historic Records of Daily Flow in Laguna Creek

Streamflow Gage Name	Streamflow Gage Location	Years of Daily Streamflow Data	Average Streamflow Rate (cfs)
USGS Laguna Creek Stream Gage (USGS Gage #11161590)	lat 37° 01′ 32″, long 122° 07′ 48″, ~800 feet upstream of Facility[1]	1969 to 1976	5.00
Upper Laguna Creek Gaging Station (City Gage)	lat 37° 01′ 30.38″, long 122° 07′ 51.84″, ~300 feet upstream of Facility[2]	2003 to 2019	5.05
Lower Laguna Creek Gaging Station (City Gage)	lat 37° 01′ 25″, long 122° 07′ 49″, within the concrete culvert under Smith Grade, ~300 feet downstream of Facility[3]	2003 to 2019	3.46
Anadromous Laguna Creek Gaging Station (City Gage)	lat 36° 59′ 13.07″, long 122° 09.6′ 83°, ~750 feet upstream of SR 1 culvert[4]	2003 to 2019	6.04

Sources:
1 City of Santa Cruz 2019.
2 Balance Hydrologics 2019a.
3 Balance Hydrologics 2019b.
4 Balance Hydrologics 2019c.
Notes: ~ = approximately; cfs = cubic feet per second; lat = latitude; long = longitude; SR = State Route.

In general, low flow remains in the creek in summer and fall in normal and wet years. Average flow in the creek tends to increase throughout the winter and spring. Winter and spring storms can produce pronounced peaks in flow immediately following storm events or successive winter rains. The flow pattern is characterized as flashy, with periodic high-flow events that coincide with and immediately follow winter storms (SCWD 2005).

In order to determine peak flow rates that are critical in channel geomorphology and the evaluation of potential scour of creek banks, hydraulic modeling for the project site was completed using computational fluid dynamics (B&V 2020b). Peak flow rates for a typical peak winter storm (2-year flood event), a significant flood event (100-year flood event), and an extreme flood (the upper 95th percentile confidence limit of the 100-year flood event) were determined to evaluate whether the existing channel at and downstream of the diversion structure experiences significant scour.

Peak flows along the project reach were determined to be 119 cfs, 527 cfs, and 833 cfs, for the 2-year, 10-year, and 100-year flow events, respectively. The modeling results for existing dam conditions indicate that high flow velocity of greater than 25 feet per second occurs at the toe of the dam due to the height of the vertical drop. Because of the rocky geology of the project site, the creek bed and bank line are not subjected to scour (B&V 2020b).

Laguna Creek water production (i.e., water diverted to the treatment plant from the existing Facility) has been recorded by the City from 1971 to 2019. Over the 48-year period of record, the average monthly production ranged between 0 and 81.71 million gallons, with an average of approximately 39 million gallons. The highest annual production was recorded in 2006 (980.56 million gallons). The lowest annual production of 0 million gallons was recorded in 2015 at the height of the recent historic drought period (2011 to 2017), when there was insufficient excess flow to allow for diversions. Per ongoing agreements with the CDFW, the City limits its diversions from Laguna Creek as necessary to meet a minimum flow goal of 2 cfs at the Anadromous Laguna Creek Gaging Station, for the purpose of supporting salmonid habitat within the downstream reaches of Laguna Creek. However, minimum annual flow rates as high as 15.5 cfs are sometimes maintained. The City rarely diverts creek flow during the summer and fall since stream flows at times naturally fall below 2 cfs during those dry periods.

Water Quality

General Water Quality

Laguna Creek is not listed in the Clean Water Act Section 303(d) list of impaired water bodies (SWRCB 2016). Due to the relatively undeveloped nature of the watershed, the high amount of tree canopy, and the geology and soils underlying the watershed, water temperatures, turbidity, and dissolved oxygen levels are adequate to support cold freshwater habitat including steelhead.[2] Temperatures range from 5.5°C to 18.5°C with an average of 11.3°C, and dissolved oxygen is normal, though there may be parts of the lower reaches of the creek that are low-gradient and may have low dissolved oxygen during the summer and fall baseflow period (SCWD 2005). The annual geometric mean of coliform bacteria concentrations measured in Laguna Creek between 2011 and 2017 ranged from about 10 to 800 most probable number (MPN) per 100 milliliters (mL). These data collected by the City, in combination with low turbidity levels (discussed below), indicate that Laguna Creek, as with the other North Coast creeks used by the City for water supply, typically has very good water quality conditions (Kennedy/Jenks Consultants 2018).

[2] While water quality conditions are adequate to support cold freshwater habitat including steelhead, anadromous fish species are not present in the project area due to several downstream natural barriers that limit the movement of such fish species upstream into the project area.

Sampling and analysis conducted for the upper watershed of Laguna Creek, as part of the SCWD Watershed Sanitary Survey Update (Kennedy/Jenks Consultants 2018), are summarized in Table 4.10-3. These data indicate that water quality is good and none of the water quality constituents exceed their respective maximum contaminant levels (MCLs) or secondary MCLs. Due to the lack of regulatory cleanup sites or land uses known to store hazardous materials in the Laguna Watershed, organic contaminants (i.e., fuels, solvents, etc.) are not a water quality concern (Kennedy/Jenks Consultants 2018, SWRCB 2020a).

Table 4.10-3. Summary of Water Quality Analyses for Laguna Creek (2011 to 2017)

Parameter (Unit)	Average	Median	Low	High	Number of Samples	Maximum Contaminant Level or Secondary Maximum Contaminant Level
Nitrate (mg/L)	0.37	0.38	0.00	0.78	47	10 mg/L as nitrogen, 45 mg/L as nitrate
Total Hardness (mg/L)	137.3	142.0	56.0	174.0	132	—
Calcium (mg/L)	41.9	45.0	15.0	57.0	10	—
Magnesium (mg/L)	5.1	5.2	2.8	6.6	10	—
Sodium (mg/L)	10.3	10.5	7.0	13.0	10	—
Potassium (mg/L)	2.1	2.1	1.8	2.5	10	—
Alkalinity (mg/L)	131.2	136.0	44.0	164.0	132	—
Sulfate (mg/L)	14.3	14.9	5.7	17.6	35	SMCL- 250 mg/L
Chloride (mg/L)	10.5	10.6	7.1	12.2	35	SMCL-250 mg/L
Fluoride (mg/L)	0.07	0.08	.000	0.11	35	2 mg/L
pH	8.1	8.1	7.5	8.3	132	—
Total Dissolved Solids (mg/L)	17.7.1	189.0	80.0	250.0	11	SMCL-500 mg/L
Conductivity (900 umhos/cm)	267.0	265.0	130.0	365.0	132	SMCL-900 umhos/cm
Color (Color Unit)	6.3	4.0	2.0	36.0	132	—
MBAS methylene blue active substances assay (mg/L)	0.00	0.00	0.00	0.00	6	0.5 mg/L

Source: Kennedy/Jenks Consultants 2018 (Table 5-4 to Table 5-17).
Notes: MCL = maximum contaminant level; mg/L = milligrams per liter; SCML = secondary maximum contaminant level; umhos/cm = micromhos per centimeter.

Turbidity

Turbidity in Laguna Creek has a median of 0.5 nephelometric turbidity units (NTU) (SCWD 2005). During storm events when turbidity increases to more than 20 NTUs, the City stops diverting. A review of turbidity data collected between 2011 and 2017 shows that Laguna Creek had the lowest average turbidity compared to all other City water sources (San Lorenzo River, Newell Creek, and other north coast streams), from a typical minimum of less than 0.1 NTU to a maximum of about 15 NTU in 2017 (as a 10-sample running average). The data collected over the period show that except for 2017, which was a very wet year producing significant runoff within the watersheds, the running average for turbidity in Laguna Creek did not exceed 1 NTU. Because the data was collected on a pre-defined schedule (i.e., once or twice a month), it does not necessarily capture the highest turbidity levels following peak storm events.

Sediment transport in Laguna Creek, upstream of the Facility, was monitored from 2008 to 2012, in order to collect enough data to identify the dominant mode of sediment transport, describe sediment transport variability, and facilitate development of discharge-to-sediment transport rating curves. Monitoring included an estimation of bedload and suspended sediment. Bedload includes sediment that rolls and saltates (i.e., bounces) along the bed, commonly within the lowermost 3 inches of the water column. Movement can either be continuous or intermittent but is generally much slower than the average velocity of the stream. Suspended sediment is supported by turbulence within the water column and is transported at a rate approaching the average stream velocity of flow. In Laguna Creek, suspended sediment consists primarily of fine sand, silt, and clay. Sediment samples were collected over a range of flows, from 9 cfs to 157 cfs, although peak flows recorded within the same period far exceeded 150 cfs. Based on this monitoring, the suspended sediment for Laguna Creek comprises approximately 75% to 89% of the total sediment load, similar to reports for other streams in the Santa Cruz Mountains. However, Laguna Creek upstream of the Facility exhibits lower (5 to 7 times less) annual suspended sediment yields compared to Majors Creek[3] upstream of Majors Dam. The difference is likely due to the underlying geology. Upper Laguna Creek is underlain primarily by highly resistant granitic rocks, whereas Upper Majors Creek is underlain by more erosive sandstone and siltstone. The sand to gravel size bedload sediments in upper Laguna Creek are most likely derived from bank or hillside soil failures, rather than erosion of the underlying bedrock (Balance Hydrologics 2011, 2013).

Additional sediment monitoring was completed upstream and downstream of the Laguna Creek and Majors Creek Dams, from December 2010 to April 2011. Monitoring indicated that when compared to Majors Creek, Laguna Creek transports a substantially less volume of sediment, with a majority being transported as suspended load. As previously discussed, the relative decrease in sediment transport in Laguna Creek is likely due to the underlying geology (Balance Hydrologics 2012, 2013).

An Intake Sediment Mobility Assessment (Waterways Consulting 2017) conducted at the Facility reported that opening of the sediment-control bypass valves during low flows, when the creek is unable to transport and distribute sediment effectively, may lead to downstream accumulations of sediment. The sediment transport rates within Laguna Creek at the Facility have been comparatively lower than other nearby watersheds, including the watersheds for Liddell, Reggiardo, and Majors creeks. The local streambed material in Laguna Creek near the Facility was observed to be coarser compared to those in transport, which are derived from other sources, such as landslides, tributaries and bank erosion. Overall, due to the lack of roads, more resistant geologic material, and fewer recent land use impacts, erosion and sedimentation rates in Laguna Creek are only slightly above natural background rates (SCWD 2013). In instances where high turbidity concentrations have been observed, these high turbidity concentrations are reported as short-term and as the result of high-flow storm events. These data indicate that Laguna Creek, as with the other North Coast creeks used by the City for water supply, typically has very good water quality conditions except during storm events when suspended sediment loads may increase in response to runoff from upper portions of the watershed.

4.10.1.2 Groundwater Resources

The Laguna Watershed is characterized by a bedrock groundwater aquifer, where subterranean water exists in fracture and fault zones within the underlying sedimentary and metamorphic rocks. Beyond the project area, portions of the watershed are underlain by karst terrain, consisting of limestone, dolomite, and gypsum, which have a tendency to form underground drainage systems with sinkholes and caves. These drainage systems can surface, producing springs which contribute to base flow within Laguna Creek. However, as previously discussed, swallow holes tend to form where streams flow across marble outcrops, forming sinking stream reaches, including Laguna

[3] The Majors Watershed is immediately southeast of the Laguna Watershed.

Creek upstream of the project site. This sinking stream reach along Laguna Creek intersects fracture zones leading to the Liddell Watershed. As a result, stream water losses occur where Laguna Creek traverses karst topography upstream of the Facility. Although there is subterranean water within the watershed, DWR has not designated the project site as within one of California's 517 groundwater basins (DWR 2020a). The nearest groundwater basin to the project site is the Santa Margarita Basin (DWR Basin No. 3-027), approximately 3.2 miles northeast of the project site (DWR 2020a).

A search of DWR's well completion report database yielded records for four wells within Township 10S, Range 02W, Section 30 (Public Land Survey System), within the vicinity of the project site (DWR 2020b). The wells are permitted by Environmental Health Services of Santa Cruz County, and are monitoring and domestic wells that were drilled between 1984 and 1998; it is unknown whether these wells are currently active. The static water levels were reported to be approximately between 95 to 145 feet below ground surface when the wells were drilled (DWR 2020b).

There is no publicly accessible data available pertaining to groundwater quality within the bedrock aquifer that underlies the Laguna Watershed. A review of the groundwater ambient monitoring and assessment dataset maintained by SWRCB (2020b) indicates that there are no groundwater quality monitoring wells or groundwater quality sampling data pertaining to the site or the surrounding area. No regulatory cleanup sites (and associated groundwater quality monitoring data) were identified within a 1-mile radius of the project site, indicating a lack of land uses that could be a source of contaminants to the bedrock aquifer (SWRCB 2020a).

4.10.1.3 Hydrologic Hazards

Flood mapping by the Federal Emergency Management Agency (FEMA) indicates that the project site is not within a Special Flood Hazard Area, which includes both 100-year flood zones and regulatory floodways (FEMA 2017). The project site is designated by FEMA within flood zone X, which designates areas of minimal flood hazard (FEMA 2017).

There are five reservoir dams located in Santa Cruz County that are regulated by the State Division of Safety of Dams. These dams, which are all within the San Lorenzo Watershed, include Oak Site Dam, Mill Creek Dam, Sempervirens Dam, Soda Lake Dam, and Newell Creek Dam. The latter is within the jurisdiction of the City of Santa Cruz and the remaining are the responsibility of state agencies or private entities. The reservoirs range in size from 20 acre-feet to over 10,000 acre-feet, with the oldest dam being constructed in the late 1890s and the newest in 1985. Three additional state-regulated dams located in neighboring counties also have the potential to affect Santa Cruz County residents and properties should those dams be compromised or fail. These dams include Elmer J. Chesbro Dam and Uvas Dam in Santa Clara County, as well as the San Justo Dam in San Benito County. However, none of these dams are located within the Laguna Watershed and the project site is not subject to dam failure hazards or seiche because it is not located adjacent to or downstream of a reservoir (County of Santa Cruz 2015). According to the records maintained by the County of Santa Cruz Planning Department, there have been no dam failures in the County. Rare events involving uncontrolled releases of water due to natural and human causes have occurred historically, although none of these events involved dam failure (County of Santa Cruz 2015).

4.10.2 Regulatory Framework

4.10.2.1 Federal

Clean Water Act

The Clean Water Act (CWA), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality (33 United States Code Section 1251 et seq.). The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA establishes basic guidelines for regulating discharges of both point and non-point sources of pollutants into the waters of the United States.[4] The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA. Commonly relevant sections of the act are as follows:

- **Sections 303 and 304** provide for water quality standards, criteria, and guidelines. Under Section 303(d) of the CWA, the State of California is required to develop a list of impaired water bodies that do not meet water quality standards and objectives. California is required to establish total maximum daily loads (TMDLs) for each pollutant/stressor. A TMDL defines how much of a specific pollutant/stressor a given water body can tolerate and still meet relevant water quality standards. Once a water body is placed on the Section 303(d) List of Water Quality Limited Segments, it remains on the list until a TMDL is adopted and the water quality standards are attained, or there is sufficient data to demonstrate that water quality standards have been met and delisting from the Section 303(d) list should take place. As discussed above, there are no water quality impairments relevant to the Proposed Project, and thus no TMDLs apply.
- **Section 401 (Water Quality Certification)** requires an applicant for any federal permit that proposes an activity which may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the CWA. This process is known as the Water Quality Certification/waste discharge requirements (WDRs) process. Because the Proposed Project involves in-stream work, a CWA Section 401 permit is required.
- **Section 402 (National Pollutant Discharge Elimination System)** establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the United States. This permit program is administered by the SWRCB and the nine Regional Water Quality Control Boards (RWQCBs), who have several programs that implement individual and general permits related to construction activities, stormwater runoff quality, and various kinds of non-stormwater discharges. The NPDES General Construction Permit is discussed further below.
- **Section 404** (**Discharge of Dredged or Fill Material into Waters of the United States)** establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is jointly administered by the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA). Section 4.4, Biological Resources, addresses this requirement in greater detail.

[4] Point source discharges are those emanating from a pipe or discrete location/process, such as an industrial process or wastewater discharge. Non-point source pollutants are those that originate from numerous diffuse sources and land uses, and which can accumulate in stormwater runoff or in groundwater.

Numerous agencies have responsibilities for administration and enforcement of the CWA. At the federal level, this includes the EPA, USACE, Bureau of Reclamation, and the major federal land management agencies such as the U.S. Forest Service and Bureau of Land Management. At the state level, with the exception of tribal lands, the California Environmental Protection Agency (CalEPA) and its sub-agencies, including the SWRCB, have been delegated primary responsibility for administering and enforcing certain provisions of the CWA. At the local level, the Central Coast RWQCB and the County have both enforcement and implementation responsibilities under the CWA.

Federal Antidegradation Policy

The federal Antidegradation Policy (40 Code of Federal Regulations 131.12), first included in EPA's regulations in 1983, is designed to protect water quality and water resources. The policy requires states to develop statewide antidegradation policies and identify methods for implementing them. State antidegradation policies and implementation measures must include the following provisions: (1) existing instream uses and the water quality necessary to protect those uses shall be maintained and protected; (2) where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and (3) where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. State permitting actions must be consistent with the federal Antidegradation Policy.

4.10.2.2 State

Porter–Cologne Water Quality Control Act

The Porter–Cologne Water Quality Control Act (first codified in the California Water Code Section 13000 et seq. in 1969) is the primary water quality control law for California. Whereas the CWA applies to all waters of the United States, the Porter–Cologne Act applies to waters of the state, which includes isolated wetlands and groundwater in addition to federal waters.[5] The act requires a Report of Waste Discharge for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. California Water Code Section 13260(a) requires that any person discharging waste or proposing to discharge waste, other than to a community sewer system, that could affect the quality of the waters of the state, file a Report of Waste Discharge with the applicable RWQCB. For discharges directly to surface water (waters of the United States), an NPDES permit is required, which is issued under both state and federal law; for other types of discharges, such as waste discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, or discharges to waters of the state (e.g., groundwater and isolated wetlands), WDRs are required and are issued exclusively under state law. WDRs typically require many of the same best management practices (BMPs) and pollution control technologies as are required by NPDES-derived permits.

California Antidegradation Policy

The California Antidegradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High Quality Water in California, was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the federal Antidegradation Policy, the California Antidegradation Policy applies to all waters of the state, not just surface waters. The policy requires that, with limited exceptions, whenever the existing quality of a water body is better than

[5] "Waters of the state" are defined in the Porter–Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code Section 13050[e]).

the quality established in individual basin plans, such high-quality water must be maintained and discharges to that water body must not unreasonably affect any present or anticipated beneficial use of the water resource. As stated in the Basin Plan, "discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State" (Central Coast RWQCB 2019).

Water Quality Control Plan for the Central Coastal Basin

The Porter-Cologne Water Quality Control Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans), in which beneficial uses and water quality objectives are established, and which includes implementation programs and policies to achieve those objectives (California Water Code Sections 13240 through 13247). The 2019 *Water Quality Control Plan for the Central Coastal Basin* identifies 13 beneficial uses for Laguna Creek as follows: municipal and domestic supply; agricultural supply; industrial service supply; groundwater recharge; freshwater replenishment; water contact recreation; non-contact water recreation; commercial and sport fishing; cold fresh water habitat; wildlife habitat; migration of aquatic organisms; and spawning, reproduction, and/or early development. In addition to water quality objectives for surface waters, the Basin Plan also lists groundwater quality objectives for bacteria, chemical constituents, pesticides, radioactivity, salinity, tastes and odors, and toxicity. Of particular importance to the Proposed Project is the Basin Plan's water quality objective for turbidity, which states that an "increase in turbidity attributable to controllable water quality factors shall not exceed the following limits:

1. Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%.
2. Where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU.
3. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10% (Central Coast RWQCB 2019)."

Construction General Permit (SWRCB Order No. 2009-0009-DWQ, as Amended)

For stormwater discharges associated with construction activity in the State of California, the SWRCB has adopted the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) to avoid and minimize water quality impacts attributable to such activities. The Construction General Permit applies to all projects in which construction activity disturbs 1 acre or more of soil. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling and excavation. The Construction General Permit requires development and implementation of a stormwater pollution prevention plan (SWPPP), which would specify water quality BMPs designed to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site. Routine inspection of all BMPs is required under the provisions of the Construction General Permit, and the SWPPP must be prepared and implemented by qualified individuals as defined by the SWRCB.

To receive coverage under the Construction General Permit, the project proponent must submit a Notice of Intent and permit registration documents to the SWRCB. Permit registration documents include completing a construction site risk assessment to determine appropriate coverage level; detailed site maps showing disturbance area, drainage area, and BMP types/locations; the SWPPP; and, where applicable, post-construction water balance calculations and active treatment systems design documentation. Because the Proposed Project would disturb less than 1 acre of land, compliance with the NPDES Construction General Permit is not required.

4.10.2.3 Local

County of Santa Cruz General Plan and Local Coastal Program

The Conservation and Open Space Element (Chapter 5) of the County of Santa Cruz General Plan and Local Coastal Program outlines policies and programs for the protection of surface water quality and prevention of erosion (County of Santa Cruz 2020). Table 4.11-1 in Section 4.11, Land Use and Planning, discusses applicable General Plan/Local Coastal Program policies related to hydrology and water quality.

4.10.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to hydrology and water quality. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.10.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to hydrology and water quality are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater 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 off site.

   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.

   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.

4.10.3.2 Analytical Methods

The following analysis considers whether the Proposed Project would directly or indirectly cause hydrologic and water quality impacts, taking into account the City's Standard Construction Practices (described in Section 3.6.3, Standard Construction Practices). The study area (including the study area for cumulative impacts) consists of the

7.8-square-mile Laguna Watershed, with the focus of the impact analysis being on the project site and all downstream receiving water bodies (i.e., middle and lower Laguna Creek and the coastal lagoon).

4.10.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following standards of significance as described below:

- **Groundwater Impacts (Significance Standards B and E)**. The Proposed Project does not include use of a groundwater well for dewatering or other purposes, and there are no water supply wells on the site or in the immediate vicinity. Furthermore, there would be no interference with groundwater recharge because the modified Facility would not change the existing maximum diversion rate of 7 cfs, would not involve a volumetric increase in the City's water rights, and would continue to maintain the agreed upon in-stream flows of 2 cfs. The Proposed Project would enhance the ability of the Facility to fine-tune diversion rates at any given time, including the flexibility to divert water during high flows when water quality constraints currently prevent this under existing conditions (i.e., due to excessive turbidity). However, to the extent that surface flow within Laguna Creek recharges the underlying groundwater aquifer, such as in the low-gradient lower reaches of the creek, this change in the timing of diversions would not be sufficient to measurably reduce groundwater recharge. This is because the agreed upon in-stream flows of 2 cfs, besides supporting downstream aquatic habitat, also maintain the ability of the stream channel to support groundwater recharge. Because the Proposed Project is not within a DWR-designated groundwater basin, or a locally designated groundwater basin, there is no groundwater management plan or policy with which the Proposed Project could conflict. Therefore, the Proposed Project would have no impact on groundwater, either through decreases in groundwater availability, through interference with groundwater recharge, or by otherwise conflicting with or obstructing implementation of a sustainable groundwater management plan.
- **Pollutant Release due to Flood Hazard, Tsunami, or Seiche Zones (Significance Standard D)**. As discussed above, there are no designated flood hazard zones on the project site or in the Laguna Watershed, and there are no tsunami or seiche hazards. The project site would naturally be subject to high flow events on Laguna Creek, but would not include an increase in the storage of hazardous materials. The existing 250-gallon aboveground propane tank used for the emergency backup generator, which is located along the main access road and outside of the Laguna Creek corridor, would continue to be stored on the site. Pollutants associated with construction-related materials, vehicles, and equipment would not be released as a result of flooding because construction would occur during the dry season. Because the Proposed Project would not affect the depth, extent, or frequency of flooding on site or downstream, and would not involve storage of hazardous materials or pollutants, there would be no impact with respect to this criterion.

Impacts

This section provides a detailed evaluation of hydrology and water quality impacts associated with the Proposed Project.

Impact HYD-1: Water Quality (Significance Standards A and E). The Proposed Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. ***(Less than Significant)***

Impacts to water quality through exceedance of water quality standards, non-conformance with WDRs, or by other means can potentially result from the short-term effects of construction activity (e.g., erosion and sedimentation due to land disturbances, uncontained material and equipment storage areas, improper handling of hazardous materials) and the long-term effects of operation of the retrofitted Facility (e.g., alteration of drainage patterns, use/handling of hazardous materials, and/or increases in impervious surfaces). This impact also covers the portion of Significance Standard E regarding conflict with or obstruct implementation of a water quality control plan. This analysis addresses the applicable Basin Plan objectives provided above.

Construction

Within the 2.1-acre project site, the construction of the Proposed Project would result in approximately 0.45 acres of disturbance, approximately 0.01 acres of which would remain as the permanent footprint for the new intake structure, valve vault, diversion pipeline, access stairway, and riprap bank protection. The Proposed Project would include appropriate site restoration measures, including removal of the cofferdam and temporary bypass system, mobile office and any other temporary facilities installed prior to construction initiation; along with stabilization of disturbed soils using erosion controls such as hydroseeding, hand-seeding, and/or restoration plantings. Accordingly, the potential water quality impacts associated with construction disturbance areas would be limited to the 3-month construction period planned to occur during the dry season (June to October).

The primary potential pollutant of concern associated with construction activity is sediment (i.e., high turbidity) generated from site preparation, grading and excavation, and soil stockpile activities. Although Laguna Creek is not listed under CWA Section 303(d) as impaired for sedimentation/siltation, a measurable increase in sedimentation/siltation from construction activities on the site could temporarily violate Basin Plan objectives, if not properly controlled. In addition to sediment, other pollutants associated with construction activity could include heavy metals, oil/grease, fuels, debris/trash from construction-related materials, and concrete curing compounds. Sediment can also be a carrier for these pollutants if they are released to soils. Basin Plan objectives for organic contaminants (e.g., fuels, paints, solvents) are generally the same as their drinking water quality standards (i.e., MCLs), and the Basin Plan objectives for debris and certain other compounds are qualitative in nature, requiring that release of such pollutant sources not adversely impact the beneficial uses of Laguna Creek. The most sensitive beneficial use identified in the Basin Plan with respect to water quality is “cold freshwater habitat,” due to the presence of salmonid species in the creek’s lower reaches. Without adequate precautions, wind and/or rain events that occur during construction activities could generate pollutants and/or mobilize sediment such that they contribute to the water quality degradation of receiving waters and/or violate Basin Plan objectives.

The most intensive soil disturbance would occur during the initial phases of construction for each of the Proposed Project elements, including site preparation and earthmoving activities associated with access roads improvements, staging/laydown areas, installation of the temporary cofferdam and creek bypass system, removal of impounded materials to install the new Coanda screen intake structure, and installation of the valve vault, access stairs, and riprap bank stabilization. Approximately 10 cubic yards of material upstream of the dam would be temporarily excavated and returned its original location within the creek. Approximately 40 cubic yards of material would be excavated downstream of the dam with approximately 10 cubic yards reused on site and 30 cubic yards hauled off site.

