Draft

Modification of Water Right Permit 21112 Project Draft EIR



Prepared for:

El Dorado Irrigation District

Prepared by:
June 2025

AECOM

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http://www.eid.org/Permit21112

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ACRONYMS AND OTHER ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
µm	micrometer
2017 Ozone Attainment and Progress Plan	2017 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan
2022 State SIP Strategy	2022 State Strategy for the State Implementation Plan
AB	Assembly Bill
AF	acre feet
AFY	acre-feet per year
AL	Agricultural Land
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
AMSL	above mean sea level
AQMD	Air Quality Management District
ARB	California Air Resources Board
ATCM	Airborne Toxic Control Measure
Bay-Delta	San Francisco Bay/Sacramento-San Joaquin Delta
BIOS 6 Viewers	Biogeographic Information and Observation System
BLM	Bureau of Land Management
BMP	best management practices
BRMP	Biological Resources Mitigation Plan
C	Commercial
C	Candidate
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	California Ambient Air Quality Standard
CAL FIRE	California Department of Forestry and Fire Protection
Cal OES	California Office of Emergency Services
Cal/OSHA	California Occupation Safety and Health Administration
CalEEMod	California Emission Estimator Model
CalEPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CalRecycle	California Integrated Waste Management Board
Caltrans	California Department of Transportation
Carl Moyer Program	Carl Moyer Memorial Air Quality Standards Attainment Program
CBC	California Building Standards Code
CCAA	California Clean Air Act
CCH2	Consortium of California Herbarium
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERS	California Environmental Reporting System
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFPAD	California Fish Passage Assessment Database
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGC	California Government Code

CHSC	California Health and Safety Code
CIP	Capital Improvement Planning
cm	centimeters
cm/sec	centimeter per second
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
COG	council of governments
County General Plan	El Dorado County General Plan
County	El Dorado County
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUPAs	Certified Unified Program Agencies
CVP	Central Valley Project
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
dB	Decibel
dBA	decibel A-Weighted
District	El Dorado Irrigation District
DOC	California Department of Conservation
DOF	California Department of Finance
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DPS	Distinct Population Segments
DTSC	Department of Toxic Substances Control
E	endangered
EDCPD	El Dorado County Planning Division
EDCTA	El Dorado County Transit Authority
EDCWA	El Dorado County Water Agency
EDHWTP	El Dorado Hills Water Treatment Plant
EID	El Dorado Irrigation District
EIR	Environmental Impact Report
El Dorado County AQMD	El Dorado County Air Quality Management District
ENF	Eldorado National Forest
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
ESA	environmentally sensitive area
ESA	federal Endangered Species Act
ESU	evolutionarily significant units
F	Federally
Farmland	Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
FERC	Federal Energy Regulatory Commission
FLAME	Federal Land Assistance Management and Enhancement
FMMP	Farmland Mapping and Monitoring Program
FPA	Federal Power Act
FR	Forest Resource
FRA	Federal Responsibility Area
FRAP	Fire and Resource Assessment Program

FS	sensitive
General Permit	Statewide General Construction Stormwater Discharge Permit
GHG	greenhouse gas
HCD	Housing and Community Development
HEC-ResSim	Hydrologic Engineering Center Reservoir System Simulation
HMTA	Hazardous Materials Transportation Act
HRL	Healthy Rivers and Landscapes
Hz	Hertz
I	Industrial
in/sec	inches per second
IPaC	Information for Planning and Conservation
ITP	incidental take permit
km	kilometers
L_{01}, L_{10}, L_{50}, L_{90}	The A–weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
L_{dn}	Day/Night Noise Level
LDR	Low-Density Residential
L_{eq}	Equivalent Noise Level
LEV	Low-Emission Vehicle
LHMP	Local Hazards Mitigation Plan
L_{max}	A–weighted noise level maximum
L_{min}	A–weighted noise level minimum
LRAs	Local Responsibility Areas
m	meters
mg/L	milligrams per liter
mgd	million gallon per day
MLDs	most likely descendants
MR	Mineral Source
MRZ	Mineral Resource Zones
MT CO_2e	metric tons of carbon dioxide-equivalents
MTP	Metropolitan Transportation Plan/
MW	megawatt
MWH	megawatt-hours
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NEHRP	National Earthquake Hazards Reduction Program
NEHRPA	National Earthquake Hazards Reduction Program Act
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NOP	Notice of Preparation
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NPS	National Park Service
NR	Natural Resource
NRCS	U.S. Natural Resources Conservation Service
NRHP	National Register of Historic Places

OES	Office of Emergency Services
OHV	off-highway vehicle
ORMP	Oak Resources Management. Plan
OS	Open Space
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
PCWA	Placer County Water Agency
Permit 21112	Water Right Permit 21112
PF	Public Facilities
PG&E	Pacific Gas & Electric Company
PM_{10}	particulate matter of diameter equal to or less than 10 micrometers
$PM_{2.5}$	particulate matter of diameter equal to or less than 2.5 micrometers
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
Program	Biological Resource Mitigation Program
Project 184	District's El Dorado Hydroelectric Project
Project 2101	SMUD's Upper American River Hydroelectric Project
Project 2101	Upper American River Hydroelectric Project
Project 2155	SMUD's Chili Bar Hydroelectric Project
Project No. 184	El Dorado Hydroelectric Project
Project	Modification of Water Right Permit 21112
QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Practitioner
RCRA	Resources Conservation and Recovery Act
Regional Boards	Regional Water Quality Control Board
ResSim	Reservoir System Simulation
RHNA	Regional Housing Needs Allocation
ROG	reactive organic gases
RPF	Registered Professional Forester
RPS	Renewables Portfolio Standard
RR	Rural Residential
RTIP	Regional Transportation Improvement Program
RTP	Regional transportation planning
RV	recreational vehicle
RWQCB	Central Valley Regional Water Quality Control Board
S	State
SAA	Streambed Alteration Agreement
SACOG	Sacramento Area Council of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SEMS	Standardized Emergency Management System
Silver Fork	Silver Fork of the American River
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act of 1975
SMUD	Sacramento Municipal Utility District
SO	sulfur oxides

SO_2	sulfur dioxide
South Fork	South Fork of the American River
SPI	Sly Park Intertie
SPI	Sly Park Intertie
SPRA	Sly Park Recreation Area
SR 49	State Route 49
SRA	State Recreation Area
SRAs	State Responsibility Areas
State	State of California
STIP	State Transportation Improvement Program
stratosphere	upper atmosphere
study area or Project study area	biological study area
SVP	Society of Vertebrate Paleontology
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T	threatened
TAC	toxic air contaminant
TANF	Temporary Assistance for Needy Families
TCD	temperature control device
TCP	Traditional Cultural Properties
TCRs	tribal cultural resources
tpd	tons per day
TPZ	Timberland production zone
troposphere	lower atmosphere
U.S. 50	U.S. Highway 50
U.S. Soil Conservation Service	Natural Resources Conservation Service, under the U.S. Department of Agriculture
U.S.C.	United States Code
UARP	Upper American River Project
USACE	United States Army Corps of Engineers
USC	U.S. Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Service
UWMP	Urban Water Management Plan
VES	Visual Encounter Surveys
VMT	vehicle miles traveled
VOC	volatile organic compounds
WEAP	worker environmental awareness program
WPCP	Water Pollution Control Plan
WTP	Water Treatment Plant
WUI	wildland-urban interface
Xerces	Xerces Society for Invertebrate Conservation

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

This executive summary identifies the purpose of the draft environmental impact report (EIR), provides an overview of the proposed Modification of Water Right Permit 21112 Project (Project), and identifies the potential impacts that would result from implementation of the Project and the recommended mitigation measures. This summary also presents other conclusions required by the California Environmental Quality Act (CEQA) and the State CEQA Guidelines.

1.2 PROJECT DESCRIPTION

The El Dorado Irrigation District (District) is proposing the Project through a water right change petition to add an additional authorized upstream point of diversion and an additional place of storage and point of re-diversion to storage to more effectively and efficiently manage water in the District's system and to meet future water demands within El Dorado County. The additional point of diversion is located at the District's existing El Dorado Diversion Dam near Kyburz. In addition, the District proposes to add Sly Park Dam (which forms Jenkinson Lake) as a point of re-diversion and Jenkinson Lake as an additional authorized place of storage for Water Right Permit 21112 (Permit 21112).

The District currently holds Water Right Permit 21112, issued in 2001 by the State Water Resources Control Board (SWRCB). Permit 21112 allows the District to make direct diversions from the South Fork American River (South Fork) at Folsom Reservoir; to divert water to storage in Caples, Silver, and Aloha Lakes; and, to re-divert the water released from those upstream reservoirs once it reaches Folsom Reservoir for consumptive uses. The total quantity of water that may be diverted by the District at Folsom Reservoir annually (by a combination of direct diversion and re-diversion of stored water) is 17,000 acre-feet per year (AFY). The point of diversion at Folsom Reservoir draws direct diversions from the South Fork along with water previously stored in upstream reservoirs (Caples, Silver, Aloha Lakes) that are operated pursuant to the District's Project 184 Federal Energy Regulatory Commission (FERC) license.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam. However, to re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cubic feet per second; [cfs]) to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. These future improvements would require subsequent environmental review.

1.2.1 PROJECT LOCATION

The Project location encompasses areas within and near the South Fork American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. Figure 1-1 shows the South Fork, location of the existing diversion at Folsom Reservoir, and location of the proposed diversion at El Dorado Diversion Dam near Kyburz. Figure 1-1 also shows the existing upstream reservoirs at Caples Lake, Silver Lake and Lake Aloha that provide authorized storage of Permit 21112 water.

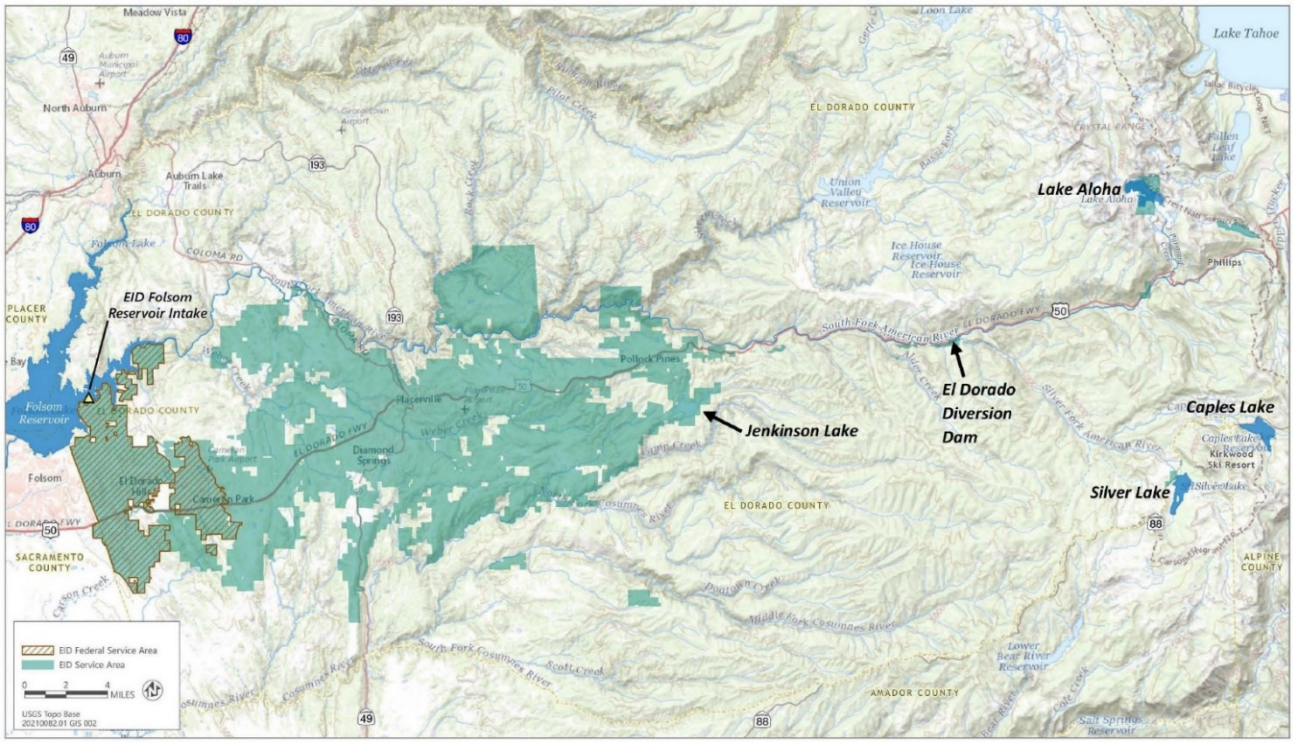


Figure 1-1. Project Location

1.2.2 PROJECT OBJECTIVES

The District is pursuing an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to provide a reliable and affordable supply of high-quality water to its service area. The Project objectives are to:

- **Meet future water demand as identified in long-term water supply planning efforts.** Long-term water supply planning documents show that the District will have increased water demand throughout its service area. The District seeks to efficiently and reliably meet future water demands with implementation of the Project.

- **Reduce cost of water conveyance and delivery.** Water conveyance utilizing pumping facilities can increase costs of operations compared to a water conveyance system that is gravity-fed or a diversion point that is close to its place of use. The District aims to use the most economical option for water conveyance and delivery with implementation of the Project.

- **Increase flexibility and reliability in water delivery systems.** Water delivery systems are more reliable and efficient when the systems are designed to allow for operational flexibility, including redundancies in the event of infrastructure constraints, supply reductions, or emergencies. The District seeks to increase operational flexibility and reliability with implementation of the Project.

- **Optimize beneficial use of Water Right Permit 21112.** The existing authorized point of diversion for consumptive use of Permit 21112 is currently at Folsom Reservoir, which constrains the service area that the District can effectively utilize for this water supply. The District seeks to optimize beneficial use of its

existing water right by adding a strategic upstream point of diversion and place of storage and re-diversion with implementation of the Project.

1.2.3 PROJECT SUMMARY

The proposed Project involves changing the District's existing Permit 21112 water right by adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake. The existing authorized Permit 21112 diversion at Folsom Reservoir would be maintained. The maximum rate of diversion of water diverted under Permit 21112 at the El Dorado Diversion Dam would be Permit 21112's existing maximum diversion rate of 156 cfs. The maximum amount of water diverted under Permit 21112 at the El Dorado Diversion Dam by a combination of either direct diversion or diversion to storage would be 15,000 AFY, and the total cumulative quantity diverted at the Folsom Reservoir diversion and the El Dorado Diversion Dam would not exceed 17,000 AFY. For example, if during a particular year 5,000 acre-feet (AF) of Permit 21112 water were diverted at El Dorado Diversion Dam, up to 12,000 AF could be diverted at Folsom Reservoir, so long as total cumulative diversion for that year under both points of diversion is no more than 17,000 AF. Similarly, the total authorized cumulative diversion to storage for Permit 21112 would remain 32,931 AFY and that total storage would be shared amongst Caples Lake, Silver Lake, Lake Aloha and the proposed additional place of storage in Jenkinson Lake. The maximum amount of water that would be re-diverted to storage in Jenkinson Lake, after initially being diverted at the El Dorado Diversion Dam, would be 15,000 AFY. Thus, the proposed Project would add an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to Permit 21112. The Project would maintain the other limitations of the Permit 21112 water right, such as season of diversion, total diversion to storage, and total direct diversion.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam. However, to convey Permit 21112's maximum rate of diversion of 156 cfs from the proposed new point of diversion at El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings.

Because the timing for implementing potential construction-related improvements to allow for the diversion of up to 156 cfs is unknown, two operational regimes for the diversion of Permit 21112 water at the El Dorado Diversion Dam are considered in this EIR: 1) existing infrastructure operations; and 2) post-construction operations:

- **Existing infrastructure operations**: This operational regime involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 (i.e., prior to construction of the

improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water at the El Dorado Diversion Dam to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- **Post-construction operations**: This operational regime involves operation of facilities to divert Permit 21112 water following construction of the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake that would allow for a maximum rate of diversion and re-diversion of up to 156 cfs.

Maintenance at the El Dorado Diversion Dam, El Dorado Canal, Forebay Reservoir, Jenkinson Lake, Hazel Creek Tunnel, Main Pipeline, and other existing facilities would continue to occur as it is currently undertaken. Activities include periodic inspection, maintenance, and repairs.

For additional Project details, see Chapter 3 "Project Description."

1.2.4 POTENTIAL APPROVALS REQUIRED

This EIR will be used in the planning and decision-making process for adoption and implementation of the proposed Project. The District will serve as the lead agency pursuant to CEQA for the Project. Other public agencies that would be expected to use the EIR in their decision-making processes as Responsible or Trustee Agencies, as defined in Sections 21069 and 21070 of CEQA and Sections 15096, 15381, and 15386 of the State CEQA Guidelines, include:

- State Water Resources Control Board – Responsible Agency because it must make a decision on whether to approve the change petition for Permit 21112; and

- California Department of Fish and Wildlife (CDFW) – Trustee Agency that will provide input to the change petition process regarding effects to fish, wildlife, or their habitat.

Future construction of infrastructure improvements may require additional permits and actions by regulatory agencies, such as:

- CDFW – Responsible Agency for issuing a Lake and Streambed Alteration Agreement should construction activities result in alteration of the bed or bank of a lake or stream;

- Regional Water Quality Control Board – potentially a Responsible Agency for issuing Waste Discharge Requirements and/or Water Quality Certification should construction activities affect waters of the state or U.S.;

- U.S. Army Corps of Engineers – Federal agency that may potentially issue a Clean Water Act Section 404 permit should construction activities result in fill of waters of the U.S.;

- U.S. Fish and Wildlife Service (USFWS) – Federal agency that consults under the Endangered Species Act for projects that may require permits regarding sensitive species of fish, wildlife, or their habitat; and
- State Historic Preservation Office – State agency that consults on compliance with the National Historic Preservation Act for projects that may impact cultural resources protected under the act.

1.3 SUMMARY OF IMPACTS AND MITIGATION MEASURES

CEQA requires that the environmental analysis contained in the Draft EIR also includes a summary of the Project and its consequences, including an identification of each potentially significant environmental effect of the Project, the level of effect the Project may have, as well as any proposed mitigation measures. Table 1-1 presents a summary of the impacts and mitigation measures identified for the proposed Project. A full description of each impact and mitigation measure is found in Chapter 4, "Environmental Analysis."

This Draft EIR addresses potential impacts associated with the Project at both a programmatic and project level. For the new proposed point of diversion at El Dorado Diversion Dam and the new place of storage and point of re-diversion to storage at Jenkinson Lake, the EIR will conduct a project-level analysis. Operational details of these elements are known, and their probable environmental impacts can be analyzed at the project level.

Because only limited information is currently available for construction-related improvements, this Draft EIR provides a programmatic analysis of these improvements. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided in the Draft EIR, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Additionally, the District is electing to defer the determination of significance for potential construction-related impacts for several CEQA resource categories (i.e., Air Quality, Greenhouse Gas Emissions, and Transportation). While the information from comparable past projects and implementation of applicable mitigation measures indicates that potential construction-related impacts to these CEQA resource categories associated with the proposed Project would be less than significant, these impact conclusions are still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

1.4 ALTERNATIVES TO THE PROJECT

A broad range of alternatives was considered for the Project. Please see Chapter 5, "Alternatives," for detailed descriptions of alternatives considered but rejected from detailed analysis. The following alternatives were analyzed in the EIR, and modelling was conducted in support of each of the Project alternatives.

1.4.1 NO PROJECT ALTERNATIVE

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam. Under the No Project Alternative, there would be no Project-related hydrologic changes in the South Fork watershed. There would be no Project-related changes to District operations at the El Dorado Diversion Dam, the El Dorado Canal, the Hazel Creek Tunnel, the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake, or Jenkinson Lake. Likewise, there would be no Project-related changes at Union Valley Reservoir, Slab Creek Reservoir, or Chili Bar Reservoir. The District would continue to make facility improvements to restore the authorized capacity of the El Dorado Canal to 165 cfs.

Under the No Project Alternative, the District would continue to exercise Permit 21112 as currently authorized under the existing permit conditions, including the time extension provided by SWRCB December 18, 2023, Order Approving Petition for Extension of Time (Order; WR 2023-0066-EXEC). Under the No Project Alternative, the use of Permit 21112 would be limited by the infrastructure available to serve water from Folsom Lake to the western portion of the District's service area. Permit 21112 water would be pumped from Folsom Lake to the El Dorado Hills Water Treatment Plant (WTP) and then pumped for delivery to District's water distribution system. Full utilization of the Permit 21112 water right from Folsom Reservoir will also require new and expanded infrastructure. Future anticipated construction projects to allow the full beneficial use of Permit 21112 water include: 1) replacement of pumps at the intake facility to reliably meet a future expanded capacity of 30 million gallons per day (mgd); 2) expansion of the El Dorado Hills Water Treatment Plant to 30 mgd; 3) construction of a new raw water line to provide additional capacity from the intake to the El Dorado Hills Water Treatment Plant; and 4) construction of several conveyance pipelines and an additional pump station to meet future water demands. The existing terms of Permit 21112 require the District to complete construction work and apply the water to full beneficial use by December 31, 2040.

1.4.2 DIRECT DIVERSION ONLY ALTERNATIVE

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this alternative. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

This scenario assumes the maximum rate of diversion at the El Dorado Diversion Dam is 156 cfs, which is the authorized maximum rate of direct diversion under Permit 21112. The maximum rate of diversion into the Hazel Creek Tunnel is 156 cfs. To convey Permit 21112's maximum rate of diversion of 156 cfs from the El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. These improvements would be same as the proposed Project. However, because Permit 21112 water is limited to use only as direct diversion under this alternative, the rate of diversion at any given time will depend upon the combined demands of Reservoir 1 WTP and Reservoir A WTP.

The season of diversion for Permit 21112 is November 1 to July 31.

1.4.3 REDUCED SEASON OF DIVERSION ALTERNATIVE

The Reduced Season of Diversion Alternative is similar to the proposed Project, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

The maximum rate of diversion into the Hazel Creek Tunnel is 156 cfs. To convey Permit 21112's maximum rate of diversion of 156 cfs from the El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. These improvements would be same as the proposed Project.

1.4.4 EXISTING INFRASTRUCTURE ALTERNATIVE

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) but without future construction and represents a scenario with the same physical infrastructure constraints as the Baseline scenario. This alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Due to capacity limits of existing conveyance infrastructure, this alternative limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. The season of diversion for Permit 21112 is November 1 to July 31.

Because this alternative would maintain the same physical infrastructure constrains as currently existing, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake in order divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, as proposed with the Project.

1.4.5 REDUCED DIVERSION ALTERNATIVE

The Reduced Diversion Alternative is similar to the Existing Infrastructure Alternative, but with more restrictive constraints on the maximum flow rate of Hazel Creek Tunnel and the total annual volume of Permit 21112 water allowed through the tunnel, thus effectively reducing diversion to storage of Permit 21112 water in Jenkinson Lake.

The Reduced Diversion Alternative represents operations with the same physical infrastructure constraints as the Baseline scenario, but with Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to Reservoir 1 WTP and/or to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to Reservoir A WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this alternative, and the maximum flow rate of Permit 21112 water through Hazel Creek Tunnel is limited to 45 cfs.

Due to capacity limits of existing conveyance infrastructure, this operational regime limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. The season of diversion for Permit 21112 is November 1 to July 31. Because this alternative would maintain the same physical infrastructure constrains as currently existing, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, as proposed with the Project.

1.5 POTENTIAL AREAS OF CONCERN AND ISSUES TO BE RESOLVED

The Project involves the diversion of surface water that may result in hydrologic changes in affected river reaches and reservoirs within the Project area (e.g., changes to stream flows and reservoir storage). During the public scoping period for this EIR, stakeholders expressed interest and concerns regarding how potential changes to stream flows and/or reservoir storage may impact aquatic resources (e.g., special status salmonids in the Lower American River). Also, during the scoping period for this EIR, stakeholders expressed interest and concerns regarding how potential changes to stream flows in the South Fork American River may impact recreational opportunities associated with whitewater rafting, kayaking, and other whitewater-related experiences. The EIR contains extensive analysis for these areas of concern. The hydrologic changes associated with the Project and the corresponding impact analysis performed for the Project are based on detailed hydrologic modelling, the results of which are provided in Appendices B1 through B3 of this EIR. The potential impacts associated with these subjects are further analyzed in detail in Chapter 4.4, “Biological Resources,” and Chapter 4.16, “Recreation,” of this EIR.

Table 1-1. Summary of Impacts and Mitigation Measures

Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.1 Aesthetics			
Impact 4.1-1. Have a substantial adverse effect on a scenic vista?	NI	None Required.	NI
Impact 4.1-2. In nonurbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings?	LTS	None Required.	LTS
Impact 4.1-3. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a State scenic highway?	LTS	None Required.	LTS
Impact 4.1-4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	LTS	None Required.	LTS
4.2 Agriculture and Forestry Resources			
Impact 4.2-1. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use?	NI	None Required.	NI
Impact 4.2-2. Conflict with existing zoning for agricultural use or a Williamson Act Contract?	NI	None Required.	NI
Impact 4.2-3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	LTS	None Required.	LTS
Impact 4.2-4. Result in the loss of forest land or conversion of forest land to non-forest use?	LTS	None Required.	LTS
Impact 4.2-5. Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use?	LTS	None Required.	LTS

B = beneficial LTS = less than significant NI = no impact PS = potentially significant S = significant SU = significant and unavoidable

Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.3 Air Quality			
Impact 4.3-1. Conflict with or obstruct implementation of the applicable air quality plan?	NI for existing infrastructure operations and post-construction operations Construction-related impacts Speculative	**Mitigation Measure 4.3-1a: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed El Dorado County Air Pollution Control District thresholds.** Prior to construction of any infrastructure improvement for the Project, the District shall quantify construction-related criteria air pollutant emissions for each proposed construction activity. Emissions calculations shall quantify emissions from all construction-related sources, including but not limited to construction equipment use; vehicle trips (i.e., worker commutes, vendor trips, and haul trucks); and fugitive emissions from paving and architectural coatings. Emissions shall be compared to the El Dorado County Air Quality Management District (El Dorado County AQMD) thresholds of significance of 82 pounds per day for each reactive organic gases (ROG) and gases and oxides of nitrogen (NO_X). If ROG and NO_X emissions do not exceed applicable thresholds, then exhaust emissions of all other criteria air pollutants from equipment and vehicles would be less than significant. Should modeled emissions exceed this performance standard, the District shall revise the construction requirements for the proposed infrastructure improvement to incorporate measures to reduce construction-related emissions below applicable thresholds. Measures may include but are not limited to the following: limit operation time of heavy equipment, limit equipment idling time, require use of cleaner-fuel equipment, require use of electric or hybrid powered equipment, and/or require use of local construction contractors. Using the revised construction requirements, the District shall quantify construction-related criteria air pollutant emissions for each proposed construction activity to ensure that implementation of the measures reduces construction-related emissions below the 82 pounds per day thresholds for ROG and NO_X.	No mitigation measures required for operational impacts Potential construction-related impacts and mitigation measures to be determined based on project level analysis[1]

[1] While the information from comparable past projects and implementation of applicable mitigation measures indicates that potential construction-related impacts to air quality associated with the proposed Project would be less than significant, this impact conclusion is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.3-1. (Continued)		**Mitigation Measure 4.3-1b: Dust and Emissions Control Plan** The District shall require that the selected contractor prepare and implement a Project Dust and Emissions Control Plan. The following measures shall be conducted throughout the construction period to limit and control dust and air emissions: • All material excavated, stockpiled, or graded shall be sufficiently watered, treated, or covered to prevent fugitive dust from leaving the property boundaries and/or causing a public nuisance. • All areas with vehicle traffic shall be watered or have a dust palliative applied as necessary to minimize dust emissions. • All on-site vehicle traffic shall be limited to a speed of 15 mph on unpaved roads. • All land clearing, grading, earth moving, or excavation activities on the Project shall be suspended as necessary to prevent excessive windblown dust when winds are expected to exceed 20 mph. • All inactive portions of the construction site shall be covered, seeded, or watered or otherwise stabilized until a suitable cover is established. • All material transported off-site shall be either sufficiently watered or securely covered to prevent it from being entrained in the air and there must be a minimum of six (6) inches of freeboard in the bed of the transport vehicle. • Paved streets adjacent to the Project shall be reasonably clean through methods such as sweeping or washing at the end of each day, or more frequently, if necessary, to remove excessive accumulations or visibly raised areas of soil which may have resulted from activities at the Project area. • Prior to the end of construction, the applicant shall re-establish ground cover on the site through seeding. • The Project contractor shall ensure that all construction equipment is properly maintained.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.3-1. (Continued)		The Project is not located in an area mapped as having, or otherwise known to have, ultramafic rock, serpentine, or naturally occurring asbestos (El Dorado County 2015). However, if naturally occurring asbestos is discovered during Project construction, the following shall occur: 1. If naturally occurring asbestos, serpentine, or ultramafic rock is discovered in the area to be disturbed after the start of any construction or construction-related activity, a Professional Geologist or the Air Pollution Control Officer must report the discovery to the El Dorado County AQMD no later than the next business day; and 2. The Project shall comply with applicable provisions of Rule 223-2 and the California Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (CCR Title 17, Section 93105).	
Impact 4.3-2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?	NI for existing infrastructure operations and post-construction operations Construction-related impacts Speculative	**Implement Mitigation Measure 4.3-1a and Mitigation Measure 4.3-1b.**	No mitigation measures required for operational impacts Potential construction-related impacts and mitigation measures to be determined based on project level analysis[2]

[2] While the information from comparable past projects and implementation of applicable mitigation measures indicates that potential construction-related impacts to air quality associated with the proposed Project would be less than significant, this impact conclusion is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.3-3. Expose sensitive receptors to substantial pollutant concentrations?	PS	**Mitigation Measure 4.3-1b: Dust and Emissions Control Plan**	LTS
Impact 4.3-4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	LTS	None Required.	LTS
4.4 Biological Resources			
Impact 4.4-1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?			
Special-Status Species in Reservoirs	LTS	None Required.	LTS
Sanford's Arrowhead	LTS	None Required.	LTS
Foothill Yellow-legged Frog	LTS	None Required.	LTS
Special Status Fish Species in South Fork	LTS	None Required.	LTS
Northwestern Pond Turtles	LTS	None Required.	LTS
Special-Status Plants	PS	**Mitigation Measure 4.4-1: Conduct Preconstruction Special-status Plant Surveys and Implement Avoidance and Minimization Measures** Before the start of any Project construction activity, focused special-status plant surveys shall be conducted by a qualified botanist in the Project construction footprint, including areas used for staging and access, and within 100 feet of the boundaries of these areas. The Project footprint is defined as all areas that could potentially be subject to temporary or permanent ground-disturbing activities. Surveys shall be conducted at an appropriate time of year during which the species are likely to be detected, generally during the blooming period. Surveys will follow current CDFW guidelines, Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2018). If no special-status plant species are detected during special-status plant surveys of construction areas and surrounding buffers, no impacts on special-status plants would occur. The results of the survey shall be documented in a technical report and kept on file at the District. No further actions would be required.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Special-Status Plants (Continued)		If special-status plants are found in the survey area but not in the Project footprint, the District shall delineate the area as an environmentally sensitive area (ESA) on project plans and protect the plants in place during construction using temporary fencing to protect plants from disturbance. The integrity of the ESA fencing shall be maintained and periodically inspected throughout construction. Following completion of construction, the ESA fencing shall be removed. If special-status plant populations are documented in the Project footprint and cannot be avoided with an ESA buffer, the District shall develop and implement a Biological Resources Mitigation Plan (BRMP) to minimize and compensate for the loss of special-status plants. The BRMP will be developed in consultation with CDFW before construction activities begin in areas containing special-status plant species. The BRMP will provide protocols for preserving and replacing plants with a 1B and 2B CRPR rank (or others, if appropriate) and will include appropriate compensation measures determined through consultation with CDFW, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures to be implemented if the initial mitigation fails. The BRMP shall include, but not be limited to the following implementation options: • Salvaging of and relocation of plant(s) to appropriate habitat areas outside of project ground disturbance; • Collection of seeds or propagules from special-status plants that would be affected by construction related ground disturbance for establishment in a protected area; • Collection of and relocation of soil from ground disturbance areas to nearby areas of suitable habitat in the immediate vicinity of special-status plant occurrences to preserve the soil seed bank; • Use of removed soil for revegetation and postconstruction grading to maintain the soil seed bank and re-establishment of the disturbed population onsite following construction. The performance standard for successful implementation of the BRMP shall be a documented no net loss of special-status plant populations that are temporarily or permanently affected by Project construction. Monitoring and reporting protocols outlined in the BRMP will be used to assess success. Contingency measures outlined in the BRMP will be used if initial monitoring indicated that BRMP implementation may fall short of specific performance standards. The BRMP will also indicate when mitigation will be considered successful and complete, and when monitoring and reporting may cease.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Special-Status Plants (Continued)		**Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program** Before the start of any Project construction activity, the District shall develop a Project-specific worker environmental awareness program (WEAP). The WEAP will identify the special-status species and other sensitive biological resources found in or near the Project site and will describe the best management practices and avoidance, minimization and mitigation measures that must be implemented to prevent, minimize, or compensate for potential impacts to these resources. The WEAP will also describe specific conditions of any Project permits from regulatory agencies (if applicable) and any mitigation measure commitments affecting Project construction practices such as preconstruction surveys, avoidance buffers, required monitoring etc. The WEAP will initially be presented to the construction team and workers at Project construction kickoff. Printed handouts and other materials, if deemed appropriate, will be distributed and used for future reference by the construction team. Following Project kickoff, the Contractor construction foreperson, or predetermined alternate Contractor designee, will be responsible for making sure that other workers on the Project receive WEAP training as they come onto the Project. A roster of WEAP-trained construction workers will be maintained in the Project construction office and made available for review by regulatory agencies, the District, or other responsible parties, as required by the Project's Mitigation Monitoring and Reporting Program or Project permits. **Mitigation Measure 4.4-3: Reduce the Spread and Introduction of Invasive Noxious Weeds.** To reduce the spread and introduction of weeds, the following measures shall be implemented: • All Project-related equipment and vehicles will be decontaminated of weeds and soils prior to arrival at the Project construction site. • Topsoil, mulch, and seed used in Project-related activities (e.g. restoration, reseeding, erosion control, and soil stabilization) shall be certified weed-free. Construction equipment and materials arriving onsite will be inspected for proper weed free conditions by a designated person from the construction management team. **Mitigation Measure 4.3-1b: Implement a Dust and Emissions Control Plan**	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Monarch Butterfly	PS	**Mitigation Measures 4.4-4. Conduct Preconstruction Milkweed Surveys and Implement Avoidance and Minimization Measures** Before the start of any Project construction activity, a qualified biologist shall conduct a habitat assessment for suitable monarch butterfly habitat in the Project's construction footprint, including areas used for staging and access, and within 100 feet of the boundaries of these areas. The survey will be conducted in all potentially suitable habitats for monarch butterflies in the Project construction footprint and the 100-foot buffer area. The survey may be conducted concurrently with the special-status plant survey described in Mitigation Measure 4.4-1. If no milkweed plants or suitable monarch butterfly habitat are detected during the surveys, no impacts on monarch butterflies would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required. If monarch butterfly habitat in the form of milkweed plants is found in the survey area but not in the Project footprint, the District shall delineate the area as an environmentally sensitive area (ESA) on project plans and protect it in place using ESA temporary fencing. The integrity of the ESA fencing will be maintained and periodically inspected throughout construction. If monarch butterfly habitat in the form of substantial milkweed patches occurs in the Project footprint and potential impacts cannot be avoided with an ESA buffer, the District will develop and implement a BRMP to minimize and compensate for the loss of milkweed plants. The BRMP will be developed before construction activities begin in areas containing monarch butterfly habitat in the form of substantial patches of milkweed. The BRMP will describe protocols for preserving and replacing milkweed and other species important to monarch butterflies, as described in Managing for Monarchs in the West (Xerces 2018). The BRMP will include methods for implementation of monarch butterfly habitat restoration, success criteria, monitoring and reporting protocols, and contingency measures to be implemented if the initial mitigation fails. The performance standard for successful implementation of the BRMP will be no net loss of monarch butterfly habitat in the form of milkweed patches that are temporarily or permanently affected by Project construction. The following mitigation measure shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program**	LTS

B = Beneficial LTS = less than significant NI = no impact PS = potentially significant S = significant SU = significant and unavoidable

Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Foothill Yellow-legged Frog	PS	**Mitigation Measure 4.4-5: Conduct Surveys for Foothill Yellow-legged Frogs and Implement Avoidance and Minimization Measures.** Before the start of any Project construction activity, the District shall conduct preconstruction surveys for all areas of Project-related ground disturbance that could support foothill yellow-legged frogs. The surveys shall include a habitat assessment as described in A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog (*Rana boylii*) (Seltenrich and Pool 2002). If no suitable habitat for foothill yellow-legged frogs is documented during the surveys, no impacts would occur. The results of the survey shall be documented in a technical report kept on file and the District, and no further actions would be required. If the habitat assessment indicates suitable foothill yellow-legged frog habitat is present in the Project construction area, Visual Encounter Surveys (VES) and site assessments will be conducted as described in Seltenrich and Pool (2002). If the VES indicate presence of egg masses, tadpoles, juveniles or subadults/adults in areas that could be adversely affected by Project construction activities, the District will develop a BRMP in consultation with CDFW and USFWS to avoid, minimize and mitigate potential Project impacts before construction activities begin. The District will also consult with CDFW and USFWS to determine if a State or federal incidental take permit (ITP) may be required for construction. The BRMP will describe avoidance and minimization measures, habitat restoration, if necessary, success criteria, monitoring and reporting protocols, and contingency measures or compensatory mitigation to be implemented if the initial mitigation fails. The performance standard for the successful implementation of the BRMP shall be complete avoidance of take of foothill yellow-legged frog and no net loss of foothill yellow-legged frog habitat.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Foothill Yellow-legged Frog (Continued)		If dewatering or a stream bypass is required during construction, the District shall prepare and implement a Dewatering Plan or Stream Bypass Plan, as described in Mitigation Measure 4.10-5, (Prepare and Implement a Dewatering and/or Stream Bypass Plan) in EIR Section 4.10 Hydrology and Water Quality. The Dewatering Plan will describe the methods to be used for dewatering, the location of the dewatering, the estimated amount of water, the discharge locations, the Best Management Practices (BMPs) and avoidance and minimization measures to be implemented during dewatering, and any erosion protection measures needed at the point of discharge. The Dewatering Plan or Stream Bypass Plan will be provided to CDFW prior to construction as component of the Streambed Alteration Agreement (see Mitigation Measure 4.4-12 below). The following mitigation measures shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program** **Mitigation Measure 4.10-1 Stormwater Management during Construction** **Mitigation Measure 4.9-1a Comply with all Regulations on the Transport and Use of Hazardous Materials** **Mitigation Measure 4.9-1b Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation** **Mitigation Measure 4.4-12– Obtain a Streambed Alternation Agreement from CDFW and Implement all Agreement Conditions.**	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Northwestern Pond Turtle	PS	**Mitigation Measure 4.4-6: Conduct Surveys for Northwestern Pond Turtles and Implement Avoidance and Minimization Measures.** Before the start of any Project construction activity, the District shall conduct preconstruction surveys in all areas of Project ground disturbance that could support northwestern pond turtles. The surveys will include a habitat assessment as described in Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion (USGS 2006). If no suitable habitat for northwestern pond turtles is detected during the surveys, no impacts would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required. If the habitat assessment indicates suitable habitat for northwestern pond turtle is present in the Project area, visual surveys shall be conducted as described in USGS 2006 to assess aquatic and upland habitat. If the visual surveys indicate the presence of northwestern pond turtles in areas that could be adversely affected by Project construction activities, the District will develop a BRMP to avoid, minimize and mitigate potential Project impacts. The District will develop the BRMP and appropriate compensation measures, if needed, before construction activities begin. The BRMP will describe implementation of avoidance and minimization measures, avoidance of take, habitat restoration, if necessary, success criteria, monitoring and reporting protocols, and contingency measures or compensatory mitigation to be implemented if the initial mitigation fails. The performance standard for the successful implementation of the BRMP shall be complete avoidance of take of northwestern pond turtles and no net loss of northwestern pond turtle habitat. The following mitigation measures shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program** **Mitigation Measure 4.10-1 Stormwater Management during Construction** **Mitigation Measure 4.9-1a Comply with all Regulations on the Transport and Use of Hazardous Materials** **Mitigation Measure 4.9-1b Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation**	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Raptors	PS	**Mitigation Measure 4.4-7: Conduct Preconstruction Surveys for Special Status Raptors and Implement Avoidance and Minimization Measures.** Before the start of any Project construction activity, the District will conduct preconstruction surveys as described below in all areas subject to potential direct impacts or indirect disturbance associated with Project construction. 4.4-7a. A qualified biologist will conduct preconstruction surveys as described in the Northern Goshawk Inventory and Monitoring Technical Guide (USFS 2006). This protocol requires two visits, the first to be conducted during the nestling stage (generally late May through late June or early July), and the second during the fledgling stage (late June through mid-August). If no active goshawk nests are detected, no impacts would occur to nesting goshawks. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required. If an active nest is detected the nest will be mapped and a buffer will be established around the nest. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers). 4.4-7b. A qualified biologist will conduct preconstruction surveys as described in the Protocol for Evaluating Bald Eagle Habitat and Populations in California (Garcia and Associates & PG&E 2004). Initial bald eagle nest searches shall be conducted when eagles are most likely to be found at nest sites and as early in the breeding season as possible (late February through March). Additional surveys shall be conducted in mid-nesting season (late April through May) and late in the season (early June to early July). If no active bald eagle nests are detected, no impacts would occur to nesting bald eagles. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required. If an active nest is detected the nest will be mapped and a non-disturbance buffer will be established around the nest. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers).	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Raptors (Continued)		4.4-7c. A qualified biologist will conduct preconstruction surveys consistent with methods described in the Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls (USFWS 2012) or other currently accepted protocol. The surveys shall occur between March 15 and August 31 or within the timeframe defined in the most current accepted protocol. If no active spotted owl nests are detected, no impacts would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required. If an active spotted owl nest is detected the nest will be mapped and a non-disturbance buffer will be established around the nest for the duration of nesting. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers). The following mitigation measure shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program**	
Willow Flycatcher	PS	**Mitigation Measure 4.4-8: Conduct Preconstruction Surveys for Willow Flycatcher and Implement Avoidance and Minimization Measures.** Before the start of any construction activities a qualified biologist shall assess the areas subject to potential Project construction impacts and disturbance to determine if suitable willow flycatcher nesting habitat (i.e., dense willow thickets near standing water, wet meadows) is present. If suitable nesting habitat for willow flycatchers is present, a qualified biologist will conduct preconstruction surveys consistent with A Willow Flycatcher Survey Protocol for California (Bombay et al. 2003). This protocol requires a minimum of two separate surveys, one conducted between June 15 – 25 and one during either June 1–14 or June 26–July 15.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Willow Flycatcher (Continued)		If no willow flycatcher nesting activity is detected, no impacts would occur to nesting willow flycatchers. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required. If an active nest is detected the nest will be mapped and a non-disturbance buffer will be established around the nest. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers). The ESA buffer will be delineated with highly visible fencing that will be monitored and maintained until the young have fledged from the nest. Periodic monitoring of the nest will occur as described in ICF International and H.T. Harvey and Associates (2013). The monitoring biologist shall have the authority to stop work if there is evidence that proposed construction activity might result in harassment (e.g., discouraging adult birds from incubation or feeding young) that could jeopardize survival of eggs, young, or fledglings. The following mitigation measure shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program**	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Nesting Migratory Birds	PS	**Mitigation Measure 4.4-9: Conduct Preconstruction Surveys for Nesting Birds and Implement Avoidance and Minimization Measures.** If possible, conduct vegetation removal from approximately September 1 to February 28) to avoid the bird breeding season (March 1 through August 31). If construction activities are initiated outside the bird breeding season, then no pre-construction nesting survey shall be required. If Project construction occurs during the bird breeding season (March 1 through August 31), a qualified biologist shall conduct preconstruction nest surveys no more than 7 days before the start of construction. The survey would cover the Project footprint, including areas used for staging and access, and a 500- foot buffer beyond the boundaries of these areas. If an active nest (defined as a bird building a nest, sitting on a nest, carrying food to young, etc.) is found, non-disturbance ESA buffer will be delineated with highly visible flagging that will be periodically monitored and maintained until the young have fledged from the nest. The extent of the buffer shall be determined by a qualified biologist based on consideration of the species, the expected extent of noise or construction disturbance, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers). The following mitigation measure shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program**	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Special-Status Bat Species	PS	**Mitigation Measure 4.4-10: Conduct Preconstruction Habitat Assessment for Bats and Implement Avoidance and Minimization Measures.** Before the start of any Project construction activity, a qualified biologist will conduct a preconstruction habitat assessment in and within 100 feet of the Project footprint. The assessment will be conducted in early spring and will evaluate whether suitable habitat for bat maternity roosts is present. Construction is not expected to occur during the overwintering season due to the elevation constraints for the Project. If highly suitable habitat for maternity roosts is present in an area that will be subject to vegetation removal and ground disturbing activities, removal of the highly suitable roost habitat will be conducted outside of the maternity season (May 1 to August 31) to avoid harm to the species. If a highly suitable roost tree or structure is to be removed, trees and/or structures surrounding the roost habitat should be removed first, allowing any bats that may be present time to leave the area. A qualified biologist will be present during removal of the habitat tree or structure supporting the potential bat roost. The following mitigation measure shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program**	LTS
Impact 4.4-2. Have a substantial adverse population effect on special-status salmonids based on water temperature changes that would affect a substantial number of individuals during sensitive life cycle stages of the species?	LTS	None Required.	LTS
Impact 4.4-3. 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 California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?	PS	**Mitigation Measure 4.4-11– Map Riparian Habitats and Other Sensitive Natural Communities and Implement Avoidance, Minimization, and Mitigation Measures.** A qualified biologist shall map the location and extent of riparian habitat and any other sensitive natural communities in the Project construction footprint, including areas used for staging and access. The survey will occur prior to construction and may be conducted concurrently with the special-status plant survey described in Mitigation Measure 4.4-1.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.4-3. (Continued)		If no riparian habitat or sensitive natural communities are detected during the surveys, no impacts on riparian habitat or sensitive natural communities would occur. The results of the survey shall be documented in a technical report and kept on file at the District. No further actions would be required. If riparian habitat or sensitive natural communities are found in the Project footprint, the District shall clearly identify these area as Environmentally Sensitive Areas (ESAs) on Project plans and protect the habitat in place during construction, using ESA temporary fencing. The integrity of the ESA fencing shall be maintained and periodically inspected throughout construction. If impacts cannot be avoided with an ESA buffer, the District shall develop and implement a BRMP to minimize and if necessary to compensate for the loss of habitat. The BRMP shall identify ways to restore or compensate for loss of riparian vegetation along the stream that supports wildlife, fish, or other aquatic life and any other sensitive natural community that would be affected by Project construction. Mitigation may be accomplished through onsite restoration, replacement, or enhancement of impacted habitat, or offsite mitigation at an established mitigation bank. The performance standard for successful implementation of the BRMP shall be no net loss of riparian habitat or other sensitive natural communities that are temporarily or permanently affected by Project construction. **Mitigation Measure 4.4-12– Obtain a Streambed Alteration Agreement from CDFW and Implement all Agreement Conditions.** The District shall obtain a Streambed Alteration Agreement (SAA) from CDFW subject to Section 1602 of the California Fish and Game Code for proposed construction activities that will affect the bed and bank of a regulated water body such as a natural stream or lake. All conditions of the Streambed Alteration Agreement shall be implemented as part of Project compliance. Relevant measures of the SAA shall be included in the WEAP training for the Project. The following mitigation measure shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program**	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.4-4. Have a substantial adverse effect on federally or state protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	PS	**Mitigation Measure 4.4-13– Map Federally or State Protected Wetlands and Implement Avoidance, Minimization, and Mitigation Measures, and/or Obtain Permits.** A qualified biologist shall map the location of potential wetlands and other waters that may be considered jurisdictional by USACE under Section 404 of the Clean Water Act (CWA) or by the Regional Water Quality Control Board (RWQCB) under the CWA Section 401 or the state's Porter Cologne Act using methods described in USACE's regulations (33 CFR 328), which require use of the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) along with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). The wetland survey area shall include the Project construction footprint, including areas used for staging and access. The wetland survey will occur prior to construction and may be conducted concurrently with the special-status plant survey described in Mitigation Measure 4.4-1. If no federally or state protected wetlands are detected during the surveys, no impacts would occur with implementation of water quality protection measures described below. The results of the survey shall be documented in a technical report and kept on file at the District. No further action would be required. If state or federally protected wetlands are detected during the surveys, the District shall delineate the area as an ESA on Project plans and protect the wetlands during construction, using ESA temporary fencing. The integrity of the ESA fencing shall be maintained and periodically inspected throughout construction. If wetlands are found in the Project construction footprint and potential direct impacts cannot be avoided with an ESA buffer, a wetland delineation report for the Project shall be prepared and used for Project permitting. If Project activities would result in the placement of dredged or fill material into "Waters of the U.S.," subject to USACE regulations or "Waters of the State" subject to Regional Water Quality Control Board regulation the District will avoid or reduce such potential impacts to the maximum extent feasible.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.4-4. (Continued)		The District shall obtain a CWA Section 404 permit from the USACE and a CWA Section 401 Water Quality Certification from the RWQCB for any impacts to Waters of the U.S. or Waters of the State, and/or a Waste Discharge Permit for any Waters of the State not subject to federal jurisdiction, but subject to the State's Porter Cologne Act. The District shall comply with all conditions of the Section 404 and 401 permits and/or Waste Discharge Permit requirements. The following mitigation measures shall also be implemented: **Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program** **Mitigation Measure 4.10-1 Stormwater Management during Construction** **Mitigation Measure 4.9-1a Comply with all Regulations on the Transport and Use of Hazardous Materials** **Mitigation Measure 4.9-1b Prepare and Implement a Hazardous Materials Release Prevention Plan**	
Impact 4.4-5. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	LTS	None Required.	LTS
Impact 4.4-6. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	NI	None Required.	NI
Impact 4.4-7. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	NI	None Required.	NI
4.5 Cultural Resources			
Impact 4.5-1. Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	PS	**Mitigation Measure 4.5-1a: Identification of Cultural Resources** Project activities would have the potential to affect cultural resources if the construction activity would directly disturb, destroy, or remove all or part of a resource including built environment resources. In addition, some resources may be affected if activity adjacent to their location may directly affect the setting, feeling, or association of the resource.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.5-1. (Continued)		Prior to the start of construction activities, the District shall retain a qualified cultural resources specialist to conduct a cultural resources inventory of all Project areas that could be affected by construction. Previously identified resources shall be revisited and assessed for any changes since the last inventory and any newly identified resources shall be inventoried. The results of the inventory shall be documented in a report that also recommends suitable avoidance and minimization measures for the Project. These measures shall be incorporated into construction plans. **Mitigation Measure 4.5-1b: Implement Appropriate Avoidance and Protection Measures for Cultural Resources** Resources documented during the cultural resources inventory called for in Mitigation Measure 4.5-1a in the Project construction zones shall be clearly marked for avoidance prior to construction to prevent damage by physical impact of construction equipment and/or vehicles. The established avoidance zones shall be fenced or otherwise clearly marked in the field and shall be maintained throughout the duration of the construction period. If avoidance zone fencing or marking is disturbed during construction, the avoidance area shall be monitored by a spotter until the fencing can be replaced. Protective fencing shall remain in place for the entire duration of construction and shall be removed once construction is complete. **Mitigation Measure 4.5-1c: Cultural Resource Awareness Training** The District shall provide cultural resources awareness training for workers prior to beginning Project construction. The District shall have a qualified archaeologist prepare training materials (i.e., printed handouts) that provide information on the following topics: 1. How to recognize cultural resources, including prehistoric and historic artifacts 2. How to comply with the avoidance and minimization measures for cultural resources 3. What to do if artifacts are encountered in the Project area 4. Information on other measures relevant to cultural resources Information on regulations and applicable civil and criminal penalties for violations. The training shall initially be presented to key Project personnel at the Project kickoff. Printed handouts shall be distributed and used for future reference by Project personnel. Project personnel that are trained during the Project kickoff shall be responsible for making sure that other workers on the Project receive the training	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.5-1. (Continued)		before initiating on-site work. A roster of trained Project personnel shall be maintained in the Project construction office and made available for review by regulatory agencies, if needed. This training may be conducted in coordination with the tribal cultural resource awareness training (MM TRIB-2), biological resources awareness training (MM BIO-2), and paleontological resources awareness training (MM GEO-2). **Mitigation Measure 4.5-1d: Proper Handling of Inadvertent Discovery of Cultural Resources** If cultural resources are encountered during construction, compliance with federal and State regulations and guidelines regarding the treatment of cultural resources and/or human remains shall be required. 1. If potential prehistoric or historic-period archaeological resources are encountered during Project implementation, all construction activities within 100-feet shall halt and the District shall be notified. 2. A qualified archaeologist, defined as one meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology, shall inspect the findings as soon as practicable following discovery and report the results of the inspection to the District. 3. If the identified archaeological resource is determined to be prehistoric, the District and qualified archaeologist shall coordinate with and solicit input from a culturally affiliated Native American Tribal Representative regarding significance and treatment of the resource as a potential Tribal Cultural Resource. Any Tribal Cultural Resources discovered during Project work shall be treated in consultation with the tribe, with the goal of preserving in place with proper treatment. See MM TRIB-1, TRIB-2, and TRIB-3 for more discussion of tribes and culturally sensitive areas. If the District determines that the resource qualifies as a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines) and that the Project has potential to damage or destroy the resource, mitigation shall be implemented in accordance with PRC Section 21083.2 and CEQA Guidelines Section 15126.4. Consistent with CEQA Guidelines Section 15126.4(b)(3), mitigation shall be accomplished through either preservation in place or, if preservation in place is not feasible, data recovery through excavation.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.5-1. (Continued)		4. If preservation in place is feasible, this may be accomplished through one of the following means: (1) modifying the construction plan to avoid the resource; (2) incorporating the resource within open space; (3) capping and covering the resource before building appropriate facilities on the resource site; or (4) deeding the resource site into a permanent conservation easement. 5. If avoidance or preservation in place is not feasible, a qualified archaeologist shall prepare and implement a detailed treatment plan to recover the scientifically consequential information from and about the resource, which shall be reviewed and approved by the District prior to any excavation at the resource site. Treatment of unique archaeological resources shall follow the applicable requirements of PRC Section 21083.2, including creation of a treatment plan. Treatment for most resources shall consist of (but shall not be limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim of targeting the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the Project. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and State repositories, libraries, and interested professionals.	
Impact 4.5-2. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064?	PS	**Mitigation Measure 4.5-1a: Identification of Cultural Resources** **Mitigation Measure 4.5-1b: Implement Appropriate Avoidance and Protection Measures for Cultural Resources** **Mitigation Measure 4.5-1c: Cultural Resource Awareness Training** **Mitigation Measure 4.5-1d: Proper Handling of Inadvertent Discovery of Cultural Resources**	LTS
Impact 4.5-3. Would the project disturb any human remains, including those interred outside of formal cemeteries?	PS	See **Impact 4.18-2.**	LTS
4.6 Energy			
Impact 4.6-1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	PS	**Mitigation Measure 4.6-1: Implement Energy-Efficient Construction Practices.** Prior to construction of any Project elements associated with infrastructure improvements for the Project, the District or its contractor(s) shall require and implement the following energy-efficient construction practices during construction:	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.6-1 (Continued)		• Improve fuel efficiency from construction equipment and vehicles: – Minimize idling time either by shutting equipment and vehicles off when not in use or reducing the time of idling to no more than 5 minutes (as required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site. – Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated. – Train equipment operators in proper use of equipment. – Use the proper size of equipment for the job. – Use equipment with new technologies (repowered engines, electric drive trains) as feasible and applicable for the equipment types required by the construction activities. • Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines) as feasible and applicable for the equipment types required by the construction activities. Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power as feasible and applicable based on the location of the construction activities.	
Impact 4.6-2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	PS	**Mitigation Measure 4.6-1: Implement Energy-Efficient Construction Practices** **Mitigation Measure 4.6-2: Comply with all Regulations Related to Energy Use during Construction** The District and any Contractors shall comply with all federal, state, and local plans, policies, ordinances rules, and regulations related to energy use during construction. For example, as required and applicable, any construction and demolition waste, including vegetation and soils from land clearing, would be appropriately reused, recycled, or diverted from disposal, as required by the El Dorado County Construction and Demolition Debris Recycling Ordinance (Title 8, Chapter 8.43). The regulations and codes related to energy use include those monitored by the state and/or local jurisdictions including the El Dorado County Environmental Management Department.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.7 Geology and Soils			
Impact 4.7-1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death, involving rupture of a known earthquake fault as delineated on the most recent Alquist Priolo Earthquake Fault Zoning Map or based on other substantial evidence of a known fault, strong seismic ground shaking, liquefaction, or seismically-induced landslides?	NI	None Required.	NI
Impact 4.7-2. Result in substantial soil erosion or the loss of topsoil?	PS	**Mitigation Measure 4.7-1: Stormwater Management During Construction** The District shall develop and implement a Water Pollution Control Plan (WPCP) or Stormwater Pollution Prevention Plan (SWPPP) during construction. A site-specific WPCP will be required if disturbed areas are less than one acre. Compliance with the Construction General Permit, including the development and implementation of a SWPPP, will be required if disturbed areas are one or more acres. The construction site BMPs listed below will be included in the WPCP or SWPPP, as applicable. • Spill prevention and control • Stabilized construction entrance/exit • Material delivery and storage • Solid waste management • Stockpile management • Storm drain inlet protection • Street sweeping and vacuuming • Vehicle and equipment maintenance, cleaning, and fueling • Concrete waste management • Silt fencing, fiber rolls, or gravel bags • Hydroseeding The District shall ensure the SWPPP is prepared by a certified Qualified SWPPP Developer (QSD) and implemented consistent with all applicable requirements. The plan will then be implemented at the construction site by the construction contractor and monitored by a Qualified SWPPP Practitioner (QSP)	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.7-3. 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?	PS	**Mitigation Measure 4.7-2: Perform Geotechnical Studies and Implement Design Recommendations** During design and engineering of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, the District shall conduct geotechnical studies of the proposed construction footprint. These studies shall be conducted by certified professional engineers and/or geologists and be focused on identifying any expansive soils, unstable geologic units, unstable soils, and soils that could become unstable due to the Project. The findings of these studies shall be summarized in a report and, as necessary, shall include measures to reduce any risks relating to soil instability and expansive soils, including on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse during or after construction. The District shall consider all recommendations provided in the geotechnical report in the final design of the improvements.	LTS
Impact 4.7-4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	PS	**Implement Mitigation Measure 4.7-2: Perform Geotechnical Studies and Implement Design Recommendations**	LTS
Impact 4.7-5. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	NI	None Required.	NI
Impact 4.7-6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	PS	**Mitigation Measure 4.7-3a: Paleontological Resources Awareness Training** The District shall provide paleontological awareness training for workers prior to beginning Project construction activities. The District shall have a qualified paleontologist prepare training materials (i.e., printed handouts) that provide information on the following topics: • How to recognize paleontological resources • What to do if paleontological resources are suspected or encountered in the Project area • Information on avoidance and other measures relevant to paleontological resources • Confidentiality and appropriate treatment of paleontological resources • Information on regulations and applicable civil and criminal penalties for violations	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.7-6. (Continued)		The training shall initially be presented to key Project personnel at the Project kickoff. Printed handouts shall be distributed and used for future reference by Project personnel. Project personnel that are trained during the Project kickoff shall be responsible for making sure that other workers on the Project receive the training before initiating on-site work. A roster of trained Project personnel shall be maintained in the Project construction office and made available for review by regulatory agencies, if needed. **Mitigation Measure 4.7-3b: Proper Handling of the Unanticipated Discovery of Paleontological Resources or Unique Geologic Features** If paleontological resources (i.e., fossils) and/or unique geologic features are encountered during construction, compliance with federal regulations (16 USC Chapter 1C, Sections 470aa through 470aaa11) and guidelines (SVP guidelines) regarding the treatment of such resources shall be required. If paleontological resources or unique geologic features are encountered during ground disturbing activities, work within 100 feet of the discovery shall be halted until the District notifies a qualified geologist or paleontologist to evaluate the significance of the find. If the find is determined to be significant, the District shall determine the appropriate avoidance measures or other appropriate mitigation in consultation with a qualified geologist or paleontologist and landowner, such as site salvage. Significant paleontological resources recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified paleontologist according to current professional standards. The SVP provides guidelines on assessment and mitigation of adverse impacts to paleontological resources.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.8 Greenhouse Gas Emissions			
Impact 4.8-1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than cumulatively considerable for existing infrastructure operations and post-construction operations Construction-related impacts Speculative	**Mitigation Measure 4.8-1: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed applicable thresholds.** Prior to construction of any Project elements associated with infrastructure improvements for the Project, the District or its contractor(s) shall quantify construction related GHG emissions for all Project-related construction activities. Emissions calculations shall quantify emissions from all construction-related sources, including but not limited to construction equipment use and vehicle trips (i.e., worker commutes, vendor trips, and haul trucks). Emissions shall be compared to the threshold of 1,100 MT CO_2e per year, or a more recent threshold adopted by El Dorado County AQMD available at the time of the analysis. Should modeled emissions exceed this performance standard, the District shall revise the construction requirements for the proposed infrastructure improvements to incorporate measures to reduce construction-related emissions below applicable thresholds. Measures may include, but are not limited to the following: • Improve fuel efficiency from construction equipment: • Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 5 minutes as required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site. • Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated. • Train equipment operators in proper use of equipment. • Use the proper size of equipment for the job.	No mitigation measures required for operational impacts Potential construction-related impacts and mitigation measures to be determined based on project level analysis[3]

[3] While the information from comparable past projects and implementation of applicable mitigation measures indicates that the Project's potential construction-related impacts associated with greenhouse gas emissions would be less than significant, this impact conclusion is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.8-1 (Continued)		• Use equipment with new technologies (repowered engines, electric drive trains) as feasible and applicable for the equipment types required by the construction activities. • Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines) as feasible and applicable for the equipment types required by the construction activities. • Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power as feasible and applicable based on the location of the construction activities.	
Impact 4.8-2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	LTS	None Required.	LTS
4.9 Hazards and Hazardous Materials			
Impact 4.9-1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment.	PS	**Implement 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials** The District and any Contractors shall comply with all federal, state, and local plans, policies, ordinances rules, and regulations regarding the transport and use of hazardous materials. These include, but are not limited to, the following: • 49 CFR 173, 49 CFR 177, and CCR Title 26, Division 6 • CCR Titles 8 and 22, • The Uniform Fire Code • Section 25100, Division 20 of the California Health and Safety Code • Cal EPA's Unified Program These regulations and codes are monitored by the state and/or local jurisdictions, including the El Dorado County Environmental Management Department.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.9-1 (Continued)		**Implement 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan** • For construction activities located within the FERC boundary, the District shall require the Contractor to follow the Project No. 184 Hazardous Substances Plan. For construction activities not located in the FERC boundary, the District shall prepare a Hazardous Materials Release Prevention Plan to reduce the risk of exposure to hazards due to the handling of hazardous materials during construction. Throughout construction, the construction contractor shall be responsible for following the plan and implementing the action plan in the event of a spill. The plan shall identify control measures to prevent the release of hazardous materials, as well as a detailed action plan to respond to an incidental spill in compliance with all local, State, and federal regulations relating to the handling and disposal of hazardous materials. The plan shall include, but would not be limited to, the following: • Containment and cleanup equipment (e.g., absorbent pads, mats, socks, granules, drip pans, shovels, and lined clean drums) shall be at the staging areas and construction sites for use, as needed. • Staging areas where refueling, storage, and maintenance of equipment occur shall not be located within 100 feet of drainages to reduce the potential for contamination by spills. • Construction equipment shall be maintained and kept in good operating condition to reduce the likelihood of line breaks or leakage. • No refueling or servicing shall be done within 25 feet of a waterway and without absorbent material (e.g., absorbent pads, mats, socks, pillows, and granules) or drip pans underneath to contain spilled material. If these activities result in an accumulation of materials on the soil, the soil shall be removed and properly disposed of as hazardous waste. • If a spill is detected, construction activities shall immediately cease in the area, and the procedures described in the plan shall be immediately enacted to safely contain and remove spilled materials. • Hazardous waste shall not be stored or accumulated within the Project area. All contaminated materials shall be classified as hazardous waste and disposed of in accordance with all local, State, and federal regulations. • Spill areas shall be restored to pre-spill conditions, as practicable.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.9-1 (Continued)		• Spills shall be documented and reported to the District and appropriate resource agency personnel.	
Impact 4.9-2. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	NI	None Required.	NI
Impact 4.9-3. 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?	NI	None Required.	NI
Impact 4.9-4. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	NI	None Required.	NI
Impact 4.9-5. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	PS	**Mitigation Measure 4.9-2: Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)** Prior to construction, the construction contractor and/or the District shall prepare a traffic control plan. The traffic control plan shall contain detailed measures in order to ensure acceptable levels of traffic flow, emergency response notification and response times, and public and school bus transit coordination and detours. The Plan shall include at a minimum: discussion of expected construction schedule and locations, traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. The construction contractor and/or the District shall implement the traffic control plan during construction activities associated with the Project.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.9-6. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	PS	**Mitigation Measure 4.9-3: Implement Mitigation Measure 4.20-1: Prepare and Implement a Fire Safety Plan.** The District shall require the Project contractor to prepare a Fire Safety Plan prior to construction. This plan shall be implemented by the Contractor during all construction activities. The plan shall describe the preventative measures for fire protection, fire-related roles and responsibilities of construction personnel, procedures for evaluating weather conditions during which fire risk is elevated (and identify conditions under which activities would cease due to elevated fire conditions), equipment required to prevent fire and respond to fire immediately, relevant emergency services agency contacts, and other measures taken to reduce fire risk, responsibilities of the work crews during construction.	LTS
4.10 Hydrology and Water Quality			
Impact 4.10-1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	PS	**Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction** **Mitigation Measure 4.10-2: Implement Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials** **Mitigation Measure 4.10-3: Implement Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan** **Mitigation Measure 4.10-4: Prepare and Implement a Dewatering and/or Stream Bypass Plan**. The District and/or Contractor shall prepare and implement a Dewatering Plan or Stream Bypass Plan during construction where this type of construction activity is required. The Dewatering Plan will describe the methods used for dewatering, the location of the dewatering, the estimated amount of water, the discharge locations, the BMPs and avoidance and minimization measures to be implemented during dewatering, and any erosion protection measures needed at the point of discharge. If dewatering of the stream channel is needed, the length of the dewatered stream channel and the duration that the creek is dewatered will be kept at a minimum, disturbance to the channel will be minimized, and downstream flows will be adequate to prevent stranding of fish during dewatering activities. The Stream Bypass Plan will describe the diversion approach, the discharge points, the BMPs	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.10-1 (Continued)		and avoidance and minimization measures to be implemented during diversions, and any erosion protection measures needed at the point of discharge. If a stream bypass is required, the length of water conveyance will be kept at a minimum. **Mitigation Measure 4.10-5: Design for Channel Stabilization Measures from the Hazel Creek Tunnel to Jenkinson Lake** The District shall have a registered engineer design the stabilization measures that will be implemented at the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Stabilization measures located within this channel will be sized based on maximum flow rates and velocities anticipated post-construction	
Impact 4.10-2. Degrades receiving water temperatures in a manner that adversely affects beneficial uses?	LTS	None Required.	LTS
Impact 4.10-3. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	NI	None Required.	NI
Impact 4.10-4. 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 a substantial erosion or siltation on- or off-site; ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or **iv.** Impede or redirect flood flows?	PS	**Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction** **Mitigation Measure 4.10-4: Prepare and Implement a Dewatering and/or Stream Bypass Plan** **Mitigation Measure 4.10-5: Design for Channel Stabilization Measures from the Hazel Creek Tunnel to Jenkinson Lake**	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.10-5. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	PS	**Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction** **Mitigation Measure 4.10-2: Implement Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials** **Mitigation Measure 4.10-3: Implement Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan**	LTS
Impact 4.10-6. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	PS	**Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction** **Mitigation Measure 4.10-2: Implement Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials** **Mitigation Measure 4.10-3: Implement Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan** **Mitigation Measure 4.10-4: Prepare and Implement a Dewatering and/or Stream Bypass Plan** **Mitigation Measure 4.10-5: Design for Channel Stabilization Measures from the Hazel Creek Tunnel to Jenkinson Lake**	LTS
4.11 Land Use and Planning			
Impact 4.11-1. Physically divide an established community?	NI	None Required.	NI
Impact 4.11-2. 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?	NI	None Required.	NI
4.12 Mineral Resources			
Impact 4.12-1. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	NI	None Required.	NI
Impact 4.12-2. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	NI	None Required.	NI

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.13 Noise			
Impact 4.13-1. 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?	PS	**Mitigation Measure 4.13-1a Restriction of Construction Operational Hours** Construction truck traffic along Hazel Valley Road, and access roads through the cabin tracts, campgrounds at Jenkinson Lake, and the Sand Flat Campground shall be limited to daytime periods between 7 am and 7 pm, Monday through Friday and 8 am and 5 pm on weekends, and on federally recognized holidays, whenever feasible. Additionally, construction activities that occur within 500 feet of sensitive receptors (i.e., residences along Hazel Valley Road, the residences at Alder Creek Tract, residences at 30 Mile Stone Tract, campgrounds at Jenkinson Lake, and the Sand Flat Campground) shall occur only between the daytime hours of 7 am and 7 pm Monday through Friday, and 8 am and 5 pm on weekends and federally recognized holidays. Construction occurring further than 500 feet of sensitive receptors and not contributing to an increase in traffic along the roads identified, may occur outside of the daytime hours. All construction equipment shall be fitted with factory installed muffling devices and all construction equipment shall be maintained in good working order. **Mitigation Measure 4.13-1b: Limit Construction Season** Construction activities shall not occur during the peak recreation season, which is generally from Memorial Day weekend to Labor Day weekend.	LTS
Impact 4.13-2. Generation of excessive groundborne vibration or groundborne noise levels?	PS	**Mitigation Measure 4.13-1a Restriction of Construction Operational Hours** Construction truck traffic along Hazel Valley Road, and access roads through the cabin tracts, campgrounds at Jenkinson Lake, and the Sand Flat Campground shall be limited to daytime periods between 7 am and 7 pm, Monday through Friday and 8 am and 5 pm on weekends, and on federally recognized holidays, whenever feasible. Additionally, construction activities that occur within 500 feet of sensitive receptors (i.e., residences along Hazel Valley Road, the residences at Alder Creek Tract, residences at 30 Mile Stone Tract, campgrounds at Jenkinson Lake, and the Sand Flat Campground) shall occur only between the daytime hours of 7 am and 7 pm Monday through Friday, and 8 am and 5 pm on weekends and federally recognized holidays. Construction occurring further than 500 feet of sensitive receptors and not contributing to an increase in traffic along the roads identified, may occur outside of the daytime hours.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.13-2 (Continued)		All construction equipment shall be fitted with factory installed muffling devices and all construction equipment shall be maintained in good working order. **Mitigation Measure 4.13-1b: Limit Construction Season** Construction activities shall not occur during the peak recreation season, which is generally from Memorial Day weekend to Labor Day weekend.	
Impact 4.13-3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	NI	None Required.	NI
4.14 Population and Housing			
Impact 4.14-1. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	NI	None Required.	NI
Impact 4.14-2. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	NI	None Required.	NI
4.15 Public Services			
Impact 4.15-1. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: fire protection; police protection; schools; parks; or other public facilities?	PS	**Mitigation Measure 4.15-1: Implement Mitigation Measure 4.20-1: Prepare and Implement a Fire Safety Plan.** The District shall prepare and implement a Fire Safety Plan prior to construction. This plan shall be implemented by the Contractor during all construction activities. The plan will describe the fire prevention process for treatment activities, weather conditions during which fire risk is elevated and all equipment operation and pile burning shall cease, equipment used to prevent fire and respond to a fire immediately, other measures taken to reduce fire risk, responsibilities of the work crews during construction. The Fire Safety Plan will also include applicable local, state, and federal requirements, including the California Fire Code and the El Dorado County Ordinance 8.08-Fire Prevention.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.16 Recreation			
Impact 4.16-1. Would the Project result in substantial adverse changes to, or loss of, recreational uses affecting a substantial number of people?	PS	**Mitigation Measure 4.16-1: Implement Mitigation Measure 13-1b: Limit Construction Season** Construction activities within the Sly Park Recreation Area shall occur outside of the peak recreation season, which is generally from Memorial Day weekend to Labor Day weekend.	LTS
4.17 Transportation			
Impact 4.17-1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	PS	**Mitigation Measure 4.17-1: Prepare and Implement Traffic Control Plan** Prior to construction, the construction contractor and/or the District shall prepare a traffic control plan. The traffic control plan shall contain detailed measures in order to ensure acceptable levels of traffic flow, emergency response notification and response times, and public and school bus transit coordination and detours. The Plan shall include at a minimum: discussion of expected construction schedule and locations, traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. The construction contractor and/or the District shall implement the traffic control plan during construction activities associated with the project.	LTS
Impact 4.17-2. Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b)?	NI for existing infrastructure operations and post-construction operations Construction-related impacts Speculative	**Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)**	No mitigation measures required for operational impacts Potential construction-related impacts and mitigation measures to be determined based on project level analysis

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.17-3. Substantially increases hazards due to a geometric design feature (such as sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	PS	**Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)**	LTS
Impact 4.17-4. Result in inadequate emergency access?	PS	**Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)**	LTS
4.18 Tribal Cultural Resources			
Impact 4.18-1. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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?	PS	**Mitigation Measure 4.18-1a: Implement Best Management Practices to Reduce or Avoid Impacts on Tribal Cultural Resources** The District shall implement the following measure to reduce or avoid impacts on TCRs. If interested Native American tribe(s) provide information demonstrating the significance of the Project site and specific evidence supporting the determination that the site is sensitive for TCRs, the District will conduct a site visit with tribal representatives to evaluate the potential for TCRs at the Project site. If tribal representatives and the District determine the site is sensitive for TCRs and that the proposed Project may have a significant impact on TCRs, the District, in consultation with tribal representatives, will develop and implement best management practices (BMPs) to reduce or avoid impacts on TCRs. BMPs may include but are not limited to: 1) modify the proposed Project to preserve the TCRs in place, 2) establish exclusion zones and/or minimize work activities in proximity to TCRs, or (3) implement other recommendations developed in consultation with tribal representatives to minimize potential impact. **Mitigation Measure 4.18-1b: Tribal Cultural Resource Awareness Training** The District shall provide TCR awareness training for workers prior to beginning Project construction activities. The District shall utilize information provided by culturally affiliated tribal representatives to develop the training materials (i.e., printed handouts) that provide information on the following topics: • How to recognize TCRs • What to do if TCRs are suspected or encountered in the Project area • Information on avoidance and other measures relevant to TCRs • Confidentiality and culturally appropriate treatment of TCRs • Information on regulations and applicable civil and criminal penalties for violations	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.18-1 (Continued)		The training materials will be shared with tribal representatives and tribal representatives will be invited to participate in the training. The training shall be presented to Project personnel at the Project kickoff. Printed handouts shall be distributed and used for future reference by Project personnel. A roster of trained Project personnel shall be maintained in the Project construction office and made available for review by regulatory agencies and culturally affiliated tribal representatives if needed. This training may be conducted in coordination with the biological resource awareness training (M 4.4-1a), cultural resources awareness training (MM 4.5.2), and paleontological resources training (MM 4.7-3a). **Mitigation Measure 4.18-1c: Proper Handling of Inadvertent Discovery of Tribal Cultural Resources** The District shall implement the following measure to reduce or avoid impacts and address the evaluation and treatment of inadvertent discoveries of potential TCRs during Project activities. If any suspected TCRs are discovered during Project construction activities, all work shall cease within 100-feet of the discovery. The District shall invite a tribal representative from culturally affiliated tribes to visit the site and examine the discovery to determine whether or not the discovery represents a TCR (PRC §21074). Tribal representatives shall have 48 hours to respond to the District's notification and schedule a site visit. If the discovery represents a TCR, the District will work with tribal representatives to develop recommendations for culturally appropriate treatment. Recommendations may include but are not limited to: (1) modifying the Project to preserve the TCR in place, (2) establishing exclusion zones and/or minimizing work activities in proximity to the TCR, or (3) implementing other recommendations developed in consultation with tribal representatives to minimize potential impacts to the TCR. Work at the discovery location will not resume until the agreed upon treatment has been implemented to the satisfaction of the District. Also see MM 4.5-1a in Section 4.5 Cultural Resources of this DEIR for measures to treat an inadvertent discovery that qualifies as a historical or a unique archaeological resource.	

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.18-2. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?	PS	**Mitigation Measure 4.18-2 Unanticipated Discovery of Human Remains** Although human remains from archaeological contexts are rarely found in Sierran sites, it is necessary to develop a strategy for dealing with this possibility. If human remains are encountered, work shall halt in the vicinity and the El Dorado County Coroner shall be notified immediately pursuant to Public Resources Code (PRC) Section 7050.5. If human remains are of Native American origin, the coroner shall notify the Native American Heritage Commission (NAHC) within 24 hours of this identification. The NAHC shall identify the person or persons it believes to be the most likely decedent (MLD) from the deceased Native American. The MLD shall have an opportunity to make a recommendation to the landowner or the person responsible for the excavation work for means of treating, with appropriate dignity, the human remains, and any associated grave goods as provided in PRC Section 5097.98.	LTS
4.19 Utilities and Service Systems			
Impact 4.19-1. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	LTS	None Required.	LTS
Impact 4.19-2. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	NI	None Required.	NI
Impact 4.19-3. Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	NI	None Required.	NI
Impact 4.19-4. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	LTS	None Required.	LTS
Impact 4.19-5. Comply with Federal, State, and Local Management and Reduction Statutes and Regulations Related to Solid Waste?	LTS	None Required.	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.20 Wildfire			
Impact 4.20-1. Substantially impair an adopted emergency response plan or emergency evacuation plan?	PS	**Mitigation Measure 4.20-1: Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)** Prior to construction, the construction contractor and/or the District shall prepare a traffic control plan. The traffic control plan shall contain detailed measures in order to ensure acceptable levels of traffic flow, emergency response notification and response times, and public and school bus transit coordination and detours. The traffic control plan shall include at a minimum: discussion of expected construction schedule and locations, traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. The construction contractor and/or the District shall implement the traffic control plan during construction activities associated with the project.	LTS
Impact 4.20-2. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	PS	**Mitigation Measure 4.20-2: Prepare and Implement a Fire Safety Plan.** The District shall require the Project contractor to prepare a Fire Safety Plan prior to construction. This plan shall be implemented by the Contractor during all construction activities. The plan shall describe the preventative measures for fire protection, fire-related roles and responsibilities of construction personnel, procedures for evaluating weather conditions during which fire risk is elevated (and identify conditions under which activities would cease due to elevated fire conditions), equipment required to prevent fire and respond to a fire immediately, relevant emergency services agency contacts, and other measures taken to reduce fire risk.	LTS
Impact 4.12-3. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	NI	None Required.	NI

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact 4.20-4. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	PS	**Mitigation Measure 4.20-3: Implement Mitigation Measure 4.10-1: Stormwater Management During Construction** The District shall require the construction contractor to implement a Water Pollution Control Plan (WPCP) or Stormwater Pollution Prevention Plan (SWPPP) during Project-related construction activities. A site-specific WPCP will be required if disturbed areas are less than one acre. Compliance with the Construction General Permit, including the development and implementation of a SWPPP, will be required if disturbed areas are one or more acres. The construction site best management practices (BMPs) listed below will be included in the plan, as applicable. • Spill prevention and control • Stabilized construction entrance/exit • Material delivery and storage • Solid waste management • Stockpile management • Storm drain inlet protection • Street sweeping and vacuuming • Vehicle and equipment maintenance, cleaning, and fueling • Concrete waste management • Silt fencing, fiber rolls, or gravel bags • Hydroseeding The District will prepare the WPCP or SWPPP prior to the start of construction. The plan will during construction by the construction contractor. The District and/or a third-party consultant shall monitor performance and compliance with the WPCP or SWPPP.	LTS

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2 INTRODUCTION

2.1 PROJECT INTRODUCTION

The El Dorado Irrigation District (District) is proposing Modification of Water Right Permit 21112 (Project) through a water right change petition to add an additional authorized upstream point of diversion and an additional place of storage and point of re-diversion to storage to more effectively and efficiently manage water in the system and meet future water demands within El Dorado County. The additional upstream point of diversion is located at the District's existing El Dorado Diversion Dam near Kyburz. In addition, the District proposes to add Jenkinson Lake as an authorized place of storage and to add a point of re-diversion to storage at Sly Park Dam (which forms Jenkinson Lake and is hereafter referred to as Jenkinson Lake) to allow for storage of Water Right Permit 21112 (Permit 21112) water in Jenkinson Lake.

The District currently holds Water Right Permit 21112, issued in 2001 by the State Water Resources Control Board (SWRCB). Permit 21112 allows the District to make direct diversions from the South Fork American River (South Fork) at Folsom Reservoir; to divert water to storage in Caples, Silver, and Aloha Lakes; and, to re-divert the water released from those upstream reservoirs once it reaches Folsom Reservoir for consumptive uses. The total quantity of water that may be diverted by the District at Folsom Reservoir annually (by a combination of direct diversion and re-diversion of stored water) is 17,000 acre-feet per year (AFY). The point of diversion at Folsom Reservoir draws direct diversions from the South Fork along with water previously stored in upstream reservoirs (Caples, Silver, Aloha Lakes) that are operated pursuant to the District's Project 184 Federal Energy Regulatory Commission (FERC) license.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam. However, to re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cubic feet per second; [cfs]) to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. These future improvements would require subsequent environmental review.

2.2 THE ENVIRONMENTAL REVIEW PROCESS

The California Environmental Quality Act (California Public Resources Code [PRC] 21000 et seq.)(CEQA) requires public agencies to identify, disclose, and consider the potential environmental impacts of proposed discretionary actions that the agencies are considering for approval. A project that may have a significant impact on the environment cannot be approved unless the Lead Agency makes the approval contingent upon the implementation of mitigation measures that would reduce or avoid that impact to the furthest extent feasible. When a project may have significant environmental impacts, the Lead Agency must prepare an environmental impact report (EIR) before it considers whether to approve the project.

The District, as the Lead Agency for the Project, has prepared this Draft EIR for public review and comment per the requirements of

Article 7, Sections 15080 to 15097 of the CEQA Guidelines (Title 14 California Code of Regulations Chapter 3 Section 15000 et seq.), which describes the EIR process, as well as other requirements set forth in the regulations. As discussed below, the Draft EIR will be available for review and comment by public agencies and

the general public for a period of 60 days. Prior to considering the Project, the District will prepare a Final EIR that includes the Draft EIR, the comments received on the Draft EIR, written responses to those comments, a list of the commenters, and any revisions made to the Draft EIR in response to the comments per Section 15132 of the CEQA Guidelines. As required under Section 15090 of the CEQA Guidelines, prior to considering the approval of the Project, the District Board of Directors will certify that: 1) the information contained in the Final EIR has been completed in compliance with CEQA; 2) the Board reviewed and considered the information contained in the Final EIR before making a decision; and 3) the Final EIR reflects the District's independent judgment and analysis.

2.2.1 CEQA Purpose and Authority

This Draft EIR has been prepared pursuant to CEQA and the CEQA Guidelines. CEQA requires that State and local government agencies consider the environmental consequences of projects over which they have discretionary authority before taking action on those projects.

The purpose of this Draft EIR is to analyze the potential environmental impacts of the Project, while describing ways to reduce or avoid these potential impacts. Additionally, this Draft EIR identifies alternatives to the proposed Project that would meet the Project objectives while reducing one or more significant environmental impacts.

CEQA requires that each public agency mitigate or avoid the significant environmental effects of projects it approves or implements whenever feasible. An EIR is an informational document used in State, regional, and local planning and decision-making processes to disclose potential environmental effects. The purpose of the EIR is not to recommend approval or denial of a project. However, the public agency's decision whether to approve or to deny the Project must take into consideration the information provided by the EIR.