Due to the Proposed Project's short-term construction schedule of approximately 3 months during the low-flow period within Laguna Creek (June to October) and implementation of City's Standard Construction Practices related to erosion control and water quality protection (i.e., standard water quality BMPs), potential impacts on water quality would be reduced. Although the potential for stormwater runoff would be low, rainfall occasionally occurs during the construction period, primarily in the later part of the construction window, between September and October. If a rain event were to occur, erosion of temporary soil stockpiles on the site or loose soils along the edge of excavated areas may result in discharges of sediment-laden stormwater runoff into Laguna Creek. In addition, short-term water quality impacts could occur as a result of mobilization of uncured concrete and/or other construction materials or debris.

As part of the City's Standard Construction Practices, which are included in the Proposed Project, the contractor would be required to implement water quality BMPs to avoid or substantially reduce the potential for pollutant contributions to Laguna Creek. These include the following, which are described in Section 3.6.3 and summarized below:

- Installation of erosion control BMPs consisting of construction site perimeter controls, stabilization of exposed soils and stockpiles, isolating spoil disposal sites and concrete wash sites from waterways or jurisdictional resources, installation of runoff control devices, and periodic inspection of BMPs including after rain events to verify they are functioning as intended and repaired/replaced if necessary (Standard Construction Practices #1 through #3 and #5);
- Implementation of wind erosion (dust) controls (Standard Construction Practice #4);
- Control of hazardous materials in a manner than prevents release to soil or surface water by establishing containment areas a minimum of 65 feet away from the active stream channel, with daily checks for vehicle fuel leaks, provision of spill kits, regular equipment inspections, and use of watertight containers and secondary containment (Standard Construction Practices #6 though #8);
- Keeping a tidy worksite and properly managing waste and trash (Standard Construction Practice #9);
- Measures to minimize work in the active channel and general in-stream disturbances, and appropriate restoration/revegetation activities (Standard Construction Practices #10 through #15); and
- Implementation of dewatering best management practices that minimizes the extent and duration of creek disturbances in any one location; captures and relocates aquatic vertebrates; maintains adequate flow upstream and downstream of coffer dams; avoids seepage; avoids discharge of dirt, dust, or other deleterious material; and returns the streambed to as close to pre-project condition as possible (Standard Construction Practices #17 through #23).

In addition, as described in the Basis of Design Report (B&V 2020a), a proposed 3-foot-high cofferdam and 12-inch bypass piping, designed to accommodate streamflows of 12 cfs, would be installed during construction to control potential increased streamflow associated with a rain event. The 3-foot-high cofferdam is deemed adequate for typical summer streamflows (B&V 2020a). Based on the data for average daily flows at Upper Laguna Creek Gaging Station, 12 cfs streamflow has only been exceeded three days during the proposed months of construction (June to October) during the period data has been collected at the project site (from October 1969 to October 1976 and October 2003 to September 2019). Specifically, from June 4 to June 6, 2011, the Upper Laguna Creek Gaging Station registered an average daily flow rate of 19 cfs and a maximum flow rate of 45 cfs (City of Santa Cruz 2019). Because this discreet stream flow event was an anomaly, stream overtopping of the cofferdam and associated erosion of sediments during a rainfall event during construction is not anticipated.

With implementation of the City's Standard Construction Practices pertaining to construction erosion control and installation of the cofferdam and bypass piping, the Proposed Project would have a less-than-significant impact related to water quality standards and waste discharge requirements and would not substantially degrade surface or groundwater quality.

Operation and Maintenance

The water quality effects of operation and maintenance of the Proposed Project would not differ substantially from existing conditions because the Facility would continue to be generally the same size and have the same capacity and purpose, while improving the City's ability to fine-tune diversions and manage sediment. The Coanda screen is designed to direct suspended sediment flows over the screen and turbidity of diverted water is low, maintaining sediment loads within the creek during high flow. Past observations have shown that untimely opening of the bypass valve may lead to downstream accumulations of sediment when the creek is unable to transport and distribute sediment effectively (i.e., during low flows) (Waterways Consulting, Inc. 2017). Operation of the proposed sediment blowoff valve would be managed so that sediment blowoff generally occurs during higher flows. In addition, the Proposed Project has been designed to minimize the sediment content of water diverted through the Coanda screen, which is expected to reduce the need for and frequency of sediment blowoff. As described in Chapter 3, Project Description, an adaptive management plan developed in collaboration with applicable resource agencies would guide the blowoff of minor amounts of sediment that could collect within the intake structure.

Hydraulic modeling analysis using computational fluid dynamics was completed for the Proposed Project to determine if undesirable or erosive hydraulic conditions could occur as a result of the proposed improvements (B&V 2020b). Through detailed comparison of flow velocities under several peak flow scenarios (corresponding to the 2-year, 100-year, and upper 95th percentile confidence limit of the 100-year flood event) under both existing and proposed conditions, it was determined that the Proposed Project would result in similar flow conditions downstream of the diversion structure. Specifically, under both existing and proposed conditions, high velocities and high levels of turbulence would occur immediately downstream of the dam during peak flow scenarios. The Proposed Project would not increase erosion or scour resulting from peak flow velocities due to the rocky geology of the project site. Therefore, during operation, the Proposed Project would have a less-than-significant impact with respect to water quality standards or waste discharge requirements and would not substantially degrade surface or groundwater quality.

Impact HYD-2: Alteration of Drainage Patterns (Significance Standard C). The Proposed Project would not 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 off site; 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. ***(Less than Significant)***

As discussed under Impact HYD-1, the Proposed Project would not substantially affect the hydraulics of the creek downstream of the dam because the Facility would retain the general size and elevation of the existing structure. The altered flow patterns under the Proposed Project are discussed in Impact HYD-1 above as they relate to water quality. As described above, hydraulic modeling indicates that the Proposed Project, including the minor incremental increase in impervious surfaces associated with the valve vault, access stairs, and riprap bank stabilization, would not substantially affect flow velocities compared to the existing conditions. The overall purpose

of the riprap bank protection is to maintain existing flow patterns as they are, and avoid scour, which means that the feature functions to maintain the drainage pattern and course of the creek. The Proposed Project would not create new runoff or contribute to measurable increases in the rate or amount of runoff because the change in impervious surfaces would be negligible, and thus have a negligible effect on runoff, especially when considered in the context of typical flow conditions within the 7.8-square-mile watershed area. Therefore, the Proposed Project would have a less-than-significant impact with respect to alteration of drainage patterns.

4.10.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative hydrology and water quality impacts associated with the Proposed Project and other reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area of analysis for cumulative water quality impacts is the Laguna Watershed.

The Proposed Project would not contribute to cumulative impacts related to groundwater (Significance Standards B and E) and release of pollutants due to inundation by flood, tsunami, or seiche (Significance Standard D) because it would have no impact related to these standards, as described above. Therefore, these significance standards are not further evaluated.

Impact HYD-3: Cumulative Water Quality Impacts (Significance Standard A, C, and E). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to water quality or alteration of drainage patterns. ***(Less than Significant)***

The known cumulative projects planned within the Laguna Watershed include the Santa Cruz Water Rights Project, the Laguna Pipeline portion of the North Coast System Repair and Replacement Project, and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan. No construction or development within the Laguna Watershed is proposed as part of the Santa Cruz Water Rights Project and therefore this project would not contribute to potential cumulative hydrology and water quality impacts in the watershed during construction. While the Laguna Pipeline and the Reggiardo Diversion upgrade would entail limited construction within the watershed, they would occur at least several years after construction of the Proposed Project and therefore would not result in significant cumulative impacts during construction of the Facility in the Laguna Watershed. Long-term benefits to water quality would result from implementation of the both the Proposed Project and the Reggiardo Diversion upgrade, which would provide sediment transport during high flows to avoid pulsing of sediment to downstream locations.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects in the Laguna Watershed that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts to hydrology and water quality. Similar to the Proposed Project, other future projects proposed in the Laguna Watershed would be required to implement construction water quality BMPs, either through implementation of a SWPPP, per the Construction General Permit, or through implementation of an Erosion and Sediment Control Plan required per County ordinances, if relevant. In the cumulative condition, the Laguna Watershed would remain largely undeveloped and would continue to yield creek flows with good water quality.

As described above, the impacts of the Proposed Project would be limited to potential water quality impacts during construction, which would be less than significant through application of the City's Standard Construction Practices. In addition, the Proposed Project would have limited impacts related to alteration of drainages; these impacts would also be less than significant. The impacts of the Proposed Project on hydrology and water quality would be temporary during construction and localized to the site. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the Laguna Watershed, would result in less-than-significant cumulative impacts to hydrology and water resources, and no further mitigation measures are required.

4.10.3.5 Mitigation Measures

As described above, the Proposed Project would not result in significant hydrology and water quality impacts, and therefore, no mitigation measures are required.

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4.11 Land Use and Planning

This section describes the existing land use and planning conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on a review of the Proposed Project's consistency with applicable plans, policies, and regulations.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to land use and planning.

4.11.1 Existing Conditions

The project site is located in the unincorporated community of Bonny Doon within Santa Cruz County on a portion of Assessor's Parcel Number 062-101-03, which is privately owned land. The City was deeded access and rights for operation of the Facility per an agreement from January 1889 (Henneuse 1889). Laguna Creek bisects the project site, which is densely forested and contains the existing Laguna Creek Diversion Facility (Facility). The project site is within the Bonny Doon Planning Area of the County of Santa Cruz General Plan.

The land use designation of the site is Mountain Residential (R-M). The objectives of the R-M designation are to provide for very-low-density residential development (10 to 40 net developable acres per dwelling unit) in areas which are unsuited to more intensive development due to the presence of physical hazards and development constraints, the necessity to protect natural resources, and the lack of public services and facilities required to support higher densities; as well as to maintain a large proportion of the County in open space to retain the existing rural scenic character and a sustainable environment (County of Santa Cruz 2020).[1] The project site is zoned Timber Production (TP), allowing for the growing and harvesting of timber and other forest products. Additionally, the TP zone allows one single-family dwelling on the property (County of Santa Cruz 2019). The project site is located within the coastal zone and, thus, is subject to regulation by the California Coastal Act or applicable Local Coastal Program (LCP). In Santa Cruz County, coastal permitting authority is administered by the County pursuant to its certified Local Coastal Program, as further described in Section 4.11.2, Regulatory Framework, below.

The project site is surrounded by undeveloped, heavily forested land, with scattered, low-density residential development to the east, south, and west. The nearest residence to the project site is across Smith Grade, approximately 100 feet south of the site boundary. Surrounding parcels are designated R-M and Rural Residential (R-R) and zoned TP, Residential Agricultural (RA), and Special Use (SU). The objectives of the R-R designation are to provide low-density residential development (2.5 to 20 net developable acres per unit) on lands suitable for rural development which have access from roads maintained to rural road standards and adequate fire protection, and where limited public services and facilities, physical hazards and development constraints including water

[1] The net developable area is the portion of a parcel used for density calculations and consists of the amount of developable land minus public or private road rights-of-way and land that is not developable. Land that is not developable includes the following: (1) land with slope greater than 30 percent and coastal bluffs; (2) riparian corridors, wooded arroyos, canyons, stream banks, areas of riparian vegetation and areas within a 50 foot riparian buffer setback from the riparian corridor; (3) lakes, marshes, sloughs, wetlands, water areas, beaches, and areas within the 100-year floodplain, and any associated buffer setback established by federal, state or County regulations; (4) areas of recent or active landslides; (5) land within 50 feet of an active or potentially active fault trace; (6) commercial agricultural land and mineral resource areas; and (7) areas subject to coastal inundation as defined by geological hazards assessment or full geologic report.

availability and septic capability, and the desire to maintain rural character restrict more intensive development of these areas (County of Santa Cruz 2020). Allowed uses on lands zoned as RA include one single-family dwelling, one second dwelling unit, home occupations, small-scale agriculture, greenhouses, wineries, private stables and paddocks, schools, community facilities, open space, and recreational uses (County of Santa Cruz 2019). The SU zoning district allows all uses permitted in the RA zoning district, provided the use is consistent with the General Plan, all other permitted or conditionally permitted uses are consistent with the General Plan, and Level 5 use approval is obtained (County of Santa Cruz 2019).[2]

4.11.2 Regulatory Framework

4.11.2.1 Federal

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides the management of the nation's coastal resources, including the Great Lakes. CZMA provides management to balance economic development with environmental conservation. The California Coastal Commission (CCC) has jurisdiction for CZMA implementation through the state, except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdiction area. The CCC will apply additional land use policies when reviewing federally licensed and permitted activities, ensuring consistency with California's coastal management programs in accordance with the CZMA federal consistency provision.

4.11.2.2 State

California Coastal Act

In 1976, the California State Legislature enacted the California Coastal Act (Public Resources Code Section 30000 et seq.) to provide long-term protection of the state's 1,100-mile coastline for the benefit of current and future generations. The California Coastal Act provides for the management of lands within California's coastal zone boundary, as established by the Legislature and defined in the California Coastal Act (Section 30103). The boundary of the coastal zone varies across the state and varies from a couple hundred feet to 5 miles inland of the shore. The coastal zone boundary also extends approximately 3 miles off shore.

The goals of the California Coastal Act, per Public Resources Code Section 30001.5, are to:

a. Protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.

b. Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.

c. Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sounds resources conservation principles and constitutionally protected rights of private property owners.

[2] A Level 5 development permit approval applies to certain types of projects that must go through the County's Zoning Administrator. These projects require a public noticing process and a public hearing. Additionally, required findings specified in Section 18.10.230(a) of the Santa Cruz County Code must be made as part of the approval.

d. Assure priority for coastal-dependent and coastal-related development over other development on the coast.

e. Encourage state and local initiative and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

Furthermore, the California Coastal Act includes specific policies to achieve these goals within the coastal zone (see Division 20 of the Public Resources Code). These policies include the legal standards applied to coastal planning and regulatory decisions made by the CCC pursuant to the California Coastal Act. The California Coastal Act requires that individual jurisdictions adopt a LCP to implement the California Coastal Act at the local level. After the CCC certifies an LCP, the local government becomes the coastal development permit (CDP) permitting authority. As indicated previously, coastal permitting authority is administered by the County pursuant to its certified LCP, as further described below.

California Government Code

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, and transmission of water supplies are exempt from local (i.e., county and city) building and zoning ordinances. The Proposed Project evaluated in this EIR meets these criteria and, thus, is legally exempt from Santa Cruz County building and zoning ordinances.

California State Lands Commission

The State Lands Commission has regulatory management and authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The State Lands Commissions may also have residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions. All granted and ungranted, tidelands, submerged lands, and navigable lakes and waterways are subjected to the protections of the Common Law Public Trust. The project site does not include lands under the jurisdiction of the State Lands Commission.

4.11.2.3 Local

City of Santa Cruz General Plan and Local Coastal Program

The project site is located in unincorporated Santa Cruz County, and therefore, the City of Santa Cruz General Plan and LCP do not apply to the Proposed Project. As such, the policies of these plans are not summarized or further evaluated in this section.

County of Santa Cruz General Plan and Local Coastal Program

The County of Santa Cruz (County) has a CCC-certified LCP and is therefore the authority to issue a CDP for the Proposed Project. The *1994 General Plan and Local Coastal Program* for the County is a comprehensive, long-term planning document for the unincorporated areas of the County. The County's LCP was certified by the California Coastal Commission in 1994. The Land Use Element in the General Plan/LCP provides for the designation and location of land uses throughout the unincorporated areas in the County.

The County's certified LCP that applies to activities within the coastal zone is administered by the County Planning Department, pursuant to the California Coastal Act, and includes: (1) the LCP land use plan consisting of the policies and adopted land use, resource, constraint and shoreline access maps and charts contained in the General Plan/LCP document; and (2) the implementing ordinances.

As the Proposed Project is within the coastal zone and is not exempt from the LCP, it would require compliance with the LCP, including LCP policies and standards contained LCP implementing ordinances. The LCP implementing ordinances in Santa Cruz County Code (SCCC) Chapter 13.03 include the following sections that are relevant to the Proposed Project:

- Zoning Regulations (Chapter 13.10)
- Coastal Zone Regulations (Chapter 13.20)
- Geologic Hazards (Chapter 16.10)
- Grading Regulations (Chapter 16.20)
- Erosion Control (Chapter 16.22)
- Riparian Corridor and Wetlands Protection (Chapter 16.30)
- Sensitive Habitat Protection (Chapter 16.32)
- Significant Trees Protection (Chapter 16.34)
- Native American Cultural Sites (Chapter 16.40)
- Paleontological Resource Protection (Chapter 16.44)
- Timber Harvesting Regulations (Chapter 16.52)
- Permit and Approval Procedures (Chapter 18.10)

While some of these ordinances require separate approvals or permits (e.g., Riparian Exception, Significant Tree Permit), such approvals are not required for the Proposed Project, as it falls under California Government Code Section 53091 (d) and (e) and is legally exempt from County building and zoning ordinances, as discussed above. The relevant LCP policies and ordinances are addressed through the CDP findings made by the County. The SCCC requires the following CDP findings for approval of a CDP in accordance with Chapter 18.10:

(A) That the project is a use allowed in one of the basic zone districts that are listed in LCP Section 13.10.170(D) as consistent with the LCP Land Use Plan designation of the site.

(B) That the project does not conflict with any existing easement or development restrictions such as public access, utility, or open space easements.

(C) That the project is consistent with the design criteria and special use standards and conditions of this chapter pursuant to SCCC 13.20.130 and 13.20.140 et seq.

(D) That the project conforms with the public access, recreation, and visitor-serving policies, standards and maps of the LCP Land Use Plan, including Chapter 2: Section 2.5 and Chapter 7.

(E) That the project conforms to all other applicable standards of the certified LCP.

(F) If the project is located between the nearest through public road and the sea or the shoreline of any body of water located within the coastal zone, that the project conforms to the public access and public recreation policies of Chapter 3 of the California Coastal Act.

(G) In the event of any conflicts between or among the required findings, required findings in subsections (E) and (F) of this section shall prevail. [Ord. 5182 § 1, 2014; Ord. 4346 §§ 54, 55, 1994; Ord. 3435 § 1, 1983].

The Proposed Project's consistency with relevant LCP policies and implementing ordinances is analyzed below.

4.11.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to land use and planning. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.11.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to land use and planning are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

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.

4.11.3.2 Analytical Methods

The methodology applied to assess and evaluate impacts related to land use and planning is based on information obtained from review of existing and proposed land uses and development on the project site, review of existing surrounding land uses and development, and review of the Proposed Project's potential for conflicts with the relevant portions of the Santa Cruz County General Plan/LCP and SCCC.

4.11.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not **physically divide an established community (Significance Standard A)**. The Proposed Project would involve upgrades and modifications to existing water supply infrastructure and would continue the existing land use on the project site. The Proposed Project would not introduce a new linear element within the landscape, such as a freeway or other type of barrier that could divide an existing community. Therefore, the Proposed Project would have no impact related to physically dividing an established community and this standard is not further evaluated.

Impacts

This section provides a detailed evaluation of land use and planning impacts associated with the Proposed Project.

Impact LU-1: Conflicts with Land Use Plans, Policies, or Regulations (Significance Standard B). The Proposed Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. ***(Less than Significant)***

This discussion focuses on land use plans, policies, and regulations that relate to avoiding or mitigating environmental effects, and whether any conflict could create a significant physical impact on the environment. As described above, land use plans and policies applicable to the Proposed Project include the County of Santa Cruz

General Plan/LCP and SCCC. Table 4.11-1 includes an analysis of the Proposed Project's potential for conflicts with specific General Plan/LCP policies and implementing ordinances contained in the SCCC relevant to the Proposed Project.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
Chapter 2, Land Use Element		
Objective 2.23, Conservation of Coastal Land Resources		
2.23.2 Designation of Priority Sites. Reserve the sites listed in Figure 2-5 for coastal priority uses. Apply use designations, densities, development standards, access, and circulation standards.	Section 13.20.110(D)	**No Conflict.** The project site in not located in a coastal priority area identified in Figure 2-5 of the General Plan.
Chapter 5, Conservation and Open Space Element		
Objective 5.1, Biological Diversity		
5.1.6, Development Within Sensitive Habitats. Sensitive habitats shall be protected against any significant disruption of habitat values; and any proposed development within or adjacent to these areas must maintain or enhance the functional capacity of the habitat. Reduce in scale, redesign, or, if no other alternatives exist, deny any project which cannot sufficiently mitigate significant adverse impacts on sensitive habitats unless approval of a project is legally necessary to allow a reasonable use of the land.	Section 16.32.050(B)	**No Conflict.** Any development activity that has received a riparian exception according to the provisions of Chapter 16.30 would not likely be subject to this chapter according Section 16.32.105, if the Planning Director determines that the project received an equivalent review in granting a riparian exception. Given that a riparian exception is expected to apply to the Proposed Project, it is expected that the Sensitive Habitat Protection Ordinance and related policies will not apply. Regardless, the Proposed Project improvements would restore natural fluvial functions in Laguna Creek by allowing for the movement of sediment past the existing dam, as well as provide appropriate fish screening consistent with regulatory requirements, which would enhance the functional capacity of downstream fisheries and aquatic habitats. Temporary impacts that could occur to sensitive habitats during construction would be offset by the net benefits to sensitive habitats that would occur during project operation. As indicated in Section 4.4, Biological Resources, all temporary impacts would be reduced to a less-than-significant level with the implementation of mitigation measures.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
5.1.8, Chemicals Within Sensitive Habitats. Prohibit the use of insecticides, herbicides, or any toxic chemical substance in sensitive habitats, except when an emergency has been declared, when the habitat itself is threatened, when a substantial risk to public health and safety exists, including maintenance for flood control by Public Works, or when such use is authorized pursuant to a permit issued by the Agricultural Commissioner.	Section 16.32.050(A)	**No Conflict.** The Proposed Project would not include the use of insecticides or herbicides, and generally would not include toxic chemical substances. Fuels would temporarily be used during project construction. As indicated in Section 4.9, Hazards and Hazardous Materials, propane for the emergency backup generator would continue to be stored on the site (250-gallon aboveground tank), as under existing conditions, and such storage would continue to comply with applicable regulations for the use and storage of such material. No other fuels, gas, oil, solvents, petroleum products, etc., are stored on site.
5.1.9, Biotic Assessment. Within the following areas, require a biotic assessment as part of normal project review to determine whether a full biotic report should be prepared by a qualified biologist: (a) Areas of biotic concern, mapped; (b) Sensitive habitats, mapped & unmapped.	Sections 16.32.060 – 16.32.070	**No Conflict.** The County did not specifically require a biotic assessment for the Proposed Project. Regardless, a Biological Resources Assessment for the Proposed Project was prepared by a qualified biologist and is provided in Appendix C of this EIR.
Objective 5.2, Riparian Corridors and Wetlands		
5.2.2, Riparian Corridor and Wetland Protection Ordinance. Implement the protection of Riparian Corridors and Wetlands through the Riparian Corridor and Wetland Protection ordinance to ensure no net loss of riparian corridors and riparian wetlands. The ordinance identifies and defines riparian corridors and wetlands, determines the uses which are allowed in and adjacent to these habitats, and specifies required buffer setbacks and performance standards for land in and adjacent to these areas. Any amendments to this ordinance shall require a finding that riparian corridors and wetlands shall be afforded equal or greater protection by the amended language.	Section 16.30.040	**No Conflict.** In accordance with SCCC Section 16.30.060, the Proposed Project qualifies as a riparian exception considering the unique circumstances of its design, function, and net benefit to natural resources (see Section 4.4, Biological Resources, for additional information). Therefore, the Proposed Project is exempt from the provisions of the Riparian Corridor and Wetland Protection Ordinance and related General Plan/LCP policies.
5.2.3, Activities Within Riparian Corridors and Wetlands. Development activities, land alteration and vegetation disturbance within riparian corridors and wetlands and required buffers shall be prohibited unless an exception is granted per the Riparian Corridor and Wetlands Protection ordinance. As a condition of riparian exception, require evidence of approval for development from the U.S. Army Corps of Engineers, California Department of Fish and Game, and other federal or	Sections 16.30.040 – 16.30.070	**No Conflict.** As described above, the Proposed Project would qualify for a riparian exception. The City would provide the County with evidence of permit approvals as indicated, as part of the CDP approval process.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
state agencies that may have regulatory authority over activities within riparian corridors and wetlands.		
Objective 5.6, Maintaining Adequate Streamflows		
5.6.2, Designation of Critical Water Supply Streams. Designate the following streams, currently utilized at full capacity, as Critical Water Supply Streams: Laguna. Majors, Liddell, San Vicente, Mill and Reggiardo Creeks; San Lorenzo River and its tributaries above the City of Santa Cruz; Soquel Creek and its tributaries; Corralitos Creek and Browns Valley Creek and their tributaries upstream of the City of Watsonville diversion points. Oppose or prohibit as legal authority allows, new or expanded water diversion from Critical Water Supply Streams. Prohibit new riparian or off stream development, or increases in the intensity of use, which require an increase in water diversions from Critical Water Supply Streams. Seek to restore in-stream flows where full allocation may harm the full range of beneficial uses.	—	**No Conflict.** The Proposed Project would not result in an increase in water diversion from Laguna Creek, as indicated in Chapter 3, Project Description. The Proposed Project would maintain beneficial in-stream flows suitable for various salmonid life stages within the downstream anadromous reaches of Laguna Creek.
Objective 5.7, Maintaining Surface Water Quality		
5.7.3, Erosion Control For Stream and Lagoon Protection. For all new and existing development and land disturbances, require the installation and maintenance of sediment basins, and/or other strict erosion control measures, as needed to prevent siltation of streams and coastal lagoons.	Sections 16.22.060 – 16.22.070	**No Conflict.** The Proposed Project includes erosion control best management practices, described in Section 3.6.3 of this EIR.
Objective 5.9, Hydrological, Geological, and Paleontological Resources		
5.9.1, Protection and Designation of Significant Resources. Protect significant geological features such as caves, large rock outcrops, inland cliffs and special formations of scenic or scientific value. hydrological features such as major waterfalls or springs, and paleontological features, through the environmental review process. Designate such sites on the General Plan and LCP Resources and Constraints Maps where identified. Currently identified sites of Significant Hydrological, Geological and Paleontological Features are as follows: Bonny Doon Planning Area: (a) Majors Creek Canyon: The cliffs and exposed rocks of this canyon to the east of Highway 1 are outstanding scenic features.	Chapter 16.44	**No Conflict.** As described in Section 4.7, Geology and Soils, the project site is not located in an area of known significant hydrological, geological, and paleontological resources. However, the site is underlain by middle to late Miocene Monterey Formation, which has produced scientifically significant fossils and is considered to have high paleontological resources sensitivity. As indicated in the above section, impacts to unique paleontological resources would be reduced to a less-than-significant level with identified mitigation measures.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
(b) Martin Road: East and west of Martin Road, encompassed in the botanical sites, are unusual sandhill outcroppings. (c) Wilder Creek: This area contains a concentration of limestone caves worth protecting. (d) Table Rock: Highly scenic coastal rock formations (sedimentary intrusive bodies) can be found in the vicinity of Table Rock and Yellow Bank Creek.		
Objectives 5.10a, Protection of Visual Resources, and 5.10b, New Development in Visual Resource Areas		
5.10.2, Development Within Visual Resource Areas. Recognize that visual resources of Santa Cruz County possess diverse characteristics and that the resources worthy of protection may include, but are not limited to, ocean views, agricultural fields, wooded forests, open meadows, and mountain hillside views. Require projects to be evaluated against the context of their unique environment and regulate structure height, setbacks and design to protect these resources consistent with the objectives and policies of this section. Require discretionary review for all development within the visual resource area of Highway One, outside the Urban/Rural boundary, as designated on the GP/LCP Visual Resources Map and apply the design criteria of Section 13.20.130 of the County's zoning ordinance to such development.	Section 13.20.130	**No Conflict.** The Proposed Project does not provide ocean views, agricultural fields, open meadows, and mountain hillside views. While the project site is located in a wooded forest and is in an area identified as "scenic" in the County's Geographic Information System, public views of the site are limited to views from Smith Grade of dense tree cover along the road. The entrance points of existing unimproved access roads and the Facility fencing and gates are also visible from Smith Grade. The Proposed Project would entail retrofitting the existing dam that is set back from the road and may also include limited tree removal to accommodate road improvements to facilitate access to the site for construction equipment. As described in Section 4.2, Impacts Not Found to be Significant, once complete these project modifications would not likely be visible from Smith Grade or otherwise have a negative impact on the scenic views or characteristics along Smith Grade near the site.
5.10.3, Protection of Public Vistas. Protect significant public vistas as described in policy 5.10.2 from all publically used roads and vista points by minimizing disruption of landform and aesthetic character caused by grading operations, timber harvests, utility wires and poles, signs, inappropriate landscaping and structure design. Provide necessary landscaping to screen development which is unavoidably sited within these vistas.	Section 13.20.130	**No Conflict.** As indicated above for Policy 5.10.2, the Proposed Project would entail retrofitting the existing dam that is set back from the road and limited tree removal. The Proposed Project would not disrupt landform or aesthetic character as once complete these project modifications would not likely be visible from Smith Grade or otherwise have a negative impact on the scenic characteristics along Smith Grade near the site.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
5.10.8, Significant Tree Removal Ordinance. Maintain the standards in the County's existing ordinance which regulates the removal of significant trees and other major vegetation in the Coastal Zone, and provide appropriate protection for significant trees and other major vegetation in areas of the County located within the Urban Services Line.	Chapter 16.34	**No Conflict.** The Proposed Project would be required to obtain a CDP, which would address removal of any significant trees located within the coastal zone.
5.10.10, Designation of Scenic Roads. The following roads and highways are valued for their vistas. The public vistas from these roads shall be afforded the highest level of protection. [Smith Grade is included on the list of County scenic roads.]	Section 13.20.130	**No Conflict.** See the discussion above for Policies 5.10.2 and 5.10.3
Objective 5.12, Timber Production		
5.12.2, Uses Within Timber Production Zones. Allow the following types of uses compatible with Timber Production zoned land (TP) in accordance with the Timber Production ordinance: (a) The growing and harvesting of timber and other forest products, including Christmas trees, in conformance with the provisions of the Timber Production Zoning ordinance and the Forest Practice Act. (b) Watershed management. (c) Fish and wildlife habitat. (d) Grazing and other agricultural uses on that portion of the land not under timber production. (e) One single-family dwelling, with accessory structures and utilities, on a separate legal parcel of record, subject to the policies of this section. (f) Timber removal as necessary for the safe operation of public utility facilities.	Section 13.10.372	**No Conflict.** The Proposed Project would be considered an allowed use (Utilities) under SCCC Section 13.10.372(B).
5.12.3, Conditional Uses Within Timber Production Zones. Allow the following types of uses if conditionally approved in accordance with the Timber Production ordinance. Conditional uses must be consistent with the growing of a sustained yield tree crop, with the purposes of the Forest Taxation Reform Act of 1976 and the Timber Production zone district, and should be supported by a timber management plan.	Section 13.10.372	**No Conflict.** The Proposed Project would be considered an allowed use (Utilities) under SCCC Section 13.10.372(B).