When considering a project, the public agency may approve the project even if it would result in significant and unavoidable adverse environmental impacts so long as the EIR discloses the project's environmental effects, including:

- Significant environmental effects;
- Significant environmental effects that cannot be avoided;
- Growth inducing effects;
- Environmental effects found not to be significant; and
- Cumulative impacts.

CEQA provides that a lead agency that intends to approve a project with significant and unavoidable effects must identify the "[s]specific economic, legal, social, technological, or other considerations..." that make infeasible particular mitigation measures or alternatives identified in the EIR. In addition, the lead agency in such a case must identify the benefits of the Project that outweigh the significant effects on the environment (Statement of Overriding Considerations, California Public Resources Code Section 21081).

2.2.2 Lead Agency Determination

As the public agency undertaking the Project, the District is designated as the Lead Agency for the Project. CEQA Guidelines Section 15367 defines the Lead Agency as "... the public agency, which has the principal

responsibility for carrying out or approving a project." Other public agencies may use this document in their decision making or permit processes related to the Project.

This Draft EIR was prepared for the District by AECOM, an environmental consultant. Prior to public review, this Draft EIR was extensively reviewed and evaluated by District staff and, as such, this Draft EIR reflects the independent judgment and analysis of the District staff. A list of report preparation personnel is provided in Chapter 8 of this Draft EIR.

2.2.3 DRAFT EIR SCOPING PROCESS

NOTICE OF PREPARATION

CEQA does not require formal hearings at any stage of the environmental review process (CEQA Guidelines Section 15202[a]). However, it does encourage "wide public involvement, formal and informal, in order to receive and evaluate public reactions to environmental issues" (CEQA Guidelines Section 15201).

In accordance with the CEQA Guidelines, the District distributed a Notice of Preparation (NOP) of a Draft EIR for the Project on September 21, 2022, which provided an initial assessment of the potential for the Project to have an effect on the environment and gave the public an opportunity to provide comment on the scope of the analysis that should be included in this Draft EIR (EID 2022). A public scoping meeting was held on October 5, 2022 and the public scoping comment period closed on October 20, 2022. The comments received by the District on the NOP were considered in the preparation of this Draft EIR. The scope of this Draft EIR includes the potential environmental impacts identified in the NOP, as well as any issues raised by agencies and the public in response to the NOP. Appendix A contains the NOP, the Project Description and Probable Environmental Effects to be addressed in the Draft EIR, the presentation from the scoping meeting, and written comments received during the NOP comment period.

SCOPE OF THE DRAFT EIR

The Draft EIR will address the Project at both a programmatic and project level. For the new proposed point of diversion at El Dorado Diversion Dam and the new place of storage and point of re-diversion to storage at Jenkinson Lake, the EIR will conduct a project-level analysis. Operational details of these elements are known, and their probable environmental impacts can be analyzed at the project level.

No additional infrastructure would need to be constructed to divert Permit 21112 water at the El Dorado Diversion Dam. However, to divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe

significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

The analysis included in Chapter 4.0 focuses on the specific environmental resource topics that require further evaluation to determine if they have a potential impact. Comments received during the scoping process were taken into consideration in development of this Draft EIR. Potential impacts and thresholds of significance were established based on comments received, a comparison with the CEQA Guidelines Appendix G checklist, and resource-specific policy guidance and available scientific information.

Pursuant to CEQA and the CEQA Guidelines, the discussion of the potential effects on the physical environment is focused on those impacts that may be significant or potentially significant. CEQA allows a Lead Agency to limit the details of discussion of the environmental effects that are not considered potentially significant. (CEQA Guidelines Sections 15126.2[a] and 15128). CEQA requires that the discussion of any significant effects on the environment be limited to substantial or potentially substantial adverse changes in physical conditions that exist within the affected area, as defined in PRC Section 21060.5 (Statutory definition of "environment"). This DEIR analyses the full range of resource topics from the CEQA Appendix G Checklist.

2.2.4 PREVIOUSLY PREPARED ENVIRONMENTAL DOCUMENTS

The District has long-envisioned adding upstream points of diversion to Permit 21112. In fact, the original water right application included the El Dorado Diversion Dam as an upstream point of diversion, but the District agreed to pursue a Folsom only diversion at the time to resolve protests on the original water right application. Since the approval of Permit 21112 in 2001, several elements have led to the District's pursuit of adding an upstream point of diversion including, but not limited to: 1) the U.S. Bureau of Reclamation's (Reclamation) transfer of ownership of Jenkinson Lake to the District in 2003; 2) the District's acquisition of a license from FERC for the operation of the Project 184 in 2006; 3) Reclamation's issuance of a Warren Act Contract for the use of Permit 21112 water at Folsom, which was a condition of Permit 21112 required prior to the District's use of water under the permit; and 4) results of long-term planning assessments that indicate a portion of the Permit 21112 water supply will be necessary to serve areas of the District that cannot be effectively served from Folsom Reservoir.

To advance the effort to add upstream points of diversion to Water Right Permit 21112, the District issued a NOP on April 17, 2020. The 2020 NOP described three potential upstream points of diversion including the El Dorado Diversion Dam, Sacramento Municipal Utility District's Slab Creek Dam/Reservoir, or SMUD's White Rock Powerhouse Penstock. The District subsequently determined that the El Dorado Diversion Dam would be the most feasible, cost-effective, and practical upstream point of diversion given the extensive infrastructure needed to support the potential diversions from SMUD's facilities. Therefore, on September 21, 2022, the District issued the new NOP for the current Project.

For reference, previous CEQA documents related to Water Right Permit 21112 include:

- Final Environmental Impact Report for the Acquisition, Permanent Repair, and Operations of the El Dorado Hydroelectric Project and Acquisition of 17,000 Acre-Feet Per Year of New Consumptive Water (adopted 1999)

- Initial Study and Addendum to the 1999 EIR analyzing the Project 184 Long-Term Warren Act Contract with Reclamation (2016)
- Notice of Preparation of an Environmental Impact Report and Notice of a Public Scoping Meeting for the Modification of Water Right Permit 21112 (April 2020)
- Notice of Preparation of an Environmental Impact Report and Notice of a Public Scoping Meeting for the Project (September 2022)
- Addendum to the Final Environmental Impact Report for the Acquisition, Permanent Repair, and Operations of the El Dorado Hydroelectric Project and Acquisition of 17,000 Acre-Feet Per Year of New Consumptive Water (2021)

2.2.5 REVIEW OF THE DRAFT EIR

Upon completion of this Draft EIR, the District will file a Notice of Completion (NOC) with the State Office of Planning and Research along with a Notice of Availability (NOA) to begin the public review period (PRC Section 21161). Concurrent with the NOC, this Draft EIR will be distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, including those requesting a copy of the Draft EIR in accordance with PRC 21092(b)(3).

The NOA will be posted and published in accordance with noticing requirements of CEQA Guidelines Section 15087 and available at:

- El Dorado County Recorder-Clerk Placerville Office, 360 Fair Lane, Placerville, California
- Placerville Main Public Library, 345 Fair Lane, Placerville, California
- Pollock Pines Public Library, 6210 Pony Express Trail, Pollock Pines, California
- Placerville Mountain Democrat Newspaper
- Various river access locations along the South Fork

During the public review period, the Draft EIR, including the technical appendices, will be available for review at the following locations:

1. El Dorado Irrigation District website
2. District Customer Service Building, 2890 Mosquito Road, Placerville, California
3. Placerville Main Public Library, 345 Fair Lane, Placerville, California
4. Pollock Pines Public Library, 6210 Pony Express Trail, Pollock Pines, California
5. Pollock Pines – Camino Community Center, 2675 Sanders Drive, Pollock Pines, California

Agencies, organizations, and interested parties have the opportunity to comment on this Draft EIR during the 60-day public review period. Written comments concerning the Draft EIR for the Project should be directed to the District at the following address by the close of the comment period. Please include the commenter's full name and address.

El Dorado Irrigation District
Attn: Brian Deason
Environmental and Resources Manager

2890 Mosquito Road
Placerville, CA 95667
Email: P21112EIR@eid.org

The public comment period is identified in the NOA.

EFFECTIVELY COMMENTING ON THE EIR

Readers are invited to review and comment on the adequacy and completeness of this Draft EIR, particularly in describing the potential impacts of the Project, the level of severity, the mitigation measures being proposed to reduce or avoid those impacts, and the Project alternatives being considered.

In this regard, CEQA defines "significant effect on the environment" as 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 (CEQA Guidelines section 15382).

"Mitigation" includes actions that would avoid the impact altogether, minimize the impact, rectify by repairing, rehabilitating or restoring the impacted environment, reducing the impact over time or compensating for the impact by replacing or providing substitute resources or environments (CEQA Guidelines section 15370).

The most effective comments are those that focus on the adequacy and completeness of the environmental analysis and that are supported by factual evidence. Comments that focus on whether the Project should be approved or denied are not comments on the adequacy of this Draft EIR.

2.2.6 FINAL EIR

Upon completion of the public review period, the District will review the comments received and will prepare written responses to environmental issues raised pursuant to CEQA Guidelines 15088 and, if necessary, will make any related revisions to the Draft EIR. Comments received and the responses to comments will be included as part of the record for consideration of the Project. Responses will be incorporated into the Final EIR available for public review and provided to any commenting public agencies at least 10 days prior to certification of the EIR (CEQA Guidelines 15088(b)). The general process for the preparation and certification of an EIR is described under Section 15096 of the CEQA Guidelines.

The Final EIR will be considered by the District Board of Directors prior to determining whether to approve the Project, as per Section 15090 of the CEQA Guidelines. Specifically, the District Board of Directors must certify that:

- The Final EIR has been completed in compliance with CEQA;
- The Final EIR was presented to the Board, and that the Board reviewed and considered the information contained in the Final EIR prior to approving the Project; and
- The Final EIR reflects the independent judgment and analysis of the District Board of Directors.

Following certification of the Final EIR, the District may then consider approval of the Project as described in Section 15092 of the CEQA Guidelines, which states that a public agency shall not decide to approve or carry out a project for which an EIR was prepared unless either: (1) the Project as approved will not have a significant effect on the environment; or (2) the agency has eliminated or substantially lessened all significant effects where feasible and made a determination that any remaining significant effects found to be unavoidable are acceptable due to overriding considerations.

If the Project is approved, Section 15091 of the CEQA Guidelines requires the District to adopt findings describing how each of the significant impacts identified in the EIR is being mitigated. The findings will describe the reasons why significant unavoidable impacts, if any, cannot be mitigated. The findings will also describe the District's findings with respect to the Project alternatives that were analyzed in the EIR.

If the District decides to approve the Project, or any alternative to the Project, despite a finding that it will have significant and unavoidable impacts, the District will also adopt a statement of overriding considerations describing the benefits of the Project that in the District's judgment outweigh its significant environmental impacts, pursuant to Section 15093 of the CEQA Guidelines. Finally, the District will adopt a Mitigation Monitoring and Reporting Plan (MMRP), as required under Sections 15096 (g) and 15097 of the CEQA Guidelines, which describes how it will ensure the mitigation measures being required of the Project will be carried out.

2.3 PERMITS REQUIRED

The following permits/authorizations may be required for the Project or Project alternatives:

- State Water Resources Control Board - approval of the water right Change Petition
- U.S. Army Corps of Engineers - Clean Water Act (CWA) Section 404 Nationwide Permit
- State or Regional Water Quality Control Board - CWA Section 401 Water Quality Certification, CWA Section 402, National Pollutant Discharge Elimination System (NPDES) Construction General Permit
- California Department of Fish and Wildlife (CDFW) - California Fish and Game Code (FGC) Section 1602 Lake and Streambed Alteration Agreement
- United States Department of Agriculture, Forest Service (USFS) Special Use Permit (existing)

- U.S. Fish and Wildlife Service, Endangered Species Act Section 7
- Office of Historic Preservation, National Historic Preservation Act Section 106

3 PROJECT DESCRIPTION

3.1 INTRODUCTION

The El Dorado Irrigation District (District) is proposing Modification of Water Right Permit 21112 (Project) through a water right change petition to add an additional authorized upstream point of diversion and an additional place of storage and point of re-diversion to storage to more effectively and efficiently manage water in the District's system and to meet future water demands within El Dorado County. The additional point of diversion is located at the District's existing El Dorado Diversion Dam near Kyburz. In addition, the District proposes to add Sly Park Dam (which forms Jenkinson Lake) as a point of re-diversion and Jenkinson Lake as an additional authorized place of storage for Water Right Permit 21112 (Permit 21112).

3.2 PROJECT LOCATION

The Project location encompasses areas within and near the South Fork American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. Figure 3-1 shows the South Fork, location of the existing diversion at Folsom Reservoir, and location of the proposed diversion at El Dorado Diversion Dam near Kyburz. Figure 3-1 also shows the existing upstream reservoirs at Caples Lake, Silver Lake and Lake Aloha that provide authorized storage of Permit 21112 water.

3.3 PERMIT 21112 BACKGROUND

The District currently holds Permit 21112, issued in 2001 by the State Water Resources Control Board (SWRCB). Permit 21112 allows the District to make direct diversions from the South Fork at Folsom Reservoir; to divert water to storage in Caples, Silver, and Aloha Lakes; and, to re-divert the water released from those upstream reservoirs once it reaches Folsom Reservoir for consumptive uses. The total quantity of water that may be diverted by the District under Permit 21112 at Folsom Reservoir annually (by a combination of direct diversion and re-diversion of stored water) is 17,000 acre-feet per year (AFY). The point of diversion at Folsom Reservoir draws direct diversions from the South Fork, along with water previously stored in upstream reservoirs (Caples, Silver, Aloha Lakes) that are operated pursuant to the District's Project 184 Federal Energy Regulatory Commission (FERC) license.

Permit 21112 authorizes direct diversion of up to 15,000 AFY from the South Fork at Folsom Reservoir to be collected from November 1 through July 31 with a maximum rate of diversion not to exceed 156 cubic feet per second (cfs). Permit 21112 allows a total of up to 32,931 AFY to be diverted to storage in Caples, Silver, and Aloha Lakes from November 1 to July 31 each year. This total authorized diversion to storage is limited to 21,581 AFY at Caples Lake, 6,000 AFY at Silver Lake, and 5,350 AFY at Lake Aloha. Permit 21112 also includes conditions for stream and reservoir gaging, lake-level operational requirements to protect summer recreational uses at Caples, Silver, and Aloha Lakes, and annual reporting requirements.

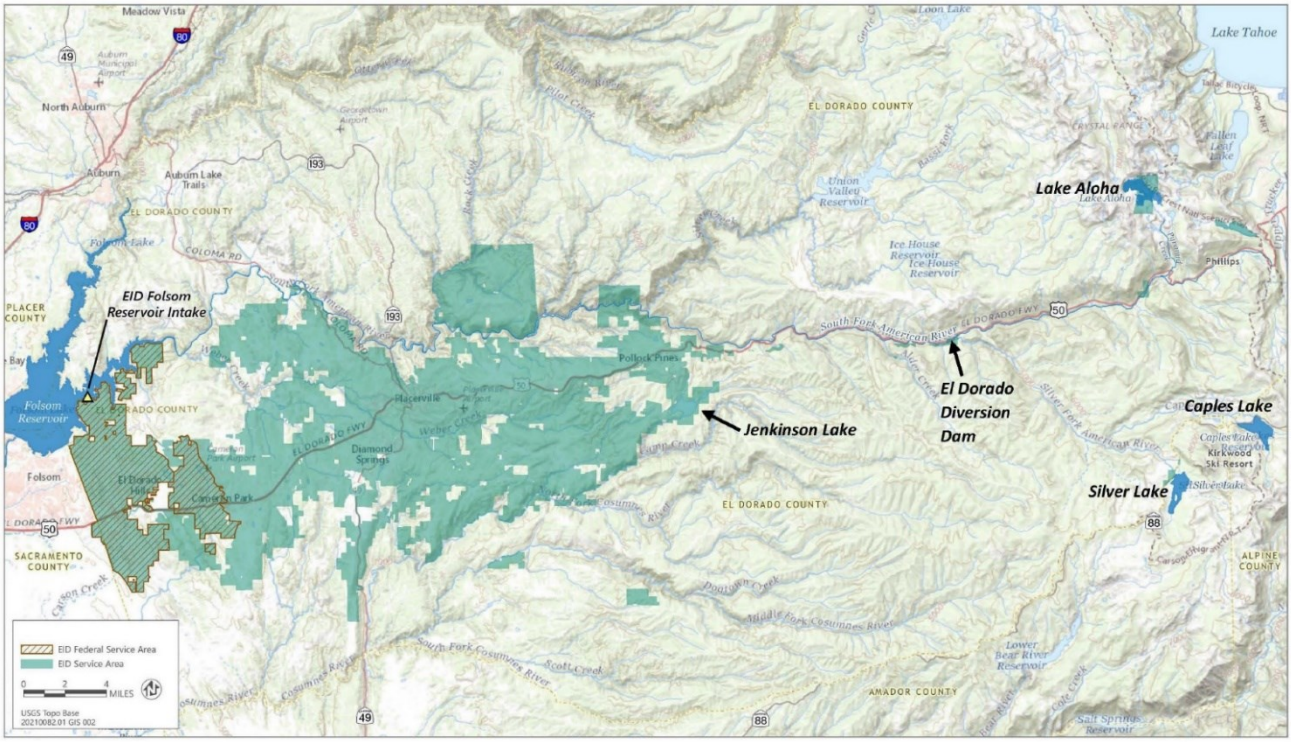


Figure 3-1. Project Location

3.4 PROJECT OVERVIEW

The District seeks to modify its existing Permit 21112 to add an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to more effectively and efficiently meet future water demands in El Dorado County. Permit 21112 presently allows the District to directly divert or re-divert water supplies for consumptive uses at Folsom Reservoir. Folsom Reservoir is located at the western boundary and lowest elevation of the District's service area. The single point of diversion and re-diversion at Folsom Reservoir for consumptive use precludes the District from effectively and efficiently utilizing this supply throughout the entirety of Permit 21112's authorized place of use.

Long-term water supply planning forecasts including the District's 2020 Urban Water Management Plan (UWMP; EID 2021) and the 2024 Water and Recycled Water Master Plan (EID 2024), and the El Dorado County Water Agency 2014 West Slope Update to the Water Resources Development & Management Plan (ECWA 2014) indicate that a portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills and at a higher elevation (Figure 3-2). Delivering water to these higher elevation areas of the District's service area would require extensive energy-intensive pumping of raw and treated water from the Folsom Reservoir area. Therefore, the District proposes to petition the SWRCB to modify Permit 21112 to allow an additional upstream point of diversion on the South Fork at the District's existing El Dorado Diversion Dam near Kyburz and an additional place of storage and point of re-diversion storage at Jenkinson Lake. The proposed changes to Permit 21112 would maintain the other limitations of the water right, such as place of use, purpose of use, season of diversion, total diversion to storage, maximum rate of diversion, and total direct diversion. The proposed changes to Permit 21112 would increase water supply reliability by maximizing the flexibility to meet

demands with multiple points of diversion of the water supply and would enable the District to divert water higher in the system at times when water is most abundant.

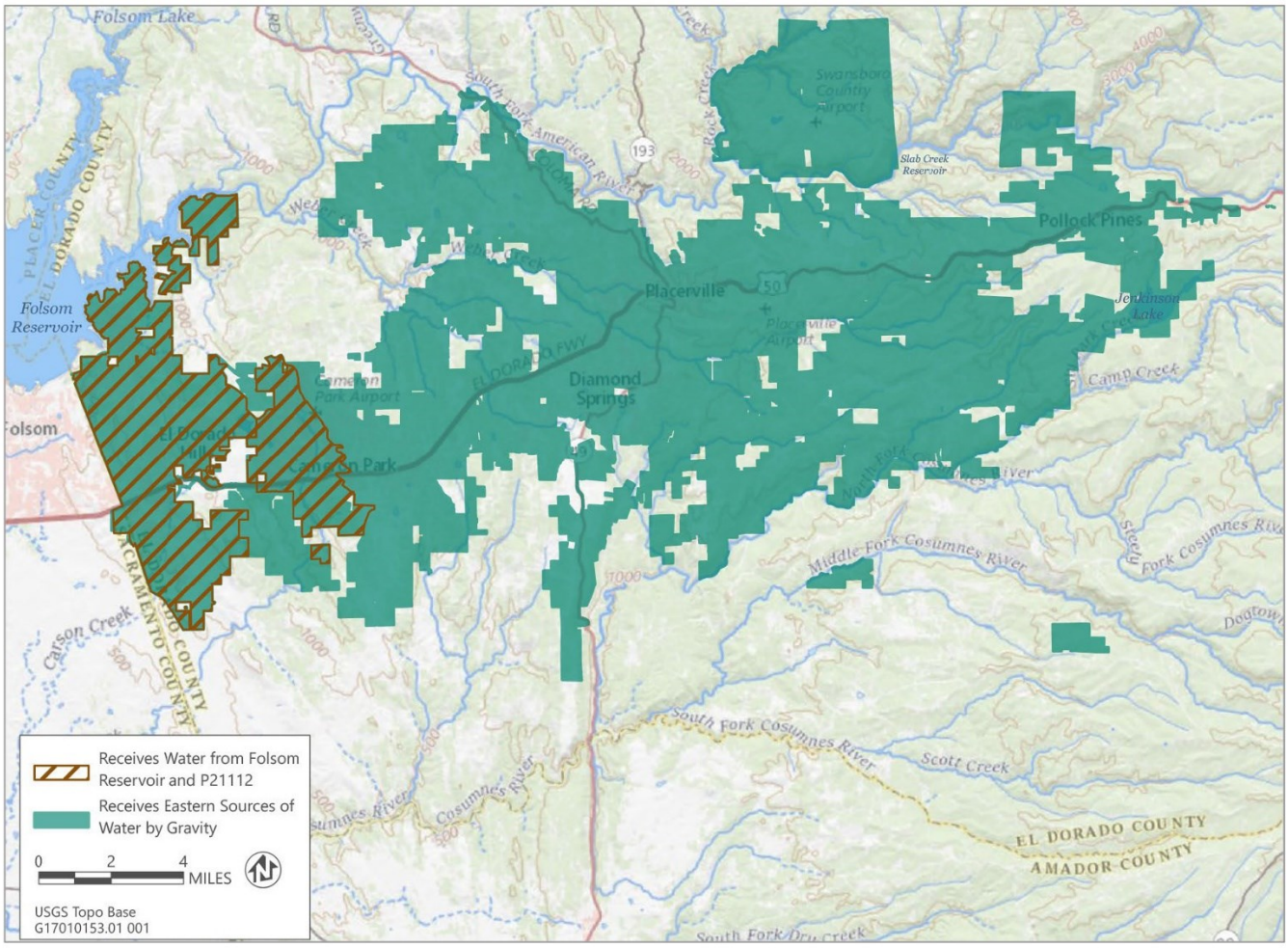


Figure 3-2. District Supply Area

With these proposed modifications, water could be diverted from higher elevations under Permit 21112 and then delivered to customers at lower elevations in the District service area. By taking Permit 21112 water supply at the El Dorado Diversion Dam, water can be treated and distributed largely via gravity flow to meet demands throughout the District's service area without excessive use of energy. In addition, allowing additional storage in Jenkinson Lake would help address the imbalance of low water availability and high water demand in the summer months. Water could be taken at the El Dorado Diversion Dam during the snowmelt season, when Jenkinson Lake is forecast not to fill to capacity, diverted into Jenkinson Lake via the Hazel Creek tunnel, and seasonally stored to allow for later delivery of the stored water during dry months of the year to meet District demands. Figure 3-3 contains a profile view of the existing diversion, proposed diversion, and locations of future population growth, which demonstrates the elevation differences between these locations and the efficiency benefits of diverting water upstream of Folsom Reservoir. Project operations would rely mainly on gravity rather than pumping, substantially reducing energy consumption and the costs of water conveyance and delivery, while improving water supply flexibility to meet growing water demand in the District's service area.

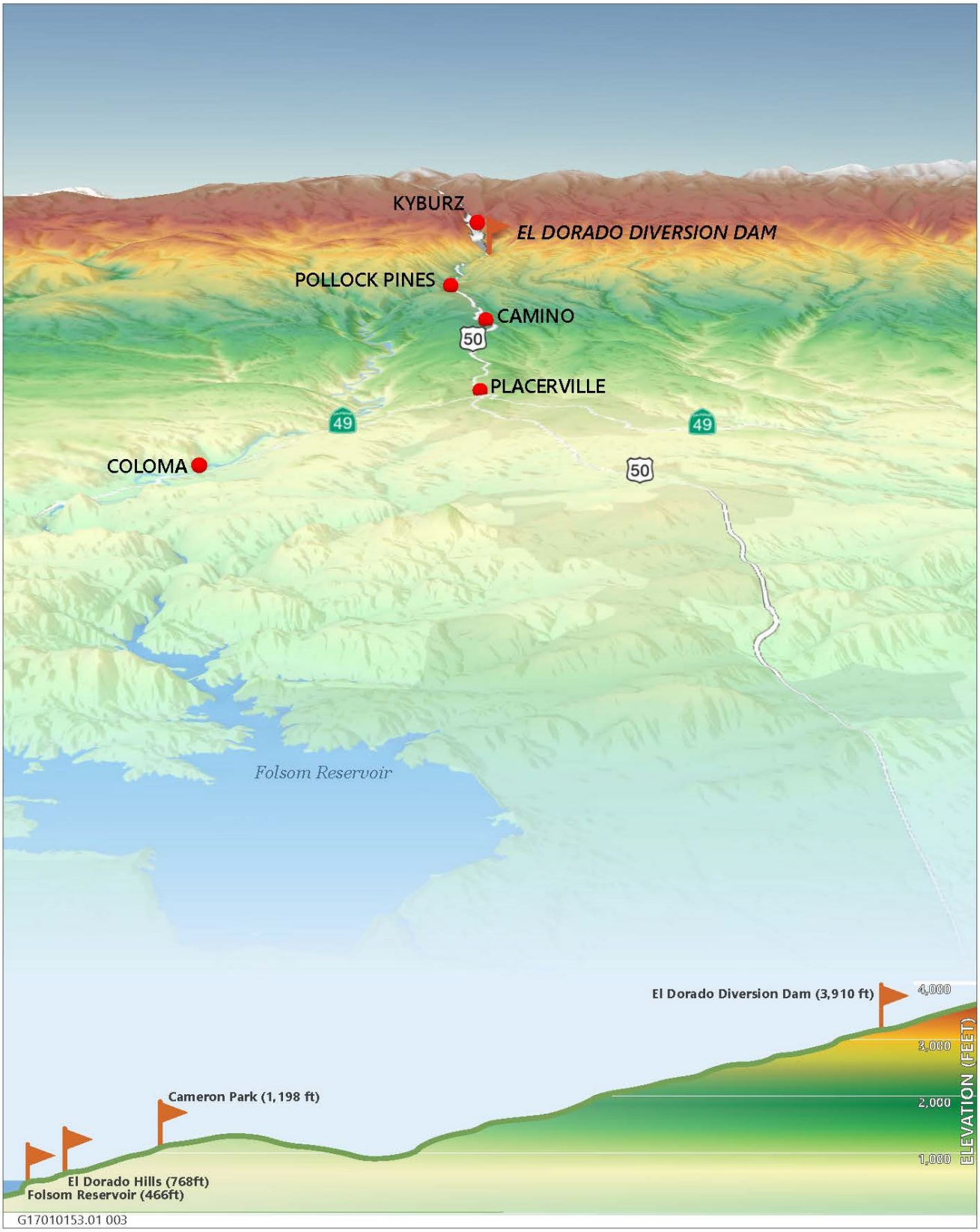


Figure 3-3. Profile View of Existing and Proposed Diversions

To convey Permit 21112's maximum rate of diversion of 156 cfs from the proposed new point of diversion at El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Because only limited information is currently available for these improvements, this Environmental Impact Report (EIR) provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts..

3.5 PROJECT OBJECTIVES

The District is pursuing an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to provide a reliable and affordable supply of high-quality water to its service area. The Project objectives are to:

- **Meet future water demand as identified in long-term water supply planning efforts.** Long-term water supply planning documents show that the District will have increased water demand throughout its service area. The District seeks to efficiently and reliably meet future water demands with implementation of the Project.

- **Reduce cost of water conveyance and delivery.** Water conveyance utilizing pumping facilities can increase costs of operations compared to a water conveyance system that is gravity-fed or a diversion point that is close to its place of use. The District aims to use the most economical option for water conveyance and delivery with implementation of the Project.

- **Increase flexibility and reliability in water delivery systems.** Water delivery systems are more reliable and efficient when the systems are designed to allow for operational flexibility, including redundancies in the event of infrastructure constraints, supply reductions, or emergencies. The District seeks to increase operational flexibility and reliability with implementation of the Project.

- **Optimize beneficial use of Water Right Permit 21112.** The existing authorized point of diversion for consumptive use of Permit 21112 is currently at Folsom Reservoir, which constrains the service area that the District can effectively utilize for this water supply. The District seeks to optimize beneficial use of its existing water right by adding a strategic upstream point of diversion and place of storage and re-diversion with implementation of the Project.

3.6 PROJECT DESCRIPTION

3.6.1 SUMMARY OF PROPOSED PROJECT

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at

Jenkinson Lake. The existing Permit 21112 diversion at Folsom Reservoir would be maintained. The maximum rate of diversion of water diverted under Permit 21112 at the El Dorado Diversion Dam would be Permit 21112's existing maximum diversion rate of 156 cfs. The maximum amount of water diverted under Permit 21112 at the El Dorado Diversion Dam by a combination of either direct diversion or diversion to storage would be 15,000 AFY, and the total cumulative quantity diverted at the Folsom Reservoir diversion and the El Dorado Diversion Dam would not exceed 17,000 AFY. For example, if during a particular year 5,000 AF were diverted at El Dorado Diversion Dam, up to 12,000 AF could be diverted at Folsom Reservoir, so long as total cumulative diversion for that year under both points of diversion is no more than 17,000 AF. Similarly, the total authorized cumulative diversion to storage for Permit 21112 would remain 32,931 AFY and that total storage would be shared amongst Caples Lake, Silver Lake, Lake Aloha and the proposed additional place of storage in Jenkinson Lake. The maximum amount of water that would be re-diverted to storage in Jenkinson Lake, after initially being diverted at the El Dorado Diversion Dam, would be 15,000 AFY. Thus, the proposed Project would add an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to Permit 21112. The Project would maintain the other limitations of the water right, such as season of diversion, total diversion to storage, and total direct diversion.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam. However, to convey Permit 21112's maximum rate of diversion of 156 cfs from the proposed new point of diversion at El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings.

3.6.2 State Water Resources Control Board Water Rights Modification Process

The District is proposing to file a petition for change with the SWRCB to permanently modify existing Water Right Permit 21112 to add an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake. Before approving the change petition, the SWRCB must find that the change will not injure any legal water user and that the change will not have unreasonable effects on fish or wildlife.

If the petitioned change has the potential to injure any legal water user or unreasonable affect fish or wildlife, the SWRCB will inform those who have requested notification about the petition. The District would also be required to notify the California Department of Fish and Wildlife of the proposed change under Title 23, Section 794 of the California Code of Regulations. Other water right holders and the public may object to the proposed change by filing a protest form with the SWRCB. Before the SWRCB can approve the petition, all protests must be resolved, either through negotiation or by the SWRCB following an investigation or hearing.

Before approving the change petition, the SWRCB must also comply with the California Environmental Quality Act (CEQA). The SWRCB may rely on the CEQA document prepared by the District. This EIR contains the information necessary for the SWRCB to make the necessary findings in compliance with CEQA.

3.6.3 Existing Infrastructure and Operations (South Fork American River)

To aid in understanding the proposed modifications to Permit 21112, this section provides a general overview of existing infrastructure and operations on the South Fork and its tributaries and connected reservoirs associated with the proposed Project. Refer to Figure 3-4 for selected existing water supply and conveyance infrastructure along the South Fork American River watershed.

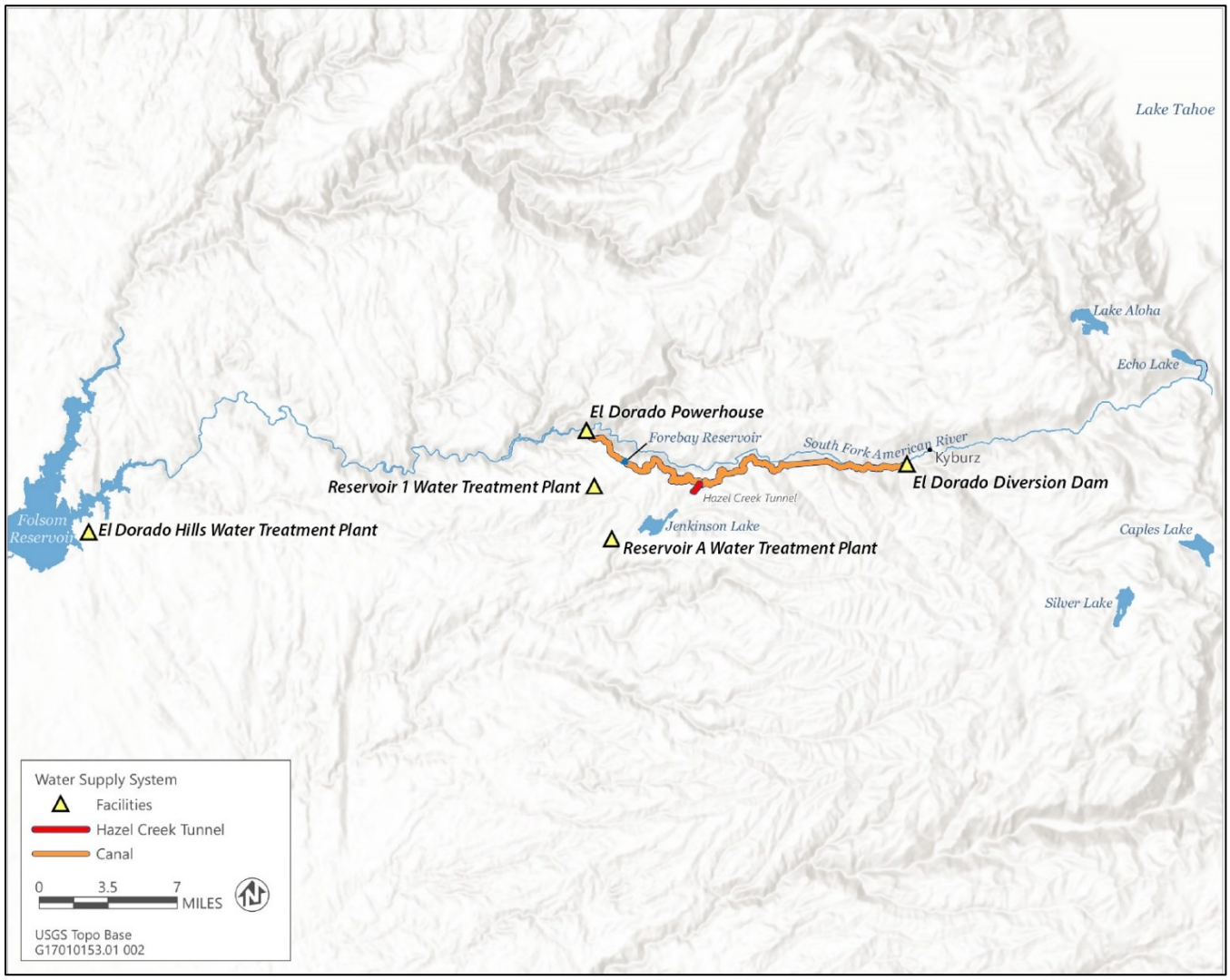


Figure 3-4. Existing Water Supply Infrastructure (South Fork American River)

Project 184 and Permit 21112

The District's Project 184 includes four reservoirs and associated dams, approximately 22 miles of conveyance facilities (i.e., canals, flumes, tunnels, and siphons), El Dorado Forebay, the 21-megawatt (MW) El Dorado Powerhouse, and other ancillary facilities. Silver Lake, Caples Lake and Lake Aloha are located in the South Fork

American River basin. Echo Lake, on the east slope of the Sierra Nevada range, is located in the Upper Truckee River basin. These reservoirs are used to store water in the winter and spring for release to the South Fork and its tributaries for consumptive, hydropower and fish and wildlife uses in the summer, fall and early winter. Permit 21112 allows up to 32,931 acre feet (AF) of water annually to be stored in Lake Aloha, Caples and Silver Lakes. Under Permit 21112, up to 17,000 AFY of water can be diverted and re-diverted from Project 184 sources at Folsom Reservoir for consumptive use. Permit 21112 allows for consumptive use of water previously stored and released for power generation from Caples Lake, Silver Lake, and Lake Aloha, as well as direct diversions from the South Fork. All of the water diverted has as Folsom Reservoir for consumption use has been first used by Project 184 for hydroelectric power generation and/or instream flows.

SOUTH FORK AMERICAN RIVER AT EL DORADO DIVERSION DAM AND EL DORADO FOREBAY

The District currently also diverts water from the South Fork at Kyburz at the El Dorado Diversion Dam under other District water rights. Water is currently diverted for hydropower purposes pursuant to the District's existing pre-1914 and hydropower appropriative water rights. The District currently diverts water for consumptive use at the El Dorado Diversion Dam under its pre-1914 rights only. Once diverted, the water is then conveyed via the El Dorado Canal to the El Dorado Forebay, which serves as the terminus of the canal upstream of the El Dorado penstock and powerhouse. Water held in the Forebay is used either to meet consumptive use or for hydropower use. Up to 15,080 AFY of water for consumptive use (under the District's pre-1914 water rights) is conveyed via the Main Pipeline to the Reservoir 1 Water Treatment Plant (WTP). The conveyance capacity of the Main Pipeline is 40 cfs. Water for hydropower use (under both the pre-1914 water right and the hydropower right) is conveyed into the penstock from the Forebay and through the turbine/ generators in the El Dorado Powerhouse. Water used for hydropower is then returned to the South Fork below the powerhouse.

The El Dorado Canal has a maximum hydraulic capacity of 165 cfs. The actual volume of flow diverted from the South Fork at the El Dorado Diversion Dam is dependent on physical constraints of current conveyance facilities and the volume of flow entering the canal from various tributaries. The District currently operates the El Dorado Canal at a maximum rate of diversion of approximately 145 cfs at the El Dorado Diversion Dam primarily due to limitations of segments of the water conveyance system (e.g., flumes, canal) that require repair or replacement to safely and reliably convey up to the authorized hydraulic capacity.

SLY PARK DAM AND JENKINSON LAKE

Jenkinson Lake is the main storage reservoir in the District and is formed by Sly Park Dam and dike. Under the District's water rights Licenses 11835 and 11836, the District is allowed to divert water from the Cosumnes River watershed and either directly use that water or store the water in Jenkinson Lake for later use. Under those water rights, the combined total amount of water that can be beneficially used by direct diversion and withdrawal from storage is 33,400 AFY. The District also has a pre-1914 water right for direct diversion of up to 12.5 cfs from Camp Creek, which typically is utilized from May through October. The District has pre-1914 water rights that can be diverted at the El Dorado Diversion Dam and conveyed through Jenkinson Lake to meet demands at the District's Reservoir A WTP. These pre-1914 rights cannot be stored in Jenkinson Lake due to the limitations of their historical pattern of use. The District has existing physical infrastructure to divert water from the South Fork at the El Dorado Diversion Dam into Jenkinson Lake via the Hazel Creek Tunnel. The Hazel Creek Tunnel originates at the El Dorado Canal and extends 2,200 feet and has a design capacity of 180 cfs. Water diverted through the Hazel Creek Tunnel discharges to a partially rip-rapped and lined drainage channel to Hazel Creek

and then to Jenkinson Lake. The existing channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake currently has an estimated capacity of approximately 80 cfs. Water is conveyed from Jenkinson Lake to the Reservoir A WTP via a raw water pipeline for treatment, transmission, and distribution. Jenkinson Lake has a maximum capacity of 41,033 acre-feet.

FOLSOM RESERVOIR

The District has three federal contracts allowing for diversion from Folsom Reservoir to deliver water to meet demands for the western portion of its service area. Water is provided via a U.S. Bureau of Reclamation Central Valley Project water service contract (Contract No. 14-06-200-1357A-LTR1-P), which has a maximum contract amount of 7,550 acre-feet per contract year (March 1 through February 28). The District also has two Warren Act contracts that allow the District's non-federal water supplies to be conveyed through the federal storage facility (i.e., Folsom Reservoir). One Warren Act contract allows diversion of up to 4,560 acre-feet from a variety of pre-1914 water rights (aka "Ditch Rights") and a post-1914 licensed water right for water stored in and then released from Weber Reservoir (Contract No. 06-WC-20-3315). The second Warren Act contract allows for use of federal facilities to divert up to 17,000 acre-feet of Permit 21112 water (Contract No. 15-WC-20-3317). The total water available under these three contracts is 29,110 acre-feet. However, the actual water available in any given year under these three contracts can be affected by a variety of factors including federal water allocation, contract terms, hydrologic conditions, water right conditions, and regulatory requirements (e.g., curtailment).

WATER TREATMENT FACILITIES

The 26-million gallon per day (mgd) Reservoir 1 WTP treats water from the South Fork delivered via Forebay Reservoir. Raw water is diverted at the El Dorado Forebay where it travels in the Main Pipeline to the Reservoir 1 WTP. The 56-mgd Reservoir A WTP treats water from Jenkinson Lake. Water treated at Reservoir 1 WTP and Reservoir A WTP are combined to serve the entire District service area. During higher demands, the 19.5-mgd El Dorado Hills WTP, shown in Figure 3-4, treats raw water from Folsom Reservoir to supply potable water to the El Dorado Hills service zone.