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
(a) Mineral production and mining operations, in conformance with the provisions of the Mining Regulations ordinance. (b) Erection, construction, alteration and maintenance of water and transmission facilities. (c) Outdoor recreation, educational or religious activities, in conformance with the provisions of the County's organized camp zoning regulations which do not conflict with the management of the parcel's timber resources. (d) Conversion to agricultural uses not exceeding ten percent of the total of the timber area on the parcel. (e) One habitable accessory structure on a legal parcel of record with a minimum size of 40 gross acres in the Coastal Zone and 10 gross acres in other areas of the County where the guest house will be located in close proximity to the principle residence. (f) Timber processing and other related facilities. (g) Commercial cannabis activities, within non-timbered portions of a site, subject to discretionary review and approval pursuant to all requirements of the non-retail commercial cannabis licensing ordinances, zoning ordinance, environmental regulations, coastal regulations, building code, and other applicable regulations, which shall include any applicable environmental review pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code. Disallow commercial cannabis cultivation on lands zoned Timber Production (TP) within the Coastal Zone. *(Added by Resolution 88-2018)*		
5.12.5, General Conditions for All Development Proposals on Timber Production Zoned Lands. Require the following conditions be met in connection with any permitted development on Timber Production zoned lands: (a) A Timber Management Plan, prepared by a Registered Professional Forester, shall be submitted to and approved by the County for the entire land holding.	Section 16.52.195	**No Conflict.** Chapter 16.52.195 of the SCCC indicates that minor conversions are conversions of 3 acres or less and are evaluated by the County within the regulatory process administered by the Department of Forestry under the authority granted in the California Code of Regulations Section 1104(a)(4), which do not require a timber harvesting plan, as described below. It should be noted that this chapter does not

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
(b) The individual designated as possessor of timber rights on the property shall enter into a binding contract with the Board of Supervisors to manage and harvest timber on the timberland and to abide by the provisions of the Timber Management Plan.		make reference to "Timber Management Plans." As indicated in Section 4.4, Biological Resources, the Proposed Project would require the removal of up to 14 trees, including redwoods. The removal of these trees and replacement with developed uses would constitute a Minor Conversion as defined in Chapter 16.52.195 of the SCCC. Minor Conversions permits are administered by CAL FIRE (14 CCR Section 1104[a][4]). As such, a tree inventory and protection plan has been developed for the Proposed Project and would require a minor conversion permit exemption prior to tree removal. The City has retained a Registered Professional Forester to assist with the minor conversion exemption process. It is anticipated that a less than 3-acre conversion exemption (14 CCR Section 1104.1[a]) approved by CAL FIRE would be required to remove these redwood trees. Timber operations conducted under an exemption are exempt from conversion permit and timber harvesting plan requirements of the California Forest Practice Rules, although they are still required to comply with all other applicable provisions of the Z'berg-Nejedly Forest Practice Act, regulations of the Board of Forestry, and currently effective provisions of county general plans, zoning ordinances and any implementing ordinances.
Objective 5.19, Archaeological Resources		
5.19.1, Evaluation of Native American Cultural Sites. Protect all archaeological resources until they can be evaluated. Prohibit any disturbance of Native American Cultural Sites without an appropriate permit. Maintain the Native American Cultural Sites ordinance.	Chapter 16.40	**No Conflict.** As described Section 4.5, Cultural Resources and Tribal Cultural Resources, there are no known archaeological resources, including Native American resources, within the project site which would be subject to project impacts, and the likelihood of encountering archaeological resources on the project site is low. The Proposed Project would include mitigation measures to avoid disturbance to resources in the event of unanticipated discovery of archaeological resources or human remains during construction.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
Chapter 6, Public Safety Element		
Objective 6.1, Seismic Hazards		
6.1.1, Geologic Review for Development in Designated Fault Zones. Require a review of geologic hazards for all discretionary development projects in designated fault zones.	Chapter 16.10	**No Conflict.** This policy and SCCC chapter, as applicable, will be addressed through the CDP process. As indicated in Section 4.7, Geology and Soils, the Proposed Project is not located in a designated fault zone.
Objective 6.3, Erosion		
6.3.4, Erosion Control Plan Approval Required for Development. Require approval of an erosion control plan for all development, as specified in the Erosion Control ordinance. Vegetation removal shall be minimized and limited to that amount indicated on the approved development plans, but shall be consistent with fire safety requirements.	Section 16.22.060	**No Conflict.** The Proposed Project would install erosion control best management practices in areas of disturbed soils, as described in Section 3.6.3, Standard Construction Practices, of this EIR.
6.3.8, On-site Sediment Containment. Require containment of all sediment on the site during construction and require drainage improvements for the completed development that will provide runoff control, including onsite retention or detention where downstream drainage facilities have limited capacity. Runoff control systems or Best Management Practices shall be adequate to prevent any significant increase in site runoff over pre-existing volumes and velocities and to maximize on-site collection of non-point source pollutants.	Section 16.22.070	**No Conflict.** The Proposed Project would include the City's Standard Construction Practices, which include sediment and runoff control measures, as described in Section 3.6.3, Standard Construction Practices, of this EIR. Project construction would occur during the dry season and would comply with all applicable regulatory requirements related to erosion control.
6.3.9, Site Design to Minimize Grading. Require site design in all areas to minimize grading activities and reduce vegetation removal based on the following guidelines: (a) Structures should be clustered; (b) Access roads and driveways shall not cross slopes greater than 30 percent; cuts and fills should not exceed 10 feet, unless they are wholly underneath the footprint and adequately retained; (c) Foundation designs should minimize excavation or fill; (d) Building and access envelopes should be designated on the basis of site inspection to avoid particularly erodable areas; (e) Require all fill and sidecast material to be recompacted to engineered standards, reseeded, and mulched and/or burlap covered.	Section 16.20.050(F)	**No Conflict.** Pursuant to SCCC Section 16.20.050(F), the Proposed Project is exempt from the provisions of the grading regulations ordinance as a utility.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
6.3.11, Sensitive Habitat Considerations for Land Clearing Permits. Require a permit for any land clearing in a sensitive habitat area and for clearing more than one quarter acre in Water Supply Watershed, Least Disturbed Watershed, very high and high erosion hazard areas no matter what the parcel size. Require that any land clearing be consistent with all General Plan and LCP Land Use policies.	Chapter 16.22	**No Conflict.** The Proposed Project would be required to obtain a CDP which would address land clearing.
Chapter 7, Parks, Recreation and Public Facilities Element		
Objectives 7.7b/7.7c, Shoreline and Beach Access		
7.7.4, Maintaining Recreation Oriented Uses. Protect the coastal blufftop areas and beaches from intrusion by nonrecreational structures and incompatible uses to the extent legally possible without impairing the constitutional rights of the property owner.	Sections 13.20.110(D) and (E)	**No Conflict.** The Proposed Project is approximately 4 miles inland from the shoreline and is not located between the ocean and the nearest public road. Therefore, the Proposed Project would not interfere with coastal blufftop areas and beaches.
7.7.6, Hiking and Biking Trail Network. Establish a system of hiking and bicycle trails and bridges which provides access to and connects the various parks, recreation areas, beaches, and urban area.	Sections 13.20.110(D) and (E)	**No Conflict.** The Proposed Project is approximately 4 miles inland from the shoreline and is not located near public hiking or bicycle trails and bridges and therefore would not interfere with such facilities.
7.7.10, Protect Existing Beach Access. Protect existing pedestrian, and, where appropriate, equestrians and bicycle access to all beaches to which the public has a right of access, whether acquired by grant or through use, as established through judicial determination of prescriptive rights, and acquisition through appropriate legal proceedings.	Sections 13.20.110(D) and (E)	**No Conflict.** The Proposed Project is approximately 4 miles inland from the shoreline and is not located between the ocean and the nearest public road. Therefore, the Proposed Project would not interfere with pedestrian, equestrian or bicycle access to beaches.
Chapter 8, Community Design Element		
Objective 8.6, Building Design		
8.6.6, Protecting Ridgetops and Natural Landforms. Protect ridgetops and prominent natural landforms such as cliffs, bluffs, dunes, rock outcroppings and other significant natural features from development. In connection with discretionary review, apply the following criteria: (a) Development on ridgetops shall be avoided if other developable land exists on the property. (b) Prohibit the removal of tree masses when such removal would erode the silhouette of the ridgeline form. Consider the cumulative effects of tree removal on the ridgeline silhouette.	Sections 13.20.110(D) and (E)	**No Conflict.** The Proposed Project would not be located on a ridgetop or prominent natural landform. Anticipated tree removal would not erode the silhouette of ridgeline forms that may be present elsewhere in the Laguna Watershed.

Table 4.11-1. Review of County of Santa Cruz General Plan/Local Coastal Program and Implementing Ordinances

General Plan/LCP Policy	Implementing Ordinance	Potential for Proposed Project to Conflict
(c) Restrict the height and placement of buildings and structures to prevent their projection above the ridgeline or treeline. Restrict structures and structural projections adjacent to prominent natural land forms. Prohibit the creation of new parcels which would require structures to project above the ridgeline, treeline or along the edge of prominent natural landforms. (d) Require exterior materials and colors to blend with the natural landform and tree backdrops.		

As summarized in Table 4.11-1, the Proposed Project would not conflict with the applicable General Plan/LCP policies and implementing ordinances. Therefore, the Proposed Project would have a less-than-significant impact related to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.

4.11.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative land use and planning impacts associated with the Proposed Project and other reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area of analysis for cumulative land use impacts is the Laguna Watershed.

The Proposed Project would not contribute to cumulative impacts related to physical division of an established community (Significance Standard A) because it would have no impact related to this standard, as described above. Therefore, this significance standard is not further evaluated.

Impact LU-2: Cumulative Land Use Impacts (Significance Standard B). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. ***(Less than Significant)***

The known cumulative projects planned within the Laguna Watershed include the Santa Cruz Water Rights Project (SCWRP), the Laguna Pipeline portion of the North Coast System Repair and Replacement Project, and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan. No construction or development within the Laguna Watershed is proposed as part of the SCWRP and therefore this project would not contribute to cumulative impacts in the watershed.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects in the Laguna Watershed that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize conflicts with adopted land use plans and ordinances.

Although these cumulative projects could have conflicts with established land use and planning documents and land use policies, they would be subject to review and approval by the City of Santa Cruz and the County of Santa Cruz, as applicable. During the review and approval process, each of these projects would be required to be designed or otherwise conditioned to avoid conflicts with adopted land use plans and ordinances. In addition, as discussed above, the Proposed Project would not conflict with the relevant policies and implementing ordinances of the LCP. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in Santa Cruz County, would result in less-than-significant cumulative impacts related to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect, and no further mitigation measures are required.

4.11.3.5 Mitigation Measures

As described above, the Proposed Project would not result in significant land use and planning impacts, and therefore, no mitigation measures are required.

4.11.4 References

County of Santa Cruz. 2019. *Basic Zone Districts – Summary of Uses.* September 20, 2019. Accessed May 7, 2020 at http://www.sccoplanning.com/Portals/2/County/Planning/zoning/Zone%20District%20Summary.pdf?ver=2019-09-20-094332-393.

County of Santa Cruz. 2020. *1994 General Plan and Local Coastal Program for the County of Santa Cruz, California*. Chapter 2, Land Use. Effective December 19, 1994; updated February 18, 2020.

4.12 Noise

This section describes the existing noise conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the Laguna Creek Diversion Retrofit Project (Proposed Project). The analysis is based on noise modeling conducted for the Proposed Project as part of the preparation of this environmental impact report (EIR). The results of the noise modeling are summarized in this section, and are included in Appendix E.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to noise.

4.12.1 Existing Conditions

4.12.1.1 Acoustic Fundamentals

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise; consequently, the perception of sound is subjective in nature, and can vary substantially from person to person. Common sources of environmental noise and relative noise levels are shown in Table 4.12-1.

Table 4.12-1. Typical Noise Levels Associated With Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher (in next room)
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing (Healthy)	0	Lowest Threshold of Human Hearing (Healthy)

Source: Caltrans 2013a.
Notes: dBA = A-weighted decibels.

A sound wave is initiated in a medium by a vibrating object (e.g., vocal chords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in Hertz (Hz), which is equivalent to one complete cycle per second.

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and to have a more useable numbering system, the decibel (dB) scale was introduced. Sound level expressed in decibels (dB) is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure and the second pressure being that of the sound source of concern. For sound pressure in air, the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly added. For example, a 65-dB source of sound, such as a truck, when joined by another 65-dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100-fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted decibels (dBA). For this reason, the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (transportation) such as automobiles, trucks, and airplanes, and stationary sources (non-transportation) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers (e.g., walls, building façades, berms). Noise generated from mobile sources generally attenuate at a rate of 3 dB (typical for hard surfaces, such as asphalt) to 4.5 dB (typical for soft surfaces, such as grasslands) per doubling of distance, depending on the intervening ground type. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 dB to 7.5 dBA per doubling of distance for hard and soft sites, respectively.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, or intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction or “shielding” provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural barriers such as earthen berms, hills, or dense woods as well as built features such as buildings, concrete berms and walls may be effective barriers for the reduction of source noise levels.

4.12.1.2 Noise Descriptors

The intensity of environmental noise levels can fluctuate greatly over time and as such, several different descriptors of time-averaged noise levels may be used to provide the most effective means of expressing the noise levels. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment near the receptor(s). Noise descriptors most often used to describe environmental noise are defined as follows:

- **L_{max} (Maximum Noise Level):** The maximum instantaneous noise level during a specific period of time.
- **L_{min} (Minimum Noise Level):** The minimum instantaneous noise level during a specific period of time.
- **Lx (Statistical Descriptor):** The noise level exceeded "X" percent of a specific period of time. For example, L50 is the median noise level, or level exceeded 50% of the time.
- **L_{eq} (Equivalent Noise Level):** The average noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq} In noise environments determined by major noise events, such as aircraft over-flights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels.
- **L_{dn} (Day-Night Average Noise Level):** The 24-hour L_{eq} with a 10-dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- **CNEL (Community Noise Equivalent Level):** The CNEL is similar to the L_{dn} described above, but with an additional 5-dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7 p.m. and 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. When the same 24-hour noise data are used, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.
- **SEL (Sound Exposure Level):** The cumulative exposure to sound energy over a stated period of time; typically the energy of an event, summed into a 1-second period of time.

Community noise is commonly described in terms of the ambient noise level which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent sound level (L_{eq}) which corresponds to the steady-state A-weighted sound level containing the same total energy as the time-varying signal over a given time period (usually 1 hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise. Use of these descriptors along with the maximum noise level occurring during a given time period provides a great deal of information about the ambient noise environment in an area.

4.12.1.3 Negative Effects of Noise on Humans

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of

annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The majority of research infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustomed to, the less tolerable the new noise source will be to an individual.

With respect to how humans perceive and react to changes in noise levels, a 1-dBA increase is generally imperceptible outside of a laboratory environment, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (Egan 1988). These subjective reactions to changes in noise levels was developed on the basis of test subjects' reactions to changes in the levels of steady-state, pure tones or broad-band noise and to changes in levels of a given noise source. Perception and reaction to changes in noise levels in this manner is thought to be most applicable in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

4.12.1.4 Vibration Fundamentals

Vibration is similar to noise in that it is a pressure wave traveling through an elastic medium involving a periodic oscillation relative to a reference point. Vibration is most commonly described in respect to the excitation of a structure or surface, such as in buildings or the ground. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery) or transient in nature (e.g., explosions, impacts). Vibration levels can be depicted in terms of amplitude and frequency; relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal, or the quantity of displacement measured from peak to trough of the vibration wave. RMS is defined as the positive and negative statistical measure of the magnitude of a varying quantity. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a period of one second. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2018). PPV and RMS vibration velocity are nominally described in terms of inches per second (in/sec). However, as with airborne sound, vibration velocity can also be expressed using decibel notation as vibration decibels (VdB) with a reference quantity of 1 micro-inch per second. The logarithmic nature of the decibel serves to compress the broad range of numbers required to describe vibration and allow for the presentation of vibration levels in familiar terms.

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. Human response to vibration has been found to correlate well to average vibration amplitude; therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity.

Typical outdoor sources of perceptible groundborne vibration include construction equipment, steel-wheeled trains, and vehicles on rough roads. Although the effects of vibration may be imperceptible at low levels, effects may result in detectable vibrations and slight damage to nearby structures at moderate and high levels, respectively. At the elevated levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in damage to structural components. The range of vibration relevant to this analysis occurs from approximately 60 VdB, which is the typical background vibration-velocity level; to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings (FTA 2018). Table 4.12-2 identifies some common sources of vibration, corresponding VdB levels, and associated human perception and potential for structural damage.

Table 4.12-2. Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB (re 1 µ-inch/sec, RMS)	Typical Events (50-foot setback)
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
—	95	Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, occasional events	75	Commuter rail, typical bus or truck over bump or on rough roads
Residential annoyance, frequent events	72	Rapid transit, typical
Approximate human threshold of perception to vibration	65	Buses, trucks, and heavy street traffic
—	60	Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	—

Source: FTA 2018.
Notes: re = in reference to; µ-inch/sec = micro-inch per second; VdB = vibration decibels; RMS = root-mean-square.

4.12.1.5 Existing Noise Environment

The Proposed Project is in the community of Bonny Doon in unincorporated Santa Cruz County, California. The land use designation of the site is Mountain Residential (R-M) and zoning is Timber Production (TP), allowing for the growing and harvesting of timber and other forest products. The project site is surrounded predominantly by undeveloped, heavily forested land, with scattered, low-density residential development to the east, south, and west. The project area has a number of existing noise sources influencing the ambient noise environment, such as, vehicular traffic, aircraft overflights, maintenance and construction operations; general community noise (e.g., landscaping activities and people interacting) and the natural environment (e.g., creek/water flowing) contribute to a lesser extent. The dominant noise source is transportation noise generated from vehicular traffic on Smith Grade.

The existing ambient noise environment was quantified through field surveys, sound level measurements, and the use of industry-standard reference data and noise prediction methodologies. Separate discussions of major noise sources identified in the project area and their respective effects are provided in the following sections.

Noise-Sensitive Land Uses

Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of the intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels.

Noise-sensitive land uses in the vicinity of the project site are primarily single-family residences. Noise-sensitive land uses nearest the project site are located approximately 100 feet south of the project site across Smith Grade. Existing land uses in the project vicinity are further described in Chapter 3, Project Description.

Ambient Noise Survey

Sound level measurements were conducted on February 2, 2020, to document the existing noise environment within and adjacent to the project site to establish baseline noise conditions against which to compare project-generated noise levels. All noise measurements were performed in accordance with American National Standards Institute (ANSI) and American Standards for Testing and Measurement guidelines, at three locations in and around the project site, as shown on Figure 4.12-1.

Noise measurements were performed using Larson Davis Laboratories Model 831, Type 1 precision integrating sound-level meters. Field calibrations were performed on the sound-level meters with acoustic calibrators before and after the measurements. All instrumentation components, including microphones, preamplifiers and field calibrators have laboratory certified calibrations traceable to the National Institute of Standards and Technology. The equipment used meets all pertinent specifications of the ANSI for Type 1 sound-level meters (ANSI S1.4-1983 [R2006]). Meteorological conditions during the monitoring periods were fair with temperatures ranging from 50°F to 63°F, light winds from 0 to 3 miles per hour, and partly cloudy skies. No precipitation occurred during the monitoring periods.

Short-term noise monitoring (15-minute duration) was conducted at 3 locations to provide insight into the existing ambient noise environment. Monitoring location ST-1 was located approximately 50-feet east of the existing dam structure centerline to capture existing operational noise levels. Monitoring locations ST-2 and ST-3 were located adjacent to the nearest noise-sensitive receptor, across Smith Grade from the project site. Monitoring equipment was configured to catalog pertinent noise metrics, such as L_{eq}, L_{min}, L_{max} and statistical Lx sound levels. Ambient noise level data cataloged during the short-term monitoring is presented in Table 4.12-3, with locations shown on Figure 4.12-1.

SOURCE: ESRI 2020, City of Santa Cruz 2020, Black & Veatch 2020

DUDEK

0 60 120 Feet

FIGURE 4.12-1

Noise Measurement Locations and Nearest Sensitive Receptor

Laguna Creek Diversion Retrofit Project - EIR

Table 4.12-3. Summary of Short-Term Ambient Noise Measurements

Site	Location	Date/Time	Average Noise Level (dBA)			
			L_{eq}	*L_{max}*	*L50*	*L90*
ST-1	50 feet east of existing dam centerline	02/02/2020 15:29	64.7	66.1	64.7	64.6
ST-2	Adjacent to nearest receptor boundary	02/02/2020 15:40	55.3	75.8	42.5	42.3
ST-3	Adjacent to nearest residential structure	02/02/2020 16:03	50.8	71.7	42.9	40.7

Source: Appendix E.
Notes: Measurement ST-1 was 5 minutes in duration and measurement ST-2, and ST-3 were 15 minutes in duration.
dBA = A-weighted decibels; L_{eq} = average equivalent noise level; L_{max} = maximum noise level; L50 = sound level exceeded 50% of the period; L90 = sound level exceeded 90% of the period.

As shown in Table 4.12-3, existing short-term noise levels range from an average of approximately 51 dBA to 65 dBA L_{eq}, with background (L90) noise levels ranging from approximately 41 dBA to 65 dBA L90 and maximum noise levels from 66 dBA to 76 dBA L_{max}.

Sound levels documented at the ST-1 location were directly attributable to water going over the dam and no mechanical noise sources associated with the existing dam or diversion facility were documented during the measurement. Sound levels at monitoring locations ST-2 and ST-3 were driven primarily by vehicular traffic on Smith Grade, with the dam, aircraft overflights, distant traffic and community noise contributing to a lesser degree.

Traffic Noise

Existing traffic noise levels were modeled for roadway segments in the project vicinity based on the Federal Highway Administration (FHWA) Traffic Noise Model prediction methodologies (FHWA 1998), and traffic volume data from the County of Santa Cruz Department of Public Works (County of Santa Cruz 2020a). Traffic data are not available for the road immediately adjacent to the project site (i.e., Smith Grade); however, information for Empire Grade, which is approximately 2.5 miles east, was available and provided by the County. As such, the traffic data for Empire Grade was used as a proxy for Smith Grade.

The FHWA Traffic Noise Model incorporates sound emissions and sound propagation algorithms based on well-established theory and accepted international standards. The acoustical algorithms contained within the FHWA Traffic Noise Model have been validated with respect to carefully conducted noise measurement programs and show excellent agreement in most cases for sites with and without noise barriers. The noise modeling accounted for factors such as vehicle volume, speed, vehicle type, roadway configuration, distance to the receiver, and propagation over different types of ground (acoustically soft and hard ground).

In order to ensure that modeled existing traffic noise levels correlate with measured traffic noise levels, field observations and data collected during short-term noise monitoring are typically used to calibrate the traffic model. However, due to the low traffic volumes present during the noise monitoring, vehicle pass-bys were insufficient to be utilized within typical Caltrans/FHWA traffic calibration methodology; therefore, no offset was incorporated in to the model.[1]

[1] Using the traffic counts and field observations cataloged during the short-term noise monitoring as an input to the traffic noise model resulted in a calibration offset of less than 1 dB in comparison to the measured traffic noise levels.

Modeled existing traffic noise levels are summarized in Table 4.12-4 at a representative distance of 100 feet from the centerline the roadway. Distances from the roadway centerline to the 60-dBA, 65-dBA, and 70-dBA L_{dn} traffic noise level contours[2] are also presented. As shown in Table 4.12-4, the location of the traffic noise contours in the project vicinity ranges from within the Empire Grade right-of-way to approximately 28 feet from the centerline of the roadway. The extent to which existing land uses in the project area are affected by existing traffic noise depends on their respective proximity to the roadway and their individual sensitivity to noise. Refer to Appendix E of this report for complete modeling inputs and results.

Table 4.12-4. Summary of Modeled Existing Traffic Noise Levels

Roadway	Segment	Average Daily Traffic	L_{dn} at 100 feet from Centerline	Distance to L_{dn} Contour (feet)[1]		
				70 dBA	*65 dBA*	*60 dBA*
Empire Grade	South Chinquapin Road[2]	2,327	51	6	13	28

Source: County of Santa Cruz 2020a.
Notes: dBA = A-weighted decibels; L_{dn} = average day-night noise level.
1 Distance to contour does not account for shielding provided by natural or built intervening objects. Actual distance to real-world noise level contours is dependent upon shielding effects in the environment under consideration.
2 Between Seven Springs Ranch Road and Smith Grade.

Aircraft Operations

During the noise monitoring survey, no aircraft overflights were observed. The project site is located approximately 3 miles south of the private Bonny Doon Village Airport and approximately 20 miles northwest of the Watsonville Municipal Airport. The project site is not located within any currently adopted 60 dB or 65 dB CNEL/L_{dn} airport noise contours. As such, noise associated with aircraft operations in the area is not a substantial contributor to the existing ambient noise environment.

Vibration

Transportation-related vibration from roadways near the project site is the primary source of groundborne vibration. Heavy truck traffic can generate groundborne vibration, which varies considerably depending on vehicle type, weight, and pavement conditions. However, groundborne vibration levels generated from vehicular traffic are not typically perceptible outside of the roadway right-of-way.

4.12.2 Regulatory Framework

4.12.2.1 Federal

Federal Noise Control Act

The U.S. Environmental Protection Agency's (EPA's) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, the EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, EPA administrators

2 The distance at which a noise source has attenuated (lessened) to the referenced noise level.

determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to state and local governments. However, noise control guidelines and regulations contained in the EPA rulings in prior years are still adhered to by designated federal agencies where relevant. No federal noise regulations are applicable to the Proposed Project.

Federal Transit Administration Construction Vibration Damage Criteria

The Federal Transit Administration (FTA) has developed standards for use on federally funded mass-transit projects. While these standards and impact assessment methodologies are not directly applicable to the Proposed Project, they are routinely used as guidelines for projects in state and local jurisdictions. The FTA vibration threshold for architectural damage to non-engineered timber and masonry structures is 0.2 in/sec PPV, 0.3 in/sec PPV for engineered concrete and masonry structures, and 0.5 in/sec PPV for concrete structures (FTA 2018).

4.12.2.2 State

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation.

Governor's Office of Planning and Research General Plan Guidelines

The Governor's Office of Planning and Research (OPR), published the State of California General Plan Guidelines (OPR 2003), which provides guidance for the acceptability of projects within specific L_{dn} contours. Table 4.12-5 summarizes acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to help craft noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Generally, residential uses (e.g., single-family homes, mobile homes, etc.) are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55 to 70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA L_{dn} and normally unacceptable in areas exceeding 70 dBA L_{dn}. Commercial uses are normally acceptable in areas up to 70 dBA L_{dn}. Between 67.5 and 77.5 dBA L_{dn}, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements.

California Department of Transportation Guideline Vibration Damage Potential Threshold Criteria

There are no state standards for vibration; however, California Department of Transportation (Caltrans) compiled a synthesis of research on the effects of vibration with thresholds ranging from 0.08 in/sec PPV to 4.0 in/sec PPV for "fragile historic buildings" and "structures of substantial construction," respectively. Based on the synthesis of research, Caltrans developed recommendations for guideline threshold criteria of 0.3 in/sec PPV for older residential structures and 0.25 in/sec PPV for historic buildings and some old buildings exposed to continuous/frequent intermittent sources. For extremely fragile historic buildings, ruins, and ancient monuments, Caltrans recommends a threshold of 0.08 in/sec PPV (Caltrans 2020).

Table 4.12-5. Summary of Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (dBA L_{dn})			
	Normally Acceptable[1]	*Conditionally Acceptable*[2]	*Normally Unacceptable*[3]	*Clearly Unacceptable*[4]
Residential—Low-Density Single-Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential—Multifamily	<65	60–70	70–75	75+
Transient Lodging—Motel, Hotel	<65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	<70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters	—	<70	65+	—
Sports Arena, Outdoor Spectator Sports	—	<75	70+	—
Playgrounds, Neighborhood Parks	<70	—	67.5–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<75	—	70–80	80+
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	—
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	—

Source: OPR 2003.

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level.

1 Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

2 New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

3 New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

4 New construction or development should generally not be undertaken.

4.12.2.3 Local

County of Santa Cruz General Plan

The County of Santa Cruz General Plan Noise Element, Chapter 9 (County of Santa Cruz 2020b) contains updated goals, objectives, and policies intended to protect citizens from exposure to excessive noise. The Noise Element establishes standards and policy to promote compatible noise environments for new development or redevelopment projects and to control excessive noise exposure of existing land uses. The following policies and standards are considered, where relevant, in the noise analysis for the Proposed Project.

Objective 9.2 Noise Exposure of Existing Sensitive Uses and Receptors

Minimize exposure of existing noise-sensitive land uses and receptors to excessive, unsafe or disruptive noise that may be generated by new land uses and development projects.

Policies

9.2.1 Require acoustical studies for all new development projects that may affect the existing noise environment affecting sensitive land uses and receptors and that may not conform to the Normally Acceptable Noise Exposure in Table 9-2 (Table 4.12-6).

9.2.2 Require site-design and noise reduction measures for any project, including transportation projects that would cause significant degradation of the noise environment due to project effects that could:

(a) Increase the noise level at existing noise-sensitive receptors or areas by 5 dB or more, where the post-project CNEL or DNL will remain equal to or below 60 dB;

(b) Increase the noise level at existing noise-sensitive receptors or areas by 3 dB or more, where the post-project CNEL or DNL would exceed 60 dB;

This policy shall not be interpreted in a manner that would limit the ability of the County to require noise related mitigation measures or conditions of approval for projects that may generate lesser increases than the above. Special consideration may also be applied to special events or activities subject to permit requirements, or to land use development permits for uses and activities exempted from County noise control regulations.

9.2.3 Incorporate noise considerations into the site plan review process, particularly with regard to parking and loading areas, ingress/egress points and refuse collection areas.

9.2.4 For all new commercial and industrial developments which would increase noise levels above the normally acceptable standards in Table 9-2 (shown as Table 4.12-6 in this EIR) or the maximum allowable standards in Table 9-3 (Table 4.12-7 in this EIR), the best available control technologies shall be used to minimize noise levels. In no case shall the noise levels exceed the standards of Table 9-3 (Table 4.12-7 in this EIR).

9.2.5 The following noise mitigation strategies are preferable to construction of conventional masonry noise barriers where these strategies are a feasible option to reduce impacts on sensitive uses:

- Avoid placement of noise sensitive uses in noisy areas.
- Avoid placement of significant noise generators in noise sensitive areas.
- Increase setbacks between noise generators and noise sensitive uses.
- Orient buildings such that the noise sensitive portions of a project (e.g. bedrooms) are shielded from noise sources (such as through careful design of floor plan).
- Use sound-attenuating architectural design and building features.
- Employ technologies that reduce noise generation, such as alternate pavement materials on roadways, when appropriate.
- Employ traffic calming measures where appropriate.

9.2.6 Require mitigation and/or best management practices to reduce construction noise as a condition of project approvals, particularly if noise levels would exceed 75 dBA at neighboring sensitive land uses or if construction would occur for more than 7 days.

Table 4.12-6. Acceptable through Unacceptable Ranges of Noise Exposure by Land Use

Land Use		Community Noise Exposure DNL or CNEL dB(A)					
		55	60	65	70	75	80
A	Residential/Lodging – Single Family, Duplex, Mobile Home, Multi Family						
B	Schools, Libraries, Religious Institutions, Meeting Halls, Hospitals						
C	Outdoor Sports Arena or Facility, Playgrounds, Neighborhood Parks						
D	Office Buildings, Business Commercial and Professional						
E	Industrial, Manufacturing, Utilities, Agriculture						

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements, and can meet the indoor noise standards.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design to meet interior and exterior noise standards, where applicable.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design to meet interior and exterior noise standards, where applicable.

Unacceptable: New construction or development should generally not be undertaken.

Source: County of Santa Cruz 2020b, Table 9-2.
Note: Outdoor noise exposure measured at the property line of receiving land use.

Table 4.12-7. Maximum Allowable Noise Exposure Stationary Noise Sources

Noise Metric[1]	Daytime[5] (7 a.m. to 10 p.m.)	Nighttime[2,5] (10 p.m. to 7 a.m.)
Hourly L_{eq} – average hourly noise level, dB[3]	50	45
Maximum Level, dB[3]	70	65
Maximum Level dB – Impulsive Noise[4]	65	60

Source: County of Santa Cruz 2020b, Table 9-3.
Notes: dB = decibel.

1 As determined at the property line of the receiving land use. When determining effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.
2 Applies only where the receiving land use operates or is occupied during nighttime hours.
3 Sound of the measurements shall be made with "slow" meter response.
4 Sound level measurements shall be made with "fast" meter response
5 Allowable levels shall be raised to the ambient noise level were the ambient level exceeds the allowable levels. Allowable levels shall be reduced five dBA if the ambient hourly Leq is at least 10 dBA lower than the allowable level.

Santa Cruz County Code

The Santa Cruz County Code contains additional guidance with the intent to control noise, to promote and maintain the health, safety and welfare of its citizens. Chapter 8.30 of the Santa Cruz County Code enumerates general standards, limitations and exemptions pertaining to noise within the County. Additionally, Chapter 13.15 institutes "Noise Planning", which codifies General Plan policies and aids in regulating noise throughout the County through land use planning and permitting. The regulations presented below are considered, where relevant, in the noise analysis for the Proposed Project.

8.30.10 Offensive Noise

(A) No person shall make, cause, suffer, or permit to be made any offensive noise.

(B) "Offensive noise" means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, activity, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, tool, structure, construction, vehicle, ride, machine, implement, or instrument.

(C) The following factors shall be considered when determining whether a violation of the provisions of this section exists:

(1) Loudness (Intensity) of the Sound.

(a) Day and Evening Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 8:00 a.m. and 10:00 p.m. and it is:

(i) Clearly discernible at a distance of 150 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 75 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data. A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(b) Night Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 10:00 p.m. and 8:00 a.m. and it is:

(i) made within 100 feet of any building or place regularly used for sleeping purposes; or

(ii) clearly discernible at a distance of 100 feet from the property line of the property from which it is broadcast; or

(iii) in excess of 60 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data. A noise not reaching this

intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(2) Pitch (frequency) of the sound, e.g., very low bass or high screech;

(3) Duration of the sound;

(4) Time of day or night;

(5) Necessity of the noise, e.g., garbage collecting, street repair, permitted construction activities;

(6) The level of customary background noise, e.g., residential neighborhood, commercial zoning district, etc.; and

(7) The proximity to any building regularly used for sleeping purposes.

13.15.040 Exemptions

(A) Noise sources normally and reasonably associated with construction, repair, remodeling, or grading of any real property, provided a permit has been obtained from the County as required, and provided said activities take place between the hours of 8:00 a.m. and 5:00 p.m. on weekdays unless the Building Official has in advance authorized said activities to start at 7:00 a.m. and/or continue no later than 7:00 p.m. Such activities shall not take place on Saturdays unless the Building Official has in advance authorized said activities, and provided said activities take place between 9:00 a.m. and 5:00 p.m. and no more than three Saturdays per month. Such activities shall not take place on Sunday or a federal holiday unless the Building Official has in advance authorized such work on a Sunday or federal holiday, or during earlier morning or later evening hours of a weekday or Saturday.

(B) Emergency Work. The provisions of this chapter shall not apply to the emission of sound for the purpose of alerting persons to the existence of an emergency or in the performance of emergency work.

13.15.050 General Noise Regulations and Unlawful Noise

(A) No use, except a temporary construction operation, shall be permitted which creates noise which is found by the Planning Commission not to conform to the noise parameters established by Table 9-2 and Table 9-3 of the Santa Cruz County General Plan beyond the boundaries of the project site at standard atmospheric pressure.

(B) Backup emergency generators shall only be operated during power outages and for other temporary purposes. If the generator is located within 100 feet of a residential dwelling unit, noise attenuation measures shall be included to reduce noise levels to an A-weighted maximum exterior noise level of 60 dB at the property line and a maximum interior noise level of 45 dB within nearby residences.

13.15.070 Noise Generating Land Use

(A) New commercial and industrial development that would increase noise levels above the normally acceptable range in Table 9-2 or the levels in Table 9-3 of the Santa Cruz County General Plan Noise Element shall require acoustic studies to determine the noise reduction requirements to be included as conditions of approval. Noise levels shall not exceed the standards in Table 9-3, and require, as conditions of approval, site design and sound reducing measures if the project would:

(1) Increase the noise level at existing noise-sensitive receptors or areas by five (5) dB Ldn or more, where the post-project Ldn would remain equal to or below 60 dB.

(2) Increase the noise level at existing noise-sensitive receptors or areas by three (3) dB Ldn or more, where the post-project Ldn would exceed 60 dB.

(B) The standards in this section shall not limit the ability of the County to impose conditions of approval on projects that increase noise levels at existing noise-sensitive receptors or areas by any amount.

13.15.080 Exterior Noise Standards

New development shall not be exposed to noise levels that exceed the normally acceptable levels in Table 9-2 of the Santa Cruz County General Plan Noise Element, which establishes acceptable through unacceptable ranges of noise exposure by land use.

4.12.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to noise. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.12.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to noise are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Result in 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. Result in excessive groundborne vibration or groundborne noise levels.

C. Expose people residing or working in the project area to excessive noise levels in 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 2 miles of a public airport or public use airport.

In analyzing noise and vibration impacts associated with the Proposed Project, pertinent noise standards introduced in the County of Santa Cruz General Plan, discussed above, have been considered and utilized to develop the following quantified significance criteria for Significance Standards A and B above.

- **Significance Standard A**. The Proposed Project would result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project if it would:
    - For temporary construction activities on the project site, a significant impact would result if construction noise exceeds 60 dBA between 10 p.m. and 8 a.m. or 75 dBA between 5 p.m. and 10 p.m. Between the hours of 8 a.m. to 5 p.m. on weekdays, construction noise is not limited, based on Santa Cruz County Code Section 8.30.10.

- For construction and operational traffic noise with the Proposed Project, a significant impact would result if traffic noise results in an increase of 3 dB to 5 dB L_{dn} or more above existing conditions, based on Santa Cruz County Code Section 13.15.070.
- For operational noise, a quantified significance criterion is not identified, given that the Proposed Project would not increase operational noise.

- **Significance Standard B.** The Proposed Project would result in the generation of a substantial temporary ground borne noise or vibration levels in the project vicinity if it would:
  - For structures located outside of the project site, a significant impact would result if groundborne noise or vibration levels exceeded the FTA guidance that suggests 0.2 in/sec PPV as a threshold level for architectural damage to non-engineered timber and masonry structures (FTA 2018).

    For historic structures located within the project site, in the absence of a more appropriate project-specific threshold for the historic dam structure that reflects the actual conditions on the dam, a significant impact would result if groundborne noise or vibration levels exceed the Caltrans threshold for fragile historic structures of 0.08 in/sec PPV (Caltrans 2020).

4.12.3.2 Analytical Methods

Potential noise impacts associated with the Proposed Project were calculated and analyzed based on project construction and operations information; information contained in the traffic analysis and air quality analysis prepared for the Proposed Project; and data obtained during on-site noise monitoring. Observations made during the site survey along with land use information and aerial photography were used to determine potential locations of sensitive receptors near the project site.

Construction

The principal source of project-generated noise would be associated with construction activities on the project site; therefore, the analysis focuses on construction noise and vibration. Construction-related noise effects were assessed with respect to nearby noise-sensitive receptors and their relative exposure (accounting for intervening topography, barriers, distance, etc.), based on application of FHWA Roadway Construction Noise Model and FTA reference noise level data and usage-factors.

Additional noise sources associated with the Proposed Project would be off-site construction traffic on the local and regional roadway network. Project-related traffic was evaluated qualitatively based on the passenger car equivalent (PCE) vehicle trips and existing traffic volumes used as an input.

Groundborne vibration impacts were qualitatively assessed based on existing reference documentation (e.g., vibration levels produced by specific construction equipment operations), through the application of Caltrans methodology outlined within the *Transportation and Construction Induced Vibration Guidance Manual* (Caltrans 2020) and the relative distance to potentially sensitive receptors from a given vibration source.

Operation

As described in Chapter 3, Project Description, the Proposed Project's operation and maintenance activities would generally remain similar to existing activities and would have a similar frequency and intensity. Similar to existing conditions, operation and maintenance would include weekly station checks; monthly cleaning, inspections of equipment, testing of the generator, and landscape maintenance; annual inspections of equipment and service of

the generator; and road maintenance every 5 years. Overall, the activities on the site, use of equipment, and vehicle trips to the site for maintenance would not substantially increase over existing conditions.

4.12.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not **expose people to excessive aircraft noise (Significance Standard C)**. The nearest airstrip to the Proposed Project is the Bonny Doon Village Airport, which is a private use airport located approximately 3 miles north. The nearest public or public-use airport is Watsonville Municipal Airport, which is located approximately 20 miles southeast of the project site. Watsonville Municipal Airport is not part of an adopted airport land use plan, and the project site is not located within the airport influence area (County of Santa Cruz 2020c). Therefore, the Proposed Project would have no impact related to exposure of people in the project area to excessive airport-related noise, and this standard is not further evaluated.

Impacts

This section provides a detailed evaluation of noise impacts associated with the Proposed Project.

Impact NOI-1: **Substantial Increase in Ambient Noise Levels (Significance Standard A).** The Proposed Project would result in generation of a substantial temporary increase in ambient noise levels during construction in the vicinity of the project in excess of applicable standards. However, the Proposed Project would not result in generation of a substantial permanent increase in ambient noise levels during operation. ***(Less than Significant with Mitigation)***

Construction

Construction of the Proposed Project would generate noise associated with the operation of heavy construction equipment and construction-related activities in the project area (e.g., pumps, generators, haul trucks, workers accessing the site, etc.). The effects of construction noise depend largely on the types of construction activities occurring on any given day, noise levels generated by those activities, distances to noise-sensitive receptors, and the existing ambient noise environment in the vicinity of the receiver.

Construction of the Proposed Project would occur in several discrete stages, with each phase varying the equipment mix and the resulting overall noise emission. These phases would alter the characteristics of the noise environment generated on the project site and in the surrounding community for the duration of the construction phase. Construction phases for the Proposed Project are anticipated to include (1) access road improvements, site preparation, and mobilization; (2) cofferdam and temporary stream bypass system; (3) Coanda screen intake structure including dam preparation, foundation work, and concrete formwork and installation of the intake screen, piping, and valves; (4) modifications to the existing intake and sediment control valves; (5) valve vault installation; (6) electrical installations; (7) access stairs and riprap bank stabilization; and (8) startup and testing, site restoration, and construction closeout.

To assess noise levels associated with the various equipment types and operations, construction equipment can be considered to operate in two modes: mobile and stationary. Mobile equipment moves around a construction site performing tasks in a recurring manner. Stationary equipment operates in a given location for an extended period of time to perform continuous or periodic operations. Operation of heavy construction equipment is generally

characterized by short periods of full-power operation followed by periods of operation at lower power, idling, or powered-off conditions. These characteristics are accounted for through the application of typical usage factors (operational percentage) to the reference maximum noise levels and calculation of levels from the "acoustical center" of the construction activity.[3] Based on the Proposed Project's site plan and operation of construction equipment, the acoustical center of construction is calculated to be approximately 114-feet from the nearest noise-sensitive receptor's property line. The FTA and FHWA have measured and documented maximum noise levels and operational characteristics for a wide range of construction machinery, which are summarized in Table 4.12-8.

Table 4.12-8. Typical Construction Equipment Noise Emission Levels

Equipment Description	Acoustical Use Factor (%)	L_{max} at 50 feet (dBA, slow)[1]
Auger Drill Rig	20	85
Backhoe	40	80
Compactor (ground)	20	93
Compressor (air)	40	80
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Concrete Saw	20	90
Crane	16	85
Dozer	40	85
Dump Truck	40	80
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Generator	50	82
Grader	40	85
Jackhammer[2]	20	85
Mounted Impact Hammer (hoe ram)[2]	20	90
Paver	50	85
Pneumatic Tools	50	85
Pumps	50	77
Rock Drill	20	85
Roller	20	85
Scraper	40	85
Tractor	40	84
Vacuum Excavator (Vac-truck)	40	85

Sources: DOT 2006; FTA 2006.
Notes: L_{max} = maximum noise level; dBA = A-weighted decibels.
1 All equipment fitted with a properly maintained and operational noise control device, per manufacturer specifications.
2 Impulsive/impact device.

The construction equipment fleet mix is based on the same information evaluated in the air quality, energy, and greenhouse gas emissions analyses in this EIR (see Appendix B). Based on the reference noise levels for the assumed fleet mixes, usage rates, and operational characteristics discussed above, overall hourly average noise levels attributable to construction activities were calculated by phase for the Proposed Project. The estimated construction noise levels at the property line of the nearest noise-sensitive receptor and the distance from the

[3] Apparent acoustical center of construction equipment operations was assumed to be the geometric mean of the nearest operations point and the farthest operations point.

acoustical center of construction activity to the 60 dBA noise level threshold for nighttime hours (10 p.m. to 8 a.m.), which would apply to proposed construction between the hours of 7:00 a.m. and 8:00 a.m. (Santa Cruz Code Section 8.30.10 [C][1][b]), are presented by phase in Table 4.12-9. No noise thresholds apply to construction activities between the hours of 8 a.m. and 5 p.m. on weekdays, based on the Santa Cruz County Code Section 13.15.070.

Table 4.12-9. Construction Noise Model Results Summary

Phase		Noise Levels (dBA L_{eq}) at nearest receptor[1]	Distance to 60 dBA L_{eq} Noise Level Standard (10 p.m. to 8 a.m.)
No.	Description		
1	Access road improvements, site preparation, and mobilization	74.4	410
2	Cofferdam and temporary stream bypass system	74.8	425
3	Coanda screen intake structure including dam preparation, foundation work, and concrete formwork and installation of the intake screen, piping, and valves	77.6	545
4	Modifications to the existing intake and sediment control valves	77.5	543
5	Valve vault installation	75.2	443
6	Electrical installations	77.6	548
7	Access stairs and bank stabilization	71.8	325
8	Start-up and testing, site restoration, and construction closeout	75.3	443

Notes: dBA = A-weighted decibels; L_{eq} = equivalent sound level

[1] Based on FTA propagation algorithms for calculation of construction noise levels from the acoustical center of construction operations.

As shown in Table 4.12-9, construction activities would generate noise levels ranging from approximately 72 dBA to 78 dBA at the nearest noise-sensitive receptor's property line in the project vicinity, depending on the phase of construction. Construction noise levels generated by the Proposed Project would exceed the 60 dBA property line noise level standard for operations between 10 p.m. and 8 a.m. As such, project-generated construction noise would result in a potentially significant impact.

As indicated in Chapter 3, Project Description, Standard Construction Practice #26, will provide for the notification of adjacent property owners of any nighttime construction schedules and will identify a Construction Noise Coordinator to respond to and address any local complaints about construction noise. Additionally, MM NOI-1 in Section 4.12.3.5, Mitigation Measures, requires appropriate treatment to noise sources and limits dispersion of the sound levels into the surrounding area. With implementation of MM NOI-1, the Proposed Project's construction-related noise impacts would be reduced to a less-than-significant level. MM NOI-1 also provides best management practices to reduce construction noise, which reflects the provisions of the County's General Plan Policy 9.2.6 (County of Santa Cruz 2020b).

Construction Traffic Noise

In addition to heavy-duty construction equipment noise, the movement of equipment, haul trucks, and workers to and from the site during construction would generate temporary traffic noise along access routes to the project site. The transport of heavy-duty construction equipment onto the project site would be minimized during construction

by keeping construction equipment staged on site for the duration of the construction phase. For this reason, the movement of heavy-duty construction equipment would be minimal. Haul truck trips and construction worker commutes would occur on a daily basis, with construction potentially beginning at 7 a.m. and ending at 5 p.m. Approximately 35 one-way haul truck trips would be required during the 3-month construction period, with two to three trips per week. As described in Section 4.13, Transportation, during the peak of construction activity, the Proposed Project would generate 50 daily trips.

Based on the ambient increase criteria contained in the Santa Cruz County Code (Section 13.15.070), the Proposed Project would have a significant impact if it would result in an increase of 3 dB to 5 dB L_{dn} or more above existing conditions. For the Proposed Project to result in an increase of 3 dB, the average daily trips on a roadway would need to double.

As indicated in Section 4.12.1.5, Existing Noise Environment, traffic data are not available for the road immediately adjacent to the project site (i.e., Smith Grade); however, information for Empire Grade, which is approximately 2.5 miles east, was available and provided by the County. As such, the traffic data for Empire Grade was used as a proxy for Smith Grade. Given that the existing average daily traffic volume on Empire Grade is 2,327 vehicles (County of Santa Cruz 2020a), the 50 peak/maximum daily haul truck and construction worker commute trips to the project site would not cause a doubling of average daily trips in the immediate area. Furthermore, 50 additional trips would not represent a doubling of trips on Smith Grade. As a result, the noise level increases along project area roadways used to reach the site would be less than 3 dB. Therefore, noise impacts associated with construction-related traffic would be less than significant.

Long-Term Traffic Noise

Long-term operation of the Proposed Project is not anticipated to result in changes to the amount of traffic on the roadway network compared to existing operations, as operations would remain consistent with current operation and maintenance activities. Routine maintenance of the facility is expected to continue to consist of weekly, monthly, and annual trips to the site by SCWD personnel in a small truck and road maintenance every 5 years, consistent with current operations.

As previously discussed, the project would need to result in a doubling of roadway traffic volumes for there to be a significant impact associated with traffic noise. As operation of the Proposed Project would not result in a net increase of vehicle trips, traffic noise levels associated with the Proposed Project would be less than significant.