3.6.4 PROPOSED MODIFICATION OF OPERATIONS AT EL DORADO DIVERSION DAM AND JENKINSON LAKE

This section provides an overview of operations, infrastructure improvements and anticipated maintenance activities associated with the Project. All proposed diversion and re-diversion operations are analyzed at a project-level of detail in this EIR in accordance with CEQA Guidelines Section 15161. While no new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam, infrastructure improvements would be required to divert Permit 21112 water at the El Dorado Diversion Dam and to Jenkinson Lake at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs). Due to physical infrastructure capacity limitations, the District currently diverts a maximum of approximately 145 cfs at the El Dorado Diversion Dam and re-diverts up to 80 cfs to Jenkinson Lake. As described in further detail herein, the proposed Project includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for diversion of up to 156 cfs. Because detailed information regarding future infrastructure improvements is not available at this time, a project-level analysis is currently not possible. Therefore, this EIR includes a programmatic analysis of the improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design

details are available, the District would evaluate the project-specific impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be deemed to be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

MODIFICATION TO PERMIT 21112

The District seeks to change Permit 21112 to add a point of diversion for consumptive use at the existing El Dorado Diversion Dam near the unincorporated community of Kyburz, California. The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed modification to Permit 21112, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112. For example, if the District were to divert 10,000 AFY per year for consumptive use under modified Permit 21112 at El Dorado Diversion Dam, the District would divert 10,000 AFY per year less at El Dorado Diversion Dam for power generation. Because water would be diverted for consumptive use instead of power generation, the Permit 21112 modification would reduce the total amount of water returned to the South Fork at the El Dorado Powerhouse.

Figure 3-5 shows a schematic of water diversion and conveyance associated with the El Dorado Diversion Dam point of diversion. With the proposed Project, Permit 21112 water would be diverted from the South Fork at the El Dorado Diversion Dam into the El Dorado Canal. From there, Permit 21112 water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP. The District currently delivers its pre-1914 water rights to Forebay Reservoir for consumptive use via Reservoir 1 WTP and hydropower uses via El Dorado Powerhouse, and to Reservoir A WTP via Jenkinson Lake for consumptive use. The proposed Project would add Jenkinson Lake as an authorized place of storage and point of re-diversion to storage of Permit 21112 water. Adding Jenkinson Lake as an authorized place of storage and a point of re-diversion to storage under Permit 21112 would allow water that has been diverted from the South Fork at the El Dorado Diversion Dam during the snowmelt season (when water is typically available) to be put to storage in Jenkinson Lake for use later in the season.

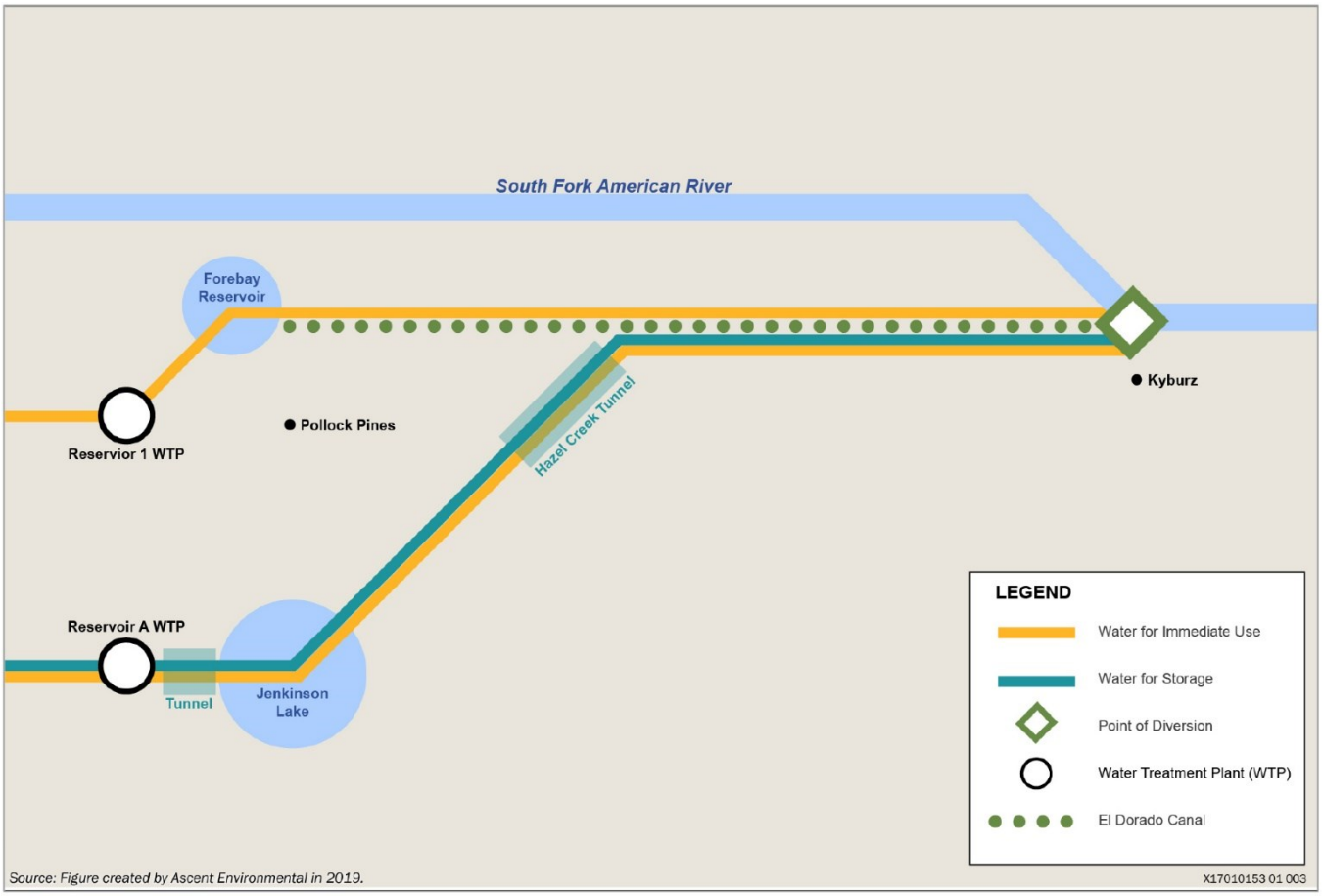


Figure 3-5. Project Water Diversion from El Dorado Diversion Dam

CONSTRUCTION ACTIVITIES

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam. However, to re-divert water at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required as described below.

El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet

Improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would be needed to divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs). As previously described, the El Dorado Canal has a maximum hydraulic capacity of 165 cfs. The actual volume of flow diverted from the South Fork at the El Dorado Diversion Dam is dependent on physical constraints of current conveyance facilities and the volume of flow entering the canal from various tributaries. The District currently operates the El Dorado Canal at a maximum rate of diversion of approximately 145 cfs at the El Dorado Diversion Dam primarily due to limitations of segments of the water conveyance system (e.g., flumes, canal) that require repair or replacement to safely and reliably convey up to the authorized hydraulic capacity. The District is continually implementing capital improvement projects to repair and replace components of these El Dorado Canal conveyance facilities and restore the authorized capacity of the El Dorado Canal. While

these improvements would be implemented absent implementation of the proposed Project, the improvements are included in the proposed Project to fully disclose potential impacts associated with changes in diversion patterns and/or construction activities that could occur for the District to divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs). These improvements would occur along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and may include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Improvements to the El Dorado Canal at the Hazel Creek Tunnel inlet would be needed as well. These improvements could include installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel.

Channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake

The Hazel Creek Tunnel has a design capacity of approximately 180 cfs. However, the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake allows only an estimated maximum diversion rate of approximately 80 cfs. Potential improvements needed to allow conveyance of up to 156 cfs would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings.

Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, as well as the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, may include:

- **Vegetation and tree removal**: Vegetation and trees may be removed within and around the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to facilitate construction equipment access, culvert replacement, bridge installation, and channel stabilization activities. Vegetation and trees may be removed in the vicinity of flume replacement or canal restoration projects to facilitate construction and protect facilities from fire and/or tree fall. Vegetation and tree removal would be implemented with heavy equipment or by hand with hand or power tools depending on access and on the sensitivity of the area.

- **El Dorado Canal improvements**: Improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet may involve replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments. Potential construction activities include demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration.

- **Hazel Tunnel Inlet:** The inlet of the Hazel Tunnel is situated adjacent to the El Dorado Canal. To divert all flow in the canal into the Hazel Creek Tunnel, a moveable bulkhead or other gate structure may be installed in the existing canal. Potential construction activities to retrofit the existing canal structure to accommodate a gate structure and modify the existing gates that regulate flow into the Hazel Creek Tunnel may include localized excavation of the canal liner, placement of concrete, installation of gate(s) and gate support structures, and installation of a control building.

- **Channel improvements**: The channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake may require improvements to be able to convey up to 156 cfs. Construction activities may include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

- **Access and staging**: Access and staging of equipment and material may occur at various locations along the El Dorado Canal and near the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Primary access is anticipated to occur along existing roads and along the El Dorado Canal bench; however some road improvements and/or temporary access roads may be necessary to access portions of the channel. Equipment and material staging would generally be located in previously disturbed areas. Construction access to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would likely be from the vicinity of Jenkinson Lake via existing roads. This could require closure of some of these roads to recreational users during certain phases of construction.

The general locations of where these construction activities may occur along the conveyance alignment are depicted in Figure 3-6 below.

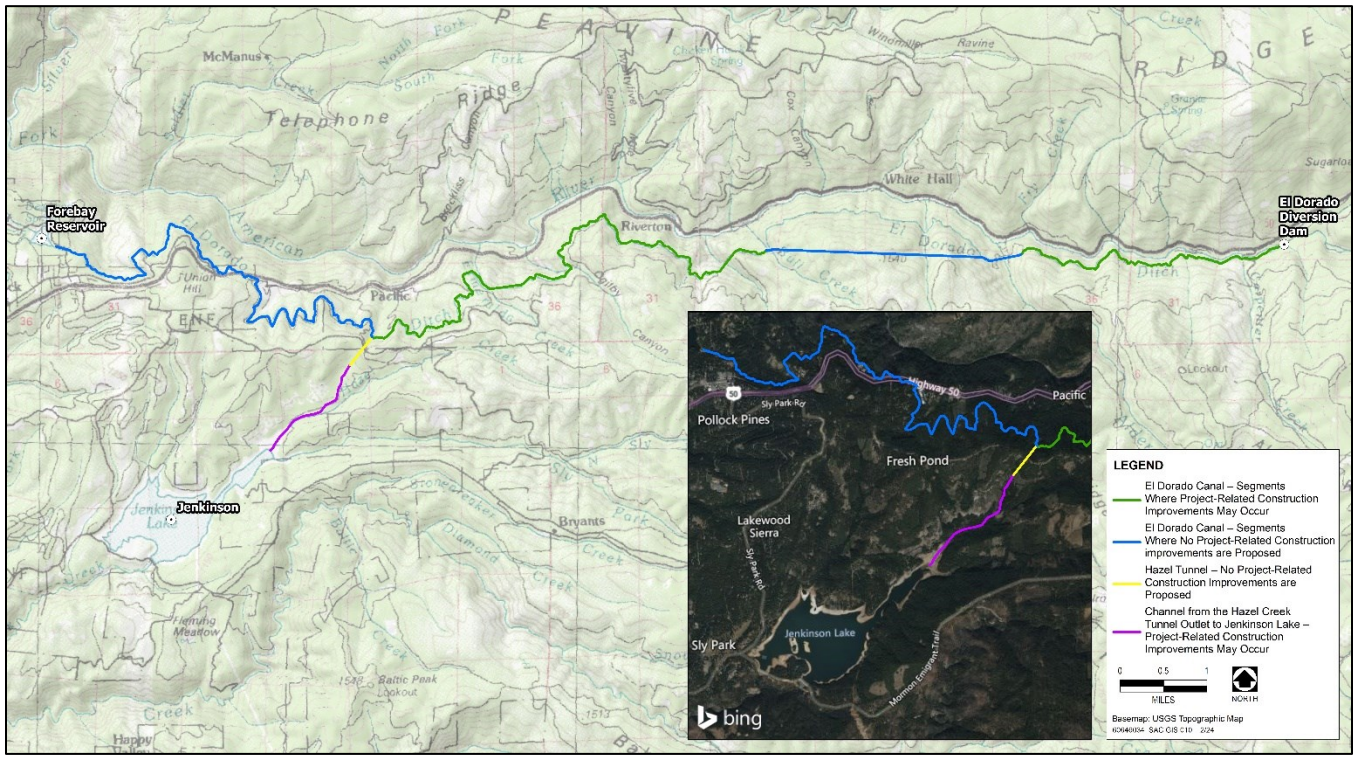


Figure 3-6. Project Construction Alignment

Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be

subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

The Reservoir 1 and Reservoir A WTPs have sufficient physical capacity to treat the consumptive water made available under the Project.

OPERATIONS AND MAINTENANCE ACTIVITIES

Because the timing for implementing potential construction-related improvements to allow for the diversion of up to 156 cfs is unknown, two operational regimes for the diversion of Permit 21112 water at the El Dorado Diversion Dam are considered in this EIR: 1) existing infrastructure operations; and 2) post-construction operations:

- **Existing infrastructure operations**: This operational regime involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water at the El Dorado Diversion Dam to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- **Post-construction operations**: This operational regime involves operation of facilities to divert Permit 21112 water following construction of the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake that would allow for a maximum rate of diversion and re-diversion of up to 156 cfs.

Maintenance at the El Dorado Diversion Dam, El Dorado Canal, Forebay Reservoir, Jenkinson Lake, Hazel Creek Tunnel, Main Pipeline, and other existing facilities would continue to occur as it is currently undertaken. Activities include periodic inspection, maintenance, and repairs.

3.6.5 CURRENT AND FUTURE BASELINES

The CEQA Guidelines Section 15125 provides the following guidance for establishing the baseline:

An EIR must include a description of the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives. The purpose of this requirement is to give the public and decision makers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts.

(1) Generally, the lead agency should describe physical environmental conditions as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental

analysis is commenced, from both a local and regional perspective. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record.

(2) A lead agency may use projected future conditions (beyond the date of project operations) baseline as the sole baseline for analysis only if it demonstrates with substantial evidence that use of existing conditions would be either misleading or without informative value to decision-makers and the public. Use of projected future conditions as the only baseline must be supported by reliable projections based on substantial evidence in the record.

(3) An existing conditions baseline shall not include hypothetical conditions, such as those that might be allowed, but have never actually occurred, under existing permits or plans, as the baseline.

The District is electing to utilize both a current and future baseline as the basis for evaluating potential impacts of the Project for water-dependent resource categories including biological resources, energy, hydrology, and recreation. The use of a future baseline for these select resources is necessary to identify which impacts are associated with the Project as compared to which impacts are associated with future increases in water demands that would otherwise occur absent the Project. The characteristics of each baseline include:

Current Baseline: The current baseline represents conditions as they existed at the time the Notice of Preparation (NOP) was published (September 2022) and includes the following elements:

- Current District water demands are based on 5-year average (2017 – 2021) water use for all District customers (34,512 AF)
- Maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs
- Maximum rate of re-diversion into the Hazel Creek Tunnel is 80 cfs
- Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP

Future Baseline: The future baseline represents projected conditions in the year 2045 based on anticipated increases in District water demands that would occur with or without the proposed Project and includes the following elements:

- Future water demands are based on projections from the District's 2020 UWMP; (Table 4-11; EID 2021) for the year 2045 for all District customers (43,320 AF). The UWMP does not specify how this total District-wide demand will be met by the District's three WTPs. Therefore, 43,320 AF is the total combined water demand that must be satisfied between the District's three WTPs (i.e., Reservoir 1, Reservoir A, and El Dorado Hills). In order to allocate these water demands among these facilities, the future baseline water demands are pro-rated based on the 5-year average (2017 – 2021) water production at each WTP, relative to

total water production for all WTPs. For example, Reservoir A 5-year average water productions were 22,453 AF, which represents 65% of the total 5-year average water production (34,512 AF). In the future baseline, it is assumed that Reservoir A would produce the same proportion of water in 2045 (i.e., 65%). Therefore, future demands to be met by Reservoir A were calculated to 65% of the total 2045 water demands (43,320 AF x 65% = 28,158 AF). This annual water demand was distributed on a monthly basis following the 5-year average (2017 – 2021) monthly water demand. This same procedure was used to assign future water demands at Reservoir 1 and El Dorado Hills WTPs.

- Maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs
- Maximum rate of re-diversion into the Hazel Creek Tunnel is 80 cfs
- Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available at the El Dorado Diversion Dam for consumptive use at Reservoir A WTP and/or Reservoir 1 WTP

Please note the only difference between the current and future baselines is the assumed District water demands. All other elements between the two baseline scenarios are the same.

3.6.6 PROJECT HYDROLOGIC MODELING

PROJECT WITH CURRENT DEMANDS AND PROJECT WITH FUTURE DEMANDS

The Hydrologic Engineering Center Reservoir System Simulation (ResSim) software developed by the U.S. Army Corps of Engineers, Institute for Water Resources, was used to model operations of the South Fork American River system with and without the proposed Project. ResSim simulates system operations utilizing user-defined inputs and rules to simulate various elements of system operations including but not limited to: physical processes (e.g., surface water inflow or accretion, evaporation, diversions), operational constraints (e.g., reservoir size, seasonal storage limits, water demands), and regulatory constraints (e.g., minimum flow requirements, lake level targets, water right permit conditions, FERC license conditions). A change to these particular inputs can change how the model operates various system components. For example, changing one variable (e.g., increasing water demands) may result in a change to another variable (e.g., different diversion pattern) since the model is utilizing the increased water demands as a new rule. The assumptions and operational rules included in the ResSim model for the proposed Project are described in detail in the Permit 21112 Change Petition HEC-ResSim Modeling Technical Memorandum, which is included as Appendix B to this EIR.

Because the analysis utilizes current and future baseline scenarios that differ by their respective water demands, different Project scenarios are necessary to facilitate hydrologic modeling of the proposed Project using ResSim. Except for the differing water demands associated with the current and future scenarios, the characteristics of both Project scenarios are the same and include:

- Two operational regimes for the diversion of Permit 21112 water at the El Dorado Diversion Dam are modelled - existing infrastructure operations and post-construction operations:
    - Existing infrastructure operations: Includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their

existing operational capacities (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- Post-construction operations: Maximum rate of diversion at the El Dorado Diversion Dam is 156 cfs, which is the maximum rate of direct diversion under Permit 21112. Maximum rate of diversion into the Hazel Creek Tunnel is 156 cfs. With the proposed Project, it is assumed that improvements are made to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to enable conveyance of up to 156 cfs.

- Up to 15,000 AF of Permit 21112 water and up to 15,080 AF of pre-1914 water is available for diversion at the El Dorado Diversion Dam for consumptive use.

- Permit 21112 water may be delivered to Forebay Reservoir for delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

- The season of diversion for the proposed Project would be within the season of diversion currently specified in Permit 21112 (i.e., November 1 to July 31). The El Dorado Canal is typically offline for maintenance and does not convey water from October through mid-December. This maintenance outage is assumed to continue into the future and therefore the operational season of diversion at the El Dorado Diversion Dam with the proposed Project is anticipated to be from mid-December to July 31.

Due to the differing water demands between the current baseline and future baseline scenarios, the modeling output and likewise potential impacts associated with each may differ. Additionally, the proposed Project includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities. This results in four different Project scenarios:

- Project with existing infrastructure and existing water demands compared to the current baseline
- Project with post-construction operations and existing water demands compared to the current baseline
- Future Project with existing infrastructure and future water demands compared to the future baseline
- Future Project with post-construction operations and future water demands compared to future baseline

Table 3-1 provides the characteristics of each of the scenarios:

Table 3-1. Characteristics of the Baseline and Project Scenarios

Current Baseline (current demands average of 2017-21 = 22,453 AF) • 145 cfs canal capacity limit • 80 cfs capacity to convey water to Jenkinson Lake • Only Pre-1914 water available at El Dorado Diversion Dam for consumptive uses	**Project (Existing infrastructure)** (current demands average of 2017-21 = 22,453 AF) • 145 cfs canal capacity limit • 120 cfs maximum rate of diversion of Permit 21112 • 80 cfs capacity to convey water to Jenkinson Lake • Up to 15,000 AF of Permit 21112 plus Pre-1914 water available at El Dorado Diversion Dam for consumptive uses	**Project (Post-Construction)** (current demands average of 2017-21 = 22,453 AF) • 156 cfs canal capacity limit • 156 cfs maximum rate of diversion of Permit 21112 • 156 cfs capacity to convey water to Jenkinson Lake • Up to 15,000 AF of Permit 21112 plus Pre-1914 water available at El Dorado Diversion Dam for consumptive uses
Future Baseline (2045 demands from 2020 UWMP = 28,184 AF) • 145 cfs canal capacity limit • 80 cfs capacity to convey water to Jenkinson Lake • Only Pre-1914 water available at El Dorado Diversion Dam for consumptive uses	**Future Project (Existing infrastructure)** (2045 demands from 2020 UWMP = 28,184 AF) • 145 cfs canal capacity limit • 120 cfs maximum rate of diversion of Permit 21112 • 80 cfs capacity to convey water to Jenkinson Lake • Up to 15,000 AF of Permit 21112 plus Pre-1914 water available at El Dorado Diversion Dam for consumptive uses	**Future Project (Post-Construction)** (2045 demands from 2020 UWMP = 28,184 AF) • 145 cfs canal capacity limit • 156 cfs maximum rate of diversion of Permit 21112 • 156 cfs capacity to convey water to Jenkinson Lake • Up to 15,000 AF of Permit 21112 plus Pre-1914 water available at El Dorado Diversion Dam for consumptive uses

Note:
AF = acre feet
cfs = cubic feet per second
Pre-1914 = Pre-1914 water rights
UWMP = Urban Water Management Plan

DIVERSION PATTERN

In general, the timing of diversions of Permit 21112 water at the El Dorado Diversion Dam would occur primarily in the winter and spring months when unimpaired flows in the South Fork are high. Permit 21112 water diverted at El Dorado Diversion Dam would be delivered in two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP; and/or 2) to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to the Reservoir A WTP. The water stored in Jenkinson Lake would be delivered to Reservoir A WTP as needed throughout the year to help meet water demands, with the highest demand occurring in late summer and fall months.

The actual pattern of diversion under the proposed Project would vary depending on a variety of system conditions (e.g., infrastructure conveyance capacity, hydrologic availability, regulatory requirements such as water right conditions and FERC license conditions, demands at Reservoir 1 WTP and Reservoir A WTP, and available storage and forecasted carry-over storage in Jenkinson Lake). Because these variables change from year to year and/or month to month, the Project's specific diversions will also vary subject to these variables. Therefore, the ResSim model was programmed to evaluate all the various system conditions to determine when diversions are forecasted to occur. For the analysis in this EIR, the ResSim model was utilized to forecast when Project diversions would occur by evaluating system conditions observed over a 46-year study period (water years

1975 to 2021). Because water currently diverted at the El Dorado Diversion Dam for hydropower generation is returned to the South Fork below the El Dorado Powerhouse and the Project would reduce the amount diverted for power generation by the amount of Permit 21112 water diverted at the El Dorado Diversion Dam for consumptive use, the reduction in flows on the South Fork below El Dorado Powerhouse with the Project serves as the metric for showing the consumptive diversion pattern that would occur with implementation of the Project. Table 3-2 through Table 3-5 provide ResSim model output that show flows on the South Fork below El Dorado Powerhouse (averaged by water year type and all year types) to illustrate when a reduction in return flows to the South Fork below the El Dorado Powerhouse would most likely occur with implementation of the proposed Project relative to the current baseline and the future Project relative to the future baseline. Table 3-2 and Table 3-3 provide monthly average flows in cfs to illustrate the pattern of diversion under the Project with existing infrastructure operational regime and the Future Project with existing infrastructure operational regime as compared to the current baseline and future baseline, respectively. Table 3-4 and Table 3-5 provide monthly average flows in cfs to illustrate the pattern of diversion under the Project and the Future Project post-construction operational regime as compared to the current baseline and future baseline, respectively. These tables illustrate that with the Project, the District would primarily divert water under Permit 21112 during the January through April timeframe.

Table 3-2. South Fork American River below El Dorado Powerhouse, Existing Infrastructure (Baseline vs Project) – monthly average flows in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	189	229	620	899	1,315	1,443	1,752	3,442	3,529	1,214	260	228	1,260
	Project, CFS	190	229	619	891	1,315	1,443	1,752	3,442	3,529	1,214	260	228	1,259
	Absolute Difference, CFS	0	0	-1	-8	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.1	0.0	-0.2	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Above Normal	Baseline, CFS	145	160	266	1,493	874	740	1,083	2,582	1,594	447	152	179	810
	Project, CFS	145	160	266	1,488	874	740	1,084	2,582	1,594	447	152	179	809
	Absolute Difference, CFS	0	0	0	-5	0	0	1	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	-0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline, CFS	141	475	563	541	1,047	1,265	1,455	1,839	949	231	116	161	732
	Project, CFS	141	475	563	526	1,045	1,268	1,460	1,844	954	233	116	165	732
	Absolute Difference, CFS	0	0	0	-16	-2	3	5	5	5	2	0	4	1
	Relative Difference (%)	0.0	0.0	0.0	-2.9	-0.2	0.3	0.3	0.3	0.5	0.7	0.3	2.5	0.1
Dry	Baseline, CFS	121	174	433	1,450	416	578	1,017	1,446	706	207	116	146	568
	Project, CFS	121	174	433	1,443	387	571	1,009	1,451	720	218	123	146	566
	Absolute Difference, CFS	0	0	0	-7	-29	-7	-8	5	13	11	7	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.5	-6.9	-1.3	-0.8	0.3	1.9	5.2	5.6	0.0	-0.2
Critically Dry	Baseline, CFS	123	109	212	138	237	337	621	713	279	109	73	108	255
	Project, CFS	123	109	212	120	179	290	595	725	296	128	90	111	248
	Absolute Difference, CFS	0	0	0	-17	-57	-47	-26	12	17	19	18	4	-7
	Relative Difference (%)	0.0	0.0	-0.1	-12.6	-24.2	-13.9	-4.1	1.7	6.1	17.0	24.1	3.3	-2.6
All Years	Baseline, CFS	149	229	441	712	799	924	1,222	2,013	1,583	519	152	166	742
	Project, CFS	149	229	441	700	778	910	1,214	2,018	1,591	527	158	168	740
	Absolute Difference, CFS	0	0	0	-12	-21	-14	-8	5	8	7	6	2	-2
	Relative Difference (%)	0.0	0.0	-0.1	-1.7	-2.6	-1.5	-0.6	0.3	0.5	1.4	4.0	1.1	-0.3

Table 3-3. South Fork American River below El Dorado Powerhouse, Existing Infrastructure (Future Baseline vs Future Project) – monthly average flows in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	190	229	620	898	1,315	1,442	1,750	3,438	3,525	1,211	256	225	1,258
	Future Project, CFS	189	229	618	881	1,315	1,442	1,750	3,439	3,525	1,211	256	225	1,257
	Absolute Difference, CFS	0	0	-3	-17	0	0	0	1	0	0	0	0	-2
	Relative Difference (%)	-0.1	0.0	-0.4	-1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Above Normal	Future Baseline, CFS	145	160	265	1,491	871	732	1,074	2,575	1,591	445	148	175	806
	Future Project, CFS	145	160	264	1,455	874	737	1,076	2,579	1,591	445	148	175	804
	Absolute Difference, CFS	0	0	-2	-35	2	6	1	4	0	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.6	-2.4	0.3	0.8	0.1	0.1	0.0	0.0	0.0	0.0	-0.2
Below Normal	Future Baseline, CFS	141	475	563	540	1,044	1,255	1,445	1,826	929	231	113	161	727
	Future Project, CFS	141	475	561	513	1,022	1,254	1,455	1,839	949	231	113	159	726
	Absolute Difference, CFS	0	0	-2	-28	-22	-1	10	13	20	0	0	-1	-1
	Relative Difference (%)	0.0	0.0	-0.3	-5.1	-2.1	-0.1	0.7	0.7	2.1	0.0	0.0	-0.8	-0.1
Dry	Future Baseline, CFS	121	174	433	1,449	416	572	1,002	1,426	687	210	118	143	562
	Future Project, CFS	121	174	429	1,428	369	536	999	1,437	708	214	118	143	556
	Absolute Difference, CFS	0	0	-4	-20	-46	-35	-3	11	21	4	0	0	-6
	Relative Difference (%)	0.0	0.0	-1.0	-1.4	-11.1	-6.2	-0.3	0.8	3.1	1.7	-0.4	0.0	-1.1
Critically Dry	Future Baseline, CFS	123	109	212	138	237	331	614	701	262	115	83	108	253
	Future Project, CFS	123	109	207	114	179	281	579	699	273	114	73	103	238
	Absolute Difference, CFS	0	0	-5	-23	-57	-50	-36	-3	11	-1	-10	-5	-15
	Relative Difference (%)	0.0	0.0	-2.2	-17.0	-24.2	-15.0	-5.8	-0.4	4.2	-0.9	-12.6	-4.2	-5.9
All Years	Future Baseline, CFS	149	229	441	711	799	919	1,215	2,002	1,570	520	153	164	739
	Future Project, CFS	149	229	438	689	772	900	1,206	2,006	1,580	520	150	162	733
	Absolute Difference, CFS	0	0	-3	-23	-27	-19	-9	4	10	0	-3	-2	-6
	Relative Difference (%)	0.0	0.0	-0.7	-3.2	-3.4	-2.1	-0.7	0.2	0.6	0.0	-2.1	-1.0	-0.8

Table 3-4. South Fork American River below El Dorado Powerhouse, Post-Construction (Baseline vs Project) – monthly average flows in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	189	229	620	899	1,315	1,443	1,752	3,442	3,529	1,214	260	228	1,260
	Project, CFS	190	229	619	889	1,314	1,442	1,751	3,441	3,528	1,213	260	228	1,259
	Absolute Difference, CFS	0	0	-1	-10	-1	-1	-1	-1	-1	-1	0	0	-1
	Relative Difference (%)	0.1	0.0	-0.2	-1.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1
Above Normal	Baseline, CFS	145	160	266	1,493	874	740	1,083	2,582	1,594	447	152	179	810
	Project, CFS	145	160	266	1,490	873	740	1,083	2,581	1,593	447	152	179	809
	Absolute Difference, CFS	0	0	0	-4	-1	-1	0	-1	-1	0	0	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.2	-0.1	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1
Below Normal	Baseline, CFS	141	475	563	541	1,047	1,265	1,455	1,839	949	231	116	161	732
	Project, CFS	141	475	563	523	1,044	1,268	1,459	1,843	953	233	116	165	732
	Absolute Difference, CFS	0	0	0	-18	-2	3	4	4	4	1	0	4	0
	Relative Difference (%)	0.0	0.0	-0.1	-3.4	-0.2	0.2	0.3	0.2	0.4	0.6	0.3	2.5	0.0
Dry	Baseline, CFS	121	174	433	1,450	416	578	1,017	1,446	706	207	116	146	568
	Project, CFS	121	174	433	1,443	385	566	1,009	1,455	719	218	123	146	566
	Absolute Difference, CFS	0	0	0	-7	-30	-12	-8	9	12	11	7	0	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.5	-7.3	-2.1	-0.8	0.6	1.8	5.2	5.6	0.0	-0.3
Critically Dry	Baseline, CFS	123	109	212	138	237	337	621	713	279	109	73	108	255
	Project, CFS	123	109	212	120	158	271	621	729	299	129	90	111	248
	Absolute Difference, CFS	0	0	0	-18	-78	-66	0	16	20	19	18	4	-7
	Relative Difference (%)	0.0	0.0	-0.1	-13.3	-33.1	-19.6	0.0	2.2	7.0	17.7	24.1	3.3	-2.9
All Years	Baseline, CFS	149	229	441	712	799	924	1,222	2,013	1,583	519	152	166	742
	Project, CFS	149	229	441	699	771	903	1,221	2,019	1,591	527	158	168	740
	Absolute Difference, CFS	0	0	0	-13	-28	-21	0	6	8	7	6	2	-3
	Relative Difference (%)	0.0	0.0	-0.1	-1.9	-3.5	-2.3	0.0	0.3	0.5	1.4	4.0	1.1	-0.4

Table 3-5. South Fork American River below El Dorado Powerhouse, Post-Construction (Future Baseline vs Future Project) – monthly average flows in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	190	229	620	898	1,315	1,442	1,750	3,438	3,525	1,211	256	225	1,258
	Future Project, CFS	190	229	618	878	1,314	1,442	1,750	3,438	3,524	1,210	256	224	1,256
	Absolute Difference, CFS	0	0	-3	-20	-1	-1	-1	0	-1	-1	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.4	-2.2	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.2
Above Normal	Future Baseline, CFS	145	160	265	1,491	871	732	1,074	2,575	1,591	445	148	175	806
	Future Project, CFS	145	160	264	1,450	873	737	1,075	2,578	1,589	444	148	175	803
	Absolute Difference, CFS	0	0	-2	-40	2	6	0	3	-1	0	0	0	-3
	Relative Difference (%)	0.0	0.0	-0.6	-2.7	0.2	0.8	0.0	0.1	-0.1	-0.1	0.0	0.0	-0.3
Below Normal	Future Baseline, CFS	141	475	563	540	1,044	1,255	1,445	1,826	929	231	113	161	727
	Future Project, CFS	141	475	561	507	1,021	1,251	1,455	1,840	949	231	113	160	725
	Absolute Difference, CFS	0	0	-2	-33	-23	-4	10	14	20	0	0	-1	-2
	Relative Difference (%)	0.0	0.0	-0.3	-6.2	-2.2	-0.3	0.7	0.7	2.1	0.0	0.0	-0.6	-0.2
Dry	Future Baseline, CFS	121	174	433	1,449	416	572	1,002	1,426	687	210	118	143	562
	Future Project, CFS	121	174	428	1,428	351	534	998	1,445	713	214	118	143	556
	Absolute Difference, CFS	0	0	-4	-21	-64	-37	-3	18	26	4	0	0	-7
	Relative Difference (%)	0.0	0.0	-1.0	-1.4	-15.5	-6.5	-0.3	1.3	3.8	1.8	-0.2	0.0	-1.2
Critically Dry	Future Baseline, CFS	123	109	212	138	237	331	614	701	262	115	83	108	253
	Future Project, CFS	123	109	207	113	155	255	600	706	275	118	81	104	237
	Absolute Difference, CFS	0	0	-5	-25	-82	-76	-14	5	13	2	-2	-3	-16
	Relative Difference (%)	0.0	0.0	-2.2	-18.0	-34.7	-22.9	-2.4	0.7	5.0	2.1	-2.9	-3.1	-6.2
All Years	Future Baseline, CFS	149	229	441	711	799	919	1,215	2,002	1,570	520	153	164	739
	Future Project, CFS	149	229	438	686	762	891	1,212	2,009	1,581	521	152	163	733
	Absolute Difference, CFS	0	0	-3	-25	-37	-28	-3	7	11	1	-1	-1	-7
	Relative Difference (%)	0.0	0.0	-0.7	-3.6	-4.6	-3.0	-0.2	0.3	0.7	0.2	-0.5	-0.7	-0.9

3.7 REQUIRED PROJECT APPROVALS

This EIR will be used in the planning and decision-making process for adoption and implementation of the proposed Project. The District will serve as the lead agency pursuant to CEQA for the Project. Other public agencies that would be expected to use the EIR in their decision-making processes as Responsible or Trustee Agencies, as defined in Sections 21069 and 21070 of CEQA and Sections 15096, 15381, and 15386 of the State CEQA Guidelines, include:

- State Water Resources Control Board – Responsible Agency because it must make a decision on whether to approve the change petition for Permit 21112; and
- California Department of Fish and Wildlife (CDFW) – Trustee Agency that will provide input to the change petition process regarding effects to fish, wildlife, or their habitat.

Future construction of infrastructure improvements may require additional permits such as:

- CDFW – Responsible Agency for issuing a Lake and Streambed Alteration Agreement should construction activities result in alteration of the bed or bank of a lake or stream;
- Regional Water Quality Control Board – potentially a Responsible Agency for issuing Waste Discharge Requirements and/or Water Quality Certification should construction activities affect waters of the state or U.S.

- U.S. Army Corps of Engineers – Federal agency that may potentially issue a Clean Water Act Section 404 permit should construction activities result in fill of waters of the U.S.; and
- U.S. Fish and Wildlife Service (USFWS) – Federal agency that consults under the Endangered Species Act for projects that may require permits regarding sensitive species of fish, wildlife, or their habitat.
- State Historic Preservation Office – State agency that consults on compliance with the National Historic Preservation Act for projects that may impact cultural resources protected under the act.

4 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

INTRODUCTION

This chapter analyzes potential environmental impacts of the Modification of Water Right Permit 21112 Project (Project). This section addresses the full list of environmental resource topics from Appendix G of the State CEQA Guidelines. Each resource section summarizes the relevant plans, policies, and regulations that compose the regulatory framework for the Project; describes the existing physical environmental conditions at the Project site and in the surrounding area; and discloses the Project's potential direct and indirect impacts. Cumulative impacts are addressed in Chapter 6. For an impact that would be potentially significant, feasible mitigation measures are identified that would avoid, minimize, rectify, reduce, eliminate, or compensate for that impact to reduce, where feasible, the level of significance below established thresholds.

ENVIRONMENTAL BASELINE

As discussed in Chapter 3 Project Description, the District is electing to utilize both a current and future baseline as the basis for evaluating potential impacts of the Project for water-dependent resource categories including biological resources, energy, hydrology, and recreation. The use of a future baseline for these select resources is necessary to identify which impacts are associated with the Project as compared to which impacts are associated with future increases in water demands that would otherwise occur absent the Project. The characteristics of each baseline include:

Current Baseline: The current baseline represents conditions as they existed at the time the Notice of Preparation (NOP) was published (September 2022) and includes the following elements:

1. Current District water demands are based on 5-year average (2017 – 2021) water use for all District customers (34,512 AF)

2. Maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs

3. Maximum rate of re-diversion into the Hazel Creek Tunnel is 80 cfs

4. Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP

Future Baseline: The future baseline represents projected conditions in the year 2045 based on anticipated increases in District water demands that would occur with or without the proposed Project and includes the following elements:

5. Future water demands are based on projections from the District's 2020 UWMP; (Table 4-11; EID 2021) for the year 2045 for all District customers (43,320 AF). The UWMP does not specify how this total District-wide demand will be met by the District's three WTPs. Therefore, 43,320 AF is the total combined water demand that must be satisfied between the District's three WTPs (i.e., Reservoir 1, Reservoir A, and El Dorado Hills). In order to allocate these water demands among these facilities, the future baseline water

demands are pro-rated based on the 5-year average (2017 – 2021) water production at each WTP, relative to total water production for all WTPs. For example, Reservoir A 5-year average water production was 22,453 AF, which represents 65% of the total 5-year average water production (34,512 AF). In the future baseline, it is assumed that Reservoir A would produce the same proportion of water in 2045 (i.e., 65%). Therefore, future demands to be met by Reservoir A were calculated to 65% of the total 2045 water demands (43,320 AF x 65% = 28,158 AF). This annual water demand was distributed on a monthly basis following the 5-year average (2017 – 2021) monthly water demand. This same procedure was used to assign future water demands at Reservoir 1 and El Dorado Hills WTPs.

6. Maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs

7. Maximum rate of re-diversion into the Hazel Creek Tunnel is 80 cfs

8. Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available at the El Dorado Diversion Dam for consumptive use at Reservoir A WTP and/or Reservoir 1 WTP

Please note the only difference between the current and future baselines is the assumed District water demands. All other elements between the two baseline scenarios are the same.

TYPES OF IMPACTS

This EIR considers direct, indirect, and cumulative impacts for each resource. The terms "direct impact" and "indirect impact," are defined below, consistent with CEQA Guidelines Sections 15064(d) and 15355. Cumulative impacts are defined in Chapter 6.

The effect of a project on the existing environment is considered a project-specific impact (as opposed to a cumulative impact, discussed in Chapter 6). Project impacts can be either direct or indirect. Examples of direct physical changes in the environment include dust, noise, and odors generated during construction or the loss of sensitive biological habitat due to grading and excavation during construction or operation. An indirect physical change in the environment is not immediately related to the project but is caused indirectly by the project.

If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect physical change in the environment. For example, the construction of new utility capacity may facilitate population growth in the service area due to the increased capacity, and that growth may in turn lead to an increase in air pollution. An indirect physical change is to be considered only if that change is a reasonably foreseeable consequence of the Project. A change that is speculative or unlikely to occur is not reasonably foreseeable.

CEQA SIGNIFICANCE CRITERIA AND DETERMINATIONS

CEQA lead agencies rely on impact significance criteria as benchmarks to determine whether changes to the existing environment caused by a Project or an alternative would cause a significant adverse effect. CEQA defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in the environment" (Public Resources Code Section 21068), and the CEQA Guidelines further clarify that a significant impact is a 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" (CEQA Guidelines Section 15382). To determine whether impacts are significant, the questions provided in CEQA Guidelines Appendix G were considered, and, where appropriate, Project-specific thresholds were developed. Lead agencies generally have broad discretion to formulate significance thresholds and to draw significance conclusions based on information in the record, including the impact's setting: "For example, an activity which may not be significant in an urban area may be significant in a rural area" (CEQA Guidelines Section 15064(a)(1), (b)). Impact conclusions reached in this Draft EIR are made based on information in the District's record, including credible science-based research, reference materials, and informed professional judgments of qualified scientists and EIR preparers. Technical studies and analyses relied upon are cited in each section of the EIR; additional Project-specific or site-specific analyses such as modelling are provided in the appendices, as appropriate. The categories used to designate impact significance for the purposes of this EIR are:

- **No Impact.** There would be no impact if there is no Project-caused change in the environment—for example, if the environmental resource does not occur within the Project site or the area of potential effect. For instance, there would be no impact related to tree removal if no tree removal is proposed in the Project site.

- **Less than significant**. This determination applies if a Project-caused change would result but would not exceed the applicable significance threshold.

- **Potentially Significant.** This determination applies if the Project would potentially result in an adverse effect that meets or exceeds the applicable significance threshold. Potentially significant impacts are further designated as follows based on the availability of feasible mitigation measures:

- **Less than significant with mitigation.** This determination applies if the Project would result in an adverse effect that meets or exceeds the applicable significance threshold, but feasible mitigation is available that would eliminate any adverse impact or reduce it to less-than-significant.

- **Significant and unavoidable.** This determination applies if the Project would result in an adverse effect that meets or exceeds the applicable significance threshold but, even with the implementation of mitigation measures to lessen the impact, if available, the residual effect would not be reduced to less-than-significant levels. No significant and unavoidable impacts were identified for the Project.