Operations

The Proposed Project does not include any new permanent noise-generating sources, such as heating, ventilation, and air conditioning; mechanical equipment; additional pumps; or power and water requirements. As the sound levels generated from operation of the Proposed Project would not substantially change from the current operations, noise from long-term operations would be less than significant.

Impact NOI-2: **Groundborne Vibration (Significance Standard B).** The Proposed Project would result in the potential generation of excessive groundborne vibration or groundborne noise levels during construction. ***(Less than Significant with Mitigation)***

Off-Site Effects

Construction activities on the project site may result in varying degrees of temporary groundborne vibration or noise, depending on the specific construction equipment used and operations involved. Representative groundborne vibration levels for various types of construction equipment, developed by FTA, are summarized below in Table 4.12-10. Pile driving and blasting would not be utilized in the construction of the Proposed Project. As shown in Table 4.12-10, heavier pieces of construction equipment, such as a bulldozer, that may be expected on the project site, have been documented to generate peak particle velocities of approximately 0.089 in/sec PPV or less at a reference distance of 25 feet (DOT 2006).

Table 4.12-10. Representative Vibration Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)[1,2]	Approximate Lv (VdB) at 25 feet[3]
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Heavy-duty Trucks (Loaded)	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: DOT 2006.
Notes:
1 Where PPV is the peak particle velocity.
2 Vibration levels can be approximated at other locations and distances using the above reference levels and the following equation: PPVequip = PPVref (25/D)1.5 (in/sec); where "PPV ref" is the given value in the above table, "D" is the distance for the equipment to the new receiver in feet.
3 Where Lv is the RMS velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.

Groundborne vibration attenuates rapidly, even over short distances. The attenuation of groundborne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with equations and reference constants found in FTA and Caltrans guidance. Using standard FTA vibration attenuation formulas, non-pile-driving construction activities would exceed the FTA recommended threshold of significance of 0.2 in/sec PPV for architectural damage to non-engineered timber and masonry structures (FTA 2018) at a distance of 15 feet or less. It is unlikely that heavy construction equipment would operate within 15 feet of any sensitive receptor, as buildings associated with the nearest off-site sensitive receptor structure are located approximately 100 feet from the project site boundary and more than 250 feet from the primary construction areas.

It is notable that groundborne vibrations from construction activities do not often reach the levels that can damage structures or affect activities that are not vibration sensitive, although the vibrations may be felt by nearby persons in close proximity and result in annoyance (FTA 2018). Additionally, the Proposed Project would not include elements that would generate groundborne vibration associated with the long-term operations. As such, the Proposed Project would have a less-than-significant impact related to groundborne vibration and groundborne noise levels.

On-Site Effects to Historic Structures

As discussed in the Section 4.5, Cultural Resources and Tribal Cultural Resources, the dam that is part of the Facility is considered a historical resource under CEQA. The dam may be susceptible to damage from vibration associated with construction of the Proposed Project. Inspection, testing, and analysis of the current condition of the dam was performed in 2018 (B&V 2018). The dam was found to be in satisfactory condition with no signs of distress or major deterioration that would jeopardize its function. Testing indicates the materials for the dam structure are in good condition with no evidence of fatigue, delamination, or weakening and has adequate material strengths for continued service. While the analysis concluded that the overall condition of the dam was favorable for continued use and was in line with modern design parameters for masonry structures, it did not directly identify sensitivity of the dam to vibration.

Both Caltrans and the FTA provide a synthesis of research on the effects of vibration on structures, with thresholds ranging from 0.08 to 4.0 in/sec PPV for "fragile historic buildings" and "structures of substantial construction," respectively. It is currently unknown which threshold would be appropriate for the dam.

As indicated in Section 4.12.3.1, Thresholds of Significance, in the absence of a more appropriate project-specific threshold for the historic dam structure that reflects the actual conditions on the dam, the Caltrans threshold for fragile historic structures of 0.08 in/sec PPV is used in the evaluation of the historic dam (Caltrans 2020). Based on the vibration levels presented in Table 4.12-10 above, the 0.08 in/sec PPV threshold would be exceeded at distances less than 27 feet and the 4.0 in/sec PPV cited by Caltrans for "structures of substantial construction" would be exceeded at distances of less than 2 feet. As a portion of the construction activities would be performed directly on the dam, including notching of the dam and doweling for anchors, there is potential for the structure to be exposed to vibration levels exceeding the Caltrans and FTA threshold criteria. Vibration could potentially damage the dam, resulting in significant impacts to the historic resource.

MM NOI-2 in Section 4.12.3.5, Mitigation Measures, requires that an appropriate threshold be developed by qualified engineering personnel that would prevent vibration impacts to the dam. Development and implementation of a construction vibration monitoring plan would be required and vibration generating construction activities would be monitored to ensure compliance with the developed threshold. With implementation of MM NOI-2, the potential for construction-related vibration impacts to the historic dam structure would be reduced to a less-than-significant level.

4.12.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative noise impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area potentially affected by noise and vibration in the vicinity of the Proposed Project would be limited to lands immediately adjacent to the haul truck and worker access route (i.e., Smith Grade) and those located within approximately 600 feet of the Proposed Project construction.

The Proposed Project would not contribute to cumulative impacts related to aircraft noise (Significance Standard C) because it would have no impact related to this standard as described above. Therefore, this significance standard is not further evaluated.

Impact NOI-3: Cumulative Noise Impacts (Significance Standards A and B). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to noise and vibration. ***(Less than Significant)***

Cumulative noise impacts could occur if sensitive receptors were exposed to noise and vibration from sources at about the same time, if multiple projects were undertaken simultaneously and in close proximity. The known cumulative projects planned within the geographic area of analysis for cumulative impacts related to noise and vibration, which is the project site and immediate vicinity, include the Laguna Pipeline portion of the North Coast System Repair and Replacement Project. The Santa Cruz Water Rights Project and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan do not overlap with and are not in the immediate vicinity of the project site. Although the Laguna Pipeline would entail limited construction within the project vicinity, it would occur several years after construction of the Proposed Project.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects that would overlap with or be located in the immediate vicinity of the Facility that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize noise and vibration impacts. Noise and vibration from the Proposed Project and cumulative projects would not combine to create a significant cumulative noise and vibration impact. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would result in less-than-significant cumulative impacts to noise and vibration, and no further mitigation measures are required.

4.12.3.5 Mitigation Measures

Implementation of the following mitigation measures would reduce potentially significant noise impacts of the Proposed Project related to noise and vibration identified in Impact NOI-1 and Impact NOI-2 above, to a less-than-significant level.

MM NOI-1: Construction Noise. The Proposed Project shall implement the following measures related to construction noise:

- Restrict construction activities and use of equipment that have the potential to generate significant noise levels (e.g., use of concrete saw, mounted impact hammer, jackhammer, rock drill, etc.) to between the hours of 8:00 a.m. and 5:00 p.m.
- Construction equipment and vehicles shall be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Internal-combustion-powered equipment shall be equipped with properly operating noise suppression devices (e.g., mufflers, silencers, wraps) that meet or exceed the manufacturer's specifications. Mufflers and noise suppressors shall be properly maintained and tuned to ensure proper fit, function, and minimization of noise.
- Pumps that are not submerged and aboveground conveyor systems shall be located within acoustically treated enclosures, shrouded, or shielded to prevent the propagation of sound into the surrounding areas.
- Portable and stationary site support equipment (e.g., generators, compressors, rock crushers, and cement mixers) shall be located as far as possible from nearby noise-sensitive receptors.

- Impact tools shall have the working area/impact area shrouded or shielded whenever possible, with intake and exhaust ports on power equipment muffled or suppressed. This may necessitate the use of temporary or portable, application-specific noise shields or barriers.
- Construction equipment shall not be idled for extended periods (i.e., 5 minutes or longer) of time in the immediate vicinity of noise-sensitive receptors.

MM NOI-2: **Construction Vibration Effects on Historic Structures.** Prior to the use of construction equipment in the vicinity of the dam, a vibration damage threshold will be established by a qualified engineer under the direction of the City. The vibration damage threshold will be developed through the evaluation of the condition of the dam structure, underlying soil conditions, and type of construction operation to be performed.

At the City's direction, a construction vibration monitoring plan will be prepared and implemented prior to the use of construction equipment near the dam. The monitoring plan shall report on the vibration damage threshold and the methods used to develop the threshold. The plan shall also establish the methodology for characterizing the existing baseline vibration levels present on the site, operational construction vibration monitoring consistent with the established threshold, and reporting to be completed during project construction.

Should the construction vibration analysis undertaken during the preparation of the monitoring plan reveal that the proposed construction methods would exceed the vibration threshold established for the dam, alternative construction methods will be explored to find a method that would allow project construction to move forward while avoiding potential vibration-related damage to the dam during construction.

4.12.4 References

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4.13 Transportation

This section describes the existing transportation conditions of the project site, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the Laguna Creek Diversion Retrofit Project (Proposed Project).

A summary of the comments received during the scoping period for this environmental impact report is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to transportation.

4.13.1 Existing Conditions

As described in Chapter 3, Project Description, the Proposed Project is located in the community of Bonny Doon, in unincorporated Santa Cruz County, California, approximately 7 miles northwest of downtown Santa Cruz. The Proposed Project consists of improvements to the existing Laguna Creek Diversion Facility (Facility). The Facility serves as a surface water collection and diversion system that supplies raw water from the Laguna Creek to the City of Santa Cruz's North Coast System.

This section describes key roadways, as well as transit, pedestrian, and bicycle facilities within the vicinity of the project site. The extent of these facilities constitutes the study area evaluated in this analysis. Regional and site access is also described.

4.13.1.1 Roadways

Roadway characteristics and roadway classifications for key vicinity roads are described below. All roadways discussed are within the unincorporated County of Santa Cruz (County) and are shown on Figure 3-1 in Chapter 3, Project Description.

Smith Grade is a generally east-west, two-lane, undivided roadway located adjacent to and serving as the primary and only connection to the project site. Smith Grade extends from Empire Grade to Bonny Doon Road, northwest of the City of Santa Cruz. Smith Grade is not designated with a functional street classification by the County of Santa Cruz General Plan Circulation Element, however, it is identified as a Major Street in the Santa Cruz County Bike Map (County of Santa Cruz 2020, 2016). Parking is allowed along some sections, and no pedestrian or bicycle facilities are present along either side of the roadway. The speed limit is not posted along Smith Grade; however, advisory speed signs along the roadway vary and allow for average speeds that range between 30 and 40 miles per hour (mph).

Empire Grade is a generally north-south, two-lane, undivided roadway that provides access to the project site from the east. Empire Grade extends from High Street in the City of Santa Cruz to Jamison Creek Road to the north. Empire Grade is not designated with a functional street classification by the County of Santa Cruz General Plan Circulation Element, however, it identified as a Major Street in the Santa Cruz County Bike Map (County of Santa Cruz 2020, 2016). Parking is allowed along some sections, and no pedestrian or bicycle facilities are present along the roadway outside of the Santa Cruz City limits. The posted speed limit is 40 mph.

Bonny Doon Road is a north-south, two-lane, undivided roadway that provides access to the project site from the west. Bonny Doon Road stretches from State Route 1 to Pine Flat Road, north of the community of Bonny Doon. Bonny Doon Road is not designated with a functional street classification by the County of Santa Cruz General Plan

Circulation Element; however, the Santa Cruz County Bike Map identifies Bonny Doon Road as a Major Street (County of Santa Cruz 2020, 2016). Parking is allowed along some sections, and no pedestrian or bicycle facilities are present along the roadway. The posted speed limit ranges between 30 mph to 45 mph.

Regional Access

Regional access to the project site is provided from State Route 1, via Bonny Doon Road and Smith Grade; or from State Route 1, via Empire Grade and Smith Grade. Access from State Route 17 to the project site is also provided via Mount Herman Road, Felton Empire Road, Empire Grade, and Smith Grade.

Site Access Roads

Two existing roads, the west and main access roads, intersect with Smith Grade on either side of Laguna Creek, and currently provide access to the project site. Both are private, unpaved roads, and access is currently restricted by padlocked gates. A third road, the east access road, splits off from the main access road within the Project site, and provide access to the upstream side of the dam.

Traffic Volumes and Level of Service

Level of service (LOS) is commonly used as a qualitative description of segment and roadway operations and is based on the capacity and the volume of traffic using the segment or roadway. The Highway Capacity Manual describes the operation of a roadway using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions).

In order to evaluate consistency with the County's General Plan LOS policies described in Section 4.13.2, Regulatory Framework, below, average daily traffic (ADT) data was gathered and analyzed for the nearest roadways within the project study area. ADT is the total number of cars passing over a segment of the roadway, in both directions on an average day. According to the Highway Capacity Manual (TRB 2016), ADT for a roadway segment is evaluated based on the volume-to-capacity (V/C) ratio of the roadway. Table 4.13-1 displays the relationship between the volume of a roadway and its capacity as a function of LOS.

Table 4.13-1. Level of Service Definitions for Volume-to-Capacity Ratio

Level of Service	V/C Ratio	General Description
A	≤0.600	Free flow
B	0.601 to ≤0.700	Stable flow (slight delays)
C	0.701 to ≤0.800	Stable flow (acceptable delays)
D	0.801 to ≤0.900	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	0.901 to ≤1.00	Unstable flow (intolerable delay)
F	>1.00	Forced flow (jammed)

Source: TRB, 2016.
Notes: V/C = volume to capacity.

Traffic data was obtained from the County of Santa Cruz GIS Web application and website (County of Santa Cruz 2020). Within proximity to the project site, ADT information is available for Empire Grade, south of Chinquapin Road, approximately 2.5 miles east of the project site; ADT information is not available for Smith Grade or Bonny Doon

Road. As of 2019, the ADT volume on Empire Grade was 2,327 vehicles. According to the Highway Capacity Manual (TRB 2016), the capacity of a two-lane roadway is approximately 3,200 passenger cars per hour for both directions. The peak hour traffic of a roadway is roughly equivalent to approximately 10% of the daily traffic of a roadway and the ADT on Empire Grade of 2,327 vehicles consists of approximately 233 peak hour vehicles. Thus, under existing conditions, a V/C ratio of 0.07 and LOS A is calculated for this segment of Empire Grade, within the project vicinity.

4.13.1.2 Transit

The project site is not directly served by an active transit service. The Santa Cruz Metropolitan Transit District (Santa Cruz Metro) provides bus service throughout the County; however, no routes operate along Smith Grade. Santa Cruz Metro routes 41 and 42 operate along Empire Grade, from the Santa Cruz Metro Center, located at 920 Pacific Avenue in the City of Santa Cruz, to the unincorporated town of Bonny Doon, providing the closest connection to the project site. The nearest stop in Bonny Doon is located approximately 2 miles from the project site, at the southwest corner of Pine Flat Road/Bonny Doon Road intersection (Santa Cruz Metro 2020).

4.13.1.3 Pedestrian and Bicycle Facilities

As stated above, aside from various hiking trails, pedestrian and bicycle facilities are not present along Smith Grade, Empire Grade, or Bonny Doon Road (County of Santa Cruz 2016).

4.13.2 Regulatory Framework

4.13.2.1 Federal

There are no federal regulations related to transportation that are directly applicable to the Proposed Project.

4.13.2.2 State

California Senate Bill 743

On September 27, 2013, Senate Bill (SB) 743 was signed into law, which creates a process to change the way that transportation impacts are analyzed under the California Environmental Quality Act (CEQA). SB 743 required the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to provide an alternative to level of service (LOS) for evaluating transportation impacts. Under the new transportation guidelines, LOS, or vehicle delay, will no longer be considered an environmental impact under CEQA. The updates to the CEQA Guidelines required under SB 743 were approved on December 28, 2018. These guidelines identify vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA and are currently being implemented as of July 1, 2020.

SB 743 requires California to reduce greenhouse gas emissions by 40% below 1990 levels by 2030. The California Air Resources Board has determined that it is not possible to achieve this goal without reducing VMT growth and specifically California needs to reduce per capita VMT across all economic sectors. SB 743 is primarily focused on passenger-cars and the reduction in per capita VMT as it relates to individual trips. The OPR Technical Advisory (OPR 2018) provides guidance and tools to properly carry out the principles within SB 743 and how to evaluate transportation impacts in CEQA. The OPR Technical Advisory was utilized within this analysis as the primary source of analysis of VMT and transportation-related impacts.

4.13.2.3 Local

County of Santa Cruz

As required by state law, the County has adopted a General Plan and Local Coastal Program that work in tandem with each other to create and address goals and policies as related to the transportation system of the County. Within the General Plan, the Circulation Element serves as the key policy statement of the County regarding transportation facilities serving the unincorporated areas, including the project site (Santa Cruz County 2020). The Circulation Element contains several policies and programs that fulfill this purpose.

Specific goals identified in the Circulation Element are identified below, some of which are relevant to the Proposed Project. These goals outline the County's objectives to improve the transportation system.

- **Transportation System**: Provide a convenient, safe, and economical transportation system for the movement of people and goods, promoting the wise use of resources, particularly energy and clean air, and the health and comfort of residents.
- **Mode Choice**: Provide the public with choice in transportation modes on a well-integrated system.
- **Limit Increase in Auto Use**: Limit the increase in auto usage to minimize adverse impacts. Increase transit ridership, carpooling, vanpooling, walking and bicycling, etc.
- **Efficiency**: Provide for more efficient use of existing transportation facilities.
- **Regional Goals**: Meet the requirements of regional plans, such as the Congestion Management Program, Air Quality Management Plan and Regional Transportation Plan. Integrate planning for transportation, land use, and air quality goals.
- **Parking**: Manage parking supply to provide reasonably convenient parking for groups such as shoppers, and visitors who are most sensitive to the parking supply levels, while encouraging alternatives to solo commuting and limiting impacts on neighborhoods.
- **Bikeway System**: Develop and implement a comprehensive bikeway system that promotes bicycle travel as a viable transportation mode and meets the recreation and travel needs of the citizens of Santa Cruz County.
- **Safety**: Reduce the number and severity of bicycle accidents.
- **Coordination**: Coordinate transportation improvements in area plans with the General Plan and LCP Land Use Plan and regional transportation plans.

The following policy pertains to the County's approach to LOS:

- **3.12.1. Level of Service (LOS) Policy**: In reviewing the traffic impacts of proposed development projects or proposed roadway improvements, LOS C should be considered the objective, but LOS D as the minimum acceptable (where costs, right-of-way requirements, or environmental impacts of maintaining LOS under this policy are excessive, capacity enhancement may be considered infeasible). Review development projects or proposed roadway improvements to the Congestion Management Program network for consistency with Congestion Management Plan goals. Proposed development projects that would cause LOS at an intersection or on an uninterrupted highway segment to fall below D during the weekday peak hour will be required to mitigate their traffic impacts. Proposed development projects that would add traffic at intersections or on highway segments already at LOS E or F shall also be required to mitigate any traffic volume resulting in a 1% increase in the volume/capacity ratio of the sum of all critical movements. Projects

shall be denied until additional capacity is provided or where overriding finding of public necessity and or benefit is provided.

4.13.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to transportation. The section identifies the standards of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified.

4.13.3.1 Thresholds of Significance

The standards of significance used to evaluate the impacts of the Proposed Project related to transportation are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.

B. 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.

4.13.3.2 Analytical Methods

Construction

The Proposed Project would result in the temporary addition of haul trucks, vendor trucks, and worker vehicles to the circulation network over the course of an approximately 3-month construction period. The construction phasing schedule and vehicle trip assumptions are provided in Section 4.3, Air Quality, Table 4.3-4. As the number of vehicles traveling to and from the project site is expected to fluctuate over the 3-month period, this analysis provides an estimation of project traffic for the period of peak activity during the construction period and evaluates the relative effect of temporary construction traffic on the circulation system.

Operation

As described in Chapter 3, Project Description, the Proposed Project's operation and maintenance activities would generally remain similar to the existing activities that occur currently within the project site. Operation and maintenance activities associated with the Proposed Project would therefore generate nominal new traffic volume to the circulation network.

4.13.3.3 Project Impact Analysis

This section provides a detailed evaluation of transportation impacts associated with the Proposed Project.

Impact TRA-1: Conflict with a Program, Plan, Ordinance, or Policy Addressing the Circulation System (Significance Standard A). The Proposed Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. ***(Less than Significant)***

Construction

The construction of the Proposed Project was evaluated to determine study area and roadway network impacts. The Institute of Transportation Engineers' *Trip Generation, 10th Edition* (ITE 2017) does not contain trip rates for the construction-related activities that would be associated with the Proposed Project. Trip generation estimates for construction projects are based on average or peak number of workers and trucks that would be required for the proposed construction activities. Construction traffic includes the number of workers and the amount of delivery (vendor) and haul truck traffic that would be generated to and from the site daily and during the AM and PM peak commuting hours. The maximum number of construction-related trips is expected to occur over a series of construction phases that would overlap or occur concurrently. Therefore, the overall peak construction period was utilized to calculate the estimated trip generation for the Proposed Project.

Overlap of the following phases is estimated to generate peak worker and truck traffic, representing the peak construction period.

- Cofferdam and Temporary Stream Bypass System (Pipe Installation)
- New Coanda Screen Intake and Valve Vault Structures (Excavation; Doweling; Concrete Pour; New Intake Structure, Coanda Screen)
- Electrical Installations (Electrical Conduit)
- Access Stairs and Riprap Bank Stabilization (Access Stairs)

Construction would occur in 2021 over a period of approximately 3 months, targeted to occur between June and October. As described in Chapter 3, Project Description, the construction activities would occur in one 10-hour shift between 7:00 a.m. and 5:00 p.m., Monday through Friday. Although actual work hours may fluctuate within the 10-hour shift depending on the phase of construction, workers were assumed to arrive during the AM peak hour and leave the site during the PM peak hour to provide a conservative analysis. All truck trips were averaged over the 8-hour workday to estimate peak hour trips. The number of truck trips were converted using Passenger Car Equivalent (PCE) factors to account for the relatively greater impact of a larger vehicle on the circulation system. All truck trips were converted to PCE trips using a factor of 2.0 PCE for vendor trucks and 3.0 PCE for haul trucks for the purposes of this analysis.

The trip generation estimates during the peak construction period are summarized in Table 4.13-2 below and detailed information is provided in Appendix F. Construction of the Proposed Project would generate 50 daily trips, 25 AM peak hour trips (25 inbound and 0 outbound), and 25 PM peak hour trips (0 inbound and 25 outbound), during the peak construction period. With the application of PCE factors to truck trips, the Proposed Project would generate 74 total PCE daily trips, and 37 PCE trips during the AM peak hour (37 inbound and 0 outbound) and 37 PCE trips during the PM peak hour (0 inbound and 37 outbound).

These trips are anticipated to occur along Empire Grade, Smith Grade, or Bonny Doon Road. The construction-related traffic would be temporary and short term.

Table 4.13-2. Peak Day Construction Trip Generation Estimates

Vehicle Type		Daily Trips[1]	AM Peak Hour			PM Peak Hour		
			In	*Out*	*Total*	*In*	*Out*	*Total*
Cofferdam and Temporary Stream Bypass System								
Pipe Installation	Non-PCE Trips	10	5	0	5	0	5	5
	PCE-Adjusted Trips	10	5	0	5	0	5	5
New Coanda Screen Intake and Valve Vault Structures								
Excavation	Non-PCE Trips	4	2	0	2	0	2	2
	PCE-Adjusted Trips	8	4	0	4	0	4	4
Doweling and Anchorage	Non-PCE Trips	2	1	0	1	0	1	1
	PCE-Adjusted Trips	2	1	0	1	0	1	1
Installation of Rebar and Pouring Concrete	Non-PCE Trips	14	7	0	7	0	7	7
	PCE-Adjusted Trips	22	11	0	11	0	11	11
Installation of Coanda Screen	Non-PCE Trips	4	2	0	2	0	2	2
	PCE-Adjusted Trips	8	4	0	4	0	4	4
Electrical Installations								
Electrical Conduit Installation	Non-PCE Trips	4	2	0	2	0	2	2
	PCE-Adjusted Trips	6	3	0	3	0	3	3
Access Stairs and Riprap Bank Stabilization								
Access Stairs	Non-PCE Trips	12	6	0	6	0	6	6
	PCE-Adjusted Trips	18	9	0	9	0	9	9
	Project Total	**50**	**25**	**0**	**25**	**0**	**25**	**25**
	Project Total (PCE)	**74**	**37**	**0**	**37**	**0**	**37**	**37**

Source: Appendix F.
Notes: PCE = Passenger Car Equivalent
[1] Daily trips represent the number of trips to and from the project site (i.e., two trips represents one vehicle traveling to the work area and leaving the work area)

As shown in Table 4.13-2, under the peak construction phase, a maximum of approximately 37 vehicles would be added during the peak hour to this segment of Empire Grade.[1] It is estimated that with the addition of the project peak hour traffic to the existing 233 peak hour vehicles, approximately 270 peak hour vehicles would be along this segment of Empire Grade. Therefore, with the addition of project peak hour traffic to this segment of Empire Grade, the V/C ratio would increase to 0.08 and remain at LOS A. For the remaining study area roadways of Bonny Doon Road and Smith Grade, it is expected that the V/C ratio would also remain within the range of acceptable LOS (LOS D or better). Additionally, all of the peak construction phase vehicles would be temporary and would be removed from all study roadways once construction is completed.

As described above, the transportation analysis of the peak construction phase indicates that the expected number of peak hour and daily trips would not create a measurable impact to any roadways or intersections in the area and would not cause the County's transportation facilities to operate below the County's LOS policy. Furthermore, the addition of project traffic during the peak hour would not substantially change the LOS of the segment of Empire

[1] Segment of Empire Grade south of Chinquapin Road, approximately 2.5 miles east of the project site.

Grade, and LOS A conditions would remain. Additionally, as all construction activities would occur on site and nominal vehicular traffic would be added to the circulation network during construction, the Proposed Project would not conflict with the operation of existing Santa Cruz Metro transit facilities, or degrade bicycle or pedestrian facilities identified in the Circulation Element. Further, as discussed above, no pedestrian or bicycle facilities are provided along Smith Grade, at or near the project site. The Proposed Project would not increase roadway capacity, generate a permanent increase in traffic, or change traffic patterns that could cause an impact to the circulation system including transit, roadway, bicycle, and pedestrian facilities. Therefore, as construction of the Proposed Project would not conflict with adopted policies, plans, or programs addressing the circulation system, impacts would be less than significant.

Operation

Due to the nominal amount of trips generated during operations and maintenance associated with the Proposed Project, the roadway conditions in the project vicinity would not substantially differ from existing conditions as discussed in Section 4.13.1, Existing Conditions. Therefore, as operation of the Proposed Project would not conflict with adopted policies, plans, or programs addressing the circulation system, impacts would be less than significant.

Impact TRA-2: Vehicle Miles Traveled (Significance Standard B). The Proposed Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b). ***(Less than Significant)***

CEQA Guidelines Section 15064.3(b) focuses on VMT for determining the significance of transportation impacts. It is further divided into four subdivisions: (1) land use projects, (2) transportation projects, (3) qualitative analysis, and (4) methodology. The Proposed Project would be categorized under (3), qualitative analysis, as this Subdivision (b)(3) recognizes that lead agencies may not be able to quantitatively estimate VMT for every project type. In these situations, lead agencies are directed to evaluate factors such as the availability of transit, proximity to other destinations, and other factors that may affect the amount of driving required by the project. Additionally, Subdivision (b)(3) indicates that a qualitative analysis of construction traffic is often appropriate. A qualitative analysis of VMT in provided in this analysis as the Proposed Project consists of elements that would generate temporary construction-related traffic.