MITIGATION MEASURES

Consistent with CEQA and CEQA Guidelines Section 15370, this EIR describes feasible mitigation measures to avoid or minimize significant adverse effects of the Project. Mitigation can include one or more actions to avoid, minimize, restore, preserve and maintain, and/or compensate for an impact by providing a substitute resource.

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4.1 AESTHETICS

This section provides an analysis of potential impacts on the aesthetic and visual quality of the Project study area and surrounding vicinity. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.1.1 EXISTING CONDITIONS

REGIONAL SETTING

The Project Area is generally located on the west slope of the Sierra Nevada mountain range and is characterized by a wide range of landscapes: forested slopes of the rugged South Fork of the American River canyon beginning at approximately 3,900 feet elevation at the El Dorado Diversion Dam (approximately 1.5 miles west of the town of Kyburz), rolling hills covered by grasslands and oak woodlands including the Coloma Valley at approximately 760 feet elevation, and Folsom Reservoir at approximately 470 feet elevation. Much of the land along the South Fork between the El Dorado Diversion Dam and Chili Bar Reservoir is undeveloped U.S. Forest Service land that is moderately forested above the immediate banks of the river. The Marshall Gold Discovery State Historic Park is located in Coloma and areas within the Coloma Valley along the South Fork include undeveloped lands, private residences, resorts, and river rafting businesses. The southern shore of Folsom Reservoir transitions from relatively undeveloped lands to suburban residential areas in proximity to the current authorized point of diversion for Permit 21112 at the Folsom Lake Raw Water Intake.

In addition, Silver Lake, Caples Lake and Lake Aloha are located in the South Fork American River basin. Echo Lake, on the east slope of the Sierra Nevada range, is located in the Upper Truckee River basin. These reservoirs are used to store water in winter and spring for release to the South Fork and its tributaries for consumptive, hydropower, and fish and wildlife uses in the summer, fall, and early winter. The shores around the reservoirs are either forested or consist of granitic outcrops.

PROJECT SETTING

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The Project setting for this aesthetics analysis includes locations within view of facilities involved in the diversion and conveyance of Permit 21112 water, as well as locations that may not be within view of facilities involved in the diversion and conveyance of Permit 21112 but which may experience a physical change as a result of implementation of the Project that could in turn result in a change to the surrounding visual character.

The facilities involved in the proposed diversion and conveyance of Permit 21112 water include the El Dorado Canal, which consists of a variety of conveyance structures including canal, tunnels, flumes, and siphons that conveys water approximately 22 miles through a forested landscape from the El Dorado Diversion Dam near Kyburz to Forebay Reservoir in the rural community of Pollock Pines. The Forebay Reservoir is a re-regulating reservoir with a surface area at full capacity of approximately 23 acres. Water levels in Forebay Reservoir fluctuate frequently depending on hydropower and consumptive water demands. Almost the entire shoreline is

visible to drivers along Forebay Road. Forebay Reservoir is used by nearby residents and other visitors for recreation activities such as fishing and picnicking.

Water diverted at the El Dorado Diversion Dam can also be delivered to Jenkinson Lake through the Hazel Creek Tunnel, which allows water to be conveyed from the El Dorado Canal to Jenkinson Lake. Water diverted through the Hazel Creek Tunnel is conveyed into a partially rip-rapped and lined drainage channel that connects to Hazel Creek which ultimately flows into Jenkinson Lake. Once water enters Hazel Creek it comingles with natural flows of the creek. The Hazel Creek Tunnel and the drainage channel are located in a remote area that is not readily accessible and therefore not visible to the public. In its lower reaches, Hazel Creek flows next to a developed campground within the Sly Park Recreation Area (SPRA), however this segment is in its natural state. Jenkinson Lake is also located within the SPRA and has a surface area of approximately 650 acres. The lake is surrounded by over 9 miles of trails that accommodate hikers, bikers, and equestrians. The trail system winds through thick forested areas and open meadows while closely following the entire lake shore perimeter. Surrounding the reservoir are 10 day-use areas, two boat ramps and 15 developed campgrounds. Motorist traveling along Sly Park Road and Mormon Immigrant Trail have intermittent views of the lake and the surrounding forest. Lake levels fluctuate substantially with the season and are dependent on hydrologic conditions and consumptive water demands.

STATE SCENIC HIGHWAYS

U.S. Highway 50 (U.S. 50) is a heavily traveled east-west route across the Sierra Nevada and is a designated state scenic highway east of Placerville (Caltrans 2023). U.S. 50 generally closely follows the South Fork of the American River (South Fork), and motorists have occasional views of the river from U.S. 50 between Kyburz and Riverton. West of Riverton to the community of Fresh Pond, U.S. 50 still tracks the South Fork, but views from U.S. 50 are generally blocked by trees. Near Fresh Pond, U.S. 50 and the South Fork diverge from one another. Views of the river from U.S. 50 and other surrounding areas include deep pools, cascades, and large boulders in the river and riparian vegetation, mixed conifers, and vegetated steep slopes along the river. Flows in the South Fork fluctuate based on diversion, and seasonal conditions of rainfall, snowmelt and natural runoff.

State Route 49 (SR 49) is designated as an eligible state scenic highway between SR 120 and Grass Valley (Caltrans 2023). Views from SR 49 include river and riparian vegetation and mixed conifers. In the Project area, the South Fork is visible from SR 49 near Coloma.

4.1.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Federal Power Act 16 U.S.C. §§ 797(e) and 808 (2000)

The Federal Power Act (FPA) is the primary federal statute governing the wholesale transmission and sale of electric power, as well as the regulation of hydroelectric power (CRS 2020). The Federal Energy Regulatory Commission (FERC) licenses and regulates the construction and operation of non-federal hydropower projects under the FPA. The District owns and operates the El Dorado Hydroelectric Project (Project No. 184) under a license with FERC. The District, as the Licensee of Project No. 184 is responsible to comply with the articles and conditions contained in the FERC license, including the following condition relevant to aethetics:

Article 402 and Condition No. 54 – Visual Resource Management Plan: The plan establishes the District's responsibilities for the protection of visual resources on all lands within the FERC boundary (EID 2008).

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Scenic Highway Program

Caltrans manages the California Scenic Highway Program. The purpose of this program is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. Caltrans manages the State Scenic Highway Program, provides guidance, and assists local government agencies, community organizations, and citizens with the process to officially designate scenic highways.

A highway may be designated as scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The California Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. The status of a state scenic highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program, applies to Caltrans for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a scenic highway (Caltrans 2023).

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

There are no regional or local plans, policies, regulations, or ordinances relevant to aesthetics that are applicable to the Project.

4.1.3 IMPACT ANALYSIS

METHODOLOGY

The aesthetic value of an area is a measure of the variety and contrast of the area's visual features, the character and quality of those features, and the scope and scale of the scene, combined with the anticipated viewer response. The analysis of aesthetics impacts for the Project uses a qualitative approach for characterizing and evaluating the visual resources of the areas that could be affected by the Project. This approach is based on the following three steps:

1. An objective inventory of the visual features or visual resources that comprise the landscape.
2. An assessment of the character and quality of the visual resources in the context of the overall character of the regional visual landscape.
3. Consideration of the importance to viewers, or sensitivity of the viewers, to the identified visual resources in the landscape.

Because an assessment of visual quality is a subjective matter, reasonable people can disagree as to whether alteration in the visual character of the environmental setting would result in adverse, beneficial, or negligible effects on the visual character. However, Appendix G of the State CEQA Guidelines provides thresholds which can be used to provide a standard from which to conduct the assessment.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: existing infrastructure (pre-construction), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project would result in a significant impact on aesthetics if the Project would:

a) have a substantial adverse effect on a scenic vista;

b) except as provided in Public Resources Code Section 21099, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; or

c) substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a State scenic highway;

d) create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.1-1. Have a substantial adverse effect on a scenic vista?

Scenic vistas are typically categorized as either panoramic views (visual access to a large geographic area) or focal views (visual access to a particular object, scene, setting, or feature of interest). They consist of outstanding

examples of the natural environment, or the built environment considering the surrounding context and setting. Scenic vistas exhibit the highest degree of vividness, intactness, and unity, and consist of outstanding examples that are often regarded as "the best of its kind." No designated scenic vistas (by the County or others) are located within the Project Area.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

No designated scenic vistas (by the County or others) are located within the Project Area. Therefore, operations with existing infrastructure would not affect existing scenic vistas or unique views, and **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

No designated scenic vistas (by the County or others) are located within the Project Area. Therefore, construction would not affect existing scenic vistas or unique views, and **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

No designated scenic vistas (by the County or others) are located within the Project Area. Therefore, post-construction operations would not affect existing scenic vistas or unique views, and **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.1-2. In nonurbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not change flows in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. Water that is currently diverted at the El Dorado Diversion Dam under other water rights and used for hydropower purposes would be diverted for consumptive uses instead under the proposed Project. This change from non-consumptive diversion for hydropower purposes to a consumptive diversion to meet water demands would result in reduced return flows below the El Dorado Powerhouse. Thus, there would be slight reductions in flow below the El Dorado Powerhouse because the consumptive use water would be permanently diverted and not returned to the South Fork. Those reductions would not change the visual character of the areas from the El Dorado Powerhouse through Slab Creek Reservoir, Chili Bar Reservoir, through the Coloma Valley and down to Folsom Reservoir given the relatively small volume of water compared to total flows in the South Fork and the influence of operations of SMUD's facilities, and the re-regulation in Slab Creek Reservoir and Chili Bar Reservoir.

Modeling conducted for the Project indicates that operation with existing infrastructure may also cause slight decreases in Folsom Reservoir elevations because decreased return flows from the El Dorado Powerhouse would result in reduced inflows to Folsom Reservoir compared to the existing condition. Water levels in Forebay Reservoir would continue to fluctuate within its normal range of operations as dictated by demands for consumptive use and hydropower generation similar to current conditions and reservoir elevations in Jenkinson Lake would generally be higher in summer months compared to current conditions. However, these minor hydrologic effects would not be noticeable to motorists traveling along Forebay Road or Sly Park Road or to visitors to Folsom Reservoir, Slab Creek Reservoir, and Chili Bar Reservoir. Reservoir levels at Folsom Reservoir, Slab Creek Reservoir, and Chili Bar Reservoir currently fluctuate constantly depending on storage, diversion, and seasonal fluctuation and would continue to fluctuate in similar ways with reduced return flows below the El Dorado Powerhouse. Therefore, Project-related fluctuation would be indistinguishable from current fluctuation. (See Section 4.10, "Hydrology and Water Quality," for further discussion of modeling methodology and results.)

Operations with existing infrastructure would result in small changes in flows within the South Fork and reservoirs would fluctuate within their normal range of operations. These conditions would not substantially degrade the existing visual character or quality of the site and its surroundings in nonurbanized areas and this impact would be **less than significant**.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in

Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

All construction-related activities involve improvements to existing water conveyance facilities. The improved facilities would generally be constructed in the same location as the existing facilities and therefore would not degrade the existing visual character or quality of the site and its surroundings. These facilities are generally located in remote areas that are not readily visible to the public. The minor removal of trees and vegetation associated with these improvements would not substantially detract from the existing viewshed because the surrounding area is heavily forested and vegetation management activities occur in the immediate area around the existing facilities. Any minor alterations to the viewsheds near these facilities would be temporary in nature and the areas would be restored following construction completion. Therefore, this impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations could decrease flows in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse by up to 11 cfs (i.e., the difference between existing infrastructure maximum rate of diversion at the El Dorado Diversion Dam of 145 cfs and 156 cfs). In general, the timing of diversions of Permit 21112 water at the El Dorado Diversion Dam would occur primarily in the winter and spring months when unimpaired flows in the South Fork are high. For example, the average monthly flows in the South Fork from November 1 to July 31 (i.e., the season of diversion under P-21112) for water years 2006 – 2023 is 457 cfs (range 97 cfs to 1,150 cfs) (USGS 2024). A change of 11 cfs would represent approximately 2% of the average monthly flow in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. Even under the lowest average monthly flow of 97 cfs, an 11 cfs change would only represent a change in river stage of 0.05 feet (USGS 2021). Such small changes would not be visibly detectable and thus not substantially degrade the existing visual character or quality of the area or its surroundings.

With the proposed Project, water that is currently diverted at the El Dorado Diversion Dam under other water rights and used for hydropower purposes would be diverted for consumptive uses instead under the proposed Project. This change from non-consumptive diversion for hydropower purposes to a consumptive diversion to meet water demands would result in reduced return flows below the El Dorado Powerhouse. Thus, there would be slight reductions in flow below the El Dorado Powerhouse because the consumptive use water would be

permanently diverted and not returned to the South Fork. Those reductions are not expected to change the visual character of the areas from the El Dorado Powerhouse through Slab Creek Reservoir, Chili Bar Reservoir, through the Coloma Valley and down to Folsom Reservoir given the relatively small volume of water compared to total flows in the South Fork and the influence of operations of SMUD's facilities, and the re-regulation in Slab Creek Reservoir and Chili Bar Reservoir.

Post-construction operations may also cause slight decreases in Folsom Reservoir elevations because decreased return flows from the El Dorado Powerhouse would result in reduced inflows to Folsom Reservoir compared to the existing condition. Water levels in Forebay Reservoir would continue to fluctuate within its normal range of operations as dictated by demands for consumptive use and hydropower generation similar to current conditions and reservoir elevations in Jenkinson Lake would generally be higher in summer months compared to current conditions. However, these minor hydrologic effects would not be noticeable to motorists traveling along Forebay Road or Sly Park Road or to visitors to Folsom Reservoir, Slab Creek Reservoir, and Chili Bar Reservoir. Reservoir levels at Folsom Reservoir, Slab Creek Reservoir, and Chili Bar Reservoir currently fluctuate constantly depending on storage, diversion, and seasonal fluctuation and would continue to fluctuate in similar ways with reduced return flows below the El Dorado Powerhouse. Therefore, Project-related fluctuations would be indistinguishable from current fluctuations.

Post-construction operations of the proposed Project would result in small changes in flows within the South Fork and reservoirs would fluctuate within their normal range of operations. These conditions would not substantially degrade the existing visual character or quality of the site and its surroundings in nonurbanized areas and this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.1-3. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a State scenic highway?

U.S. 50 is a heavily traveled east-west route across the Sierra Nevada and is a designated state scenic highway east of Placerville (Caltrans 2023).In addition, SR 49 is designated as an eligible state scenic highway between SR 120 and Grass Valley (Caltrans 2023).

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

U.S. 50 generally closely follows the South Fork and motorists have occasional views of the river from U.S. 50 between Kyburz and Riverton. West of Riverton to the community of Fresh Pond, U.S. 50 still tracks the South Fork, but trees and elevational differences generally block views of the South Fork from U.S. 50. Near Fresh Pond, U.S. 50 and the South Fork diverge from one another and the South Fork is not visible from U.S. 50 downstream of that point. Operations with existing infrastructure would not change flows in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. Because diversions at the El Dorado Diversion Dam would not change under operations with existing infrastructure there would be no changes to scenic resources that are visible from U.S. 50 or SR 49 in the South Fork from the El Dorado Diversion Dam to

the El Dorado Powerhouse. Water that is currently diverted at the El Dorado Diversion Dam under other water rights and used for hydropower purposes would be diverted for consumptive uses instead under the proposed Project. This change from non-consumptive diversion for hydropower purposes to a consumptive diversion to meet water demands would result in reduced return flows below the El Dorado Powerhouse. Thus, there would be slight reductions in flow in the South Fork below the El Dorado Powerhouse because the consumptive use water would be permanently diverted and not returned to the South Fork. All reaches of the South Fork below the El Dorado Powerhouse are not visible from U.S. 50. Likewise, none of the reservoirs associated with the Project are visible from U.S. 50. Therefore, any Project-related hydrologic effects would not be observable from U.S. 50. Thus, pre-construction operations would have no effect on scenic resources within a designated scenic highway and there would be **no impact**.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake is not visible from a designated State scenic highway and therefore construction activities associated with these facilities would not damage scenic resources within the view of a State scenic highway. Segments of the El Dorado Canal from the El Dorado Diversion Dam to Hazel Creek Tunnel are adjacent to State scenic highway U.S. 50. However, these segments are generally not visible or noticeable to drivers along U.S. 50 due to the heavily forested landscape and elevation differences between the El Dorado Canal and U.S. 50. Any segments of the El Dorado Canal from the El Dorado Diversion Dam to Hazel Creek Tunnel that may be visible from U.S. 50 would be only momentarily visible to drivers on U.S. 50. Because the El Dorado Canal is generally not visible or only momentarily visible from U.S. 50, construction activities along the El Dorado Canal from the El Dorado Diversion Dam to Hazel Creek Tunnel would likewise not be visible or only momentarily visible to drivers along U.S. 50. Thus, construction activities associated with the Project would not substantially damage scenic resources within a designated scenic highway. Therefore, this impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations could decrease flows in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse by up to 11 cfs (i.e., the difference between existing infrastructure maximum rate of diversion at the El Dorado Diversion Dam of 145 cfs and 156 cfs). In general, the timing of diversions of Permit 21112 water at the El Dorado Diversion Dam would occur primarily in the winter and spring months when unimpaired flows in the South Fork are high. For example, the average monthly flows in the South Fork from November 1 to July 31 (i.e., the season of diversion under P-21112) for water years 2006 – 2023 is 457 cfs (range 97 cfs to 1,150 cfs) (USGS 2024). A change of 11 cfs would represent approximately 2% of the average monthly flow in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. Even under the lowest average monthly flow of 97 cfs, an 11 cfs change would only represent a change in river stage of 0.05 feet (USGS 2021). Such small changes would not be visibly detectable and thus not cause substantial damage to scenic resources or be noticeable to motorists who have momentary views of the South Fork from U.S. 50.

With the proposed Project, water that is currently diverted at the El Dorado Diversion Dam under other water rights and used for hydropower purposes would be diverted for consumptive uses instead under the proposed Project. This change from non-consumptive diversion for hydropower purposes to a consumptive diversion to meet water demands would result in reduced return flows below the El Dorado Powerhouse. Thus, there would be slight reductions in flow below the El Dorado Powerhouse because the consumptive use water would be permanently diverted and not returned to the South Fork. All reaches of the South Fork below the El Dorado Powerhouse are not visible from U.S. 50. Therefore, any changes in flow in the South Fork below the El Dorado Powerhouse would not impact scenic resources within view of a scenic highway.

Post-construction operations may also cause slight decreases in Folsom Reservoir elevations because decreased return flows from the El Dorado Powerhouse would result in reduced inflows to Folsom Reservoir compared to the existing condition. Water levels at Forebay Reservoir would continue to fluctuate within its normal range of operations as dictated by demands for consumptive use and hydropower generation similar to current conditions and reservoir elevations in Jenkinson Lake would generally be higher in summer months compared to current conditions. Reservoir levels at Folsom Reservoir, Slab Creek Reservoir, and Chili Bar Reservoir currently fluctuate constantly depending on storage, diversion, and seasonal fluctuation and would continue to fluctuate in similar ways with reduced return flows below the El Dorado Powerhouse. None of the reservoirs associated with the proposed Project are visible from the designated segment of U.S. 50. Therefore, there would be no impact to scenic resources within view of a scenic highway.

Any Project-related hydrologic effects would be small or not observable from U.S. 50. Thus, post-construction operations would not result in substantial damage to scenic resources within a designated scenic highway. The impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.1-4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operation with existing infrastructure does not involve physical alteration of facilities and would not require new sources of lighting or create a new source of glare. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake could result in new temporary sources of nighttime lighting. Temporary construction lighting may be required to facilitate nighttime work and for security purposes. Nighttime lighting for these activities would be a short-term effect that would cease at the end of construction and would not constitute a substantial new source of light. All construction-related activities involve improvements to existing water conveyance facilities. The improved facilities would be constructed in the same location as the existing facilities, which are generally located in remote areas that are not readily visible to the public. Due to the remote location and low visibility, the improved facilities would not create a substantial new source of glare. Because the Project would only result in short-term impacts associated with nighttime lighting during construction activities, the Project would not create a substantial new source of light and glare. This impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations does not involve physical alteration of facilities and would not require new sources of lighting or create a new source of glare. **No impact** would occur.

Mitigation Measures

No mitigation is required.

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4.2 AGRICULTURE AND FORESTRY RESOURCES

This section provides an analysis of potential impacts on agriculture and forestry resources associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.2.1 EXISTING CONDITIONS

AGRICULTURAL RESOURCES

The California Department of Conservation's Important Farmland classifications—Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance—recognize the land's suitability for agricultural production by considering the physical and chemical characteristics of the soil, such as soil temperature range, depth of the groundwater table, flooding potential, rock fragment content, and rooting depth. The classifications also consider location, growing season, and moisture available to sustain high-yield crops. Together, Important Farmland and Grazing Land are defined by the California Department of Conservation as "Agricultural Land" (California Public Resources Code, Sections 21060.1 and 21095).

The Project location encompasses areas within and near the South Fork American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake (see Figure 3-1 in Chapter 3, "Project Description"). According to the El Dorado County Important Farmland map, published by the California Department of Conservation's Division of Land Resource Protection, the majority of the Project Area is designated as Other Land, and the Project Area in the vicinity of El Dorado Diversion Dam is not mapped (DOC 2018).

Williamson Act

Under the California Land Conservation Act of 1965, also known as the Williamson Act, local governments can enter into contracts with private property owners to protect land (within agricultural preserves) for agricultural and open space purposes. No lands are under Williamson Act contract within the Project Area.

FORESTRY RESOURCES

Appendix G of the CEQA Guidelines defines "forestland" as land that can support 10 percent native tree cover and woodland vegetation of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources—timber, aesthetics, fish and wildlife, biodiversity, water quality, or recreation—and other public benefits (California Public Resources Code Section 12220[g]).

Forestry resources in the Project Area consist of mixed evergreen forest. A more detailed description of the surrounding forest resources and habitat is presented in Section 4.4, "Biological Resources."

4.2.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

1989 Eldorado National Forest Land and Resource Management Plan

The purpose of the Forest Plan is to direct the management of the Eldorado National Forest. The Plan proscribes compatible sets of Forest practices for the land and resources. Acres are assigned to different resource uses, and targets are set for the production of market and nonmarket goods and services. Environmental protection is gained by applying the management requirements to the approved Forest activities. The Plan also meets legal requirements and deals with local, state, and national issues. To accomplish its purpose, the Plan:

- Names Forest's long-range goals and objectives for a 10-year period;
- Schedules the location and occurrence of forest practices by management areas;
- Establishes Standards and Guidelines for forest practices; and
- Ties management activities directly to the Forest Service budgeting system, linking them with periodic assessments and programs developed at the national level under the Forest and Rangeland Resources Planning Act.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Important Farmland Inventory System and Farmland Mitigation and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) was established by the State of California in 1982 to continue the Important Farmland mapping efforts begun in 1975 by the U.S. Soil Conservation Service (now called the Natural Resources Conservation Service, under the U.S. Department of Agriculture). The intent was to produce agricultural resource maps, based on soil quality and land use across the nation. The Department of Conservation sponsors the FMMP and also is responsible for establishing agricultural easements, in accordance with California Public Resources Code Sections 10250–10255.

The Department of Conservation FMMP maps are updated every two years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance. The following list provides a comprehensive description of all the categories mapped by the Department of Conservation (DOC 2023):

- **Prime Farmland**—Land that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.
- **Farmland of Statewide Importance**—Land similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture.
- **Unique Farmland**—Land of lesser quality soils used for the production of the state's leading agricultural cash crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California.

- **Farmland of Local Importance**—Land that is of importance to the local agricultural economy, as defined by each county's local advisory committee and adopted by its board of supervisors.
- **Grazing Land**—Land with existing vegetation that is suitable for grazing.
- **Urban and Built-Up Lands**—Land that is used for residential, industrial, commercial, institutional, and public utility structures and for other developed purposes.
- **Other Lands**—Land that does not meet the criteria of any of the previously described categories and generally includes low-density rural developments, vegetative and riparian areas not suitable for livestock grazing, confined-animal agriculture facilities, strip mines, borrow pits, and vacant and non-agricultural land surrounded on all sides by urban development.

Important Farmland is classified by the Department of Conservation as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. Under CEQA, the designations for Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are defined as "agricultural land" or "farmland" (Public Resources Code Sections 21060.1 and 21095, and CEQA Guidelines Appendix G).

California Public Resources Code

Public Resources Code Section 12220(g): "Forest land" is land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions and that allows for management of one or more forest resources including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

Public Resources Code Section 4526: "Timberland" means 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. Commercial species shall be determined by the board on a district basis.

Public Resources Code Section 51104(g): "Timberland production zone" or "TPZ" means an area which 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 in subdivision (h). With respect to the general plans of cities and counties, "timberland preserve zone" means "timberland production zone."

Regional and Local Plans, Policies, Regulations, and Ordinances

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance (El Dorado County 2019). However, the District aims to comply

with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to agricultural and forestry resources include the following:

- **Goal 7.4:** Identify, conserve, and manage wildlife, wildlife habitat, fisheries, and vegetation resources of significant biological, ecological, and recreational value.
    - **Policy 7.4.4.1:** The Natural Resource land use designation shall be used to protect important forest resources from uses incompatible with timber harvesting.
- **Goal 8.3:** Forest Land Conservation: Maintain healthy sustainable forests that provide for raw materials while limiting the intrusion of incompatible uses into important forest lands.
    - **Policy 8.3.1.1:** Lands suitable for timber production which are designated Natural Resource (NR) on the General Plan land use map and zoned Timber Production Zone (TPZ) or Forest Resource (FR) are to be maintained for the purposes of protecting and encouraging the production of timber and associated activities.
    - **Policy 8.3.3.1:** Forest lands are reserved for multiple use purposes directly related to timber production, mineral resource extraction, wildlife, grazing, and recreation.
    - **Policy 8.3.3.2:** The Natural Resource land use designation shall be applied for the purposes of conserving and protecting important forest lands and maintaining viable forest-based communities. In determining whether particular lands constitute important forest lands, the Board of Supervisors shall consider the advice of the Agricultural Commission.

4.2.3 IMPACT ANALYSIS

METHODOLOGY

The evaluation of potential impacts on agricultural resources was based on a review of the Department of Conservation Important Farmland maps and Williamson Act Contract maps for El Dorado County (Department of Conservation 2018). Appendix G of the CEQA Guidelines focuses the analysis on conversion of agricultural land on Prime Farmland, Farmland of Statewide Importance, or Unique Farmland; therefore, any conversion of these lands would be considered a significant impact under CEQA.

The evaluation of potential impacts on forestry resources was based on the potential for implementing the Project to remove forestry resources as defined Public Resources Code Section 12220(g).

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant [WTP] and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek and then to Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Section 3.6.4. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs,

with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the Project would have a potentially significant impact related to agriculture and forestry resources if it would:

a) convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;

b) conflict with existing zoning for agricultural use or a Williamson Act contract;

c) conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]);

d) result in the loss of forestland or conversion of forestland to non-forest use; or

e) involve other changes in the existing environment that, because of their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.2-1. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

The Project location encompasses areas within and near the South Fork American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. According to the El Dorado County Important Farmland map, the majority of the Project Area is designated as Other Land, and the Project Area in the vicinity of El Dorado Diversion Dam is not mapped (DOC 2018). Other Land is not considered Important Farmland under CEQA (Public Resources Code Sections 21060.1 and 21095 and CEQA Guidelines Appendix G). Therefore,

operations with existing infrastructure would not convert Important Farmland to non-agricultural uses. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The Project location encompasses areas within and near the South Fork from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. According to the El Dorado County Important Farmland map, the majority of the Project Area is designated as Other Land, and the Project Area in the vicinity of El Dorado Diversion Dam is not mapped (DOC 2018). Other Land is not considered Important Farmland under CEQA (Public Resources Code Sections 21060.1 and 21095 and CEQA Guidelines Appendix G). Therefore, construction activities would not convert Important Farmland to non-agricultural uses. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The Project location encompasses areas within and near the South Fork from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. According to the El Dorado County Important Farmland map, the Project Area in the vicinity of Jenkinson Lake is designated as Other Land, and the Project Area in the vicinity of El Dorado Diversion Dam is not mapped (DOC 2018). This land is not considered Important Farmland under CEQA (Public Resources Code Sections 21060.1 and 21095 and CEQA Guidelines Appendix G). Therefore, post-construction operations would not convert Important Farmland to non-agricultural uses. **No impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.2-2. Conflict with existing zoning for agricultural use or a Williamson Act Contract?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam. The Project Area and adjacent land are not zoned for agricultural uses. No parcels in or adjacent to the Project Area are under Williamson Act contracts (DOC 2018). Therefore, operations with existing infrastructure would not conflict with existing zoning for agricultural uses or a Williamson Act contract. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The Project Area and adjacent land are not zoned for agricultural uses. No parcels in or adjacent to the Project Area are under Williamson Act contracts (DOC 2018). Therefore, construction activities would not conflict with existing zoning for agricultural uses or a Williamson Act contract. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The Project Area and adjacent land are not zoned for agricultural uses. No parcels in or adjacent to the Project Area are under Williamson Act contracts (DOC 2018). Therefore, post-construction operations would not conflict with existing zoning for agricultural uses or a Williamson Act contract. **No impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.2-3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

The Project Area is designated by the El Dorado County General Plan as Natural Resources and zoned by El Dorado County as Forest Resource and Timber Production (El Dorado County 2012, 2019).

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would involve only minor hydrologic changes within waterways and reservoirs associated with the Project and would not affect forest land, timberland, or timberland zoned Timber Production. Therefore, the Project would not conflict with existing zoning or cause rezoning of forest land, timberland, or timberland zoned Timber Production. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

All construction-related activities involve improvements to existing water conveyance facilities. The improved facilities would be constructed in the same location as the existing facilities, which are generally located in remote areas that are heavily forested. Anticipated construction activities may include vegetation and tree removal in the vicinity of the existing water conveyance facilities. However, the removal of trees for construction activities would be minor relative to the surrounding forested landscape and would not conflict with existing zoning or cause rezoning of forest land, timberland, or timberland zoned Timber Production. The impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would involve only minor hydrologic changes within waterways and reservoirs associated with the Project and would not affect forest land, timberland, or timberland zoned Timber Production. Therefore, the Project would not conflict with existing zoning or cause rezoning of forest land, timberland, or timberland zoned Timber Production. **No impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.2-4. Result in the loss of forest land or conversion of forest land to non-forest use?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would involve only minor hydrologic changes within waterways and reservoirs associated with the Project. These minor hydrologic effects would not result in the loss of forest land or conversion of forest land to non-forest use. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

All construction-related activities involve improvements to existing water conveyance facilities. The improved facilities would be constructed in the same location as the existing facilities, which are generally located in remote

areas that are heavily forested. Anticipated construction activities may include vegetation and tree removal in the vicinity of the existing water conveyance facilities. However, the removal of trees for construction activities would be minor relative to the surrounding forested landscape and would not result in the loss of forest land or conversion of forest land to non-forest use. The impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would involve only minor hydrologic changes within waterways and reservoirs associated with the Project. These minor hydrologic effects would not result in the loss of forest land or conversion of forest land to non-forest use. **No impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.2-5. Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

No agricultural land uses occur in or adjacent to the Project Area. Therefore, operations with existing infrastructure would not result in other changes in the physical environment that would cause conversion of farmland to non-agricultural uses. Forest land is present within the Project Area. However, operations with existing infrastructure would involve only minor hydrologic changes within waterways and reservoirs associated with the Project and these minor hydrologic effects would not result in other changes in the physical environment that would cause conversion of forest land to non-forest uses. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill,

construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

No agricultural land uses occur in or adjacent to the Project Area. Therefore, construction activities would not result in other changes in the physical environment that would cause conversion of agricultural land to non-agricultural uses. Forest land is present within the Project Area. All construction-related activities involve improvements to existing water conveyance facilities. The improved facilities would be constructed in the same location as the existing facilities, which are generally located in remote areas that are heavily forested. Anticipated construction activities may include vegetation and tree removal in the vicinity of the existing water conveyance facilities. However, the removal of trees for construction activities would be minor relative to the surrounding forested landscape and would not result in other changes in the physical environment that would cause conversion of forest land to non-forest uses. The impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

No agricultural land uses occur in or adjacent to the Project Area. Therefore, post-construction operations would not result in other changes in the physical environment that would cause conversion of agricultural farmland to non-agricultural uses. Forest land is present within the Project Area. However, post-construction operations would involve only minor hydrologic changes within waterways and reservoirs associated with the Project and these minor hydrologic effects would not result in other changes in the physical environment that would cause conversion of forest land to non-forest uses. **No impact** would occur.

Mitigation Measures

No mitigation is required.

4.3 AIR QUALITY

This section analyzes the potential impacts on air quality associated with construction and implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.3.1 EXISTING CONDITIONS

Air quality is defined as the concentration of pollutants in relation to their impact on human health. Ambient concentrations of air pollutants are determined by the amount of emissions released by pollutant sources and the ability of the atmosphere to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the Project Area are influenced by factors such as topography, meteorology, and climate, as well as the quantity emissions released by air pollutant sources.

TOPOGRAPHY, CLIMATE, AND METEOROLOGY

The Project is located in El Dorado County within the Mountain Counties Air Basin, which comprises Plumas, Sierra, Nevada, the middle portion of Placer, and the western portion of El Dorado, Amador, Calaveras, Tuolumne, and Mariposa counties. The basin lies along the northern Sierra Nevada mountain range, close to or contiguous with the Nevada border, and covers an area of roughly 11,000 square miles. Elevations in the Project Area range from over 10,000 feet at the Sierra Nevada crest down to several hundred feet above sea level at the Sacramento County boundary. Throughout El Dorado County, where the Project is located, the topography is highly variable and includes rugged mountain peaks and valleys with extreme slopes and differences in altitude in the Sierra Nevada as well as rolling foothills to the west.

The climate of the Mountain Counties Air Basin varies considerably with elevation and proximity to the Sierra Nevada crest. The terrain features of the basin make it possible for various climates to exist in relatively close proximity. The pattern of mountains and hills causes a wide variation in rainfall, temperature, and localized winds throughout the basin. Temperature variations have an important influence on basin wind flow, dispersion along mountain ridges, vertical mixing, and photochemistry.

Precipitation levels are high at the highest mountain elevations but decline rapidly toward the western portion of the basin. Winter temperatures in the mountains can be below freezing for weeks at a time, and substantial depths of snow can accumulate; however, in the western foothills, winter temperatures usually dip below freezing only at night and precipitation falls as a mix of rain and light snow. In the summer, temperatures in the mountains are mild, with daytime peaks in the 70s to low 80s degrees Fahrenheit, but the western end of the County can routinely exceed 100 degrees Fahrenheit.

The varied topography and meteorology in the region lead to localized air quality conditions. Regional airflows are affected by the mountains and hills, which direct surface air flows, cause shallow vertical mixing, and create areas of high pollutant concentrations by hindering dispersion.

AIR POLLUTANTS OF CONCERN

Criteria Air Pollutants

Federal and State air quality standards have been established by the U.S. Environmental Protection Agency (EPA) and at the state level by the California Air Resources Board (ARB), respectively, for six common air pollutants, known as criteria air pollutants. The criteria pollutants include ground-level ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (which is further subdivided into PM of diameter equal to or less than 10 micrometers [PM_{10}] and PM of diameter equal to or less than 2.5 micrometers [$PM_{2.5}$]), and lead. The following provides a brief description of these criteria air pollutants, including their source types and health effects.

Ozone

Ozone is a colorless gas that is odorless at ambient levels. It exists primarily as a beneficial component of the ozone layer in the upper atmosphere (stratosphere), shielding the earth from harmful ultraviolet radiation emitted by the sun, and as a pollutant in the lower atmosphere (troposphere).

Ozone is the primary component of urban smog. It is not emitted directly into the air but is formed through a series of reactions involving reactive organic gases (ROG) (also referred to as volatile organic compounds [VOC]) and oxides of nitrogen (NO_X) in the presence of sunlight. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X includes various combinations of nitrogen and oxygen, including nitric oxide, NO_2, and others, typically resulting from the combustion of fossil fuels (EPA 1999).

Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry.

Individuals exercising outdoors, children, and people with lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term ozone exposure (lasting for a few hours) can result in changes in breathing patterns, reductions in breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes. In recent years, a correlation has also been reported between elevated ambient ozone levels and increases in mortality rates (EPA 2021a). An increased risk of asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Carbon Monoxide

CO is a colorless and odorless gas that, in the urban environment, is primarily produced by the incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. Generally, 85 percent of the statewide anthropogenic CO emissions are from mobile sources; the other 15 percent consists primarily of CO emissions from residential wood-burning stoves/furnaces and agricultural burning, as well as some from stationary-source fuel combustion waste disposal (e.g., landfills and incinerators), petroleum production, and industrial mineral

processes (ARB 2017). Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called "hot spots," which can be hazardous to human receptors adjacent to the intersections. Overall, CO emissions are decreasing, in part because the Federal Motor Vehicle Control Program has mandated increasingly lower emission levels for vehicles manufactured since 1973.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, drastically reducing the amount of oxygen available to the cells. Adverse health effects associated with exposure to high CO concentrations, typically only attainable indoors or within similarly enclosed spaces, include dizziness, confusion, unconsciousness, and death. CO exposure is especially harmful to individuals who suffer from cardiovascular diseases (EPA 2021a).

Nitrogen Dioxide

NO_2 is one of a group of highly reactive gases known as oxides of nitrogen, or NO_X. NO_2 is formed when ozone reacts with nitric oxide (i.e., NO) in the atmosphere. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources. NO_X also react with water, oxygen, and other chemicals to form nitric acids, contributing to the formation of acid rain.

Inhalation is the most common route of exposure to NO_2. Breathing air with a high concentration of NO_2 can lead to respiratory illness. Short-term exposure can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups (EPA 2021b).

Sulfur Dioxide

SO_2 is one component of the larger group of gaseous sulfur oxides (SO_X). SO_2 is used as the indicator for the larger group of SO_X, as it is the component of greatest concern and found in the atmosphere are much higher concentrations than other gaseous SO_X. SO_2 is typically produced by stationary sources such as coal and oil combustion facilities, steel mills, refineries, and pulp and paper mills, and is also a component of gasoline and diesel fuel. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract.

Particulate Matter

PM is a complex mixture of extremely small particles and liquid droplets. Particulate matter is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust

particles. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 millionths of a meter or 0.0004-inch) or less. Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns or less (i.e., 2.5 millionths of a meter or 0.0001 inch). The major area-wide sources of $PM_{2.5}$ and PM_{10} are fugitive dust, especially from roadways, agricultural operations, and construction, and demolition. Sources of PM also include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. While exhaust emissions from mobile sources contribute only a very small portion of directly emitted PM_{10} and $PM_{2.5}$ emissions, they are a major source of ROG and NO_X, which undergo reactions in the atmosphere to form particulate matter, known as secondary particles. These secondary particles make up the majority of PM pollution.

Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is known as diesel particulate matter (DPM). More than 90 percent of DPM is less than 1 μm in diameter, and thus is a subset of $PM_{2.5}$. As discussed further below under Toxic Air Contaminants, ARB identified DPM as a toxic air contaminant (TAC) in 1998 based on published evidence of a relationship between diesel exhaust exposure and lung cancer, and the cancer-causing effects of DPM have been further supported by subsequent studies (ARB 2022a).

The size of particulate matter is directly linked to the potential for causing health problems. Particles that are 10 micrometers in diameter or smaller generally pass through the throat and nose and enter the lungs more easily than larger particles. Some particulate matter, such as pollen, occurs naturally. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. PM_{10} bypasses the body's natural filtration system more easily than larger particles and can lodge deep in the lungs. $PM_{2.5}$ penetrates even more deeply into the lungs, and this is more likely to contribute to health effects—at concentrations well below current PM_{10} standards. Once inhaled, these particles can affect the heart and lungs and cause serious health effects and even death. The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAH), and other toxic substances adsorbed onto fine particulate matter (referred to as the "piggybacking effect"), or with fine dust particles of silica or asbestos. Effects related to short- and long-term exposure to elevated concentrations of PM_{10} include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, a weakened immune system, and cancer (World Health Organization 2021). $PM_{2.5}$ poses an increased health risk because these very small particles can be inhaled deep in the lungs and may contain substances that are particularly harmful to human health.

Lead

Lead is a highly toxic metal that may cause a range of human health effects. Lead is found naturally in the environment and is used in manufactured products. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. Soon after its inception, EPA began working to reduce lead emissions, issuing the first reduction standards in 1973. Lead emissions have decreased substantially as a result of the near elimination of leaded gasoline use. Metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB has identified lead as a TAC.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotients. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures, and death, although it appears that lead does not directly affect the respiratory system.

Ambient Air Quality

EPA and ARB use ambient air quality monitoring data to inform the attainment status designation for criteria air pollutants based on whether or not the national ambient air quality standards (NAAQS) and California Ambient Air Quality Standard (CAAQS), respectively, have been achieved (NAAQS and CAAQS are further discussed below in Section 4.3.2, "Regulatory Setting"). The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement.

The three basic designation categories are "attainment," "nonattainment," and "unclassified":

- Attainment: This designation signifies that pollutant concentrations in the area do not exceed the established standard. In most cases, a maintenance plan is required for a region after it has attained an air quality standard and is designated as an attainment or maintenance area after previously being designated as nonattainment. Maintenance plans are designed to ensure continued compliance with the standard.
- Nonattainment: This designation indicates that a pollutant concentration has exceeded the established standard. To identify the severity of the problem and the extent of planning and actions required to meet the standard, nonattainment areas are assigned a classification that is commensurate with the severity of their air quality problem (e.g., moderate, serious, severe, extreme). The severity of the non-attainment status for the ozone NAAQS directly affects the control measures required in their Air Quality Attainment Plan, Air Quality Management Plan, or Clean Air Plan, as well as the timeline for achieving attainment of the NAAQS.
- Unclassified: This designation indicates that insufficient data exists to determine attainment or nonattainment.

As shown in Table 4.3-1, the El Dorado County portion of the Mountain Counties Air Basin is designated as nonattainment for the federal and State ozone standards, the federal $PM_{2.5}$ standard, and the State PM_{10} standard. For all other criteria air pollutants, the region is designated as unclassified or attainment.