Furthermore, OPR's Technical Advisory provides several "screening thresholds" that may be applied to identify land use projects that should be expected to cause a less-than-significant impact without detailed study; specifically, the "screening threshold for small projects" states that projects that generate fewer than 110 daily trips generally may be assumed to cause a less-than-significant impact (OPR 2018). As shown in Table 4.13-2 above, during the peak overlapping construction phases, the Proposed Project would result in approximately 74 total PCE daily trips within the study area and roadway network. Once construction is completed, VMT would return to pre-project conditions similar to the existing operations at the Facility. Therefore, as the Proposed Project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b), impacts would be less than significant.

Impact TRA-3: Geometric Design Hazards (Significance Standard C). The Proposed Project would not substantially increase hazards due to a geometric design feature or incompatible use. ***(Less than Significant)***

Construction

As described previously, construction of the Proposed Project would result in a temporary increase in local traffic as a result of construction-related workforce traffic, material deliveries, and construction activities. The primary off-site impacts from the movement of construction trucks would include short-term and intermittent effects on traffic operations because of the slower movements and larger turning radii of delivery and haul trucks compared to passenger vehicles.

The Proposed Project would be accessed from Smith Grade via two existing access roads, the west and main access roads. During construction, both roads would be maintained and improved to allow construction vehicles safe egress and ingress. The west access road leads to the western edge of the dam, while the main access road leads to the control building and it also splits into the east access road, which leads to the eastern edge of the dam. All parking and staging areas for construction would occur on site, and would not block traffic along Smith Grade.

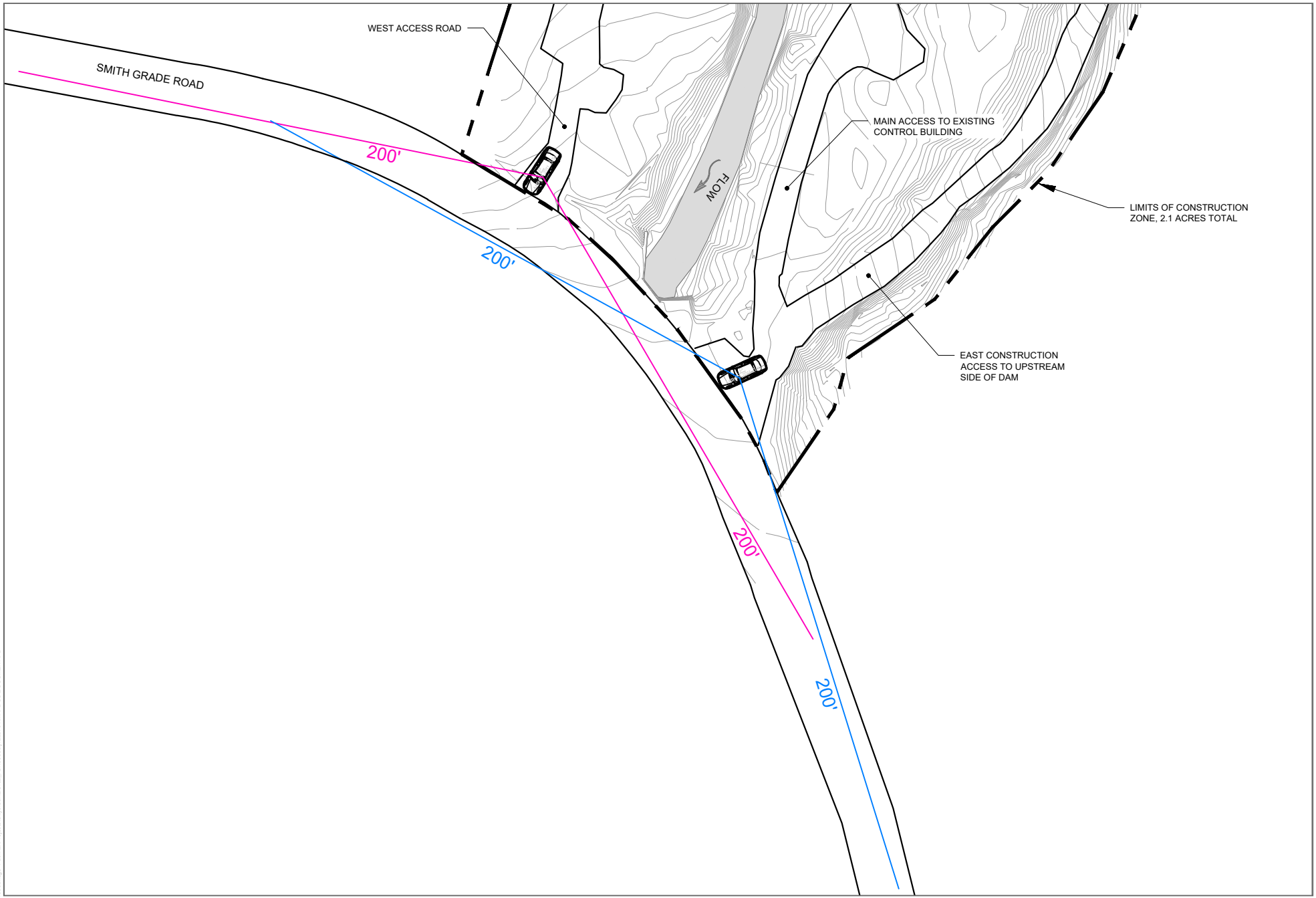
In order to fully evaluate the safety of egress from the two access roads onto Smith Grade, a sight distance analysis was performed. As discussed above, Smith Grade does not have posted speed limits; however, advisory speed signs along the roadway allow for average speeds that range between 30 and 40 mph. Although no advisory speed signs are posted in the vicinity of the project site, the sight distance analysis was conducted for a roadway designed for 30 mph to account for the curved roadway/turns along this section of Smith Grade near both access roads. Figure 4.13-1 shows the expected sight distance visible from both the west access road and main access road.

The American Association of State Highway and Transportation Officials (AASHTO) identifies sight distance in *A Policy on Geometric Design of Highways and Streets* (*The Green Book)* as the length of the roadway ahead that is visible to a driver, and should be long enough to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path (AASHTO 2018). Safe conditions for a vehicle waiting at the access driveways and motorists traveling along Smith Grade would exist when adequate stopping sight distance, the length required for a vehicle to react and stop to an object in its path, is available. The AASHTO Green Book (Table 3-1) recommends a stopping sight distance of approximately 200 feet at speeds of 30 mph. As such, a clear line of sight of 200 feet from a motorist traveling southbound and northbound along Smith Grade to a vehicle exiting either of the access driveways would provide safe conditions for motorists traveling along Smith Grade and for those maneuvering from one of the access driveways onto Smith Grade. As shown in Figure 4.13-1, the sight distance lines primarily extend along the Smith Grade right-of-way, where brush, trees, or other obstacles would not obscure views. Additionally, review of the access driveways indicates that potential obstructions to a clear line of sight are minimal, as foliage is generally low-growing between the fence line and Smith Grade and overhanging branches are generally above eye-level at the driveways. Furthermore, the Proposed Project would require an encroachment permit from the County, which includes development and approval of a Traffic Control Plan for ingress to/egress from the project site, as indicated in Section 3.8, Project Permits and Approvals, and would address access and ensure safety for construction vehicle movement near the site.

As discussed in Chapter 3, Project Description, the Proposed Project identifies potential improvements to the access roads, including limited tree removal to accommodate road widening, grading, compaction, and placement of aggregate. The locations of both driveways would remain unchanged, and the aforementioned improvements would not introduce sharp curves or degrade the conditions of either driveway's intersection with Smith Grade. Additionally, construction equipment would be hauled to and from the Project site, and all construction activities would occur on-site, beyond the Smith Grade right-of-way. The Proposed Project would not entail the introduction of incompatible uses on Smith Grade. Therefore, as construction of the Proposed Project would not introduce hazardous design features or incompatible land uses, impacts would be less than significant.

Operation

Once operational, the Proposed Project would generate nominal traffic and vehicle trips associated with routine maintenance of the Facility similar to existing conditions, and therefore, would not create hazardous roadway conditions. Therefore, as operation of the Proposed Project would not result in hazardous design features or incompatible land uses, impacts would be less than significant.



SOURCE: AASHTO 2011, City of Santa Cruz 2020, Black & Veatch 2020

DUDEK

0 24 48 Feet

FIGURE 4.13-1

Sight Distance Analysis

Laguna Creek Diversion Retrofit Project - EIR

Impact TRA-4: Emergency Access (Significance Standard D). The Proposed Project would not result in inadequate emergency access. ***(Less than Significant)***

As discussed above and shown on Figure 4.13-1, two access roads, the west access road and the main access road, provide ingress to and egress from the project site via Smith Grade. As discussed in Chapter 3, Project Description, both access roads would be cleared of excess vegetation and maintained so that construction traffic could access either side of the dam during the construction period. Emergency vehicles would be able to access the site from the west or main access road, and the improvements noted above would not degrade the conditions of either access road from existing conditions. Therefore, with the Proposed Project, access roads would continue to comply with all applicable local requirements related to emergency vehicle access and circulation identified in the Santa Cruz County Fire Code, and the Proposed Project would not result in inadequate emergency access. During operation, the Proposed Project would generate limited vehicle trips associated with routine maintenance of the Facility, similar to existing conditions, and there would be no changes to emergency access to the site or in the vicinity. Therefore, the Proposed Project would not obstruct emergency access and impacts associated with inadequate emergency access would be less than significant.

4.13.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative transportation impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.1-1 in Section 4.1, Introduction to Analysis, and as relevant to this topic. The geographic area for the impact analysis is identified as the project site along with the extent of Empire Grade, Smith Grade, and Bonny Doon Road that would support haul truck, vendor truck, and worker vehicle access to the project site.

Impact TRA-5: Cumulative Transportation Impacts (Significance Standards A, B, C, and D). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to transportation. ***(Less than Significant)***

The known cumulative projects planned within the project vicinity include the Santa Cruz Water Rights Project, the Laguna Pipeline portion of the North Coast System Repair and Replacement Project, and the Reggiardo Diversion upgrade identified in the Anadromous Fisheries Habitat Conservation Plan. The Santa Cruz Water Rights Project would not result in construction within the Laguna Watershed and would not result in operational changes related to the Proposed Project that would affect transportation. Although the Laguna Pipeline and Reggiardo Diversion upgrade would entail limited construction within the project vicinity, they would occur several years after construction of the Proposed Project.

As indicated in Section 4.1, there are not any known substantive proposed or pending development projects in the project vicinity that would be under the jurisdiction of the County. However, if any such projects are proposed they would be subject to County approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize transportation impacts. It is not anticipated that the cumulative projects would contribute a substantial amount of vehicle trips to the study area along Empire Grade, Smith Grade, or Bonny Doon Road. As described above, the Proposed Project would generate a minor amount of trips associated with the construction and no change in trips is anticipated with operations and maintenance of the Facility, which would be similar to existing conditions. The cumulative projects, in addition to the Proposed Project, would not combine to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Additionally, the cumulative projects, in addition to the Proposed Project, would not combine to create inadequate emergency access conditions within the study area or near the project

site. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the geographic area, would result in less-than-significant cumulative impacts to transportation, and no mitigation measures are required.

4.13.3.5 Mitigation Measures

As described above, the Proposed Project would not result in any significant transportation impacts, and therefore, no mitigation measures are required.

4.13.4 References

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5 Other CEQA Considerations

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. The environmental impact report (EIR) must also discuss (1) significant environmental effects of the proposed project, (2) significant environmental effects that cannot be avoided if the proposed project is implemented, (3) significant irreversible environmental changes that would result from implementation of the proposed project, and (4) growth-inducing impacts of the proposed project.

This chapter summarizes the significant environmental effects that cannot be avoided if the Laguna Creek Diversion Retrofit Project (Proposed Project) is implemented (i.e. significant unavoidable impacts). It also addresses the significant irreversible environmental changes and growth-inducing impacts of the Proposed Project. An evaluation of the significant environmental effects of the Proposed Project, applicable mitigation measures, the level of impact significance before and after mitigation, and evaluation of cumulative impacts, is provided in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. Chapter 6, Project Alternatives, addresses alternatives to the Proposed Project.

5.1 Significant Unavoidable Impacts

The CEQA Guidelines require a description of any significant impacts, including those that can be mitigated but not reduced to a level of insignificance (Section 15126.2[b]). Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described. This EIR identified no significant unavoidable project or cumulative impacts.

5.2 Significant Irreversible Environmental Changes

The CEQA Guidelines require a discussion of significant irreversible environmental changes with project implementation, including uses of nonrenewable resources during the initial and continued phases of the project (Section 15126.2[c]). As described in Section 15126.2(c), uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts, such as those arising from highway projects that provide access to a previously inaccessible area, generally commit future generations to similar uses. Irreversible damage can also result from environmental accidents associated with the project.

According to Section 15126.2(c), a project would generally result in a significant irreversible impact if:

- The project would involve a large commitment of nonrenewable resources during initial and continued phases of the project;
- Primary and secondary impacts would generally commit future generations to similar uses;
- The project would involve uses in which irreversible damage could result from environmental accidents; or
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

Implementation of the Proposed Project would involve the use of a limited amount of nonrenewable resources. Specifically, the construction of the Proposed Project would require the use of fossil fuels, construction materials, and labor. These expenditures would be, for the most part, irrecoverable. However, the Proposed Project would use a limited amount of such resources and their use for this project would not impede the continued availability of these resources for other projects. Proposed Project operation would continue the existing land use on the project site; therefore, it would not commit future generations to land uses that do not already exist. As evaluated in Section 4.6, Energy, the demand for energy during construction would be minor and demand during operation would not substantially increase over existing conditions.

Irreversible changes to the physical environment could occur from accidental release of hazardous materials associated with construction activities. However, construction and operation of the Proposed Project would entail use of a limited quantity of hazardous materials, such as fuel for equipment during construction and for the backup emergency generator during operations. Additionally, as described in Section 4.9, Hazards and Hazardous Materials, environmental accidents would be minimized through adherence to federal, state, and local regulations and through application of the City's Standard Construction Practices, described in Section 3.6.3, Standard Construction Practices, which include measures to prevent accidental release of hazardous materials and development of emergency plans that outline procedures to follow in the event of an accidental release. Therefore, the potential for accidental release of hazardous materials would be less than significant.

No other irreversible changes are expected to result from the construction or operation of the Proposed Project.

5.3 Growth-Inducing Impacts

CEQA requires that any growth-inducing aspect of a project be discussed in an EIR. This discussion should include consideration of ways in which the project could directly or indirectly foster economic or population growth in adjacent and/or surrounding areas. Projects that could remove obstacles to population growth, such as expansion of major public services, must also be considered in this discussion.

According to CEQA Guidelines Section 15126.2(e), a project would have the potential to induce growth if it would:

- Remove obstacles to population growth (e.g., through the expansion of public services into an area that does not currently receive these services), or through the provision of new access to an area, or a change in restrictive zoning or land use designation; or
- Result in economic expansion and population growth through employment opportunities and/or construction of new housing.

The Proposed Project would consist of modifications and improvements to infrastructure at the existing Laguna Creek Diversion Facility (Facility) to protect a critical water supply for the City by addressing constraints, improving environmental conditions on site and downstream of the site, improving operational efficiency, improving safety and access at the Facility, and implementing a project that is relatively cost-effective. The Proposed Project would not entail an increase in the amount of water diverted at the Facility, procurement of additional water supplies, or expansion of public services into areas that do not currently receive these services. Thus, the Proposed Project would not directly or indirectly remove obstacles to population growth. As discussed in Section 4.2.4, Population and Housing, the Proposed Project would not result in economic expansion, population growth, new housing, or substantial new employment opportunities. As an improvement to an existing water supply facility, the Proposed Project would not result in uses that would directly or indirectly induce substantial economic growth.

6 Alternatives

This chapter describes alternatives to the proposed Laguna Creek Diversion Retrofit Project (Proposed Project), consistent with CEQA Guidelines Section 15126.6. This chapter presents the objectives of the project, a summary of its significant environmental impacts, and a description of the alternatives that were considered but rejected from further consideration, followed by an analysis of the three alternatives evaluated, including the No Project Alternative. A comparison of the three alternatives to the Proposed Project is provided and the environmentally superior alternative is identified.

According to CEQA Guidelines Section 15126.6, an environmental impact report (EIR) shall describe a range of reasonable alternatives to the project or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. The guidelines further require that the discussion focus on alternatives capable of eliminating significant adverse impacts of the project or reducing them to a level of insignificance even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly. The alternatives analysis also should identify any significant effects that may result from a given alternative.

The lead agency is responsible for selecting a reasonable range of potentially feasible project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The range of alternatives is governed by a "rule of reason" that requires the EIR to set forth only those potentially feasible alternatives necessary to permit a reasoned choice. The alternatives shall be limited to those that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only those that the lead agency determines could feasibly attain most of the basic objectives of the project. An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

An EIR is not required to consider alternatives which are infeasible. "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines Section 15364). Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or already owns the alternative site). None of these factors establishes a fixed limit on the scope of reasonable alternatives.

6.1 Project Objectives

As described above, alternatives considered in the EIR should be feasible, and should attain most of the basic project objectives. The project objectives, identified in Chapter 3, Project Description, of this EIR are as follows:

- Protect a critical water supply for the City by addressing constraints at the Facility to maintain full system functionality and minimize service interruptions.
- Improve environmental conditions at both the intake with upgraded screen technology for fish protection and in downstream reaches by facilitating sediment movement to support aquatic species habitat.

- Improve overall operational efficiency by incorporating technology that allows for fine-tuned control of diversion rates to enhance the SCWD's ability to meet instream flow requirements and regulation of water levels downstream of the Facility.
- Improve safety and access at the Facility to facilitate the City's ability to maintain the Facility and conduct operational activities.
- Implement a project that is relatively cost-effective in terms of both capital and operation/maintenance costs.

6.2 Overview of Significant Project Impacts

Alternatives should focus on reducing or avoiding significant environmental impacts associated with the project as proposed. As described in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the Proposed Project would result in the following significant or potentially significant environmental impacts that could result during construction. All of these impacts would be reduced to a less-than-significant level through incorporation of mitigation measures. The Proposed Project would not result in significant impacts during operations.

- **Impact BIO-1: Special-Status Species.** The Proposed Project could have a substantial adverse effect on special-status species during construction.
- **Impact BIO-2: Sensitive Vegetation Communities.** The Proposed Project could have a substantial adverse effect on the redwood forest alliance vegetation community during construction that would result in both temporary and permanent impacts.
- **Impact BIO-3: Jurisdictional Wetlands and Waters.** The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts.
- **Impact CUL-1: Historical Resources.** The Proposed Project could cause a substantial adverse change in the significance of the Laguna Creek Dam, which is a historical resource, due to modifications of the Facility that would occur during construction.
- **Impact CUL-2: Archaeological Resources.** The Proposed Project could cause a substantial adverse change in the significance of an archaeological resource during construction.
- **Impact CUL-3: Human Remains.** The Proposed Project could inadvertently disturb human remains during construction.
- **Impact CUL-4: Tribal Cultural Resources.** The Proposed Project could cause a substantial adverse change in the significance of a tribal cultural resource during construction.
- **Impact GEO-4: Paleontological Resources.** The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature.
- **Impact NOI-1: Substantial Increase in Ambient Noise Levels.** The Proposed Project would result in generation of a substantial temporary increase in ambient noise levels during construction in the vicinity of the project in excess of applicable standards. However, the Proposed Project would not result in generation of a substantial permanent increase in ambient noise levels during operation.
- **Impact NOI-2: Groundborne Vibration.** The Proposed Project would result in the potential generation of excessive groundborne vibration or groundborne noise levels during construction.

6.3 Alternatives Considered but Eliminated

This section discusses alternatives that were considered but were eliminated from detailed consideration because they did not meet most of the basic project objectives; were found to be infeasible for technical, environmental, or social reasons; or they did not avoid significant environmental impacts.

The City considered the following alternatives, which were eliminated from further consideration as explained below:

- Abandon Dam and Secure Alternate Water Source
- Relocate Dam
- Infiltration Gallery/Filter Bed
- Reed Bed Filter/French Drain
- Outlet Valve Improvements

6.3.1 Abandon Dam and Secure Alternate Water Source

The Water Supply Augmentation Strategy for the City does not consider abandonment of any of its surface water sources, including the Laguna Creek Dam and diversion. Rather, to fill the agreed-upon worst-year gap of 1.2 billion gallons per year during modeled worst-year conditions, the Water Supply Advisory Committee (WSAC) Final Report on Agreements and Recommendations (October 2015), which was incorporated by reference into the 2015 Urban Water Management Plan (SCWD 2016) includes the following Water Supply Augmentation Strategy portfolio elements (WSAC 2015):

- **Element 0:** Additional water conservation with a goal of achieving an additional 200 to 250 million gallons per year of demand reduction by 2035 by expanding water conservation programs.
- **Element 1:** Passive recharge of regional aquifers by working to develop agreements for delivering surface water to the Soquel Creek Water District and/or the Scotts Valley Water District[1] so they can rest their groundwater wells, help the aquifers recover, and potentially store water for use by SCWD in drought years.
- **Element 2:** Active recharge of regional aquifers by using existing infrastructure and potential new infrastructure in the Purisima aquifer in the Soquel-Aptos Basin,[2] in the Santa Margarita/Lompico/Butano aquifers[3] in the Scotts Valley area, or in both to store water that can be available for use by the City in drought years.
- **Element 3:** A potable water supply using advanced-treated recycled water as its source as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the goals of cost-effectiveness, timeliness, or yield. In the event advanced-treated recycled water does not meet the City's needs, desalination would become Element 3.

An alternative that abandons the Laguna Creek Dam was eliminated from detailed consideration, as abandoning the dam would not meet the primary project objective to protect the Laguna Creek diversion as an important water supply for the City. Such an alternative was also eliminated as it would require the City to reconsider its Water Supply Augmentation Strategy to replace the water diverted from Laguna Creek with some other source of supply.

1 While WSAC recommendations considered only delivering surface water to Soquel Creek Water District and the Scotts Valley Water District, current planning considers delivering surface water to San Lorenzo Valley Water District and Central Water District as well.

2 The Soquel-Aptos Basin is now referred to as the Mid-County Groundwater Basin.

3 The Santa Margarita/Lompico/Butano aquifers are now referred to as the Santa Margarita Groundwater Basin.

6.3.2 Relocate Dam

The 2005 Program EIR for the North Coast System Repair and Replacement Project (SCWD 2005) considered but dismissed an alternative, called Laguna Alternative 5, which would have relocated the Laguna Creek Dam downstream from its current location to a location in the anadromous reach of the creek near the mouth of Laguna Creek. The alternative also included a new pump station and distribution piping. This alternative was dismissed from detailed evaluation in the 2005 EIR as: (1) it would require the City to acquire property and access to a new dam site; (2) it would permanently consume steelhead and coho salmon spawning and rearing habitat; (3) it would be required to provide upstream and downstream passage for steelhead and coho salmon, in an area where passage is currently unimpeded; (4) it would need to be constructed in a reach that is heavily used by California red-legged frog; (5) the location in the anadromous reach could reduce the quality of water obtained by the City and could reduce water availability during the dry season, as the diversion would be downstream of several small diversions that the City has no control over; and (6) it would likely be visible from State Route 1, which is a designated scenic highway, and other coastal vantage points. This alternative was also considered but eliminated from detailed consideration in this EIR as it would not meet the basic objectives of the Proposed Project and would not reduce the significant and potentially significant impacts of the Proposed Project. Specifically, this alternative would cause greater or additional impacts than the Proposed Project, related to steelhead and coho salmon, California red-legged frog, and coastal views.

6.3.3 Infiltration Gallery/Filter Bed

This alternative would use an infiltration gallery to divert water at the same location that water is currently diverted at the Facility. In order to construct the system, this alternative would entail the removal of sediment from behind the dam and replacement of that material with a permeable filter bed and subsurface collector pipe system. The system would be comprised of a multi-stage filter bed arrangement located within the Laguna Creek reservoir (upstream of the dam) using a patented sludge dewatering bed technology that was developed to separate water from solids in the water/wastewater industries. The technology enhances drainage by preventing compaction of the filter media, by uniformly distributing solids across the surface of the filter, and by natural development of vacuum-assisted gravity drainage upon release of impounded saturation water. This alternative would not affect the dam itself.

As described above, the infiltration gallery and filter bed would be installed upstream of the dam. The sediment upstream of the dam would be excavated to several feet below the surface of the creek bed for the full width of the creek and a concrete perimeter wall would be constructed. Within the perimeter wall, the filter bed, consisting of filter sand, pea gravel, and drain rock, would be installed. Beneath the filter bed, a perforated infiltration pipe would collect water and divert it to the existing flume. Sediment would need to be periodically mechanically removed from the filter bed to maintain the drainage capacity of the filter. This alternative would have a relatively large area of permanent impact within the creek bed.

This alternative was considered but eliminated from detailed consideration due to uncertainty about its long-term performance and maintenance requirements. The reliability of this alternative is uncertain as storm events could wash out the materials within the filter bed, introducing these materials into downstream reaches of Laguna Creek. In addition, sediment deposited from storm events in the filter bed would reduce its performance, both in terms of water quality and flow. Annual maintenance would be necessary to maintain the filter bed, requiring dewatering of the reservoir, removal of accumulated sediments, and/or replacement of washed out filter bed material.

6.3.4 Reed Bed Filter/French Drain

This alternative is similar to the Infiltration Gallery/Filter Bed alternative described above, but it would use native materials for the filter bed. Excavation upstream of the dam would be required to install a perforated pipe and install native filter bed materials. Water would be pumped to the City's system through the perforated pipe, similar to the Infiltration Gallery /Filter Bed alternative. This alternative was ultimately eliminated from detailed consideration because it would require power in order to operate the system, as well as concerns over clogging and potential failure.

6.3.5 Sediment Bypass Valve Improvements

This alternative would entail improvements to the sediment bypass valves in the dam, including enlarging the existing valves or adding additional valves in the dam. In addition, the fish screen would be upgraded. This alternative was considered but eliminated from detailed consideration because the existing sediment bypass valves in the dam are not reliable and the construction of enlarged or additional valves would be likely to result in similar clogging issues and continue to require periodic excavation of sediment from upstream of the dam.

6.4 Alternatives Selected for Further Analysis

This section describes the alternatives to the Proposed Project that were selected and analyzed according to CEQA Guidelines Section 51526.6(a). These alternatives, including the No Project Alternative, represent a reasonable range of alternatives to the Proposed Project that would feasibly attain most of the project's basic objectives, and would avoid or substantially lessen significant adverse environmental effects of the Proposed Project.