TOXIC AIR CONTAMINANTS (TAC)

Both federal and state air quality regulations also focus on TACs. A TAC is an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may otherwise pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their toxicity or health risk may pose a threat to public health even at low concentrations. TACs can be separated into carcinogens and noncarcinogens, based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur. Noncarcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur.

Table 4.3-1. Attainment Designations for El Dorado County

Pollutant	California Standard	Federal Standard
Ozone	Nonattainment	Severe Nonattainment
Carbon Monoxide	Unclassified	Unclassified / Attainment
Particulate Matter—10 Micrometers or Less	Nonattainment	Unclassified
Particulate Matter—2.5 Micrometers or Less	Unclassified	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead	Attainment	Unclassified / Attainment
Sulfates	Attainment	No Federal Standard
Hydrogen Sulfide	Attainment	No Federal Standard
Vinyl Chloride	Unclassified	No Federal Standard
Visibility-Reducing Particles	Unclassified	No Federal Standard

Source: ARB 2022b; EPA 2024

According to the *California Almanac of Emissions and Air Quality* (ARB 2013), most of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (i.e., diesel particulate matter). Other TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel particulate matter (DPM) differs from other TACs because it is not a single substance, but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, type of lubricating oil, and presence or absence of an emission control system. Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists. However, emissions of DPM are forecasted to decline; it is estimated that emissions of DPM in 2035 will be less than half those in 2010, further reducing statewide cancer risk and non-cancer health effects (ARB 2022a).

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Asbestos has been mined for applications requiring thermal insulation, chemical and thermal stability, and high tensile strength. Asbestos is also found in its natural state in rock or soil (known as naturally occurring asbestos [NOA]). According to the Asbestos Review Area map for El Dorado County, NOA is not typically found in the geological formations present in the Project area (El Dorado County Air Quality Management District [AQMD] 2015).

ODORS

Odors are typically considered a local air quality problem. Though odors are not a health hazard, reactions to odors can cause irritation, anger, or anxiety, or even circulatory and respiratory problems, nausea, vomiting, and headaches. The ability to detect odors varies considerably among the population and overall is subjective. 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. A person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity through the phenomenon known as odor fatigue.

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Children, pregnant women, the elderly, those with existing health conditions, and athletes or others who engage in frequent exercise are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered sensitive receptors include schools, daycare centers, parks and playgrounds, and medical facilities.

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution, even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial uses are not sensitive receptors.

The area surrounding the Project construction alignment (see Exhibit 3-6) is mostly undeveloped public lands. The Project area includes the communities of Kyburz and Pollock Pines, which contain noise-sensitive land uses such as residential areas, schools, and churches. These sensitive receptors are not located in the vicinity of the Project construction alignment, which includes segments of the El Dorado Canal between the El Dorado Diversion Dam as well as the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake (see Exhibit 3-6). The closest receptors to the Project construction alignment would be users of the campground at Jenkinson Lake and Sand Flat Campground. These users would primarily be present during the peak camping season, which is between Memorial Day and Labor Day. There are no other known sensitive receptors in the vicinity of the Project's construction alignment.

4.3.2 REGULATORY SETTING

Ambient air quality standards have been adopted at federal and state levels for criteria air pollutants. In addition, both the federal and state governments regulate the release of TACs. The Project Area is in the Mountain Counties Air Basin and is subject to the rules and regulations imposed by the El Dorado County AQMD. The following federal, state, regional, and local laws, regulations, plans, or guidelines were considered during the analysis of Project-related potential impacts to air quality.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Clean Air Act

The Clean Air Act (CAA) was passed in 1963 by the United States Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. The act delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to State and local agencies.

Under the act, EPA has established the National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants (see Table 4.3-2). The purpose of the NAAQS is two-tiered: primarily to protect public health, and

secondarily to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property).

The CAA also requires each state to prepare an air quality control plan, referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments and to determine whether implementing them will achieve ambient air quality standards. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Clean Air Act

ARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CAA allows states to adopt more stringent standards or to include other pollution species. The CCAA, signed into law in 1988, required ARB to establish CAAQS for criteria air pollutants for which EPA has established NAAQS, as well as for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter (see Table 4.3-2). The CCAA also requires all areas of the state to achieve and maintain the CAAQS by the earliest practical date. Similar to the NAAQS, the CAAQS incorporate a margin of safety to protect sensitive individuals. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources and provides districts with the authority to regulate indirect sources. ARB also maintains air quality monitoring stations throughout the state in conjunction with air districts. ARB uses the data collected at these stations to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

ARB is the lead agency for developing the SIPs in California. SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products. Local air districts and other agencies prepare SIP elements and submit them to ARB for review and approval. ARB forwards SIP revisions to the United States Environmental Protection Agency (EPA) for approval and publication in the Federal Register. Most recently, in September 2022, ARB adopted the *2022 State Strategy for the State Implementation Plan* (2022 State SIP Strategy).

Table 4.3-2. National and California Ambient Air Quality Standards (NAAQS and CAAQS)

Pollutant	Averaging Time	California Standardsa	Federal Primary Standardsb	Major Pollutant Sources
Ozone[c]	1-hour	0.09 ppm (180 µg/m^3)	–	Motor vehicles, paints, coatings, and solvents.
Ozone[c]	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Motor vehicles, paints, coatings, and solvents.
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3) 9 ppm (10 mg/m^3)	Internal combustion engines, primarily gasoline-powered motor vehicles.
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	35 ppm (40 mg/m^3) 9 ppm (10 mg/m^3)	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM_{10})[d]	Annual Arithmetic Mean	20 µg/m^3	– [8]	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Respirable Particulate Matter (PM_{10})[d]	24-hour	50 µg/m^3	150 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Respirable Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Respirable Particulate Matter ($PM_{2.5}$)	24-hour	–	35 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Lead	30-day Average	1.5 µg/m^3	–	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
Lead	Calendar Quarterly	–	0.15 µg/m^3	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
Lead	Rolling 3-Month Average[12]	–	0.15 µg/m^3	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
Sulfates (SO_4)[e]	24-hour	25 µg/m^3	–	Industrial processes.
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents.

Notes for Table 4.3-2 – not applicable; CAAQS = California Ambient Air Quality Standards; CO = Carbon Monoxide; H_2S = Hydrogen sulfide; NAAQS = National Ambient Air Quality Standards; NO_2 = Nitrogen Dioxide; PM_{10} = Respirable Particulate Matter; $PM_{2.5}$ = Respirable Particulate Matter; ppm = parts per million; PVC = polyvinyl chloride; SO_2 = Sulfur Dioxide; SO_4 = Sulfates; µg/m^3 = micrograms per cubic meter

* Standard has not been established for this pollutant/duration by this entity.

[a] California standards for ozone, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and 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. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three 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/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, is equal to or less than the standard.

[c] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

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

[e] On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual arithmetic mean standards were revoked.

Source: ARB 2022b

ARB has established emission standards for vehicles sold in California and for various types of equipment. California gasoline specifications are governed by both state and federal agencies. During the past decade, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after-treatment-based exhaust standards for NO_X and PM starting in 2011 that are more than 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road, heavy-duty diesel engines. ARB has also adopted control measures for DPM and more stringent emissions standards for various on-road mobile sources of emissions, including transit buses, diesel-powered trucks, and off-road diesel equipment (e.g., tractors, generators). For example, for equipment already in use, the air board adopted rules for in-use off-road diesel vehicles—including construction equipment—in 2007, most recently amended in November 2022. Beginning in 2014, air board regulations required off-road equipment fleets to begin gradual replacement of older engines with newer, cleaner engines; the installation of exhaust filters on remaining older engines; or some combination of the two to achieve fleet-wide emissions reductions. Those rules also limit idling to 5 minutes; and require a written idling policy for larger vehicle fleets, fleet operators to provide information on their engines to the air board, and vehicles to be labeled with an air board-issued vehicle identification number. The off-road rules require the retrofit or replacement of diesel engines in existing equipment. The most recent amendments require the phase-out of the oldest and highest-emitting off-road engines from operation in California through the year 2036, the details of which are dependent upon the equipment tier and fleet size; restrict the addition of vehicles with Tier 3 and Tier 4 interim engines through the year 2035, which is an expansion of provisions of the regulation prior to amendment; require contracting entities to obtain and retain a fleet's valid Certificate of Reported Compliance prior to awarding a contract or hiring a fleet beginning in 2024; and, beginning in 2024, mandate the use of renewable diesel (either "R99" or "R100") for all fleets.

Assembly Bill 1807 (Tanner Air Toxics Act) and Assembly Bill 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987)

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets up a formal procedure for ARB to designate substances as TACs. Once a TAC is identified, ARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (i.e., a point

below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions.

California Air Resources Board Regulations for Mobile Sources

Idling of Commercial Heavy-Duty Trucks (13 California Code of Regulations [CCR] 2485)

This Airborne Toxic Control Measure (ATCM) was adopted to control emissions from idling trucks. It prohibits idling for more than 5 minutes for all commercial trucks with a gross vehicle weight rating over 10,000 pounds. The ATCM contains an exception that allows trucks to idle while queuing or involved in operational activities.

In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.)

This ATCM requires that specific fleet average requirements are met for criteria air pollutant emissions, particularly NO_X and particulate matter, from in-use off-road diesel-fueled vehicles. Where average requirements cannot be met, Best Available Control Technology requirements apply.

California Low-Emission Vehicle Program

ARB first adopted Low-Emission Vehicle (LEV) program standards in 1990. These first LEV standards ran from 1994 through 2003. LEV II regulations, running from 2004 through 2010, represent continuing progress in emission reductions. As the state's passenger vehicle fleet continues to grow and more sport utility vehicles and pickup trucks are used as passenger cars rather than work vehicles, more stringent LEV II standards were adopted to provide reductions necessary for California to meet federally mandated clean air goals outlined in the 1994 SIP. In 2012, the ARB adopted the LEV III amendments to California's LEV regulations. These amendments, also known as the Advanced Clean Car Program, include more stringent emission standards for model years 2017 through 2025 for criteria pollutants and greenhouse gas emissions for new passenger vehicles.

Carl Moyer Memorial Air Quality Standards Attainment Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program), a partnership between the ARB and local air districts, issues grants to replace or retrofit older engines and equipment with engines and equipment that exceed current regulatory requirements to reduce air pollution. Money collected through the Carl Moyer Program complements California's regulatory program by providing incentives to effect early or extra emission reductions, especially from emission sources in environmental justice communities and areas disproportionately affected by air pollution. The program has established guidelines and criteria for the funding of emissions reduction projects.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County Air Quality Management District (AQMD)

AQMD Rules and Regulations

The El Dorado County AQMD has adopted rules to improve air quality in the district. Below is a summary of these rules as they apply to the Project:

- **Rule 202 - Visible Emissions:** A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three (3) minutes in any one (1) hour which is:

  A. As dark or darker in shade as that designated as No. 1 on the Ringlemann chart, as published by the United States Bureau of Mines, or

  B. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (A) of this section.

- **Rule 207 - Particulate Matter:** A person shall not release or discharge into the atmosphere from any source or single processing unit, exclusive of sources emitting combustion contaminants only, particulate matter emissions in excess of 0.1 grains per cubic foot of dry exhaust gas at standard conditions.

- **Rule 223 - Fugitive Dust - General Requirements**

  223.1 General:

  A. **Purpose:** The purpose of this Rule is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

  B. **Applicability:** The provisions of this rule are applicable to specified outdoor fugitive dust sources. The definitions, exemptions, requirements, administrative requirements, recordkeeping requirements, and test methods set forth in this rule are applicable to Rules 223, 223-1 and 223-2 of the Rules and Regulations of the El Dorado County Air Quality Management District.

  223.4 Requirements:

  A. **Visible Emissions Not Allowed Beyond Boundary Line:** A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area, such that the presence of such fugitive dust remains visible, or exceed shade darker as that designated as No. 0 on the Ringelmann Chart, or exceed zero percent opacity as determined in accordance with EPA Method 9, in the atmosphere beyond the boundary line of the emission source.

  B. **Concentration Limit:** A person shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter, 24-hour average, when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA approved equivalent methods for PM_{10} monitoring. Sampling, if deemed necessary and required by the Air Pollution Control Officer, shall be conducted in accordance with the procedures specified in Section 223.5.A.

- **Rule 223-1 Fugitive Dust - Construction, Bulk Material Handling, Blasting, Other Earthmoving Activities and Carryout and Trackout Prevention**

  223-1.1 General:

  A. **Purpose:** The purpose of this rule is to limit fugitive dust emissions from construction, and construction related activities.

B. **Applicability:** This rule applies to any construction or construction related activities, including, but not limited to, land clearing, grubbing, scraping, travel on site, and travel on access roads. This rule also applies to all sites that are subject to this rule where carryout or trackout has occurred or may occur on paved public roads or the paved shoulders of a paved public road. This rule also applies to the construction of new landfill disposal sites or modification to existing landfill disposal sites prior to commencement of landfilling activities.

C. **Discovery of Naturally Occurring Asbestos:** If owner/operator discovers any naturally occurring asbestos, serpentine, or ultramafic rock after the Project has commenced, then:

1. If naturally-occurring asbestos, serpentine, or ultramafic rock is discovered by the owner/operator, a Professional Geologist, or the Air Pollution Control Officer in the area to be disturbed after the start of any construction or construction related activity, the owner/operator must report the discovery to the El Dorado County AQMD no later than the next business day; and

2. The Project must comply with applicable provisions of Rule 223-2 and the State of California Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations (CCR Title 17, Section 93105).

- **RULE 223-2 Fugitive Dust - Asbestos Hazard Mitigation**

5-2.1 General:

A. **Purpose:** The purpose of this Rule is to reduce the amount of asbestos particulate matter entrained in the ambient air as a result of any construction or construction related activities that disturbs or potentially disturbs naturally occurring asbestos by requiring actions to prevent, reduce or mitigate asbestos emissions.

B. **Applicability:** Unless one of the exemptions specified in Section 223-2.2 Exemptions applies, this Rule shall apply to any construction or construction related activity that:

1. Is in excess of 20 cubic yards of graded material per project, or if required by the Air Pollution Control Officer and

2. Meets either of the following criteria:

- Any portion of the area to be disturbed:
  - is located in a geographic ultramafic rock unit, or
  - has naturally-occurring asbestos, serpentine or ultramafic rock as determined by owner/operator, Professional Geologist or the Air Pollution Control Officer, or
  - is located within designated Naturally Occurring Asbestos Review Areas on the current El Dorado County Naturally Occurring Asbestos Review Area Map.
- Naturally-occurring asbestos, serpentine, or ultramafic rock is discovered by the owner/operator, a Professional Geologist, or the Air Pollution Control Officer in the area to be disturbed after the start of any construction or construction related activity.

1-9.1 General Requirements:

A. Visible emissions shall not exceed the shade designated as No. 0 on the Ringelmann Chart, or 0% opacity as determined in accordance with EPA Method 9, at 25 feet from the point-of-origin and at the property line. Visible emissions shall not exceed the shade designated as No. 1 on the Ringelmann Chart, or 20% opacity as determined in accordance with EPA Method at the point of-origin.

B. Vehicle Speed Limitations and Posting of Speed Limit Signs

    a. An owner/operator shall limit the speed of vehicles traveling within construction sites to a maximum of 15 miles per hour.

    b. An owner/operator shall post speed limit signs limiting vehicle speed to maximum of 15 miles per hour that meet State and Federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance.

C. When sustained wind speeds result in visible dust emissions in excess of the standards in Section 223- 2.4 A. [shown as 1-9.1 General Requirements (A.) above, as listed in the El Dorado County AQMD Rule], despite the application of dust mitigation measures, grading and earthmoving operations except for dust mitigation activities shall be suspended.

D. Warning Signs shall be posted at the main entrance(s) to the Project for the duration of soil disturbance activities. Signs shall be posted in letter of sufficient size as to be readily visible and legible. The following wording is recommended: "Warning. Soils in the area may contain naturally occurring asbestos. Asbestos is a known carcinogen. Report excessive fugitive dust to the contractor at (contractor phone number), NOA Hotline: 888-FYI4NOA or El Dorado County AQMD: 530-621-6662"

    1. The following operations and activities are expressly prohibited:

        - Rock crushing of asbestos-containing material;

        - Use of blower devices for any removal of asbestos-containing material.

AQMD Air Quality Plans

The Sacramento region is designated a nonattainment area for the federal 8-hour standard ozone air quality standard. The region, known as the Sacramento Federal Nonattainment Area, includes all of Sacramento and Yolo counties and portions of Placer, El Dorado (western portion, approximately Pollock Pines westward to the County line), Solano, and Sutter counties. As a part of the Sacramento Federal Nonattainment Area, the El Dorado County AQMD works with the other local air districts within the Sacramento area to develop a regional air quality management plan under the federal CAA requirement. The regional air quality management plan describes and demonstrates how the Sacramento Federal Nonattainment Area is meeting requirements under the federal CAA in demonstrating reasonable further progress and attainment of the NAAQS for ozone. The most current version of the plan, the *2017 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* (2017 Ozone Attainment and Progress Plan), was prepared and adopted by ARB on November 16, 2017 (SMAQMD 2017). Some elements of the Ozone Attainment and Progress Plan were updated in 2018 and included in the 2018 Updates to the California State Implementation Plan, which updated SIP elements for nonattainment areas throughout the state, as needed. These updates to the plan were adopted by ARB on October 15, 2018. The Ozone Attainment and Progress Plan is the currently adopted and applicable air quality plan for the region. ARB submitted to the EPA the 2023 Sacramento Regional 2015 National Ambient Air

Quality Standard 8-Hour Ozone Attainment and Reasonable Further Progress Plan prepared by the five local air districts representing the Sacramento Federal Nonattainment Area to address the 8-hour ozone standard promulgated by EPA in 2015, for which the region is designated severe nonattainment. EPA action on this plan is still forthcoming.

The particulate matter planning region includes all of Sacramento County, the eastern portion of Yolo County, the western portions of El Dorado and Placer counties and the northeast portion of Solano County. The region prepared the *$PM_{2.5}$ Maintenance Plan and Redesignation Request* (SMAQMD 2013) to address how the region attained and would continue to attain the 24-hour $PM_{2.5}$ standard. In 2017, EPA found that the area attained the 2006 24-hour $PM_{2.5}$ NAAQS by the attainment date of December 31, 2015. The *$PM_{2.5}$ Maintenance Plan and Redesignation Request* will be updated and submitted in the future based on the clean data finding made by the EPA.

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *"Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code."*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance (El Dorado County 2015). However, the District aims to comply with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to air quality include the following:

Objective 6.7.7: Construction Related, Short-Term Emissions: Reduce construction related, short-term emissions by adopting regulations which minimize their adverse effects.

- **Policy 6.7.7.1**: The County shall consider air quality when planning the land uses and transportation systems to accommodate expected growth, and shall use the recommendations in the most recent version of the El Dorado County AQMD Guide to Air Quality Assessment: Determining Significance of Air Quality Impacts Under the California Environmental Quality Act, to analyze potential air quality impacts (e.g., short-term construction, long-term operations, toxic and odor-related emissions) and to require feasible mitigation requirements for such impacts. The County shall also consider any new information or technology that becomes available prior to periodic updates of the Guide. The County shall encourage actions (e.g., use of light-colored roofs and retention of trees) to help mitigate heat island effects on air quality.

4.3.3 IMPACT ANALYSIS

METHODOLOGY

Methodology and thresholds for criteria air pollutant impacts and community health risk, as set forth in the El Dorado County AQMD Guide to Air Quality Assessment (El Dorado County AQMD 2002) were utilized in this analysis of the Project's potential impacts to air quality.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- The operational existing infrastructure phase of the Project includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

- The operational post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of state CEQA Guidelines, the Project would have a potentially significant impact related to air quality if it 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.

As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations. The El Dorado County AQMD thresholds of significance are presented below and are considered in the evaluation of air quality impacts.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.3-1. Conflict with or obstruct implementation of the applicable air quality plan?

Air quality plans describe air pollution control strategies to be implemented by a city, county, or regional air district. The primary purpose of an air quality plan is to bring an area that does not attain NAAQS and CAAQS into compliance with those standards pursuant to the requirements of the Clean Air Act and California Clean Air Act. As discussed previously, the most current air quality plan is the 2017 Ozone Attainment and Progress Plan.

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operational and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with operations with existing infrastructure is anticipated to remain similar to existing conditions and would not include new emissions sources. Therefore, operations with existing infrastructure would not conflict with or obstruct implementation of the applicable air quality plan. Thus, there would be **no impact**.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. The exact location and extent of these Project activities are not known at this time. However, reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Potential construction activities would result in the temporary generation of criteria air pollutant emissions of ROG or NO_X. Project construction activities would result in the generation of fugitive dust PM_{10} and $PM_{2.5}$ emissions as a result of earth moving activities, travel on paved and unpaved roadways, and material hauling. In addition, during construction, various types of equipment and vehicles would temporarily operate at the construction site(s), as well as travel to and from the site(s) within the region. Construction-related exhaust emissions would be generated from construction equipment, construction workers' commutes, and construction material hauling. These mobile activities would primarily involve the use of diesel- and gasoline-powered

equipment that would generate emissions of criteria air pollutants. Finally, in the case that construction would require any asphalt paving, these activities would result in evaporative emissions of ROG.

The El Dorado County General Plan and the El Dorado County AQMD have adopted goals and rules intended to improve air quality in the county and the air basin as a whole. The portion of the county within which Project construction activities could occur is in nonattainment for state and federal ozone, state PM_{10}, and federal $PM_{2.5}$. The goals and rules of El Dorado County and the El Dorado County AQMD that are applicable to the Project are listed above in the regulatory framework of this section. El Dorado County AQMD has also established recommended best management practices for dust suppression to prevent visible emissions beyond project boundaries (El Dorado County AQMD 2002); compliance with best management practices, as applicable, would ensure Project construction would not result in fugitive dust at a level that would conflict with or obstruct implementation of the applicable air quality plan. Additionally, the El Dorado County AQMD has determined that mass emissions of ROG and NO_X in excess of 82 pounds per day from any project could affect the AQMD's commitment to attain the federal one-hour ozone standard in the Sacramento Region (El Dorado County AQMD 2002).

Because the details of Project construction requirements are unknown at this time, it is not possible to accurately determine the type and intensity of use of construction equipment that would be required, nor details associated with excavation quantities, material hauling, the typical number of construction workers or other similar project specifics. Therefore, potential construction-related emissions of criteria air pollutants cannot be accurately quantified at this time. However, in order to disclose what potential impacts the proposed Project could have on air quality, the District is providing information for comparable past projects for illustrative purposes in this EIR.

The District routinely conducts infrastructure improvements along the El Dorado Canal and other water conveyance facilities that are comparable in size and scope to the construction activities associated with the proposed Project. The types of construction activities (e.g., vegetation removal, demolition of existing structures, localized excavation and backfill, grading, placement of concrete, slope and channel stabilization, construction of conveyance structures, and site restoration), as well as the types of construction equipment utilized for these types of infrastructure projects are likewise similar. These past projects can therefore provide a useful metric to illustrate the potential impacts to air quality associated with construction activities for future infrastructure improvements under the proposed Project. While these past projects provide insight into the potential impacts to air quality that would be associated with the proposed Project, a subsequent project-level analysis would be performed prior to implementation of infrastructure improvements associated with the proposed Project and appropriate mitigation described herein would be implemented as necessary to ensure potential impacts are reduced to a less than significant level.

The air quality analysis is provided for the following recent comparable infrastructure projects:

- Sly Park Intertie Improvements Project (EID 2024)
- Upper Main Ditch Piping Project (EID 2018a)
- Flumes 38, 39/40, 44 and Canal Replacement Project (EID 2018b)

A detailed air quality emissions analysis was performed for each project. The analysis incorporated estimates for the types of construction equipment to be used, construction crew size, worker and vendor vehicle haul trips, and construction schedule. The air quality analysis for each project was based on these project-specific estimates and

assumptions that were then used as inputs to the California Emission Estimator Model (CalEEMod). The unmitigated emissions modeling demonstrates that ROG and NO_X emissions would not exceed the EDCAQMD significance thresholds for the three comparable projects. Additional details for each project and the results of the CalEEMod analysis are provided below.

Sly Park Intertie Improvements Project

The Sly Park Intertie (SPI) Improvements Project involves the replacement of approximately 6 miles of an existing 22- to 24-inch diameter steel pipeline, which extends between the District's Reservoir 1 Water Treatment Plant and Reservoir A Water Treatment Plant and continues to the Sly Park Hills Tank. The SPI Project would replace the SPI with a new pipeline and also include installation of a new pump station and associated appurtenances. Key construction activities would include site preparation and vegetation clearing, excavation and removal of the existing pipeline, placement of bedding materials as required, placement of the new sections of piping (typically 20- to 40-foot sections), backfilling and compaction of the trench, placement of appurtenances such as isolation valves, blow-offs, air relief valves and manways along the pipeline, and restoration of the disturbed area. Additionally, a new pump station, electrical service, and backup power supply generator would be constructed at Reservoir A Water Treatment Plant. Construction is planned to occur over a period of approximately 18-months. As a pipeline replacement, post-construction operations of the pipeline are anticipated to be similar to existing conditions. However, the project includes the operation of a new pump station and backup generator. The backup generator was assumed to operate up to 100 hours per year for scheduled maintenance. Therefore, there is an analysis of both construction-related emissions and operations-related emissions. The unmitigated emissions modeling results of the CalEEMod analysis are provided in the tables below.

Table 4.3-3. Maximum Daily Projected Emissions Estimates, Construction, Sly Park Intertie Improvements Project

	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Pump Station Maximum Daily Construction Emissions (lbs/day)	7.56	17.70	17.40	9.43	2.37
Pipeline Replacement Maximum Daily Construction Emissions (lbs/day)	3.18	32.30	25.80	34.00	5.51
Project Total Maximum Daily Construction Emissions (lbs/day)	10.74	50.00	43.20	43.43	7.88
El Dorado AQMD Significance Thresholds (lbs/day)	**82**	**82**	**n/a**	**n/a**	**n/a**
Exceed Threshold	**No**	**No**	**n/a**	**n/a**	**n/a**

Key:
AQMD = Air Quality Management District
CalEEMod = California Emissions Estimate Model
CO = carbon monoxide
lbs/day = pounds per day
n/a = not applicable
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns
PM_{10} = particulate matter less than 10 microns
ROG = reactive organic gases
Data source: Table 3.3-5. From EID 2024

Table 4.3-4. Maximum Daily Projected Emissions Estimates, Operation, Sly Park Intertie Improvements Project

	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Pump Station Maximum Daily Operational Emissions[1]	0.06	0.02	0.08	<0.005	<0.005
Emergency Generator Maximum Daily Operational Emissions	2.50	11.20	6.38	0.37	0.37
Total Maximum Daily Operational Emissions	2.56	1.22	6.46	0.37	0.37
El Dorado AQMD Significance Thresholds (lbs/day)	**82**	**82**	**n/a**	**n/a**	**n/a**
Exceed Threshold	**No**	**No**	**n/a**	**n/a**	**n/a**

Note:
[1] Pump station operational emissions from area and energy sources.
Key:
AQMD = Air Quality Management District
CalEEMod = California Emissions Estimate Model
CO = carbon monoxide
lbs/day = pounds per day
n/a = not applicable
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns
PM_{10} = particulate matter less than 10 microns
ROG = reactive organic gases
Data source: Table 3.3-6. From EID 2024

Upper Main Ditch Piping Project

The Upper Main Ditch Piping Project involved the conversion of an earthen lined ditch to a 3-mile buried 42-inch pipe. The pipeline connects the El Dorado Forebay to the Reservoir 1 Water Treatment Plant. The project includes appurtenant facilities such as tying into the outlet pipe downstream of the Forebay Reservoir Valve House and improvements to the inlet facility at the Water Treatment Plant. Project activities include tree removal, excavation and trenching for pipeline placement, grading and compaction, and placement of appurtenances such as isolation valves, blow-offs, air relief valves and manways along the pipeline. Construction related activities were estimated to occur over 12-months (approximately 30 weeks), spread over two construction seasons, during the annual ditch outage that typically occurs each fall and winter. Operational activities were considered to be similar to existing conditions and therefore, no operations-related analysis was necessary to conclude that there would be no long-term impacts to air quality. The unmitigated emissions modeling results of the CalEEMod analysis are provided in the table below.

Table 4.3-5. Predicted Maximum Daily Project Emissions Estimates, Construction, Upper Main Ditch Piping Project

	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Year 1 Maximum Daily Unmitigated Construction Emissions (lbs/day)	6.27	63.70	34.82	21.86	13.12
Year 2 Maximum Daily Unmitigated Construction Emissions (lbs/day)	1.55	15.63	12.92	0.95	0.73
Project Total Maximum Daily Unmitigated Construction Emissions (lbs/day)	7.82	79.34	47.73	22.8	13.85
El Dorado AQMD Significance Thresholds (lbs/day)	**82**	**82**	**n/a**	**n/a**	**n/a**
Exceed Threshold	**No**	**No**	**n/a**	**n/a**	**n/a**

Data source: Table 3-3.5 from EID 2018a

Flumes 38, 39/40, 44, and Canal Replacement Project

The Flumes 38, 39/40, 44, and Canal Replacement Project involved the conversion of approximately 1,200 feet of wooden flumes to concrete structures and relining of approximately 1,900 feet of concrete canal. Project activities include tree and vegetation removal, demolition of the existing facilities, grading, hillside stabilization, and construction of mechanically stabilized earth walls to support the new concrete conveyances, improvements to the canal bench, and application of air-placed concrete to the existing segments of the canal and conversion of wooden flume structures to pre-cast or air-placed concrete canal or box culvert. Construction related activities

were estimated to occur in two phases over 11-months with phase 1 occurring August and December in the first year and phase 2 occurring July to December during the second year. Operational emissions were not modeled because there was no increase in capacity of the conveyance. The unmitigated emissions modeling results of the CalEEMod analysis are provided in the table below.

Table 4.3-6. Maximum Unmitigated Project Construction-Related Emissions, Construction, Flumes 38, 39/40, 44, and Canal Replacement Project

Year	ROG pounds per day	NO_x pounds per day
2018	4.42	39.38
2019	3.95	35.51
Maximum Daily	**4.42**	**39.38**
EDCAQMD Threshold	*82*	*82*
Threshold exceeded?	No	No

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases
Data source: Table 7 from EID 2018b

The analysis of these three comparable projects illustrates that projects of similar size and scope to the proposed Project would not exceed the El Dorado County AQMD significance thresholds for ROG or NO_X emissions. Moreover, not all proposed Project construction activities would be occurring concurrently. Therefore, it is reasonable to assume that based on the nature of the anticipated construction, the fact that impacts are assessed based on daily emissions, and the District's analysis of similar construction projects, that impacts of the proposed Project would not exceed the El Dorado County AQMD significance thresholds for ROG or NO_X emissions. Additionally, the analyses for these projects are based on unmitigated emissions modeling. The proposed Project includes mitigation measures that would further help minimize potential impacts to air quality. Mitigation Measure 4.3-1a requires the District conduct a detailed quantification of all Project-related construction emissions and implement best management practices to reduce construction-related emissions so that daily emissions do not exceed El Dorado County Air Pollution Control District thresholds. Mitigation Measure 4.3-1b requires the District to implement best management practices to control fugitive dust associated with construction activities. Although the best available evidence indicates impacts would be less than significant even without mitigation, a definitive determination of significance is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Operational and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with post-construction operational conditions is anticipated to remain similar to existing conditions and would not include new emissions sources. Therefore, post-construction operations would not conflict with or obstruct implementation of the applicable air quality plan. Thus, there would be **no impact**.

Mitigation Measures

Mitigation Measure 4.3-1a: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed El Dorado County Air Pollution Control District thresholds.

Prior to construction of any infrastructure improvement for the Project, the District shall quantify construction-related criteria air pollutant emissions for each proposed construction activity. Emissions calculations shall quantify emissions from all construction-related sources, including but not limited to construction equipment use; vehicle trips (i.e., worker commutes, vendor trips, and haul trucks); and fugitive emissions from paving and architectural coatings. Emissions shall be compared to the El Dorado County Air Quality Management District (El Dorado County AQMD) thresholds of significance of 82 pounds per day for each reactive organic gases (ROG) and gases and oxides of nitrogen (NO_X). If ROG and NO_X emissions do not exceed applicable thresholds, then exhaust emissions of all other criteria air pollutants from equipment and vehicles would be less than significant.

Should modeled emissions exceed this performance standard, the District shall revise the construction requirements for the proposed infrastructure improvement to incorporate measures to reduce construction-related emissions below applicable thresholds. Measures may include, but are not limited to the following: limit operation time of heavy equipment, limit equipment idling time, require use of cleaner-fuel equipment, require use of electric or hybrid powered equipment, and/or require use of local construction contractors. Using the revised construction requirements, the District shall quantify construction-related criteria air pollutant emissions for each proposed construction activity to ensure that implementation of the measures reduces construction-related emissions below the 82 pounds per day thresholds for ROG and NO_X.

Mitigation Measure 4.3-1b: Dust and Emissions Control Plan

The District shall require that the selected contractor prepare and implement a Project Dust and Emissions Control Plan. The following measures shall be conducted throughout the construction period to limit and control dust and air emissions:

- All material excavated, stockpiled, or graded shall be sufficiently watered, treated, or covered to prevent fugitive dust from leaving the property boundaries and/or causing a public nuisance.
- All areas with vehicle traffic shall be watered or have a dust palliative applied as necessary to minimize dust emissions.
- All on-site vehicle traffic shall be limited to a speed of 15 mph on unpaved roads.
- All land clearing, grading, earth moving, or excavation activities on the Project shall be suspended as necessary to prevent excessive windblown dust when winds are expected to exceed 20 mph.
- All inactive portions of the construction site shall be covered, seeded, or watered or otherwise stabilized until a suitable cover is established.

- All material transported off-site shall be either sufficiently watered or securely covered to prevent it from being entrained in the air and there must be a minimum of six (6) inches of freeboard in the bed of the transport vehicle.

- Paved streets adjacent to the Project shall be reasonably clean through methods such as sweeping or washing at the end of each day, or more frequently, if necessary, to remove excessive accumulations or visibly raised areas of soil which may have resulted from activities at the Project area.

- Prior to the end of construction, the applicant shall re-establish ground cover on the site through seeding.

- The Project contractor shall ensure that all construction equipment is properly maintained.

The Project is not located in an area mapped as having, or otherwise known to have, ultramafic rock, serpentine, or naturally occurring asbestos (El Dorado County 2015). However, if naturally occurring asbestos is discovered during Project construction, the following shall occur:

1. If naturally occurring asbestos, serpentine, or ultramafic rock is discovered in the area to be disturbed after the start of any construction or construction-related activity, a Professional Geologist or the Air Pollution Control Officer must report the discovery to the El Dorado County AQMD no later than the next business day; and

2. The Project shall comply with applicable provisions of Rule 223-2 and the California Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (CCR Title 17, Section 93105).

Significance after Mitigation

Mitigation Measure 4.3-1a requires the District conduct a detailed quantification of all Project-related construction emissions and implement specified best management practices to reduce construction-related emissions so that daily emissions do not exceed El Dorado County AQMD thresholds. Mitigation Measure 4.3-1b requires the District to implement a Dust and Emissions Control Plan to control fugitive dust associated with construction activities. Implementation of Mitigation Measures 4.3-1a and 4.3-1b would substantially lessen exhaust and evaporative emissions of criteria pollutants, including ROG and NO_X, and fugitive dust PM emissions, respectively, from potential future construction activities associated with future infrastructure improvements for the Project. While the information from comparable past projects and implementation of Mitigation Measures 4.3-1a and 4.3-1b indicates that potential impacts to air quality associated with the proposed Project would be less than significant, this impact conclusion is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Impact 4.3-2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the Mountain Counties Air Basin and surrounding regions, and this regional impact is cumulative rather than being attributable to any one source. A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future projects. The portion of El Dorado County within which Project construction would occur is designated nonattainment for ozone under federal and state standards, for $PM_{2.5}$ under federal standards, and for PM_{10} under state standards. CEQA-related air quality thresholds of significance are tied to long-term air quality planning, which focuses on achieving or maintaining attainment designations with respect to the NAAQS and CAAQS for criteria air pollutants, which are scientifically substantiated, numerical concentrations considered to be protective of human health. These numerical thresholds for construction- and operation-related emissions of criteria air pollutants and precursors are the basis for determining whether a project's discrete emissions would result in a regional contribution (i.e., significant) to the baseline nonattainment status of the air basin. As discussed in Impact 4.3-1 above, the El Dorado County AQMD has established thresholds for ROG and NO_X, emissions above which for any given project would have a significant adverse impact on air quality in the Sacramento Federal Nonattainment Region and may be used to determine the extent to which a project's emissions of criteria air pollutants and precursors would contribute to the regional degradation of ambient air quality within the region.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with the Project utilizing existing infrastructure is anticipated to remain similar to existing conditions and would not include new emissions sources. Therefore, operations with existing infrastructure would not result in a cumulatively considerable net increase of any criteria pollutant. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. The exact location and extent of these Project activities are not known at this time. However, reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water

from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Because construction emissions are temporary, and the best available evidence indicates Project emissions would be below applicable thresholds, even without mitigation, it is reasonable to assume the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. However, a definitive determination of significance is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with post-construction operational conditions is anticipated to remain similar to existing conditions and would not include new emissions sources. Therefore, post-construction operations would not result in a cumulatively considerable net increase of any criteria pollutant. **No impact** would occur.

Mitigation Measures

Implement Mitigation Measure 4.3-1a and Mitigation Measure 4.3-1b.

Significance after Mitigation

Implementation of Mitigation Measures 4.3-1a and 4.3-1b would reduce exhaust and evaporative emissions of criteria pollutants, including ROG, NO_X, and PM, and fugitive dust PM emissions, respectively, from potential construction activities. Mitigation Measure 4.3-1b would ensure that Project construction implement applicable best available fugitive dust control measures, consistent with El Dorado County AQMD rules and regulations. Based on emissions for comparable projects, it is reasonable to assume that Project emissions would be below El Dorado County AQMD thresholds. Implementation of Mitigation Measures 4.3-1a and 4.3-1b would ensure that construction-related emissions would be under applicable thresholds. While the information from comparable past projects and implementation of Mitigation Measures 4.3-1a and 4.3-1b indicates that potential impacts to air quality associated with construction of the proposed Project would be below applicable thresholds, and therefore, based on AQMD guidance, the Project would not contribute to a cumulatively considerable net increase of a criteria pollutant for which the project region is nonattainment under the NAAQS and CAAQS, a definitive impact conclusion would require speculation given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance of construction-related air quality impacts to subsequent project-level environmental analysis once sufficient design details are known.

Impact 4.3-3. Expose sensitive receptors to substantial pollutant concentrations?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with the Project utilizing existing infrastructure is anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, operations with existing infrastructure would not expose sensitive receptors to substantial pollutant concentrations. Thus, there would be **no impact**.

Construction Impacts

As noted in Section 4.3.1, "Existing Conditions," the area surrounding potential construction activities associated with the Project is mostly public lands with limited land uses associated with sensitive receptors. Sensitive receptors such as residences, schools, or medial facilities are not located in the vicinity of the Project construction alignment and therefore would not be exposed to increases in air pollutant emissions. The only potentially proximate receptors would be those associated with campsite users at Jenkinson Lake and Sand Flat Campground, which are located in the vicinity of the Project construction alignment.

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. The exact location and extent of these Project activities are not known at this time. However, reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Project construction has the potential to generate or result in exposure to emissions that include criteria air pollutants, toxic air contaminants, fugitive dust CO, and asbestos, each of which is described in more detail as it pertains to construction impacts below.

Criteria Air Pollutants

Criteria air pollutants can have human health effects at various concentrations, dependent upon the duration of exposure and type of pollutant. The NAAQS and CAAQS were established to protect the public with a margin of

safety from adverse health impacts caused by exposure to air pollution. Similarly, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. With respect to regional air quality, the El Dorado County AQMD region is currently designated as nonattainment for the NAAQS and CAAQS for the ozone standards and for the CAAQS for PM_{10}. Projects that emit criteria air pollutants that exceed the El Dorado County AQMD thresholds of significance are considered to be "cumulatively considerable" and may contribute to the regional cumulative degradation of air quality that could result in impacts to human health.

Health effects associated with ozone include respiratory symptoms, worsening of lung disease, and damage to lung tissue. ROG and NO_X are precursors to ozone, for which the Mountain Counties Air Basin is designated as nonattainment with respect to the NAAQS and CAAQS. The contribution of ROG and NO_X to regional ambient ozone concentrations is the result of complex photochemistry. The increases in ozone concentrations due to ozone precursor emissions tend to be found downwind of the source location because of the time required for the photochemical reactions to occur. Health effects associated with short- and long-term exposure to elevated concentrations of PM_{10} include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, a weakened immune system, and cancer (WHO 2021). $PM_{2.5}$ poses an increased health risk because these very small particles can be inhaled deep in the lungs and may contain substances that are particularly harmful to human health.

Adverse health effects induced by regional criteria pollutant emissions generated by project construction (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale, where emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollutant may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project or plan area.

Existing models have limited sensitivity to small changes in regional criteria pollutant concentrations, and as such, translating project-generated regional criteria pollutants to specific health effects would not produce meaningful results. In other words, minor increases in regional air pollution from project-generated ROG and NO_X would have nominal or negligible impacts on human health. Currently, ARB and EPA have not approved a quantitative method to meaningfully and consistently translate the mass emissions of criteria air pollutants from a project to quantified health effects.

In 2020, the Sacramento Metropolitan Air Quality Management District (SMAQMD) published Guidance (SMAQMD 2020), which provides a screening level analysis estimating the health effects of criteria air pollutants and their precursors, as well as provides guidance for conducting a health effects analysis of a project. The Guidance was prepared by conducting regional photochemical modeling and relies on the EPA's Benefits Mapping and Analysis Program to assess health impacts from ozone and $PM_{2.5}$. An analysis was conducted to estimate the level of health effects for a proposed project that has emissions at the maximum SMAQMD-recommended thresholds of significance using 41 hypothetical project locations, as well as a screening model conducted to estimate potential health effects for strategic areas where development is anticipated to cause exceedance of thresholds of significance. The results were used to develop two screening tools intended to

support individual projects in analyzing health risks from criteria pollutants: the Minor Project Health Screening Tool for projects with criteria pollutant emissions below SMAQMD's adopted thresholds of significance, and the Strategic Area Project Health Screening Tool for projects with emissions between two and eight times the SMAQMD threshold levels. Both the Minor Project Health Screening Tool and Strategic Area Project Health Screening Tool are based on the maximum thresholds of significance adopted within the five air district regions contemplated within SMAQMD's Guidance (SMAQMD 2020). The air district thresholds considered in SMAQMD's Guidance included thresholds from SMAQMD as well as the El Dorado County Air Quality Management District, the Feather River Air Quality Management District, the Placer County Air Pollution Control District, and the Yolo Solano Air Quality Management District.