The selected alternatives were based on engineering options previously considered by the SCWD, as well as an assessment of ways to reduce significant impacts of the Proposed Project. The following three alternatives, which are summarized in Table 6-1, were selected for comparative analysis in this EIR:

- **No Project Alternative.** This alternative would entail no action at the project site.
- **Alternative 1 (Spillway Gate and Fish Screen).** This alternative would entail installing a new cylindrical fish screen at the existing intake that would be compliant with fish protection regulations; cutting a notch in the dam and installing a spillway gate on a new support structure and having a spillway chute at the face of the dam to achieve sediment transport; and installing riprap protection along the base of the spillway and along the bank.
- **Alternative 2 (Plate Screen with Brush).** This alternative would entail replacing the existing intake screen with a new vertical plate screen that would be compliant with fish protection regulations and would have an automated mechanical traveling brush system to keep the screen clear of excess sediment.

The analysis below presents the alternatives to the Proposed Project that were considered. Each alternative is examined for its ability to reduce environmental impacts relative to the Proposed Project, feasibility of implementation, and ability to meet project objectives. Table 6-2 shows each alternative's ability to meet the project objectives, relative to the Proposed Project's ability to fully achieve the objectives.

Table 6-1. Summary of Alternatives

Characteristic	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Description	Continue to operate under existing conditions through expiration of the Section 1602 Lake or Streambed Alteration Agreement permit at which time maintenance would not be possible (no work within channel)	Notch dam and install support structure and spillway chute on face of dam Pneumatically operated crest gate in notch Riprap apron on bank and possibly in streambed below chute Rotating cylindrical fish screen with static brushes to be installed at face of existing intake	Same as existing, but with replacement of existing intake screen with new compliant screen
Temporary Footprint	None	Larger than Proposed Project	Less than Proposed Project
Permanent Footprint	None	Larger than Proposed Project with protruding spillway chute from face of dam	Minimal increase relative to existing conditions; less than Proposed Project
Modifications to Laguna Creek Dam	None	Greater than to Proposed Project	None

Table 6-2. Ability of Alternatives to Meet Project Objectives

Objective	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Objective #1: Protect a critical water supply for the City by addressing constraints at the Facility to maintain full system functionality and minimize service interruptions.	Poor	Good	Poor
Objective #2: Improve environmental conditions at both the intake with upgraded screen technology for fish protection and in downstream reaches by facilitating sediment movement to support aquatic species habitat.	Poor	Good	Moderate
Objective #3: Improve overall operational efficiency by incorporating technology that allows for fine-tuned control of diversion rates to enhance the SCWD's ability to meet instream flow requirements and regulation of water levels downstream of the Facility.	Moderate	Excellent	Poor
Objective #4: Improve safety and access at the Facility to facilitate the City's ability to maintain the Facility and conduct operational activities.	Poor	Poor	Moderate
Objective #5: Implement a project that is relatively cost-effective in terms of both capital and operation/ maintenance costs.	Poor	Poor	Moderate

Note: The Proposed Project would fully achieve (i.e., have excellent achievement) of each of the project objectives listed above.

6.4.1 No Project Alternative

The No Project Alternative is described below, followed by a discussion of its impacts relative to the Proposed Project and its ability to meet the project objectives.

6.4.1.1 Description

CEQA Guidelines Section 15126.6(e)(3)(B) describes the "No Project" Alternative as the circumstance under which the project does not proceed. The purpose of describing and analyzing a No Project Alternative is to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project (CEQA Guidelines Section 15126.6[e][1]). The No Project Alternative includes those activities that would reasonably be expected to occur in the foreseeable future if the Proposed Project were not approved.

The Facility would continue to operate under existing conditions through expiration of the existing Section 1602 Lake or Streambed Alteration Agreement (SAA) permit issued for the Facility at which time maintenance work within the creek channel would not be possible.[4] As the existing intake screen is not compliant with fish protection requirements, modifications to the intake are expected to be a condition of the California Department of Fish and Wildlife's (CDFW's) re-issuance of the Section 1602 SAA permit. Therefore, the No Project Alternative assumes that CDFW would not re-issue the permit for creek channel maintenance.

Therefore, after expiration of the permit, excavation at the intake screen or behind the dam to maintain the operations of the intake would not be possible. In the absence of the City's sediment management, the intake screen would eventually become blocked by sediment or the creek channel would migrate away from the intake. In the event that the creek channel migrates away from the left/east bank where the intake is located, the intake would no longer be able to divert water to the City's water supply.

In the absence of a storm event that transports sediment to block the intake or causes the creek to migrate away from the intake, the No Project Alternative would continue to operate the same as under existing conditions. Other existing maintenance activities would continue, except for creek sediment management. However, as a result of sediment movement during a storm event or the gradual buildup of sediment over time, the intake would ultimately become inoperable and prevent the use of the Facility as a source of water supply to the City.

The No Project Alternative would not require construction and would have similar operations and maintenance activities to existing conditions, except that sediment management would differ as described above. In addition, once the intake is no longer operable, operations activities would cease.

6.4.1.2 Impact Analysis

Under the No Project Alternative, the Proposed Project would not be constructed. Therefore, the construction-related impacts to biological resources, cultural resources, paleontological resources, and noise and vibration identified in this EIR and listed above in Section 6.2, Overview of Significant Project Impacts, would not occur. In addition, the other impacts related to construction activities for the Proposed Project (identified as less than significant) would not occur, including to air quality, greenhouse gas emissions, transportation, energy, land use and planning, or hazards and hazardous materials. However, the No Project Alternative would also not realize the benefits of the

[4] Current permit (#1600-2013-0291-R3) expires in December 31, 2021.

Proposed Project to biological resources and hydrology and water quality due to the lack of improved sediment transport and compliant fish screen.

As described above, at some point in time after the existing Section 1602 Lake or Streambed Alteration Permit expires at the end of 2021, the Facility would ultimately become inoperable as the intake would eventually become blocked with sediment or the creek channel would migrate away from the intake. Therefore, the Facility would ultimately no longer function as a water management structure under the No Project Alternative. As discussed in Section 4.5, Cultural Resources and Tribal Cultural Resources, the Laguna Creek Dam is a historical resource, and the dam's continued function as a water management structure is one of the resource's essential character-defining features that enables it to convey its significance. Therefore, the loss of the Facility's function could cause a substantial adverse change in the significance of the Laguna Creek Dam. This impact to the historical resource would be significant and unavoidable as no mitigation measures are available to reduce this to a less-than-significant impact.

Overall, the No Project Alternative would avoid the significant construction-related impacts of the Proposed Project but would result in a significant unavoidable impact to cultural resources. Other project or cumulative impacts of the Proposed Project would also not occur under this alternative. Furthermore, it would not achieve benefits of the Proposed Project to biological resources and hydrology and water quality.

6.4.1.3 Ability to Meet Project Objectives

The No Project Alternative would moderately achieve one of the five project objectives and would have poor achievement of four objectives, as described below. Overall, the No Project Alternative would not achieve the project objectives.

The No Project Alternative would have **poor** achievement of the objective to protect the City's Laguna Creek water supply (**objective #1**) as it would jeopardize the reliability and long-term use of the Laguna source and prevent the City's continued ability to use the Facility for delivery of high-quality water to the City's water treatment plant, due to the anticipated failure of the Facility. The No Project Alternative would have **poor** achievement of the objective to improve environmental conditions (**objective #2**), as the screen would continue to not meet criteria for fish protection and the dam would not support natural sediment transport. The No Project Alternative would have **moderate** achievement of the objective to improve operational efficiency (**objective #3**) until the system fails and water intake is reduced/eliminated. This alternative would have **poor** achievement of the objective to improve safety and access (**objective #4**) as no improvements would be made at the Facility. The No Project Alternative would have **poor** achievement of the cost-effective objective (**objective #5**). While the cost of the No Project Alternative would be relatively minimal with limited operations and maintenance costs, it would not be cost-effective for the City to lose this source of water supply and it would not achieve any of the benefits that would occur under the Proposed Project.

6.4.2 Alternative 1: Spillway Gate and Fish Screen

Alternative 1 (Spillway Gate and Fish Screen) is described below, followed by a discussion of its impacts relative to the Proposed Project and its ability to meet the project objectives.

6.4.2.1 Description

Alternative 1 would manage sediment by installing a spillway gate along a portion of the crest of the dam and improve fish protection by installing a new intake screen technology. Alternative 1 would entail a spillway gate installed along a notch in the left/east abutment (from the vantage point of looking downstream) of the dam. Additionally, it would include a new cylindrical fish screen installed at the existing intake structure to protect fish from entrainment and impingement in the intake.

Alternative 1 would generally have similar type of features resulting in permanent and temporary footprints at the site of the Proposed Project, but both temporary and permanent footprints would be larger than those under the Proposed Project. The existing intake would continue to be used but water would be collected through a new cylindrical screen, which would extend into the creek and convey water into the existing intake structure. A larger notch than required for the Proposed Project would be removed from the dam for the installation of the spillway gate and its support structure. Riprap bank stabilization would be required along the left/east streambank. Key elements of this alternative are listed below in Table 6-3.

Table 6-3. Comparison of Design Features for Alternative 1 to the Proposed Project

Alternative 1 Component	Alternative Comparison to Proposed Project
Notch existing dam (5 feet deep × 10 feet wide)	Alternative would have deeper notch and slightly less wide, with overall greater material to be removed from dam (Proposed Project notch would be 16 inches deep × 12 feet wide)
Support structure and spillway chute near left/east abutment on downstream face of dam	Alternative would have larger footprint for support structure, with spillway chute substantially protruding from face of dam compared to Proposed Project
Pneumatically operated crest gate (5 feet high × 7.5 feet deep × 10 feet wide) installed in notch	No similar features proposed under Proposed Project
Riprap apron on bank and possibly in streambed below chute	Alternative anticipated to require a larger footprint than the riprap bank stabilization required for the Proposed Project
New rotating cylindrical fish screen (2.5 feet diameter × 7 feet long) having with static brushes to be installed at face of existing intake, and minor modifications at intake	No similar features proposed under Proposed Project

Source: B&V 2019.

Spillway Gate

Alternative 1 would use an operable spillway gate to maintain sediment transport through the dam during periods of high turbidity and sediment load and prevent sedimentation build-up upstream of the dam and maintain the channel adjacent to the intake. The spillway gate would be automated to recline as a function of creek turbidity, concentrating flows through the notch in the dam to produce higher transport velocities and keeping entrained sediments mobilized. As a result, the channel would be deepened and self-sustaining, avoiding the need for dredging the reservoir and supporting the functionality of the self-cleaning fish screen so that it does not become buried by sediment.

The key element of this alternative is a pneumatically controlled spillway gate, which would be approximately 5 feet high by 10 feet wide, as shown in Figure 6-1 and Figure 6-2. The bottom-hinged spillway gate would use an air bladder behind the gate leaf to operate the gate panel. The bladder inflates to raise the gate leaf and deflates to lower it flush with its support foundation. The complete gate system would consist of a reinforced concrete structure, hinge plate and embeds, ribbed gate leaf, air bladder, instrument and supply/discharge piping, compressed air system, and controls.

Cylindrical Fish Screen

Alternative 1 would include installation of a self-cleaning removable cylindrical fish screen, as shown in Figure 6-1 and Figure 6-2. This screen technology consists of a cylindrical wedge-wire element with an internal ported baffle pipe that evenly distributes flow into the screen over its entire surface area. The screen element is affixed to the baffle pipe at the distant end via a hydraulic or submersible electrical drive motor. The motor rotates the screen element as prompted by the control panel against a pair of fixed internal and external brushes.

Construction

Construction of Alternative 1 would require a longer construction duration than the Proposed Project, by approximately 1 month, due to the larger area of excavation and greater number of components to be installed. Overall, construction would be anticipated to occur over 4 months during the low-flow period (June to October).

Construction activities would be generally similar to those required for the Proposed Project and would include: (1) improvement of access roads, site preparation, and mobilization; (2) installation of a cofferdam and temporary creek bypass system; (3) construction of the gate support structure and spillway chute, including dam preparation, foundation work, dam notching, and concrete formwork; (4) installation of the pneumatically operated crest gate in the dam notch; (5) installation of the riprap apron along the bank and possibly in the streambed below the spillway chute; (6) installation of the rotating cylindrical fish screen at the face of the existing intake and minor modifications to the intake; (7) installation of electrical; and (8) startup and testing, site restoration, and construction closeout.

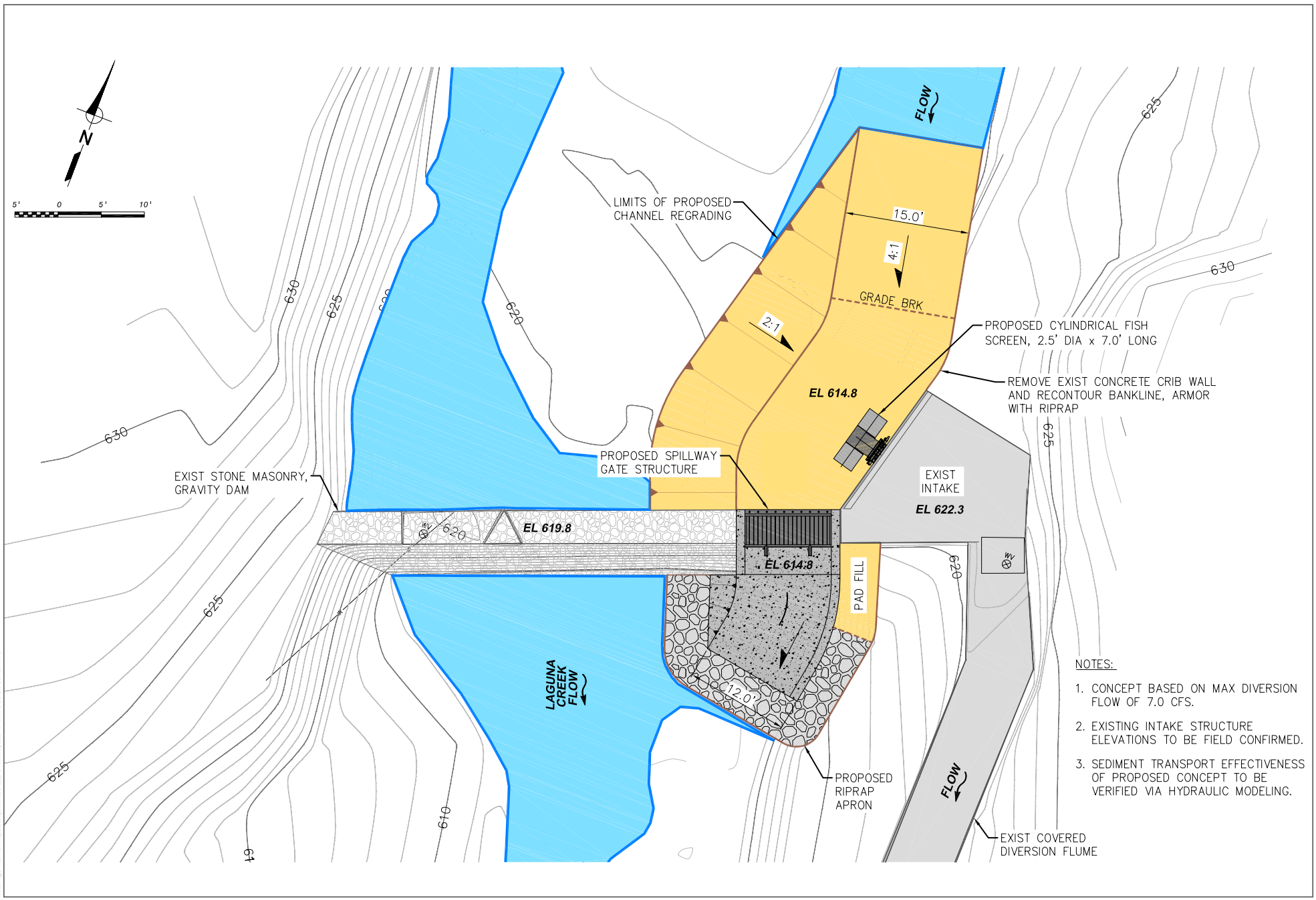
Similar to the Proposed Project, Alternative 1 would require use of heavy equipment such as excavators, drill rigs, forklifts, graders, tractors, loaders, backhoes, dumpers, and generators. Alternative 1 would have an incrementally greater number of construction worker vehicle trips due to the longer construction duration and increased amount of materials required.

Operation

Alternative 1 would have a maximum diversion capability of approximately 7 cubic feet per second, similar to the existing conditions, as well as the Proposed Project.

Operations would remain generally similar to existing operations similar to the Proposed Project with weekly checks, monthly cleaning and inspections, annual inspections of equipment and service of the generator, and road maintenance every 5 years. Similar to the Proposed Project, Alternative 1 would not require periodic sediment removal from behind the dam.

However, Alternative 1 is anticipated to require increased ongoing maintenance compared to the Proposed Project due to the design, which would be subject to potential power interruptions, have moving parts that could require repair, and lack system redundancy as it would not include an emergency water supply bypass system. This increased maintenance would likely require a limited number of increased trips to the site during the life of the alternative. In addition, the design would require a minor increase in energy use for operation of the gate compared to the Proposed Project.



SOURCE: Black & Veatch 2019

FIGURE 6-1

Alternative 1 - Spillway Gate and Fish Screen (Plan View)

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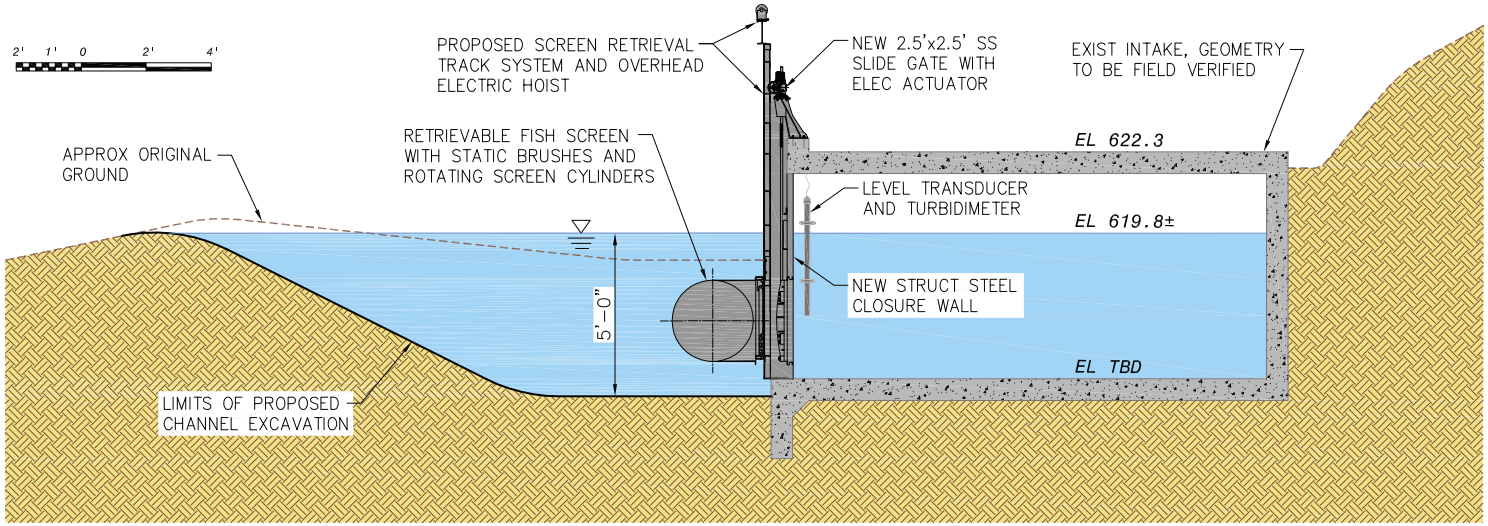
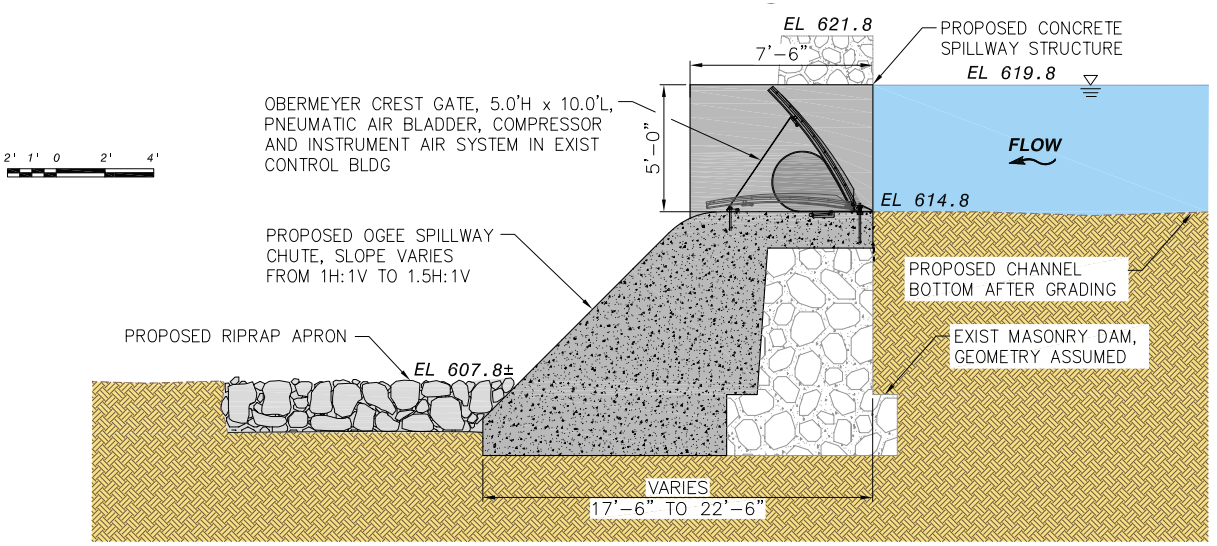
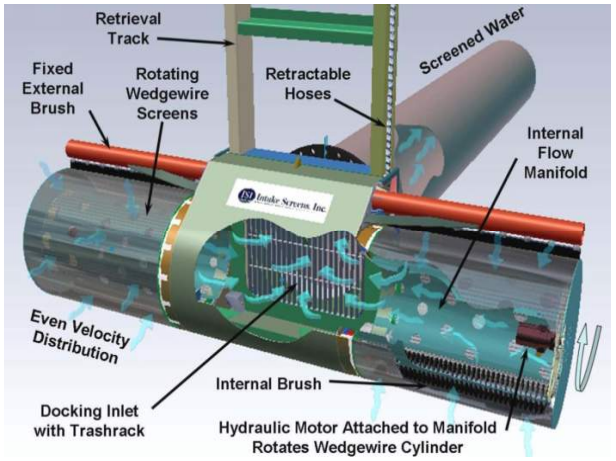


Proposed Cylindrical Fish Screen at Existing Intake (Cross -section)



Proposed Spillway Gate Structure (Cross-section)



Screen Schematic

SOURCE: Black & Veatch 2019

FIGURE 6-2

Alternative 1 - Spillway Gate and Fish Screen (Section Views)

Laguna Creek Diversion Retrofit Project - EIR

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6.4.2.2 Impact Analysis

The potential project impacts of Alternative 1 are described below, and Table 6-4 on page 6.5-21 shows a comparison of the Proposed Project's impacts to those of the alternatives. Cumulative impacts under this alternative would generally be similar to those of the Proposed Project as shown in Table 6-4.

Biological Resources

Alternative 1 would not eliminate or reduce the significant construction-related impacts on biological resources that were identified for the Proposed Project, as this alternative would entail similar types of construction activities that would produce similar impacts. However, compared to the Proposed Project, Alternative 1 would require larger areas of temporary disturbance and would have a larger permanent footprint.

A greater amount of excavation and construction work would be required within Laguna Creek and along the left/east abutment. The area within the creek upstream of the dam would be graded to facilitate flow past the new cylindrical fish screen. In addition, greater excavation behind the dam would be required to create the 5-foot deep notch in the dam. Areas downstream of the dam would also require greater disturbance within the creek to excavate to bedrock for the installation of the support structure, spillway chute, and riprap apron. Furthermore, the project components of this alternative – the support structure, gates, spillway chute, riprap apron, and cylindrical fish screen – would result in a larger permanent footprint within the non-wetland waters of the United States/state under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and CDFW. Therefore, under Alternative 1, impacts to special-status species, sensitive vegetation communities, and jurisdictional wetlands would be greater than under the Proposed Project. Similar to the Proposed Project, these potential impacts would be reduced to less-than-significant levels with implementation of mitigation measures. Other impacts related to wildlife corridors and local policies would remain less than significant.

During operations, as Alternative 1 would improve sediment management and provide fish protection consistent with current regulations, it would have beneficial impacts on biological resources, similar to the Proposed Project. In addition, operations and maintenance would generally be similar to existing conditions (also similar to the Proposed Project), although this alternative would be subject to potential failures and have a need for additional repair due to its design that includes multiple moving parts.

Overall, as the temporary and permanent footprints of Alternative 1 would be larger than the Proposed Project, this alternative would have a greater potential to impact special-status species, the sensitive redwood forest alliance vegetation community, and jurisdictional wetlands, although these impacts would be anticipated to remain less than significant with the identified mitigation measures incorporated. Other biological resource impacts would remain similar to the Proposed Project (less than significant).

Cultural Resources and Tribal Cultural Resources

Because Alternative 1 would entail similar construction activities as the Proposed Project, potential impacts pertaining to inadvertent discovery of buried cultural resources including archeological, human remains, or tribal resources, would also occur under Alternative 1. However, because of the larger temporary and permanent impact footprint for Alternative 1, the area subject to potential ground disturbance would be larger. Similar to the Proposed Project, these potential impacts would be reduced to less-than-significant levels with implementation of mitigation measures.

Like the Proposed Project, Alternative 1 would require cutting a notch into the Laguna Creek Dam, which is a historical resource, and constructing a support structure on the downstream face of dam. However, under this alternative, a deeper notch would be cut into the dam (5 feet instead of 16 inches for the Proposed Project) and a larger portion of the masonry dam structure would be removed. In addition, the larger support structure with a spillway chute as well as gates would be installed and protrude from the existing face of the dam. Construction methods for cutting the notch into the dam and constructing the support structure would be similar to those that would be used for the Proposed Project and would have a greater potential to result in construction-related vibration impacts to the dam due to the increased notching and construction required. However, mitigation identified for the Proposed Project pertaining to vibration monitoring would also apply to this alternative and would reduce the potentially significant vibration impact to the historical resource to a less-than-significant level.

The new intake structure and spillway chute that would protrude from the face of dam would be more prominent and visible than the Coanda screen and the intake support structure that would be constructed under the Proposed Project. Although the cylindrical fish screen would be submerged and would not be visible the support structure, gate, and spillway chute would only be somewhat obscured at times by flowing water. As a result, the structures that would be constructed under Alterative 1 would introduce a visual obstruction on the face of the dam.