The modeling results support a conclusion that any one proposed project in the region with emissions between two and eight times the SMAQMD thresholds of significance levels for criteria air pollutants does not on its own lead to sizeable health effects. The findings of the SMAQMD screening modeling indicate that the mean health incidence for a project emitting at the threshold of significance levels at all six representative locations was less than 6 per year for mortality and less than 6 per year for other health outcomes evaluated. The maximum reported mortality rate is 22 incidences per year and all other health outcomes evaluated are under 9 per year from a project emitting 656 pounds/day of each NO_X, ROG, and $PM_{2.5}$ at the downtown Sacramento strategic location. As noted in SMAQMD's Guidance, "each model generates conservative estimates of health effects, for two reasons: The tools' outputs are based on the simulation of a full year of exposure at the maximum daily average of the increases in air pollution concentration… [and] [t]he health effects are calculated for emissions levels that are very high" (SMAQMD 2020). Ultimately, the health effects associated with the project, using the SMAQMD guidance "are conservatively estimated, and the actual effects may be zero" (SMAQMD 2020).

As discussed above, the nature of criteria pollutants is such that the emissions from an individual project cannot be directly identified as responsible for health impacts within any specific geographic location. El Dorado County AQMD has not adopted thresholds of significance for the assessment of health risks related to the emission of criteria pollutants. Furthermore, an industry standard level of significance has not been adopted or proposed. Due to the lack of adopted thresholds of significance the health risks, this data is presented for informational purposes and does not represent an attempt to arrive at any level-of-significance conclusions.

Toxic Air Contaminants

Toxic air contaminants (TACs) are a set of airborne pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

Stationary sources of TACs include gasoline stations, dry cleaners, and diesel backup generators. On-road motor vehicles and off-road sources, such as construction equipment and trains, are also common sources of TACs. According to the California Almanac of Emissions and Air Quality (ARB 2013), most of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being diesel particulate matter (DPM). Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is known as DPM. More than 90 percent of DPM is less than 1 micrometer (μm) in diameter, and thus is a subset of $PM_{2.5}$.

Construction would generate DPM emissions from the use of off-road diesel-powered equipment and any diesel-powered trucks serving construction activities. However, as noted above, the only potentially proximate receptors would be those associated with campsite users at Jenkinson Lake and Sand Flat Campgrounds, which are located in the vicinity of the Project construction alignment. These users would primarily be present during the peak camping season, which is between Memorial Day and Labor Day, and would only be present for short durations of time while using the campgrounds. Health risk is a function of the concentration of contaminants in the environment and the duration of exposure to those contaminants. Concentrations of mobile-source DPM emissions are typically reduced by approximately 60 percent at a distance of around 300 feet (100 meters) (Zhu and Hinds 2002). Due to the remote location of potential construction activities, the fact that construction at any given location would be limited and not anticipated to generate substantial TAC emissions, the limited proximity and temporary presence of potential sensitive receptors, and the temporary nature of construction, DPM generated as a result of construction equipment or truck use would not expose sensitive receptors to substantial TAC emissions. As a result, this impact would be **less than significant**.

Fugitive Dust

Fugitive dust is typically generated during earth moving activities such as grading and excavation. Fugitive dust can cause health concerns when airborne due to potential inhalation. While specific earth-moving activities and unpaved roadway travel associated with Project construction is unknown at this time, such activities would occur proximate to the potential construction sites, which are in rural areas within and around the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake and not proximate to any sensitive receptors. Therefore, this impact would be **less than significant.**

Localized CO Emissions

Local mobile-source emissions of CO near roadway intersections are a direct function of traffic volume, speed, and delay. CO typically disperses rapidly with distance from the source under normal meteorological conditions. Under specific meteorological conditions, CO concentrations near roadways and/or intersections may reach unhealthy levels for local sensitive land uses. These higher CO concentrations, or CO hot spots, are typically observed at heavily congested roadway intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot spots due to the nature of construction activities, which normally utilize diesel-powered equipment for intermittent or short durations. While ambient CO concentrations in the region have not exceeded NAAQS or CAAQS in many years, increased localized CO concentrations could still occur, particularly at intersections of high-volume roadways. Implementation of the Project could temporarily increase traffic volumes on streets near potential Project construction sites. However, these sites would be in rural location where background concentrations of CO are low and not in areas where in which mixing of air, and therefore pollutant dispersion, would be substantially limited, such as within a tunnel, underpass, urban street canyon, below-grade roadway, or other similar setting. Therefore, although potential construction activities would result in temporary construction worker vehicle trips, it is not anticipated that these additional trips would expose sensitive receptors to substantial pollutant concentrations of CO. Therefore, this impact would be **less than significant.**

Asbestos

The Project is not located in an area mapped as having, or otherwise known to have, ultramafic rock, serpentine, or naturally occurring asbestos. Although unexpected, there is the potential for ultramafic rock/serpentine to be

discovered during grading or excavation, with the potential to expose persons to asbestos dust. This impact is **potentially significant**.

Construction Impacts Summary

As discussed above, the Project's emissions sources would be primarily related to construction activities, which would not occur in proximity to sensitive receptors and would not expose sensitive receptors to substantial pollutant concentrations, including regional criteria pollutants or localized CO, TACs, fugitive dust. Therefore, this impact would be **less than significant**. However, although unexpected, there is the potential for ultramafic rock/serpentine to be discovered during grading or excavation, with the potential to expose persons to asbestos dust. Therefore, the impact associated with construction activities potentially exposing people to asbestos dust is **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with post-construction operational conditions are anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, post-construction operations would not expose sensitive receptors to substantial pollutant concentrations. This impact would be **less than significant**.

Mitigation Measures

Mitigation Measure 4.3-1b: Dust and Emissions Control Plan

Significance After Mitigation (Asbestos):

Mitigation Measure 4.3.1b incorporates the requirements of El Dorado AQMD rules, which provide that if ultramafic rock or serpentine is discovered, the El Dorado County AQMD must be notified no later than the following business day and the Project must comply with applicable provisions of Rule 223-2 and the State of California ATCM for Construction, Grading, Quarrying, and Surface Mining Operations. With incorporation of Mitigation Measure 4.3-1b, this impact would be reduced to **less than significant with mitigation.**

Impact 4.3-4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations and maintenance activities associated with existing infrastructure, such as equipment use or vehicle trips for maintenance work, would remain similar to existing conditions. Therefore, this phase would not result in the generation of other emissions (such as those leading to odors), and there would be **no impact**.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings.

Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Potential Project construction activities could generate temporary odors associated with diesel exhaust from diesel-powered equipment and ROG emissions associated with such activities as application of asphalt. El Dorado County AQMD does not have any recommended thresholds or screening distances associated with construction-related odorous emissions. However, odors associated with diesel fumes and asphalt paving would be temporary and would disperse rapidly with distance from the source. Any potentially noxious odors would be generally confined to the immediate vicinity of the construction site; by the time such emissions reach any sensitive receptor sites, they would be diluted to well below any level that would adversely affect a substantial number of people. Therefore, this impact would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with post-construction operational conditions are anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, post-construction operations would not result in the generation of other emissions (such as those leading to odors) adversely affecting a substantial number of people. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

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4.4 BIOLOGICAL RESOURCES

This section analyzes the potential impacts on biological resources associated with implementation of the proposed Project (Project). The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.4.1 EXISTING CONDITIONS

REGIONAL AND PROJECT SETTING

The biological study area (study area or Project study area) for the Project encompasses regions within and near the South Fork of the American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. This includes the South Fork American River basin and segments of adjacent river basins which contribute flow to, or receive flow from, the South Fork, as well as the El Dorado Canal from the El Dorado Diversion Dam to Hazel Tunnel into Jenkinson's Lake, from the El Dorado Diversion Dam to Forebay Reservoir, and areas downstream of Folsom Reservoir to the Lower American River at the Watt Avenue Bridge. It also includes aquatic habitat at several reservoirs where water levels are influenced by the Project, as described below.

The South Fork originates in the Eldorado National Forest in the Sierra Nevada Mountains, within the Sierra Nevada ecoregion of California. The river descends through steep canyons characterized by coniferous pine and fir forests and exposed bedrock with elevations ranging from about 9,900 feet at its headwaters to about 480 feet at Folsom Reservoir. Riparian habitat surrounds the South Fork at differing widths based on the bank's native material; sand bars, islands, channels, and tributaries can be found along the entire extent of the river. The South Fork flows into Folsom Reservoir in the foothills of the Sierra Nevada Mountains. Releases from Folsom Reservoir flow through Lake Natoma and then into the Lower American River, which then flows through the City of Sacramento to its confluence with the Sacramento River. While the stretch below Folsom Dam is highly urbanized, the American River Parkway runs along both banks of the Lower American River and incorporates rolling hills, broadleaf woodlands, scrubby habitat, and scattered pines. The diverse communities along the South Fork provide habitat for a variety of special-status plant, wildlife and fish species, as detailed below.

The South Fork American River Watershed and associated reservoirs in the watershed are highly regulated and subject to frequent artificial changes in water levels due to reservoir releases for power generation from hydropower projects operated by the Sacramento Municipal Utility District (SMUD) and the El Dorado Irrigation District (District) and for operation of the reservoirs for storage and consumptive uses. In addition, water levels in the watershed are naturally influenced by climatic conditions and vary widely based on the type of water year, the amount of snowpack, and the timing of direct precipitation and snowmelt. SMUD operates eight plants, and the District and Hydroland Omega, LLC each operate one. SMUD also operates power facilities within the Middle Fork American River basin and transfers water to powerhouses located within the South Fork American River basin. Flow through power facilities located on the South Fork are regulated by the Federal Energy Regulatory Commission (FERC) under licenses for the District's El Dorado Hydroelectric Project (Project 184), SMUD's Upper American River Hydroelectric Project (Project 2101), and SMUD's Chili Bar Hydroelectric Project (Project 2155). (SMUD acquired the Chili Bar Hydroelectric Project in June 2021).

This EIR provides a detailed description of the South Fork watershed and description of the flow regulation by licenses and permits in Chapter 4.10 Hydrology and Water Quality. The proposed Project is requesting a

modification of Permit 21112, which would add an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake.

The following types of reservoirs exist in the watershed and provide habitat for aquatic biological resources.

Storage Reservoirs

Storage reservoirs within the study area function to store water in the winter and spring and then distribute water to the South Fork and its tributaries for consumptive, hydropower, and fish and wildlife uses in the summer, fall, and early winter. The storage reservoirs in the study area are operated by SMUD and by the District.

Lake Aloha, Caples Lake, Echo Lake, Silver Lake Reservoirs – The District operates Lake Aloha, Caples Lake, Echo Lake, and Silver Lake reservoirs. These four storage reservoirs release water into the South Fork as part of the District's El Dorado Hydroelectric Project No. 184. Water from these reservoirs is diverted at the El Dorado Diversion Dam into the El Dorado Canal (FERC 2006). Minimum flow releases are required at various locations within the South Fork watershed per the water quality certification for the District's FERC license (FERC 2006). Lake level targets are specified for Lake Aloha, Caples Lake, Echo Lake, and Silver Lake to protect summer recreational uses (State Water Resource Control Board [SWRCB] 2006; FERC 2006; Permit 21112). These reservoirs harbor ecosystems that offer specialized habitats for high-elevation species, hosting a diverse array of flora and fauna, as detailed below.

Loon Lake, Ice House and Union Valley Reservoirs – SMUD operates of Loon Lake, Ice House, and Union Valley Reservoirs; all of which are situated in the Silver Creek watershed within the Eldorado National Forest. These three storage reservoirs are upstream of the proposed Project and ultimately release water into the South Fork as part of SMUD's Upper American River Hydroelectric Project No. 2101. Minimum flow releases are required at various locations within the Silver Creek watershed per the water quality certification for SMUD's FERC license (FERC 2008). These reservoirs harbor ecosystems that offer specialized habitats for high-elevation species, hosting a diverse array of flora and fauna, as detailed below.

Jenkinson Lake Reservoir – The District owns and operates Jenkinson Lake, which serves as the District's primary storage reservoir. This reservoir is created by the Sly Park Dam and dike and has a storage capacity of 41,000 acre-feet, covering an area of 650 acres. Under the District's water rights Licenses 11835 and 11836, the District is allowed to divert water from the Cosumnes River watershed and either directly use that water or store the water in Jenkinson Lake for later use. Under those water rights, the combined total amount of water that can be beneficially used by direct diversion and withdrawal from storage is 33,400 acre feet per year (AFY). The District also has a pre-1914 water right for direct diversion of up to 12.5 cfs from Camp Creek, which typically is utilized from May through October. Water that is supplied to Jenkinson Lake from the El Dorado Canal via the Hazel Creek Tunnel is supplemental and utilizes the District's pre-1914 water rights to fulfill demands at the District's Reservoir A Water Treatment Plant (WTP). These pre-1914 rights cannot be stored in Jenkinson Lake due to the limitations of their historical pattern of use. Upon exiting the Hazel Creek Tunnel, water flows into a partially rip-rapped and lined drainage channel, eventually reaching Hazel Creek and then Jenkinson Lake. Water released from storage at Jenkinson's Lake undergoes treatment at the Reservoir A Water Treatment Plant before being utilized to satisfy consumptive demands. Typically, Jenkinson Lake experiences annual usage ranging from 18,000 to 24,000 acre-feet (EID 2021). The channel that connects the Hazel Creek tunnel to Hazel Creek and to

Jenkinson Lake itself provide habitat for a diverse range of special- status plant, wildlife, and fish species, as detailed below.

Folsom Reservoir – Folsom Reservoir is part of the Central Valley Project (CVP) managed by the Bureau of Reclamation. Folsom Reservoir is surrounded by the Folsom State Recreation Area (SRA), which is managed by California State Parks. The North, Middle and South Forks of the American River empty into Folsom Reservoir. Folsom Lake has a surface area of about 10,000 acres when full (with a 75-mile shoreline), a maximum water surface elevation of 480 feet, and a capacity of 976,000 acre-feet. Water levels normally vary from an elevation of 466 feet in early summer to a low of 426 feet in early winter (California State Parks 2023, Bureau of Reclamation 2023). Folsom Reservoir and the plant communities surrounding the reservoir serve as a habitat for a diverse range of special-status plant, wildlife, and fish species, as detailed below.

Re-Regulating Reservoirs

Forebay Reservoir – The District owns and operates Forebay Reservoir, which is located at the end of the El Dorado Canal. Under existing operations, raw water is diverted at the Forebay Reservoir where it travels in the Main Pipeline to the Reservoir 1 WTP. Water treated at Reservoir 1 WTP combines with water treated at Reservoir A WTP to serve the District service area. The Forebay Reservoir is a re-regulating reservoir with a surface area at full capacity of approximately 23 acres. Water levels in Forebay Reservoir fluctuate frequently depending on hydropower and consumptive water demands. The Forebay Reservoir is an intermediary between habitats of the high elevation and habitat of the foothills providing species with opportunities for mobility, or a larger migration path or range. The mixed conifer forest surrounding the reservoir provides ample habitat for a variety of special-status species as detailed below.

Slab Creek and Chili Bar Reservoirs – SMUD oversees the operation of the Upper American River Hydroelectric Project (Project 2101), which encompasses facilities situated along the South Fork and its tributaries. One integral component of the UARP is the Slab Creek Dam, a concrete structure located on the South Fork that forms the Slab Creek Reservoir. This reservoir, spanning 16,600 acre-feet, serves as a conduit for power generation by SMUD, resulting in minimal long-term water storage. Downstream from the Slab Creek Reservoir is SMUD's Chili Bar Reservoir. This reservoir is nestled behind the Chili Bar Dam and has a maximum surface area of 110 acres-feet. Chili Bar Reservoir lacks significant seasonal or long-term storage capabilities, as its operations primarily hinge upon releases from the Slab Creek Dam and White Rock Powerhouse, barring instances of winter storms and spring snowmelt flood events. Water discharged from the Chili Bar facilities flows into the South Fork, ultimately making its way to Folsom Reservoir**,** thus completing its trek within the broader context of the Upper American River Project's (UARP's) hydroelectric operations. These reservoirs support various vegetation communities, aquatic resources, and species habitats as detailed below, including portions of the Pacific Herd mule deer migration corridor (State of California 2024).

South Fork of the American River – South Fork

Flow in the South Fork is regulated by numerous hydroelectric, water supply, and flood control projects. Although precipitation falls primarily as snow in the higher elevations with a spring runoff that extends into early summer, river dynamics no longer reflect an unrestricted flow regime. The South Fork is 90 miles long and moves through a variety of vegetation communities, habitats, elevations, and species ranges. As described below, terrestrial habitats along the South Fork include mixed conifer forest and oak woodlands and riparian vegetation bordering the river and its tributaries in some locations. As a result, a diverse range of special-status plants,

wildlife, and fish species have the potential to occur in the water or on the banks of this river system. River reaches of the South Fork are described below in segments separated by diversions, dams, and reservoirs. Special-status species with the potential to occur in these separate river reaches are detailed further below.

South Fork above El Dorado Diversion Dam – Lakes and reservoirs in the upper tributaries of the South Fork include Silver Lake, Caples Lake, and Lake Aloha. In addition, water from Echo Lake, which is located within the Upper Truckee River basin, is delivered to the South Fork via a conduit. Monthly minimum flow releases are required at Echo Creek below Echo Dam, Pyramid Creek below Lake Aloha, Caples Creek below Caples Dam, and the Silver Fork American River below Silver Lake Dam.

South Fork below El Dorado Diversion Dam to the El Dorado Powerhouse – Water from the South Fork is diverted at the El Dorado Diversion Dam, into the El Dorado Canal, which conveys water to the Forebay Reservoir. Water in the Forebay Reservoir is then either used for hydropower generation through the El Dorado Powerhouse or may be delivered to Reservoir 1 WTP for consumptive use. Below the El Dorado Diversion Dam, the El Dorado Canal provides water to Forebay Reservoir, which supplies water to the El Dorado Powerhouse or to the Reservoir 1 Water Treatment Plant via pipeline or penstock, and water used to generate hydropower is returned to the South Fork below the powerhouse. The District also has infrastructure that diverts water from the El Dorado Canal into Hazel Creek Tunnel and conveys water from Hazel Creek Tunnel to Jenkinson Lake.

Union Reservoir and Ice House Reservoir to the South Fork via Silver Creek – Union Reservoir and Ice House Reservoir primarily operate as long-term storage reservoirs for winter/spring snowmelt runoff. Starting in mid-summer, water is released from these reservoirs to generate power. Water is diverted from Union Valley Reservoir and Ice House Reservoir, down Silver Creek, where it eventually empties into the South Fork.

South Fork from the El Dorado Powerhouse to Folsom Lake – Two concrete dams span the South Fork between the El Dorado Powerhouse and Chili Bar, creating two separate impoundments: Slab Creek Dam and Reservoir and Chili Bar Dam and Reservoir. Both Slab Creek and Chili Bar dams are used as re-regulating forebays and afterbays to various powerhouses. Slab Creek Powerhouse is located at Slab Creek Dam and generates power from run-of-river flows. White Rock Powerhouse is located upstream of Chili Bar Reservoir, and water diverted from the South Fork at Slab Creek Reservoir is returned to the river approximately 7.5 miles downstream of the diversion. Rock Creek Powerhouse also discharges to the South Fork between Slab Creek Dam and Chili Bar Reservoir. Between Slab Creek Dam and Chili Bar Reservoir, the river channel is surrounded by bedrock and boulder outcroppings and steep valley slopes in a highly confined gorge (FERC 2008).

Lower American River below Folsom Dam to Watt Avenue Bridge – The American River Division of the CVP facilities include Folsom Dam and Reservoir, its auxiliary spillway, Folsom Powerplant, Nimbus Dam, Lake Natoma, and Nimbus Powerplant. Folsom Powerplant is located at the foot of Folsom Dam on the north side of the river. Nimbus Dam, located 7 miles downstream of Folsom Dam, re-regulates releases made for power through Folsom Dam and serves as a diversion dam for the Folsom South Canal. Nimbus Dam forms Lake Natoma, with a capacity of 8,760 acre-feet and a surface area of 540 acres (Reclamation 2024).

Water released from Lake Natoma flows into the Lower American River flows 30 miles to its confluence with the Sacramento River. Riparian forest and riparian scrub habitat occur on the banks of the river, with some emergent marsh present in still or slow-moving shallow water. The Lower American River between Nimbus Dam and Watt Avenue supports more than 40 species of native and nonnative fish, including naturally spawning fall-run

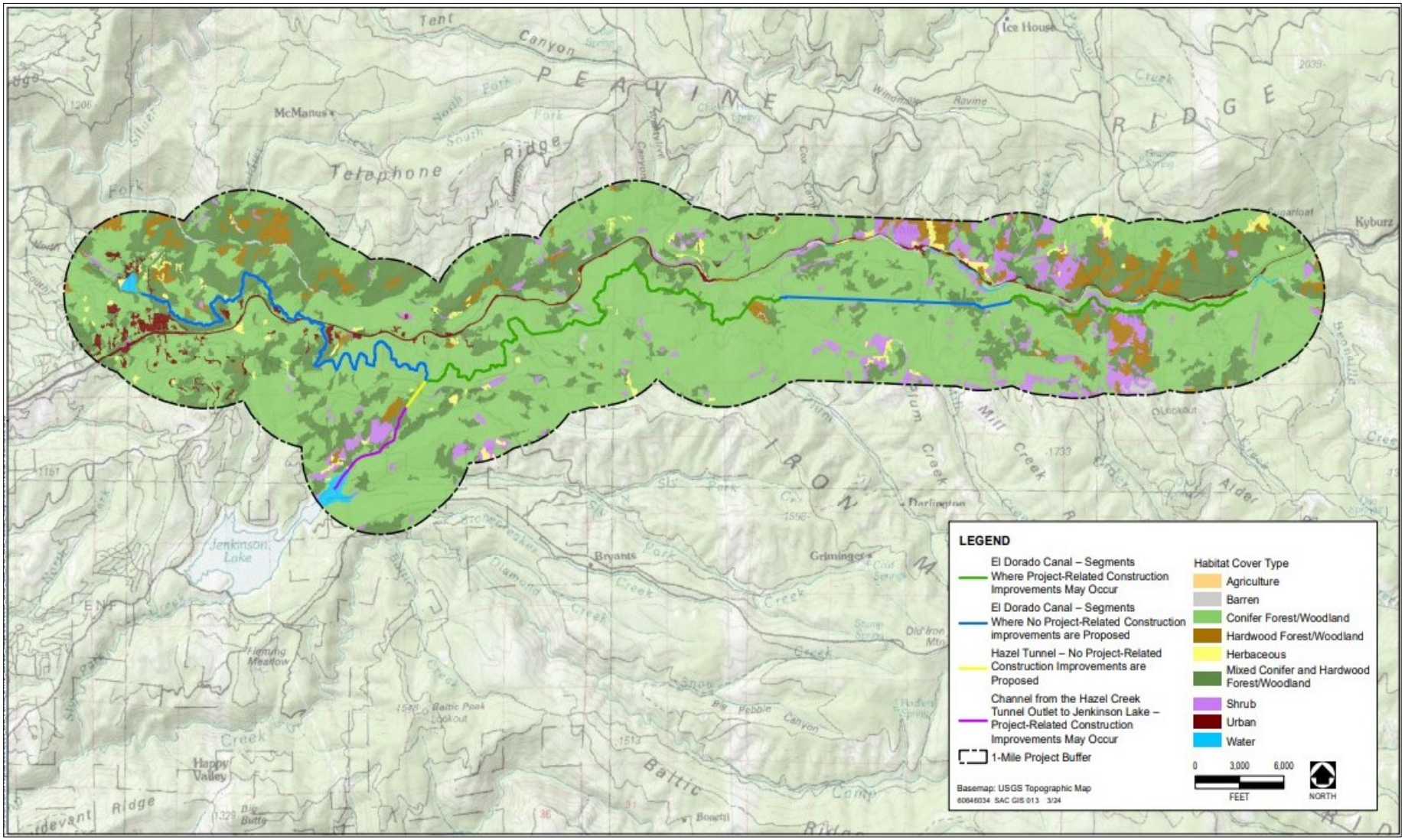
Chinook salmon and steelhead. These and other special-status salmonids are of primary management concern because of their declining numbers, or their importance to recreational/commercial fisheries. Construction of Folsom and Nimbus Dams blocked access to natural spawning grounds of salmon and steelhead trout. To compensate in part for the loss of these spawning areas, Reclamation constructed the Nimbus Fish Hatchery on the left bank of the river, about 0.3 mile below Nimbus Dam (Reclamation 2024). The downstream extent of the hydrologic study area is the Lower American River at Watt Avenue bridge. The Watt Avenue bridge is located 13.6 river miles downstream of Nimbus Dam and serves as an important point used by Reclamation and other agencies for managing water temperature in the Lower American River for listed salmonid species.

Landcover/Habitat

The landcover surrounding the Project area where construction may occur is generally dominated by conifer forest/woodland, mixed conifer forest/woodland. conifer forest/woodland and mixed conifer and hardwood forest/woodland. Figure 4.4-1 shows the location and extent of major habitat types in the Project area where construction may occur. Brief descriptions of these habitat types are provided below.

Conifer Forest/Woodland- Conifer forests and woodlands comprise forest communities dominated by evergreen trees, often interspersed with broadleaved species (CDFW 2024b). In the study area, these forested regions are primarily characterized by white fir (*Abies concolor*), Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), incense-cedar (*Calocedrus decurrens*), and California black oak (*Quercus kelloggii*). These forests exhibit a multi-layered canopy structure, with a dense or nearly impenetrable upper canopy, a more dispersed mid-canopy, and varying densities of shrub or herbaceous layers in the understory. Along rivers, creeks, and lakes, additional tree species such as cottonwood (P*opulus* spp.), willows (S*alix* spp.), and quaking aspens (*populus tremuloides*) may be present. Shrub species commonly found in the understory of the study area's conifer forest and woodlands include manzanita (*Arctostaphylos* spp.), (C*eanothus* spp.), gooseberry (*Ribes* spp.), and mountain misery (*Chamaebatia foliolosa*). Gaps in the canopy typically occur due to substrate variations, slope, microclimate, or natural and anthropogenic disturbances. Open spaces provide habitat and opportunity for annual forbs, grasses, and recruitment saplings (CDFW 2024b).

Hardwood Forest/Woodland-Hardwood Forest and woodlands are interspersed with conifer forest and woodlands in the study area. These two habitat types share some of the same species such as Douglas-fir, ponderosa pine, and incense-cedar, however; hardwood forests and woodland are typically closed forests and to qualify must be comprised of one-third evergreen species and one-third broadleaved species (CDFW 2024b). In addition, hardwood forests and woodlands often grow in a mosaic pattern of species groupings and bilayer canopies with little, to no understory. In addition to those already mentioned, common canopy species of hardwood forests and woodlands include Pacific madrone (*Arbutus menziesii*), canyon live oak (*Quercus chrysolepis*), big leaved maple (*Acer macrophyllum*), and dogwood (*Cornus* spp.) trees.



Source: AECOM; USFS Calveg 2019

Figure 4.4-1 Habitat Cover Types within a 1-mile Radius of Proposed Project Construction

Rivers, Reservoirs, and the Surrounding Riparian Zone

Rivers contain unique and dynamic niches, each of which support different aquatic or semi-aquatic species adapted to specific environmental conditions. Riparian zones along the riverbanks and reservoirs also provide important habitat for terrestrial species and contribute to overall river and reservoir health. The riparian ecosystems in the study area offer a diverse array of resources that support both common and special-status plant and wildlife species. Key resources provided to plants and wildlife by riparian habitat include:

- **Habitat Diversity**: Rivers create a variety of habitats, including riffles, pools, runs, backwaters, and riparian zones. These diverse habitats support a wide range of plant and animal species, contributing to high levels of biodiversity and ecosystem resilience. Riparian habitats along reservoirs also provide habitat transition zones between aquatic and upland habitats.

- **Nutrients**: Rivers transport nutrients from upstream sources to downstream areas, enriching soils, supporting plant growth, and sustaining food webs. Nutrient-rich sediments deposited by rivers contribute to soil fertility and productivity in floodplains and riparian zones.

- **Fish and Wildlife Migration**: Many rivers provide critical migration routes for fish and wildlife species, allowing them access or resources needed to move between habitats or other bodies of water.

- **Sediment Transport:** Rivers transport sediments downstream, shaping landscapes, forming floodplains, and replenishing coastal areas. Sediment deposition supports wetland formation, soil development, and the stability of riverine and coastal ecosystems.

- **Floodplain Dynamics:** Rivers periodically flood their surrounding floodplains, depositing sediments, nutrients, and organic matter, which support diverse riparian vegetation and wildlife. Floodplains serve as important breeding grounds, feeding areas, and refuge habitats for many species.

- **Hydrological Connectivity**: Rivers connect upstream and downstream habitats, facilitating the movement of water, nutrients, and organisms across landscapes. Hydrological connectivity supports ecological processes such as seed dispersal, colonization, and genetic exchange.

- **Water Quality Regulation**: Rivers play a crucial role in regulating water quality by filtering pollutants, buffering changes in water temperature, and diluting contaminants.

- **Erosion Control:** Riparian vegetation along riverbanks helps stabilize soils, reduce erosion, and mitigate the impacts of floods and sedimentation.

4.4.2 SPECIAL-STATUS SPECIES

Appendix D-1 (*Special-status Species with Potential to Occur in the Project Study Area*) summarizes the special-status plants, fish and wildlife species that could potentially occur in the study area and their likelihood of occurrence. The programmatic analysis of the biological resources in the study area did not include species surveys, landcover mapping or assessment of natural communities, therefore information about potential presence of special status species in the Project study area relied on existing data bases, vegetation mapping and other sources listed below.

Data from the following sources was used to determine the potential for presence of special-status species in the study area. Forest Service sensitive species were queried by region (Eldorado National Forest). The United States Geological Service (USGS) 7.5-minute Quadrangles presented in Table 4.4-1 were used to query data from the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) database, and California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants for the South Fork river runs and reservoirs in the study area as indicated in Table 4.4-1 below. The database searches focused on portions of the Project area that could potentially be affected by Project operation and construction.

Table 4.4-1 USGS 7.5-minute Quadrangles Covering the Project Study Area.

River Runs	USGS Quadrangles Searched
El Dorado Diversion Dam to El Dorado Powerhouse	Kyburz, Riverton, Pollock Pines
El Dorado Powerhouse to Folsom	Garden Valley, Slate Mountain, Pollock Pines, Coloma, Pilot Hill, Clarksville
Hazel Tunnel to Jenkinson Lake	Sly Park, Pollock Pines, Riverton, Old Iron Mountain
Folsom Dam to Watt Avenue	Folsom, Citrus Heights, Sacramento East, Carmichael
Reservoirs	**USGS Quadrangles Searched**
Jenkinson Lake	Sly Park
Forebay, Chili Bar, and Slab Creek	Garden Valley, Slate Mountain, Pollock Pines, Coloma, Pilot Hill, Clarksville
Folsom	Clarksville, Pilot Hill, Rocklin, Folsom
Areas of Construction	**USGS Quadrangles Searched**
Sections of El Dorado Canal	Sly Park, Pollock Pines, Riverton, Old Iron Mountain Kyburz, Riverton, Pollock Pines
Hazel Tunnel to Jenkinson	Sly Park, Pollock Pines, Riverton, Old Iron Mountain

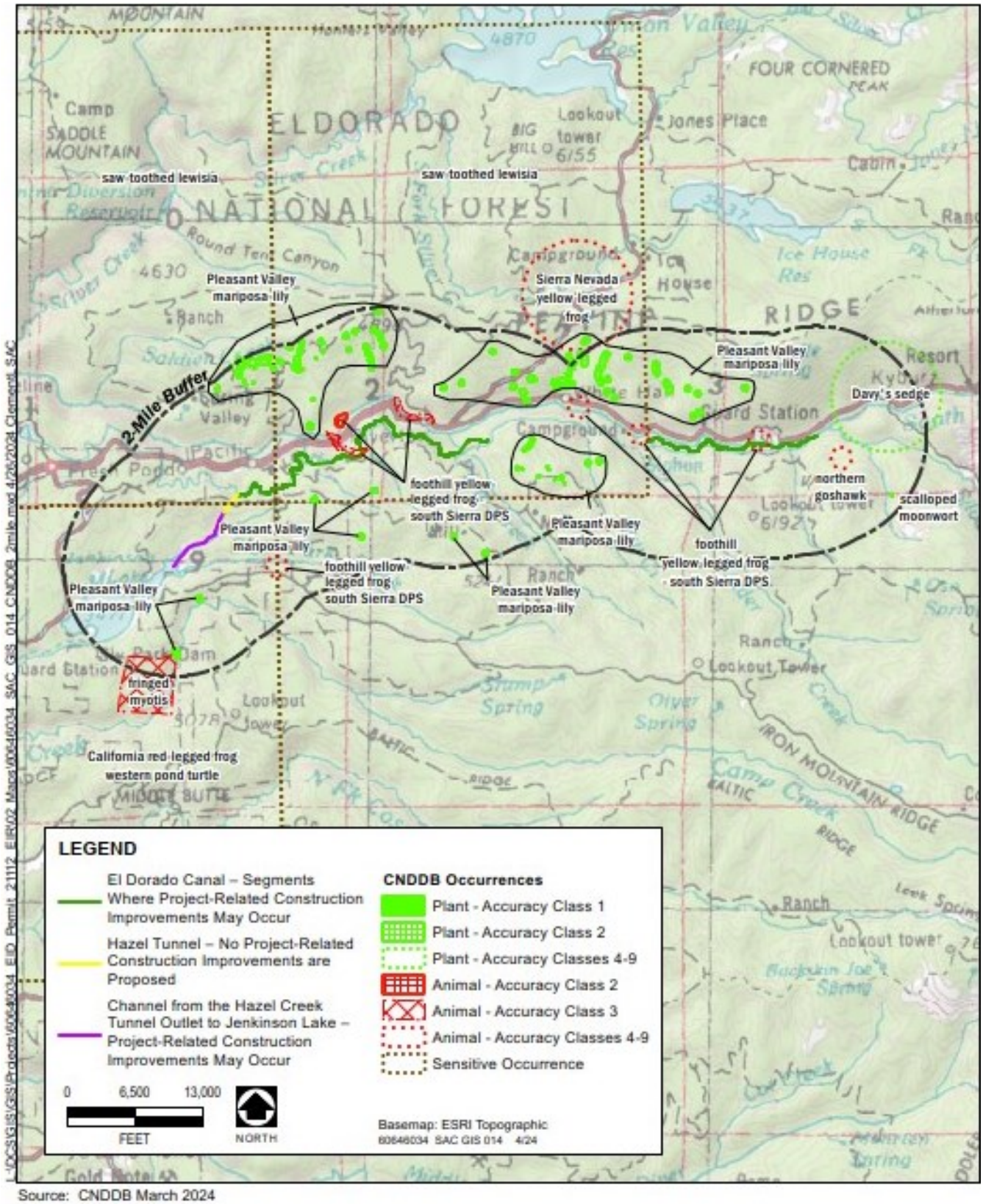
Source: AECOM 2024
USGS = U.S. Geological Survey

As described in EIR Section 4.10 *Hydrology and Water Quality,* hydrologic modeling has shown that there would be no Project effects to reservoir storage or elevations from the proposed Project at District reservoirs upstream of the El Dorado Diversion Dam (Lake Aloha, Caples Lake, Echo Lake, and Silver Lake) or at three of the SMUD reservoirs (Ice House Reservoir, Union Valley Reservoir, and Loon Lake Reservoir) (see EIR Section 4.10 *Hydrology and Water Quality* and Appendix B1). Because these reservoirs and the South Fork upstream of the El Dorado Diversion Dam would not be affected by the Project these were not included in database searches listed below.

- United States Department of Agriculture (USDA) *USDA Forest Service, Pacific Southwest Region Sensitive Species by Forest; Eldorado National Forest* (USDA 2013);
- CDFW CNDDB (CDFW 2024a);
- USFWS, IPaC database of endangered and threatened species (USFWS 2024a);
- CNPS Online Inventory (CNPS 2024).

- *California Wildlife Habitat Relationship System species range mapping resource* (CDFW 2024b);
- eBird, Cornell Lab of Ornithology (eBird 2024)
- *Amphibian and Reptile Species of Special Concern in California* (Thomson, Wright, and Shaffer 2016);
- *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California* (Shuford, W. D., and Gardali, T. 2008);
- State of California Mule Deer Migration Corridors, Pacific Herd - 2015-2020 [ds3142];
- *USFWS Threatened & Endangered Species Active Critical Habitat Report. Critical Habitats Mapper* (USFWS 2024b);
- *USFWS* Species Profile (USFWS 2024c-d);
- Calflora. *Information on California plants for research and conservation*. (Calflora 2024);
- California Fish Passage Assessment Database (CFPAD);
- *California Fish and Wildlife, Fishing Guide - A map detailing fish planting location* (CDFW 2024c);
- Biogeographic Information and Observation System (BIOS 6 Viewers) (CDFW 2024d-i);
- *Consortium of California Herbarium (CCH2) Specimen Data from the Consortium of California Herbarium* (CCH2 2024);
- *Inland Fishes of California* by Peter B. Moyle (2002);
- National Marine Fisheries Service (NMFS) federal Endangered Species Act (ESA) Critical Habitat Mapper (NMFS 2024a);
- Xerces Society for Invertebrate Conservation (Xerces) *Bumble Bee Atlas* (Xerces 2024a);
- *Xerces Monarch and Milkweed Mapper* (Xerces 2024b).

Figure 4.4-2 shows special-status species occurrences within 2 miles of the Project areas where construction activities may occur (CNDDB, March 2024).



Source: CNDDB March 2024

Figure 4.4-2. Special-status Species Occurrences within a 2-Mile Radius of Proposed Project Construction

SPECIAL-STATUS PLANTS

Information on the potential presence of special-status plant species in the study area is based on database searches from the CNDDB, IPaC, CNPS, Calflora, USDA (see Appendix D-2) and other sources listed above. Appendix D-1 summarizes the habitat requirements and likelihood of occurrence for all special-status plant species identified by the database searches and other desktop research. Eleven of these plant species could potentially occur in areas affected by Project construction or operation and are discussed in more detail below.).[1]

- Upswept Moonwort (*Botrychium ascendens*); CRPR 2B.3
- Pleasant Valley Mariposa-Lily (*Calochortus clavatus* var. *avius*); CRPR 1B.2
- Sierra Arching Sedge (*Carex cyrtostachya*); CRPR 1B.2
- Mud Sedge (*Carex limos*a); CRPR 2B.2
- Mountain Lady's-slipper (*Cypripedium montanum*); CRPR 4.2, FS
- Hutchison's Lewisia (*Lewisia kelloggii* ssp. *Hutchisonii*); CRPR 3.2, FS
- Saw-Toothed Lewisia (*Lewisia serrata*); CRPR 1B.1
- Yellow Bur Navarretia (*Navarretia prolifera* ssp. *lutea*); CRPR 4.2, FS
- Stebbins' Phacelia (*Phacelia stebbinsii*); CRPR 1B.2
- Brownish Beaked-Rush (*Rhynchospora capitellata*); CRPR 2B.2, FS
- Sanford's Arrowhead (*Sagittaria sanfordii*); CRPR 1B.2

A description of each of these species' habitat and occurrences near the Project study area are described below.

Upswept Moonwort

Description – The upswept moonwort is a fern typically found in wet areas of lower montane coniferous forests at elevations between 3,655–9,990 feet. The blooming period for this perennial species is between July and August.

Occurrence in the Project Study Area – Habitat for this species could occur in areas surrounding the El Dorado Canal, although the proposed Project construction area is near the limit of this species' elevational range. The nearest CNDDB occurrence (#128) is within 5 miles of the anticipated Project construction area.

Pleasant Valley Mariposa-Lily

Description – The Pleasant Valley mariposa-lily typically grows in lower montane coniferous forests on grasslands, meadows, and other open spaces with ample sunlight. Its habitat may also include areas with periodic disturbances, such as fire or grazing, which can help maintain open spaces. Pleasant Valley mariposa-lily prefers Josephine silt loam, volcanic and rocky substrates at elevations between 1,000–5,905 feet. The blooming period for this perennial species is between May and July.

Occurrence in the Project Study Area – This species had been recorded in the vicinity of the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. There are 15 CNDDB occurrences within one mile of the anticipated Project construction area.

[1] Species designated as "State (S) or Federally (F)" listed as rare, threatened or endangered; "Candidate (C) species for state or federal listing as threatened (T) or endangered (E)" Species with a California Rare Plant Rank (CRPR) of 1 or 2; or plant species classified as "sensitive (FS)" by the Eldorado National Forest Service.

Sierra Arching Sedge

Description – The Sierra arching sedge is found in the margins of riparian habitat and mesic areas of lower montane coniferous forests including meadows and seeps, or marshes and swamps at elevations between 2,000-4,460 feet. The blooming period for this perennial species is between July and September.

Occurrence in the Project Study Area – Habitat for this species has the potential to occur in areas surrounding the El Dorado Canal. The nearest CNDDB occurrence (#65) is within 3 miles of the anticipated Project construction area.

Mud Sedge

Description – The mud sedge is found in bogs, fens, meadows, seeps, marshes, and swamps, of both upper and lower montane coniferous forests at elevations between 3,935–8,860 feet. The blooming period for this perennial species is between July and August.

Occurrence in the Project Study Area – Habitat for this species has the potential to occur in areas surrounding the El Dorado Canal. The nearest CNDDB occurrence (#25) is within 5 miles of the anticipated Project construction area.

Mountain Lady's-slipper

Description – The mountain lady's slipper typically grows in broadleafed upland forests, cismontane woodlands, lower montane coniferous forests, or north coast coniferous forests. This species is commonly found in cool, shaded areas; near streams, seeps, or other sources of water at elevations between 605–7,300 feet. The blooming period for this perennial species is between March and August.