Although the dam would continue to retain the majority of its character defining features – specifically its location, setting, native stone or limestone masonry construction materials, the Risdon Iron Works plaque on the face of the Laguna Creek Dam, and its continued use as a water management structure – the dam structure's alignment/plan would be altered by the protruding spillway chute, which would obscure the face of the dam and its original alignment, such that it would no longer be able to convey its significance. Therefore, unlike the Proposed Project, Alternative 1 would result in a substantial adverse change in the significance of the Laguna Creek Dam and impacts to historical resources would be considered significant. No mitigation measures are available that would reduce this impact to a less-than-significant level.

Overall, impacts pertaining to the inadvertent discovery of buried cultural resources during construction activities would be reduce to less than significant levels, similar to the Proposed Project. However, impacts to the historic Laguna Creek Dam would be significant and unavoidable.

Geology and Soils

Impacts related to geology and soils would be similar to those for the Proposed Project given the largely site-specific nature of these impacts. Because Alternative 1 would have a larger temporary and permanent footprint, the potential for inadvertent discovery of a paleontological resource during construction could be greater than for the Proposed Project. However, the mitigation measure identified for the Proposed Project to protect paleontological resources would also be required for Alternative 1 and the impact would remain less than significant with mitigation incorporated. Other geology and soils impacts would remain similar to the Proposed Project (less than significant).

Hydrology and Water Quality

Alternative 1 would result in potential construction-related impacts on water quality similar to the Proposed Project, as construction would also require temporary dewatering and bypass of the creek. Dewatering best management practices (BMPs) identified in the City's Standard Construction Practices (see Section 3.6.3, Standard Construction Practices) would similarly apply to this alternative.

Similar to the Proposed Project, the water quality effects of operation and maintenance of this alternative would not differ substantially from existing conditions. This alternative would also improve the City's ability to fine-tune diversions and manage sediment, would be anticipated to result in flow conditions similar to existing conditions downstream of the structure, and would not increase erosion or scour resulting from peak flow velocities at the site.

Overall, the hydrology and water quality impacts of Alternative 1 would remain similar to the Proposed Project (less than significant).

Noise

Alternative 1 would result in noise and vibration impacts similar to the Proposed Project, as there would not be a substantial difference in construction equipment used. However, construction-related noise impacts would extend for approximately 1 month longer than the Proposed Project due to the longer construction schedule for Alternative 1. In addition, potential vibration impacts could occur to the historic Laguna Creek Dam during the notching of the dam, which would require removal of a larger area of the dam than for the Proposed Project, and excavation and construction adjacent to the dam for installation of the support structure, spillway chute, and removal of sediment at the intake. While the potential for these impacts would be greater under this alternative, the mitigation measures identified for the Proposed Project related to construction-period noise (to limit noise to the degree feasible) and vibration (to minimize impacts to the dam during construction) would remain applicable to Alternative 1 and would reduce impacts to less-than-significant levels. Other noise impacts would remain similar to the Proposed Project (less than significant).

Other Topics

Installation of the spillway gate and cylindrical fish screen under Alternative 1 would not result in substantially different impacts related to other resource topics than the Proposed Project. As described above, the construction methods would remain similar to the Proposed Project although the construction schedule would be approximately 1 month longer for Alternative 1. Operations and maintenance activities would generally be similar to the Proposed Project but may be required to occur more frequently. Therefore, associated construction impacts related to air quality, greenhouse gas emissions, and transportation, while not substantially different from those described for the Proposed Project, would be incrementally greater. Similarly, energy consumption during construction would be greater. In addition, operational energy use would also be incrementally greater under Alternative 1 due to the mechanical components of the project design which would require additional power to operate. As Alternative 1 would be located on the same project site and would entail similar development activities as the Proposed Project, impacts related to land use and planning and hazards and hazardous materials would be similar to the Proposed Project. Other environmental resource topics addressed in Section 4.2, Impacts Not Found to be Significant, would also not be significant, similar to the Proposed Project.

6.4.2.3 Ability to Meet Project Objectives

Alternative 1 would have good-to-excellent achievement of four of the five project objectives and would have poor achievement of one objective as described below. Overall, Alternative 1 would achieve some, but not all, of the project objectives.

Alternative 1 would have **good** achievement of the objective to protect the City's Laguna Creek water supply (**objective #1**); however, the alternative would not be as reliable as the Proposed Project in protecting water supply because the spillway gate would have a greater potential for interruption, operations and maintenance outages, or

functional failure. Alternative 1 would have **good** achievement of the objective to improve environmental conditions and provide fish protection consistent with current regulations (**objective #2**), as the cylindrical fish screen is a well-established technology that meets agency criteria for fish screening, instream flow releases, ramping rates, and natural sediment transport. However, it would not achieve this objective to the same degree as the Proposed Project. Alternative 1 would have **excellent** achievement of operational efficiency (**objective #3**) as it would allow the City to maximize its surface water diversions by use of technology that allows for fine-tuned control of diversion rates to enhance the SCWD's ability to meet instream flow requirements and regulation of water levels downstream of the Facility. This alternative would have **excellent** achievement of the objective to improve safety and access (**objective #4**) at the Facility as it would include similar safety and access improvements as the Proposed Project.

However, Alternative 1 would have **poor** achievement of the cost-effective objective (**objective #5**). Both capital costs and operations and maintenance costs would be higher under Alternative 1 than the Proposed Project, and the alternative would not provide any clear benefits over the Proposed Project; therefore, Alternative 1 would not meet the objective regarding cost-effectiveness.

6.4.3 Alternative 2: Plate Screen with Brush

Alternative 2 (Plate Screen with Brush) is described below, followed by a discussion of its impacts relative to the Proposed Project and its ability to meet the project objectives.

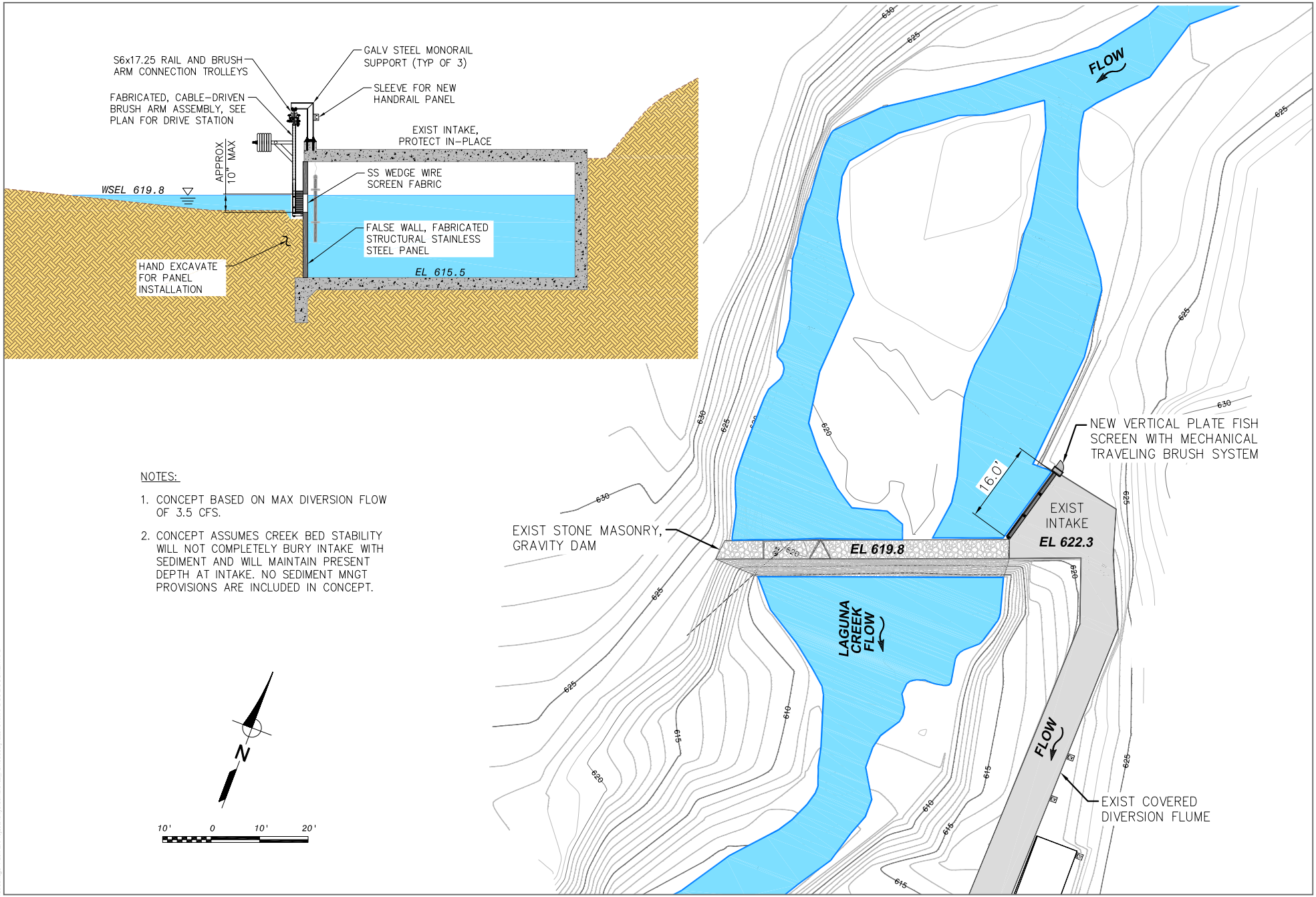
6.4.3.1 Description

Alternative 2 would be similar to existing conditions, but would entail the replacement of the existing intake screen with a new screen that would be compliant with fish protection regulations, as shown on Figure 6-3. The new vertical plate fish screen would consist of stainless steel, wedge-wire panels conforming to resource agency criteria for fish protection. Due to coarse sediments in the creek, the intake would continue to divert water even if the screen is buried by sediment. However, an automated mechanical traveling brush system would be used to maximize screen capacity by keeping the screen clear of excess sediment. Alternative 2 would have a minimal temporary construction footprint, as it would be limited to replacement of the intake screen, and the permanent footprint would be similar to existing conditions.

Construction

Construction of Alternative 2, limited to installation of a new plate screen on the existing intake, would occur over approximately 2 weeks during the low-flow period (June to October). This alternative would have a reduced construction duration by approximately 2.5 months compared to the Proposed Project. Construction activities would include temporary installation of cofferdams and dewatering of the creek, but the temporary work area would be smaller than required for the Proposed Project.

Alternative 2 would require limited hand excavation of material upstream of the dam. Alternative 2 would have a reduced number of construction worker vehicle trips due to the shorter construction duration and limited materials required.



SOURCE: Black & Veatch 2019

FIGURE 6-3

Alternative 2 - Plate Screen with Brush (Plan and Section View)

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Operation

Due to the limited depth available at the existing intake for the new screen, this alternative would have a reduced diversion capacity compared to existing conditions and Alternative 1; the maximum diversion capability would be approximately 3.5 cubic feet per second, whereas the City is capable of diverting up to approximately 7 cubic feet per second under existing conditions.

Operations would remain generally similar to existing operations with weekly checks, monthly cleaning and inspections, annual inspections of equipment and service of the generator, and road maintenance every 5 years. Unlike the Proposed Project but similar to existing conditions, Alternative 2 would require periodic sediment removal from behind the dam.

6.4.3.2 Impact Analysis

The potential project impacts of Alternative 2 are described below, and Table 6-4 on page 6.5-21 shows a comparison of the Proposed Project's impacts to those of the alternatives. Cumulative impacts under this alternative would generally be similar to those of the Proposed Project as shown in Table 6-4.

Biological Resources

Due to the much smaller temporary construction footprint required for the installation of the plate screen at the existing intake, Alternative 2 would have substantially reduce construction-related impacts on biological resources compared to the Proposed Project. While a cofferdam and temporary creek bypass would be required for construction, excavation of sediment in the creek would not be required for this alternative. Nevertheless, while impacts to special-status species, sensitive vegetation communities, and jurisdictional wetlands would be reduced compared to the Proposed Project, they would be significant. Similar to the Proposed Project, these potential impacts would be reduced to less-than-significant levels with implementation of mitigation measures. Other impacts related to wildlife corridors and local policies would remain less than significant.

Although operations and maintenance activities would be similar to existing conditions and Alterative 2 would also provide fish protection consistent with current regulations similar to the Proposed Project, it would have less benefits to biological resources as it would not improve sediment management.

Overall, as the temporary and permanent footprints of Alternative 2 would be substantially reduced compared to the Proposed Project, this alternative would have a reduced potential to impact special-status species, the sensitive redwood forest alliance vegetation community, and jurisdictional wetlands, although potentially significant impacts would still be anticipated to occur. These impacts would be reduced to less than significant with the identified mitigation measures incorporated. Other biological resource impacts would remain similar or less than the Proposed Project (less than significant) although some of the beneficial impacts of the Proposed Project would not occur under this alternative.

Cultural Resources and Tribal Cultural Resources

Alternative 2 would not have the potential to impact the historic Laguna Creek Dam because it would not require cutting a notch into the dam or otherwise modifying the historic resource; therefore, this alternative would have no impact to the resource.

Because Alternative 2 would have a much smaller construction footprint than the Proposed Project and would not require as much ground disturbance, potential impacts regarding inadvertent discovery of buried cultural resources would be reduced under Alternative 2. However, with ground disturbance there would be the potential for such impacts to occur, and therefore, similar to the Proposed Project, these potential impacts would be reduced to less-than-significant levels with implementation of mitigation measures.

Geology and Soils

Impacts related to geology and soils would be similar to those for the Proposed Project given their largely site-specific nature. Because Alternative 2 would have a much smaller temporary and permanent footprint, the potential for inadvertent discovery of a paleontological resource during construction would be reduced compared to the Proposed Project. However, with ground disturbance, potentially significant impacts could occur, and the mitigation measure identified for the Proposed Project to protect paleontological resources would also be required for Alternative 2. The impact would be less than significant with mitigation incorporated. Other geology and soils impacts would remain similar to the Proposed Project (less than significant).

Hydrology and Water Quality

Alternative 2 would result in potential construction-related impacts on water quality similar to the Proposed Project, as construction would also require temporary dewatering and bypass of the creek. Dewatering BMPs identified in the City's Standard Construction Practices (see Section 3.6.3, Standard Construction Practices) would apply to this alternative. Similar to the Proposed Project, the water quality effects of operation and maintenance of this alternative would not differ substantially from existing conditions. Overall, the hydrology and water quality impacts of Alternative 2 would remain similar to the Proposed Project (less than significant).

Noise

Alternative 2 would result in reduced noise and vibration impacts due to the shorter construction period and the reduced construction activities. However, the noise impacts during construction are conservatively assumed to be significant and the mitigation measures identified for the Proposed Project related to construction-period noise would remain applicable. Furthermore, as this alternative would require very limited excavation with hand-held equipment and notching of the dam would not be required, vibration impacts to the historic dam structure would be less than significant and mitigation would not be required. Other noise impacts would remain similar to the Proposed Project (less than significant).

Other Topics

The magnitude and duration of construction activities would be substantially reduced under Alternative 2. Therefore, associated construction impacts related to air quality, greenhouse gas emissions, and transportation, would be reduced compared to the Proposed Project. Similarly, energy consumption during construction would be lower. As Alternative 2 would be located on the same project site and would entail similar development activities as the Proposed Project, impacts related to land use and planning and hazards and hazardous materials would be similar to the Proposed Project. Other environmental resource topics addressed in Section 4.2, Impacts Not Found to be Significant, would also not be significant, similar to the Proposed Project.

6.4.3.3 Ability to Meet Project Objectives

Alternative 2 would have moderate achievement of three of the five project objectives and would have poor achievement of two objectives, as described below. Overall, the Alternative 2 would moderately meet many of the project objectives.

Alternative 2 would have **poor** achievement of the objective to protect the City's Laguna Creek water supply (**objective #1**) as it would reduce the City's maximum capability to intake water by about half (from 7 cubic feet per second to 3.5 cubic feet per second). Alternative 2 would have **moderate** achievement of the objective to improve environmental conditions (**objective #2**), as the new plate screen would provide fish protection consistent with current regulations. However, it would not achieve this objective to the same degree as the Proposed Project because it would not support natural sediment transport. Alternative 2 would have **poor** achievement of operational efficiency (**objective #3**) due to the reduction in diversion capabilities described above. This alternative would have **moderate** achievement of the objective to improve safety and access (**objective #4**) as some improvements would be made at the Facility. Alternative 2 would have **moderate** achievement of the cost-effective objective (**objective #5**) as it would provide for the Facility to operate under a limited capacity with limited capital and operational costs.

6.5 Environmentally Superior Alternative

The CEQA Guidelines (Section 15126.6[a]) requires that an EIR's analysis of alternatives identify the "environmentally superior alternative" among all of those considered. In addition, Section 15126.6 [e][2] states that if the environmentally superior alternative is the No Project Alternative, the EIR must also identify an environmentally superior alternative among the other alternatives. Furthermore, Sections 21002 and 21081 of CEQA require lead agencies to adopt feasible mitigation measures or feasible alternatives in order to substantially lessen or avoid otherwise significant adverse environmental effects, unless specific social or other conditions make such mitigation measures or alternatives infeasible.

Table 6-4 presents a comparison of project impacts between the Proposed Project and the alternatives. As described above, none of the alternatives to the Proposed Project, including the No Project Alternative, would eliminate potentially significant impacts, although Alternative 2 would generally reduce the magnitude of significant impacts.

While the No Project Alternative would reduce impacts to the majority of environmental resource topics, it would result in a new significant and unavoidable impact to historical resources as the dam would no longer function as a water management structure under the No Project Alternative, which is one of the resource's essential character-defining features that enables it to convey its significance. Alternative 1 (Spillway Gate and Fish Screen) would result in generally similar types of impacts as the Proposed Project, however, it would have a greater severity of construction-related impacts due to greater temporary and permanent disturbance footprints and a longer construction period. All of these significant impacts would be reduced to less-than-significant levels with implementation of mitigation measures identified for the Proposed Project. Alternative 2 (Plate Screen with Brush) is the environmentally superior alternative under CEQA, as it would reduce the magnitude of most project impacts. However, although Alternative 2 would moderately meet many of the project objectives, it would not meet the project objectives at the same level as the Proposed Project.

Table 6-4. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Air Quality				
Impact AIR-1: Conflict with an Applicable Air Quality Plan. The Proposed Project would not conflict with or obstruct the Monterey Bay Air Resources District's Air Quality Management Plan.	LS	NI	LS ↑	LS ↓
Impact AIR-2: Criteria Pollutant Emissions. The Proposed Project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standards, or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Project would not 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.	LS	NI	LS ↑	LS ↓
Impact AIR-3: Exposure of Sensitive Receptors. The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations.	LS	NI	LS ↑	LS ↓
Impact AIR-4: Result In Other Emissions Adversely Affecting a Substantial Number of People. The Proposed Project would not result in other emissions, such as those leading to odors, that would adversely affect a substantial number of people.	LS	NI	LS ≈	LS ≈
Impact AIR-5: Cumulative Air Quality Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to air quality.	LS	NI	LS ≈	LS ≈
Biological Resources				
Impact BIO-1: Special-Status Species. The Proposed Project could have a substantial adverse effect on special-status species during construction.	LSM	NI	LSM ↑	LSM ↓
Impact BIO-2: Sensitive Vegetation Communities. The Proposed Project could have a substantial adverse effect on the redwood forest alliance vegetation community during construction that would result in both temporary and permanent impacts.	LSM	NI	LSM ↑	LSM ↓
Impact BIO-3: Jurisdictional Wetlands and Waters. The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts.	LSM	NI	LSM ↑	LSM ↓

Table 6-4. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Impact BIO-4: Wildlife Corridors. The Proposed Project would not substantially degrade the quality or interfere with the use of a wildlife corridor or migratory route, or otherwise impede wildlife movement or use of native wildlife nursery sites.	LS	NI	LS ≈	LS ≈
Impact BIO-5: Conflicts with Local Policies or Ordinances. The Proposed Project would not conflict with local policies or ordinances protecting biological resources.	LS	NI	LS ≈	LS ≈
Impact BIO-6: Cumulative Biological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to biological resources.	LS	NI	LS ≈	LS ≈
Cultural Resources and Tribal Cultural Resources				
Impact CUL-1: Historical Resources. The Proposed Project could cause a substantial adverse change in the significance of the Laguna Creek Dam, which is a historical resource, due to modifications of the Facility that would occur during construction.	LSM	SU	SU	NI
Impact CUL-2: Archaeological Resources. The Proposed Project could cause a substantial adverse change in the significance of an archaeological resource during construction.	LSM	NI	LSM ↑	LSM ↓
Impact CUL-3: Human Remains. The Proposed Project could inadvertently disturb human remains during construction.	LSM	NI	LSM ↑	LSM ↓
Impact CUL-4: Tribal Cultural Resources. The Proposed Project could cause a substantial adverse change in the significance of a tribal cultural resource during construction.	LSM	NI	LSM ↑	LSM ↓
Impact CUL-5: Cumulative Cultural Resources and Tribal Cultural Resources Impacts. The Proposed Project, in combination with other reasonably foreseeable future development, would not result in a significant cumulative impact related to cultural resources and tribal cultural resources.	LS	NI	LS ≈	LS ≈
Energy				
Impact ENE-1: Result in Wasteful, Inefficient or Unnecessary Consumption of Energy Resources. The Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources.	LS	NI	LS ↑	LS ↓
Impact ENE-2: Conflict with an Applicable Plan. The Proposed Project would not result in conflicts with or otherwise obstruct a state or local plan for renewable energy or energy efficiency.	LS	NI	LS ≈	LS ≈

Table 6-4. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Impact ENE-3: Cumulative Energy Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy.	LS	NI	LS ≈	LS ≈
Geology and Soils				
Impact GEO-1: Seismic Hazards. The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death resulting from seismic ground shaking or seismic-related ground failure, including liquefaction.	LS	NI	LS ≈	LS ≈
Impact GEO-2: Unstable Geologic Unit or Soils. The Proposed Project would not cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse.	LS	NI	LS ≈	LS ≈
Impact GEO-3: Expansive Soils. The Proposed Project would not be located on expansive soil, as defined in the 2019 California Building Code.	LS	NI	LS ≈	LS ≈
Impact GEO-4: Paleontological Resources. The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature.	LSM	NI	LSM ↑	LSM ↓
Impact GEO-5: Cumulative Geologic Hazards. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to geology and soils.	LS	NI	LS ≈	LS ≈
Impact GEO-6: Cumulative Paleontological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to paleontological resources.	LS	NI	LS ≈	LS ≈
Greenhouse Gas Emissions				
Impact GHG-1: GHG Emissions. The Proposed Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	LS	NI	LS ↑	LS ↓
Impact GHG-2: Conflict with an Applicable GHG Reduction Plan. The Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	LS	NI	LS ≈	LS ≈

Table 6-4. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Impact GHG-3: Cumulative GHG Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to GHG emissions. However, the Proposed Project's contribution would not be cumulatively considerable.	LS	NI	LS ≈	LS ≈
Hazards and Hazardous Materials				
Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials. The Proposed Project would require use and transportation of petroleum products and small quantities of hazardous materials, but would not result in a significant hazard to the public or environment.	LS	NI	LS ≈	LS ≈
Impact HAZ-2: Reasonably Foreseeable Upset or Accident Conditions. The Proposed Project would not 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.	LS	NI	LS ≈	LS ≈
Impact HAZ-3: Wildfire Hazards. The Proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	LS	NI	LS ≈	LS ≈
Impact HAZ-4: Cumulative Hazard Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to routine transport, use, disposal, or accidental release of hazardous materials, or related to significant risk of loss, injury, or death involving wildland fires.	LS	NI	LS ≈	LS ≈
Hydrology and Water Quality				
Impact HYD-1: Water Quality. The Proposed Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	LS	NI	LS ≈	LS ≈
Impact HYD-2: Alteration of Drainage Patterns. The Proposed Project would not 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 off site; 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.	LS	NI	LS ≈	LS ≈

Table 6-4. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Impact HYD-3: Cumulative Water Quality Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to water quality or alteration of drainage patterns.	LS	NI	LS ≈	LS ≈
Land Use and Planning				
Impact LU-1: Conflicts with Land Use Plans, Policies, or Regulations. The Proposed Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LS	NI	LS ≈	LS ≈
Impact LU-2: Cumulative Land Use Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LS	NI	LS ≈	LS ≈
Noise				
Impact NOI-1: Substantial Increase in Ambient Noise Levels. The Proposed Project would result in generation of a substantial temporary increase in ambient noise levels during construction in the vicinity of the project in excess of applicable standards. However, the Proposed Project would not result in generation of a substantial permanent increase in ambient noise levels during operation.	LSM	NI	LSM ↑	LSM ↓
Impact NOI-2: Groundborne Vibration. The Proposed Project would result in the potential generation of excessive groundborne vibration or groundborne noise levels during construction.	LSM	NI	LSM ↑	LS ↓
Impact NOI-3: Cumulative Noise Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to noise and vibration.	LS	NI	LS ≈	LS ≈
Transportation				
Impact TRA-1: Conflict with a Program, Plan, Ordinance, or Policy Addressing the Circulation System. The Proposed Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	LS	NI	LS ≈	LS ≈

Table 6-4. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1 (Spillway Gate and Fish Screen)	Alternative 2 (Plate Screen with Brush)
Impact TRA-2: Vehicle Miles Traveled. The Proposed Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b).	LS	NI	LS ↑	LS ↓
Impact TRA-3: Geometric Design Hazards. The Proposed Project would not substantially increase hazards due to a geometric design feature or incompatible use.	LS	NI	LS ≈	LS ≈
Impact TRA-4: Emergency Access. The Proposed Project would not result in inadequate emergency access.	LS	NI	LS ≈	LS ≈
Impact TRA-5: Cumulative Transportation Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to transportation.	LS	NI	LS ≈	LS ≈

Notes: NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser; ≈ = similar

6.6 References

B&V (Black & Veatch). 2019. *Draft Laguna and Majors Diversions Technical Memorandum, Task 6 Alternatives Analysis Summary Report.* May 28, 2019.

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7 List of Preparers

7.1 City of Santa Cruz

Heidi Luckenbach	Deputy Water Director/Engineering Manager
Jessica Martinez-McKinney	Associate Planner II
Zeke Bean	Water Resources Supervisor
Chris Berry	Watershed Compliance Manager

7.2 Dudek

Principal-in-Charge	Ann Sansevero, AICP
Project Manager	Hannah Young, AICP
Deputy Project Manager	Catherine Wade, PhD
Air Quality, Greenhouse Gas Emissions, Energy	Nicholas Lorenzen Matthew Morales
Biological Resources	Ryan Henry
Cultural Resources	Kathryn Haley, MA John Schlagheck, MA, RPA Fallin Steffen
Geology and Soils	Perry Russell, PG Michael Williams, PhD
Hazards and Hazardous Materials	Glenna McMahon, PE Audrey Herschberger, PE
Hydrology and Water Quality	Dylan Duvergé, PG Divya Khandelwal, EIT Perry Russell, PG
Land Use and Planning	Savannah Rigney
Noise	Michael Carr, INCE
Transportation	Dennis Pascua Mladen Popovic, AICP Amanda Meroux, EIT
Graphics	Tyler Friesen Rachel Strobridge

7.2.1 Subconsultant

Jeffrey Hagar	Fisheries Biologist, Hagar Environmental Science

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