Occurrence in the Project Study Area – Habitat for the species has the potential to occur in areas surrounding the El Dorado Canal and the Hazel Creek and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. There are no reported CNDDB, CCH2, or Calflora reports of this species within 10 miles of the anticipated Project construction area (Calflora 2024).

Hutchison's Lewisia

Description – Hutchison's lewisia is a subspecies that typically inhabits upper montane coniferous forest on openings rocky ridgetops, including cliffs, talus slopes, and granite outcrops. It thrives in well-drained, sandy or gravelly slate or rhyolite tuff substrates at elevations between 2,510–7,760 feet. The blooming period for Hutchison's lewisia is between May and August but the species can occasionally be found blooming as early as April.

Occurrence in the Project Study Area – Suitable habitat for this species could occur in areas surrounding the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. There are no CNDDB occurrences within 2 miles of the Project study area.

Saw-Toothed Lewisia

Habitat Description – Saw-toothed lewisia typically inhabits broadleafed upland forest, lower montane coniferous forest, or riparian forests. It thrives in open areas with ample sunlight exposure and well-drained,

gravelly or sandy soils, on rocky, mountainous environments such as cliffs, talus slopes, and rocky outcrops. Found at elevations between 2,525–4,710 feet. The blooming period for this species is between May and June.

Occurrence in the Project Study Area – This species may occur in the vicinity of the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. CNDDB provides two general locations (CNDDB Occurrences # 1 and 2) north of the anticipated Project construction area, but the CNDDB does not provide specifics for these locations because it is considered sensitive information.

Yellow Bur Navarretia

Habitat Description – Yellow bur navarretia is a subspecies that typically inhabits open, grassy areas in chaparral or cismontane woodlands with moderate moisture availability at elevations between 2,800–4,600 feet. The blooming period for this species is between May and July.

Occurrence in the Project Study Area – Habitat for this species has potential to occur in areas surrounding the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The are no CNDDB occurrences reported for this species, however; Calflora reports many occurrences near the anticipated Project construction area (Calflora 2024).

Stebbins' Phacelia

Habitat Description – Stebbins' Phacelia typically inhabits grassy meadows or seeps in cismontane woodland and lower montane coniferous forest at elevations between 2,000–6,595 feet. The blooming period for this species is between May and July.

Occurrence in the Project Study Area – Habitat for this species has potential to occur in areas surrounding the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The nearest CNDDB occurrence (#75) is 5 miles north of the anticipated Project construction area.

Brownish Beaked-Rush

Habitat Description – Brownish beaked-rush typically inhabits wet areas in meadows, seeps, freshwater marshes, and swamps of both lower and upper montane coniferous forests at elevations between 145–6,560. The blooming period for this species is between July and August.

Occurrence in the Project Study Area – Habitat for this species has potential to occur in areas surrounding the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The nearest CNDDB occurrence (#75) is 5 miles north of the anticipated Project construction area.

Sanford's Arrowhead

Habitat Description – Sanford's arrowhead typically inhabits shallow freshwater aquatic habitats, including slow-moving streams, marshes, ponds, and shallow water bodies. It prefers areas with muddy or silty substrates and often found along the margins of water bodies or in wetland habitats at elevations between 0–2,135 feet. The blooming period for this species is between May and October, occasionally into November.

Occurrence in the Project Study Area – Suitable habitat for this species occurs within the banks of the South Fork from El Dorado Powerhouse to Folsom Lake, and in the Lower American River from Folsom Lake to Watt

Avenue. Suitable habitat for this species is also present at Folsom Reservoir, Forebay Reservoir, Chili Bar Reservoir, and Slab Creek Reservoir. This species has multiple CNDDB records between on the Lower American River between Folsom Reservoir and Watt Avenue. There are no CNDDB records in areas proposed for Project construction.

SPECIAL-STATUS WILDLIFE

Information on the potential presence of special-status wildlife species in the study area is based on database searches from the CNDDB, IPaC, and USDA sources listed above for special status plants (see Appendix D-2). In addition, Xerces (Xerces 2024b) and USFWS (USFWS 2024b-d) were used as sources of information about potential presence of special-status wildlife in the study area. Appendix D-1 summarizes the habitat requirements and likelihood of occurrence for all special-status wildlife species identified by the database searches and other desktop research. Nine of these species could potentially occur in areas affected by Project construction or operation and are discussed in more detail below. Three of these wildlife species, California red-legged frogs, Sierra Nevada yellow-legged frog, and Sierra Nevada mountain beaver, are not expected to occur in areas potentially affected by proposed Project construction or operation as described below. [2]

- Monarch butterfly (*Danaus plexippus*), FC
- California Red-Legged Frog (*Rana draytonii*) – FT, SE, FS
- Foothill Yellow-Legged Frog - South Sierra Distinct Population Segments (DPS) (*Rana boylii* pop. 5) – FE, SE, FS
- Sierra Nevada Yellow-Legged Frog (*Rana sierrae*) – FE, ST, FS
- Northwestern Pond Turtle (*Actinemys marmorata*) – FC, SSC
- American Goshawk (*Accipiter atricapillus*) – SSC, FS
- Bald Eagle (*Haliaeetus leucocephalus*) – SE, FP
- California Spotted Owl (*Strix occidentalis occidentalis*) – FC, SSC
- Willow Flycatcher (*Empidonax traillii*) – SE, FS
- Fringed Myotis (*Myotis thysanodes*) – FS
- Townsend's big-eared bat (*Corynorhinus townsendii*) – SSC
- Sierra Nevada Mountain Beaver (*Aplodontia rufa californica*) – SSC

A description of these species' habitat, lifecycle, and known occurrences in the Project study area are described below.

Monarch Butterfly

Habitat Description – Monarch butterfly habitats range from fields and roadside areas to open spaces, wetlands, and urban gardens. Milkweed and other flowering plants play a crucial role in supporting monarch populations. While adult monarchs rely on the nectar of diverse flowers for sustenance during breeding and migration, they exclusively lay their eggs on milkweed plants. Monarchs found west of the Rocky Mountains in North America primarily spend their winters in California, where they seek refuge along the Pacific Coast, often roosting in eucalyptus, Monterey pines, and Monterey cypress trees.

[2] Species designated as "State (S) or Federal (F)", "candidate (C), threatened (T), or endangered (E)" by the USFWS and/or CDFW; species designated as "fully protected (FP), or species of special concern (SSC)" in California by CDFW; or wildlife species classified as "sensitive (FS)" by the Eldorado National Forest Service.

Life History – Monarch butterflies depend on thriving populations of milkweed plants for egg-laying and as a vital food source for their larvae or caterpillars. Through the consumption of milkweed, monarchs acquire toxins known as cardenolides, which serve as a defense mechanism against predators. Furthermore, the nectar from flowers is essential for sustaining adult monarchs during the entirety of their breeding season, migration, and overwintering periods.

Occurrence in the Project Study Area – Monarch habitat, in the form of milkweed plants, has potential to occur throughout the Project study area. The Xerces Milkweed and Monarch Mapper has reports of monarch habitat surrounding Jenkinson Lake and one adult monarch sighting in 2023, approximately 2.2 miles northwest of the anticipated construction area (Xerces 2024b).

California Red-Legged Frog

Habitat Description – California red-legged frogs are highly aquatic and breed along the margins and shallow parts of sunlit pools (Barry and Fellers 2013). These pools may be natural or manmade ponds, wide slow sections of streams, or even small, spring-fed puddles. Food sources for adult California red-legged frog are highly variable, but the aquatic larvae of this species are mostly herbivorous. Adults are known to feed on aquatic and terrestrial insects and crustaceans and snails (Stebbins 1951), as well as worms, fish, tadpoles, smaller frogs, and small mammals. (Baldwin and Stanford 1987).

Life History – In the Sierra Nevada California red-legged frogs typically breed from mid-December through early April (Storer 1925, Stebbins 1951). Breeding sites may hold water only seasonally, but sufficient water must persist into the summer for tadpoles to reach a size for metamorphosis (Barry and Fellers 2013). Eggs are deposited on the surface, in permanent pools, attached to emergent vegetation (Stebbins 1954). Females lay 750 to 4,000 eggs in clusters up to 10 inches wide. The eggs are attached to vegetation 2 to 6 in below the surface (Stebbins 1954). Larval development takes 11 to 20 weeks (Calef 1973). Movement away from aquatic habitat occurs at night during the winter and spring rains. In the Sierra Nevada California red-legged frogs can move up to 2,200 feet along stream corridors between aquatic habitats during the breeding season and will also make short forays (up to 230 feet) into upland habitats to forage (Tatarian 2008). In more mesic coastal areas of California red-legged frogs have been recorded traveling up to 1.7 miles (Fellers and Kleeman 2007).

Occurrence in the Project Study Area – The nearest known population of California red-legged frogs is at Spivey Pond along the north fork of Weber Creek in El Dorado County (County) (CNDDB Occurrence #586). Spivey Pond is one seven populations of California red-legged frogs known to occur in the Sierra Nevada (Barry and Fellers 2013). Pollock Pine and associated roads and urban development and extensive tracts of upland habitat separate Spivey Pond from the Project study area. The Project study area is in a different watershed than Weber Creek, and no waterway or other hydrological feature exists between the Spivey Pond population and the Project area. Spivey Pond is 1.8 miles from proposed Project improvements at the El Dorado Canal. There are no historical records (Barry and Fellers 2013) or current records for California red-legged frog in or near the Project study area and this species is not expected to occur in areas potentially affected by Project activities.

Foothill Yellow-Legged Frog

Habitat Description – Foothill yellow-legged frogs are typically found in rocky streams and rivers with open, sunny banks, within woodland or chaparral habitats at elevations from sea level up to approximately 6,000 feet (CDFW 2019). They may also be found in isolated pools, vegetated backwaters, and deep shaded spring-fed

pools. This species is primarily aquatic, rarely encountered far from permanent water. Foothill yellow-legged frogs spend most of their time in or near streams with a home range of less than 33 ft from a body of water. Uncommonly, longer-distance movements up to 165 feet may occur during heavy precipitation events but significant seasonal movements or migrations from breeding areas have not been reported. The foothill yellow-legged frog is found in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow type habitats. Adults can be observed basking on exposed rock near the streams they inhabit. During periods of inactivity or hibernation, individuals seek cover under rocks in the streams or on shore near the water. Food sources for adult foothill yellow-legged frog consist of aquatic and terrestrial invertebrates. Adult insects appear to be favored, but snails, and pieces of molted skin have also been found in stomach samples (Fitch 1936). Tadpoles graze on algae and diatoms along rocky stream bottoms.

Life History – Foothill yellow-legged frogs usually breed after the rainy season around mid-March to May, depending on local water conditions. The breeding season for foothill yellow-legged frog lasts approximately two weeks. Females attach egg clusters to gravel or rocks in moving water near stream margins. The egg clusters consist of 200 to 300 eggs with a high and low range of 100 to 1,000 eggs. The eggs are hatched in about five days. The tadpoles will reach maximum sizes of 2.2 inches and larval development takes three to four months.

Occurrence in the Project Study Area – Three CNDDB records (Occurrence #18, 20, and 22) of foothill yellow-legged frog have been reported in the Project study area on the South Fork and tributaries. The District conducts targeted surveys for this species, most recently in 2021, at established monitoring locations in the following areas: South Fork upstream of Silver Creek, at the River's confluence with Soldier Creek, at Ogilby Creek and upstream and downstream of the Creek's confluence with the River, at Alder Creek, and on the South Fork at Maple Grove (EID 2022a). No foothill yellow-legged frogs were detected during the 2021 surveys except for two eggs masses observed at the Maple Grove monitoring location. This monitoring location is 0.24 miles from the proposed Project improvements at the El Dorado Canal. The Project area could provide potentially suitable habitat for the foothill yellow-legged frog and this species could occur in areas potentially affected by Project activities.

Sierra Nevada Yellow-Legged Frog

Habitat Description – Sierra Nevada yellow-legged frogs are typically found at elevations extending from 4,500 feet to over 11,980 feet (Jennings and Hayes 1994). This species is associated with streams, lakes and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitats (Zeiner et al 1988-1990).

Life History – Adults forage for prey at the bottom of lakes, ponds, streams, and onshore, where they feed on terrestrial and aquatic insects as well as other amphibians (USFWS 2024c). This frog overwinters at the bottom of a water body, and they return to the same summer and overwintering habitats each year (USFWS 2024c). They are primarily diurnal and lay eggs in shallow water attached to gravel or rocks (Zeiner et al 1988-1990).

Occurrence in the Project Study Area – Sierra Nevada yellow-legged frogs are considered a high-elevation species, ranging from 4,500 feet to 12,000 feet in elevation (USFWS 2024a). The nearest CNDDB occurrences (#211, #500) are above 5,000 feet in elevation and are within 3 miles of the Project study area. The Project study area is within mapped habitat (USFWS 2024c, CDFW 2024i) for this species, and this species has been detected during the District's targeted surveys at Lake Aloha auxiliary dam ponds (EID 2022b) at an elevation of

approximately 8,000 feet. Project construction is expected to occur below approximately 4,300 feet in elevation and therefore this species is not expected to occur in areas potentially affected by Project activities.

Northwestern Pond Turtle

Habitat Description – Northwestern pond turtles are typically found at elevations below 4,690 feet in permanent or nearly permanent aquatic habitat throughout California west of the Sierra-Cascade crest. They can be found in waters with temperature as low as 1 degrees Celsius (°C) or as high as 39–40ºC (Jennings and Hayes 1994). Most activity is diurnal but some crepuscular and nocturnal activity has been observed. During the breeding season females will move up to 325 feet over land to find suitable nesting sites. Other overland movement will occur in response to drying or depreciation of the current habitat. Habitats suitable for northwestern pond turtle include permanent ponds, lakes, streams, irrigation ditches or permanent pools associated with intermittent streams. Adults can be observed basking on partially submerged logs, rocks, mats of floating vegetation, or open mud banks near the water bodies they inhabit. Hatchlings are susceptible to desiccation caused by hot and dry conditions. Western pond turtles are active all year if conditions are warm but will hibernate in the muddy substrate of their aquatic habitat during cold periods. Food sources for western pond turtles include aquatic plants, beetles, aquatic invertebrates, fish, frogs, and even carrion (Stebbins 1972).

Life History – Northwestern pond turtles reach sexual maturity at approximately eight years. The turtles breed during spring or early summer and eggs are laid between March and August, depending on local conditions. There are two distinct habitats may be used for oviposition (Storer 1930). The first habitat consists of large slow-moving streams where the eggs are deposited in nests constructed on the sandy banks of the stream. The second habitat is in foothill streams where the eggs are deposited in nests on a hillside, sometimes a considerable distance from the aquatic habitat. Although soil types are not a determining factor, the soil depth must be at least 4 inches deep for nesting. Females lay between three and 11 eggs and incubation ranges from 73 to 80 days.

Occurrence in the Project Study Area – Northwestern pond turtles have been observed at Forebay Reservoir and the CNDDB shows three occurrences (#444, 768, and 1,482). Of those three CNDDB records, one of them is within the Sly Park Quadrangle where Project construction activities along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake may occur. The Project study area supports suitable habitat for northwestern pond turtle and this species could occur in areas potentially affected by Project activities.

American Goshawk

Habitat Description – American goshawk breeds in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mountains, Mount Pinos, San Jacinto, San Bernardino, and White Mountains. This species prefers middle to high elevations in mature and dense conifer and deciduous forests interspersed with meadows, forest openings, and riparian areas. Some goshawks may stay year-long in their breeding areas and others winter along the north coast, throughout foothills, or in pinyon-juniper or riparian areas of the northern deserts. Hunts for species such as medium sized birds and small mammals in wooded areas with ample snags or perches. Perches are used for diving towards prey which are caught in air, on ground, or in vegetation.

Life History – American goshawks start nesting in April in southern California, and mid-June in the north. Nesting habitat is typically in the densest part of the territory, on north-facing slopes, near a body of water (Jackman and Scott 1975). Clutch sizes are 1–5 eggs laid in 3-day intervals. for average clutch of 3 (range 1–5).

The eggs are incubated for 36–41 days, juveniles fledge approximately 40–45 days after hatching and the juveniles begin to hunt by 50 days, and often independent by 70 days.

Occurrence in the Project Study Area – The Project study area supports potentially suitable foraging and nesting habitat for American goshawk. One post-breeding goshawk was observed in August 1989 (CNDDB Occurrence #270) within 0.5 miles of the Project area, where Project construction activities along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake.

Bald Eagle

Habitat Description – Bald eagles in California are permanent residents, but some may also migrate to access larger food sources in the winter. Nesting habitat is found in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. The species has also been reintroduced into the central coast. Their winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, east of the Sierra Nevada south of Mono County, and some rangelands and coastal wetlands. About half of the wintering population is in the Klamath Basin. Bald Eagle foraging habitat requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches in large limbed trees, or rocky outcrops near water. Bald eagles will roost communally during the winter in dense, sheltered, and remote conifer stands. Bald eagle nesting habitat requires large, old-growth trees or snags in remote, mixed stands of trees located near a permanent water source. Bald eagles favor tall ponderosa pines and tree stands with less than 40% canopy (Call 1978). Food sources for bald eagles include fish, birds, voles, or other small mammals. Perches used for diving and catching prey are a necessary resource for the eagles.

Life History – Bald Eagles can be found nesting between February and July with peak activity occurring between March to June. Clutch sizes are usually two eggs but the high to low range is one to three eggs. The eggs are incubated for 34–36 days, and the juvenile eagles will stay around the nest tree for 56–98 days (Cornell Lab of Ornithology 2023).

Occurrence in the Project Study Area – This species has been observed in the Project study area. There are four CNDDB records describing observations near the Project, and a nest located near Jenkinson Lake (EID 2024). Of those four CNDDB records, none of them are in the vicinity of Project construction activities anticipated along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The nearest CNDDB occurrence of a nesting pair (#125) is 7.0 miles north of the Project area.

California Spotted Owl

Habitat Description – California spotted owls are permanent residents found throughout the Sierra Nevada Mountains from Lassen County south to central Kern County. The Southern California mountain population is more fragmented occurring from Monterey County south through the Transverse and Peninsular ranges to coastal mountains and southern San Diego County. In northern California, California spotted owls establish territories in dense, old-growth, multi-layered mixed conifer, redwood, and Douglas-fir forests and high habitat complexity at elevations of approximately 0–760 feet above mean sea level (AMSL). In southern California, this owl is more commonly associated with oak and oak-conifer habitats (Garrett and Dunn 1981). California spotted owls do not tolerate heat so roost selection will commonly be near water, under dense canopy, and on north-facing slopes in the summer (USFWS 2022). The preference for habitat complexity aligns with improved foraging opportunities

by providing habitat for prey species such as small mammals, small birds, bats, and arthropods. Perches used for diving and catching prey are a necessary resource for the owls.

Life History – California spotted owls start nesting mid-February with peak activity occurring mid-April. Nests are typically found three to 180 feet above the ground in a tree or snag cavity, the broken top of large tree, large, abandoned nest, cave, crevice, or cliff (Call 1978). Clutch sizes are 1-3 eggs. The eggs are incubated for 28–32 days, juveniles fledge approximately 35 days after hatching and the juveniles will stay around the nest tree for the duration of the nesting season (USFWS 2022).

Occurrence in the Project Study Area – This species has been observed within the Project area. There are 61 CNDDB records describing observations within five miles of the Project area where Project construction activities along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake is expected to occur. The Project study area supports suitable foraging and nesting habitat for California spotted owl and this species could occur in areas potentially affected by Project activities.

Willow Flycatcher

Habitat Description – A rare to locally uncommon, summer resident in wet meadow and montane riparian habitats from 2,000 to 8,000 feet in the Sierra Nevada (Zeiner et al 1988-1990). Occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows (Serena 1982).

Life History – Dense willow thickets are required for nesting and roosting and they usually nest near streams, standing water or seeps (Zeiner et al 1988-1990). Peak egg laying occurs in June with an incubation period of 12-13 days and both sexes care for the altricial young (Zeiner et al 1988-1990).

Occurrence in the Project Study Area – There are no confirmed nesting records for willow flycatcher in the Project study area, but eBird reports willow flycatcher observations from May, June and July. These records could be from transitory migrants but potential breeding cannot be ruled out without a habitat assessment to determine if suitable nesting habitat is present. The Project area may provide suitable nesting habitat for willow flycatchers and this species has the potential to occur in areas affected by Project construction activities.

Fringed Myotis

Habitat Description – Fringe myotis occurs in the Central Valley of California. The fringe myotis prefers open habitat in pinyon-juniper, valley foothill hardwood, and hardwood-conifer forests between 4,000 to 7,000 AMSL. Like other bats, this nocturnal species roosts in caves, mines, buildings, and crevices. They may have differing day and night roosts. The period of hibernation lasts from October through March. A water source such as a stream, lake, or pond and foraging areas are necessary when the myotis emerges after sunset to feed on beetles, moths, arachnids, and orthopterans (Black 1974). This species is migratory, making relatively short, local movements to suitable hibernacula.

Life History – Maternity colonies inhabit roosts late April to September. During this time, as many as 200 individual females group together during the rearing of young. These groups may also stay together during hibernation. Mating occurs in fall, but fertilization is delayed until spring. Fringe myotis gestation lasts 50–60 days and most young are born between May and July with peak in June. One pup is born per pair, per year.

Occurrence in the Project Study Area – This species has been observed roosting within 2.1 miles of the Project area, where Project construction activities are proposed along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The Project area supports suitable foraging and roosting habitat for fringed myotis, and this species could occur in areas affected by Project activities.

Townsend's Big-eared Bat

Habitat Description – Townsend's big-eared bat is found throughout California, in all but subalpine and alpine habitats. Like other bats, this nocturnal species roosts in cold, closed areas such as caves, mines, tunnels, buildings, or other human-made structures. They may have differing day and night roosts. This species is extremely sensitive to disturbance and if disturbed, they may abandon the roost. The period of hibernation lasts from October through April. A water source such as a stream, lake, or pond and foraging areas are necessary when the myotis emerges after sunset to feed on beetles, moths, and soft bodied insects. Townsend's big-eared bat is a sedentary species and only makes short movements to hibernation sites (Pearson et al. 1952).

Life History – Maternity colonies inhabit warm roosts late April to September. During this time, fewer than 100 individual females group together during the rearing of young. These groups begin to break apart in August. Mating occurs in fall, but fertilization is delayed until spring. Gestation lasts 56–100 days and most young are born between May and June with peak in late May. One pup is born per pair, per year.

Occurrence in the Project Study Area – This species has not been observed within 10 miles of the Project area or where Project construction activities may occur along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The Project study area supports suitable foraging and roosting habitat for Townsend's big-eared bat, and given the species wide range, it is possible this species could occur in areas potentially affected by Project construction activities.

Sierra Nevada Mountain Beaver

Habitat Description – Sierra Neveda Mountain beavers are found throughout the Cascade, Klamath, and Sierra Nevada Ranges. Typical habitat in the Sierra Nevada is montane riparian (Borrecco and Anderson 1980) where they occur in areas with canopy coverage and a dense understory near water. Deep, friable soils are required for burrowing, along with a cool, moist microclimate (Zeiner et al 1988-1990). Distribution often is scattered. Their populations are uncommon in the Sierra Nevada.

Life History – Mountain beavers breed from December through March with young born February to June. Their longevity is unknown. They are mostly nocturnal but occasionally diurnal (Maser et al. 1981). Their burrows are preferably near a stream or spring and are located within deep soils (Zeiner et al 1988-1990).

Occurrence in the Project Study Area – This species has not been observed within Project study area or where ground disturbance, vegetation removal, and Project construction activities are proposed (along the El Dorado Canal and along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake). There are no CNDDB records within 2 miles of the Project study area, but burrows of mountain beavers were found approximately 5 miles to the north of the Project area in riparian habitats along natural drainages or springs near Union Valley Reservoir and Ice House Reservoir. The El Dorado Canal is an artificial water conveyance system lacking riparian habitat, dense understories or friable soils and is not expected to provide suitable habitat

for this species. Additionally, the drainage from the Hazel Tunnel Outlet to Jenkinson Lake is an ephemeral channel and typically only has water in it when the District diverts water and is near is a well-developed recreation area and campground with high levels of human disturbance. Given the lack of suitable riparian habitat, dense understory and friable soils, this species is not expected to occur in areas potentially affected by Project construction or operation.

FISHERIES RESOURCES

The fisheries of the Sierra Nevada have generally shifted from native species to non-native or introduced species as streams and reservoirs have been manipulated for storage, flood control and power generation over the last 100 years. For many years, CFDW has stocked the Upper American River and its tributaries with hatchery-bred species such as trout and bass (CDFW 2024c). Populations of native fishes throughout the system have been reduced due to habitat and water quality deterioration coupled with the introduction of non-native fishes (Moyle and Nichols 1974). Non-native fish are likely responsible for declines in the abundance of native invertebrate and amphibian species, particularly at higher elevations (Moyle et al. 1996, Knapp and Mathews 2000). Historically, native rainbow trout (*Oncorhynchus mykiss*) have been present in the Sierra Nevada, but their genetic composition has likely been altered by hybridization with introduced hatchery-bred trout (Rogers et al. 1996).

Appendix D-1 summarizes the habitat requirements and likelihood of occurrence for special-status fish species in the Project study area that were identified by the database searches (Appendix D-2) and additional desktop research. Those species that could occur in areas potentially affected by Project construction or operation and are listed below.[3]

- Pacific lamprey (*Entosphenus tridentatus*) – SSC, FS
- Chinook Salmon – Central Valley spring-run evolutionarily significant units (ESU) (*Oncorhynchus tshawytscha* pop. 11) – FT, ST
- Chinook Salmon – Central Valley fall/late-fall-run ESU (*Oncorhynchus tshawytscha* pop. 13) – SSC
- Chinook Salmon – Central Valley winter-run ESU (*Oncorhynchus tshawytscha* pop. 7) – FE, SE
- Steelhead – Central Valley DPS (*Oncorhynchus mykiss irideus* pop. 11) – FT
- Central California Roach (*Lavinia symmetricus symmetricus*) – SSC
- Hardhead (*Mylopharodon conocephalus*) – SSC, FS
- Riffle Sculpin (*Cottus gulosus*) – SSC

A description of each of these species' habitat, lifecycle, and the known occurrences in the Project study area are provided below.

Pacific Lamprey

Habitat Description – Pacific lamprey are found in the Sacramento and San Joaquin Rivers, and tributaries of the San Francisco Bay and Delta (Moyle 2002; Moyle et al. 1995). Typically anadromous, however; some landlocked forms of lamprey exist. Lamprey live two distinct life cycles. As ammocoetes they live in freshwater for 5–7

[3] State (S) or Federal (F)", "candidate (C), threatened (T), or endangered (E)"; by the USFWS and CDFW; or species designated as "species of special concern (SSC)" in California; or fish species classified as "sensitive (FS)" by the Eldorado National Forest Service were considered for this report.

years and then move towards the ocean. Adults later return to freshwater to spawn and then die (University of California 2024).

Life History – Pacific lampreys spawn in similar habitats to salmon; in gravel bottomed streams, at the upstream end of riffle habitat, typically above suitable ammocoete habitat. Spawning occurs between March and July depending upon location within their range (USFS 2025). Breeding lampreys spawn in depressional nests in waters with low-gradient riffle, at depths of 30–150 centimeters (cm), and at temperatures of 12–18 °C (Moyle 2002). Both sexes construct the nests, often moving stones with their mouth. After the eggs are deposited and fertilized, the adults typically die within 3 to 36 days after spawning (USFS 2025).

Occurrence in the Project Study Area – This species current range occurs within the Lower American River but is precluded from the rest of the Project area by Nimbus Dam.

Chinook Salmon – Central Valley Spring-run ESU

Habitat Description – Spring run, Central Valley Chinook Salmon DPS (pop. 11) are found in the Sacramento River Drainage and in the Feather River. Anadromous fish that are born and rear in freshwater, migrate to the ocean, and return to their natal streams to spawn and die. This species occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5 °C. (Moyle 2002). The spawning fish typically choose riffle regions with large gravel substrate with runs, and cold-water pools to hold the adults.

Life History – Females build nests or redds in the gravel where she deposits eggs between late-August to early October (Yoshiyama et al., 1998). Fertilized eggs will remain in the gravel for 40–60 days. The alevins remain near substrate for another 4–6 weeks (University of California 2024). When they emerge from the yolk sac, fry they are typically swept down to areas with slower moving water. Water temperature influences growth of the fry, with an optimal range between 13–18°C. Temperatures above 24°C are lethal for the fry (University of California 2024).

Occurrence in the Project Study Area – This species is known to spawn (Moyle 1992) and rear (NMFS 2019) within the Lower American River but is precluded from the rest of the study area by Nimbus Dam.

Chinook Salmon – Central Valley Winter-run ESU

Habitat Description – Winter run, Central Valley Chinook Salmon DPS (pop. 7) are found in the Sacramento River Drainage and in the Feather River. Anadromous fish that are born and rear in freshwater, migrate to the ocean, and return to their natal streams to spawn and die. This species occurs in well-oxygenated, cool, riverine habitat with water temperatures from 10-16°C. (Moyle et al., 2017). The spawning fish typically choose riffle regions with large gravel substrate with runs, and cold-water pools to hold the adults.

Life History – Females build nests or redds in the gravel where she deposits eggs between late April – early August (Yoshiyama et al., 1998). Fertilized eggs will remain in the gravel for 40–60 days. Temperatures above 16°C are lethal to incubating eggs (Slater 1963). The alevins remain near substrate for another 4–6 weeks (University of California 2024). When they emerge from the yolk sac, fry they are typically swept down to areas with slower moving water. Water temperature influences growth of the fry, with an optimal range between 5.8-14.4°C (NMFS 2014). Temperatures above 24°C are lethal for the fry (University of California 2024).

Occurrence in the Project Study Area – This species is known to spawn (Moyle 1992) and rear (NMFS 2014) within the Lower American River but is precluded from the rest of the study area by Nimbus Dam.

Chinook Salmon – Central Valley Fall/late-fall-run ESU

Habitat Description – Fall/late-Fall run, Central Valley Chinook Salmon DPS (pop. 13) are found in the Sacramento River Drainage and in the Feather River. Anadromous fish that are born and rear in freshwater, migrate to the ocean, and return to their natal streams to spawn and die. This species occurs in well-oxygenated, cool, riverine habitat with water temperatures from 5.0 to 14.4°C. (Carter 2005). The spawning fish typically choose riffle regions with large gravel substrate with runs, and cold-water pools to hold the adults.

Life History – Females build nests or redds in the gravel where she deposits eggs between early-January to April for late-fall and late-April to early August for fall-run (Yoshiyama et al., 1998). Fertilized eggs will remain in the gravel for 40–60 days at temperatures below 12°C (Myrick and Cech, 2004). The alevins remain near substrate for another 4–6 weeks (University of California 2024). When they emerge from the yolk sac, fry they are typically swept down to areas with slower moving water. Water temperature influences growth of the fry, with an optimal range between 15–18°C (Marine and Cech 2004; Carter 2005). Temperatures above 24°C are lethal for the fry (University of California 2024).

Occurrence in the Project Study Area – This species is known to spawn (Moyle 1992) and rear (NMFS 2014) within the Lower American River but is precluded from the rest of the study area by Nimbus Dam.

Steelhead - Central Valley DPS

Habitat Description – Central Valley Steelhead DPS (pop. 11) are found in the Sacramento and San Joaquin rivers and tributary Central Valley rivers of California. Although the species is anadromous, some fish now live as resident inland trout and some of the inland trout migrate for the purpose of spawning or foraging. The resident inland trout spend their entire lives within a few hundred meters of stream or within the same lake they were produced while the sea-run fish (steelhead) hatch in freshwater and then migrate to the ocean, finally returning home to spawn (University of California 2024).

Life History – Spawning occurs in riffles or pool tails of gravelly streambeds. After breeding the resident trout disperse to slower waters and the steelhead rest before moving back out to sea. This population occurs in well-oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18°C (Moyle 2002). Optimal growth occurs at 15–18ºC with saturation levels of dissolved oxygen and mortality typically results at 24–27ºC with saturation levels of dissolved oxygen above 1.5-2.0 milligrams per liter (mg/L). Hatching takes 3–4 weeks and fry will emerge from the redd area after another 2–3 weeks (University of California 2024).

Occurrence in the Project Study Area – This species is known to spawn, rear and migrate with the Lower American River but is precluded from the rest of the study area by Nimbus Dam.

Central California Roach

Habitat Description – Central California roach are found in tributaries to the Sacramento and San Joaquin rivers and tributaries to San Francisco Bay. The species is most abundant in Sierra Nevada foothill mid-elevation streams. A resilient freshwater species, roaches are able to tolerate a wide range of temperatures and dissolved oxygen levels. Because of this resilience they can be found in a variety of aquatic habitats such as varied as cold,

clear, well-aerated streams (Moyle et al. 1982, Roscoe 1993) and intermittent streams with high temperatures (30 to 35˚ C) and low dissolved oxygen levels (1–2 parts per million [ppm]) (Moyle et al. 1982, Castleberry et al. 1990).

Life History – Temperature dependent, roach spawning occurs in March through early July, when water temperatures exceed 16˚C. Most growth occurs during the summer months and Roach may grow 20–40 millimeters (mm) in a year. Eggs are laid on and into substrates of gravel beds or riffles. Eggs hatch in 2-3 days, but the larvae remain in the protection of the nest area until they are large enough to swim (University of California 2024).

Occurrence in the Project Study Area – This species has the potential to occur within Jenkinson Lake (Stillwater Sciences 2021) and its current range includes Folsom Reservoir. This species is known to occur within the South Fork (Stillwater Sciences 2021) and the Sacramento River Drainage (Moyle 2002).

Hardhead

Habitat Description – Hardhead are widely distributed in tributary streams at low to mid-elevations in the Sacramento River, San Joaquin River, and Russian River drainages (Moyle 2002). On the Sacramento River, they occur in both the mainstem and tributaries up to 1,500 meters (m) in elevation. As bottom feeders, they prefer relatively undisturbed habitats of larger streams and reservoirs with deep (>80 cm), clear water, slow (20–40 centimeter per second [cm/sec]) velocities and sand-gravel-boulder substrates with water temperatures around 20 °C (Moyle et al. 1995).

Life History – Hardhead primarily spawn between April and May, although the spawning season may occasionally extend into August in the foothill streams of the Sacramento-San Joaquin drainage (Wang 1986). Spawning adults from larger rivers and reservoirs may migrate more than 75 kilometers (km) in April and May to spawn in tributary streams (Moyle et al. 1995). They migrate to spawning pools and deposit their fertilized eggs in sand or gravel in riffles, runs, or heads of pools (Wang 1986; Moyle 2002).

Occurrence in the Project Study Area – This species is known to occur within Folsom Reservoir (Kimsey et al. 1956), Slab Creek Reservoir, Chili Bar Reservoir, and in the South Fork (Stillwater Sciences 2021, Moyle 2002) and Lower American River (Moyle 2002).

Riffle Sculpin

Habitat Description – Riffle sculpin inhabit isolated watersheds in the Central Valley drainage and the central coast and occur in the South Fork (Stillwater Sciences 2021, Moyle et al. 1995). They live in permanent, cool, clear, shaded, headwater streams where riffles and rocky substrates and moderate gradients (Moyle 2002, Leidy 2007). They can also be found in small pools that contain undercut banks, rubble, and cover. Riffle sculpin are most abundant in water that does not exceed 25–26°C for extended periods of time. Temperatures above 30°C are usually lethal. Dissolved oxygen levels must be at or near saturation, a requirement that also restricts them to areas with flowing water (Moyle et al. 1995).

Life History – Spawning begins in February and continues until around April (Moyle 2002). Nest sites are placed under rocks in swift riffles or inside cavities in submerged logs. Embryos hatch in 11 (at 15°C) to 24 (at 10°C) days (Moyle et al. 1995). Fry assume a benthic existence and remain close to the nest.

Occurrence in the Project Study Area – This species current range includes Folsom Reservoir, and is known to occur within Slab Creek Reservoir, Chili Bar Reservoir and in the South Fork (CDFW 2020, Stillwater Sciences 2021, Moyle 2002) and Lower American River (Moyle 2002).

Fish Communities

Fish communities of Jenkinson Lake and El Dorado Forebay are largely composed of stocked trout (CDFW 2024c) and stocked rainbow trout (Stillwater Sciences 2021). Native species such as Central California roach (*Hesperoleucus symmetricus*), Sacramento sucker (*Catostomus occidentalis*), and speckled dace (*Rhinichthys osculus*) have the potential to occur, but the data is limited. Other non-native species that could occur include smallmouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) (Stillwater Sciences 2021).

Fish communities in Folsom Reservoir include hatchery trout, catfish, largemouth bass (*Micropterus salmoides*), smallmouth bass, perch, and kokanee salmon (*Oncorhynchus nerka*). (CDFW 2024c, California State Parks 2024). Fish populations in Slab Creek Reservoir and Chili Bar Reservoir include native hardhead (*Mylopharodon conocephalus*), Sacramento pikeminnow (*Ptychocheilus grandis*), and Sacramento sucker, and non-native brown trout (*Salmo trutta*) (Stillwater Sciences 2021).

The South Fork between the El Dorado Powerhouse and Folsom Reservoir supports native fish species such as Central California roach, hardhead, riffle sculpin (*Cottus gulosus*), speckled dace, rainbow trout, Sacramento pikeminnow (*Ptychocheilus grandis*) and stocked Chinook salmon (*Oncorhynchus tshawytscha*). A few non-native species that can be found here include brown trout, small mouth bass and bluegill (Stillwater Sciences 2021).

The South Fork between the El Dorado Diversion Dam and El Dorado Powerhouse support native fish species such as Central California roach, hardhead, riffle sculpin, rainbow trout and non-native species such as brown trout (Stillwater Sciences 2021).

SENSITIVE HABITATS

Sensitive habitats are those that are of special concern to resource agencies or afforded specific consideration in the State California Environmental Quality Act (CEQA) Guidelines, Section 1602 of the California Fish and Game Code, Section 404 of the Clean Water Act, and the State's Porter–Cologne Act. The programmatic analysis of biological resources in the Project study area did not include site-specific surveys for landcover mapping or assessments of riparian habitat, wetlands or other waters, or other sensitive natural communities and therefore the discussion below is a general description of sensitive habitats potentially occurring in the Project study area.

Riparian Habitat

Riparian habitat consists of herbaceous plants, shrubs, and/or trees growing along waterways. Riparian vegetation in the Project area generally occurs in the form of a narrow fringe along the edges of the stream channels and reservoirs. Riparian vegetation is sparse or absent in subreaches characterized by bedrock or boulder banks but generally occurs wherever suitable substrates are present. These riparian fringes of the South Fork are generally mesic to hydric areas, with a canopy of cottonwoods (*populus* spp.), white alder (*Alnus rhombifolia*), big-leaf maple (*Acer macrophyllum*), and willow (S*alix* sp.). These areas may contain wetlands and the understory is a typically a dense mixture of dogwood (*Cornus* sp.), hazelnut (C*orylus cornuta*), Himalayan blackberry, sedges, ferns, grasses, and forbs. Riparian habitat may also be present along the channel that conveys water from the

outfall of the Hazel Creek Tunnel to Jenkinson Lake, and along portions of the El Dorado Canal where drainages and tributaries to the South Fork occur.

Wetlands and Other Waters

Aquatic features within the Project area are potentially subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the Clean Water Act, and/or may be considered waters of the State under the Porter-Cologne Act and subject to regulation by the Central Valley Regional Water Quality Control Board (RWQCB). Streams (drainages) and associated riparian habitat are subject to regulation by CDFW under Section 1602 of the California Fish and Game Code. Streams and rivers in the Project area including the South Fork and Alder Creek qualify as Waters of the US subject to Section 404 of the Clean Water Act, as do reservoirs impounded from these streams. Wetlands associated with the streams and reservoirs may be subject to USACE jurisdiction or may qualify as waters of the state. Off-stream and off-reservoir wetlands in the Project study area may occur at natural seeps and springs and in areas with shallow groundwater or as artificial features due to leakage from water conveyance and storage facilities.

Sensitive Natural Communities

California natural communities are organized by CDFW and partner organizations, such as CNPS, based on vegetation type classification, and are ranked using the same system to assign global and State rarity ranks for plant and wildlife species in the CNDDB. Natural communities that are ranked S1–S3 are sensitive natural communities by CDFW and will be addressed in the environmental review process. Landcover mapping and an assessment of natural communities will be conducted prior to any construction work and appropriate permits will be obtained if warranted. In general, natural communities in the Project area include all riparian and wetland communities. In addition, limited areas of other sensitive natural communities such as serpentine or native grasslands, and certain conifer and scrub associations, may be present in the Project study area.

Wildlife Movement Corridors

Wildlife movement corridors have been recognized by federal and State agencies as habitat which includes migration paths, areas supporting interpopulation movement, and smaller travel corridors within an animal's territory or home range. The corridors between habitat types allow for wildlife passage between key habitat areas thus enabling connection between populations located in discrete areas and populations located in larger habitat areas. The mosaic of habitats found in large-scale landscapes result in wildlife populations that consist of discrete subpopulations composed of a large single population, often referred to as a metapopulation (McCullough 1996). Even where patches of pristine habitat are fragmented, the movement between wildlife populations are facilitated through migration and movement corridors. Depending on the condition of the linkage, gene flow between populations may be frequent resulting in high genetic diversity within a population; or less frequent gene flow resulting in low genetic diversity and complete isolation which if pressures are strong, potential local extinction (McCullough 1996, Whittaker 1998).

Within the Project area, the Pacific Deer Herd resides west of the Sierra Nevada crest in El Dorado and Placer Counties. The herds residential range is delineated by the Rubicon River on the north, the South Fork on the south, and roughly a north-south line above 2,500 feet elevation, paralleling Highway 49 between Placerville and Georgetown. (CDFW 2018, Hinz 1981). Additionally, the undisturbed and continuous expanses of land and

wetlands and/or stream channels, within the Project area are highly favored habitats to a variety of wildlife species.

Critical Habitats

The USFWS designates critical habitat for federally listed terrestrial species (including fish species that are primarily freshwater fish, such as Delta smelt). NMFS also designates critical habitat for federally listed fish that fall within their jurisdiction such as species with a marine life-stage, including anadromous fish. The following areas in the greater Project area (including the American River below Folsom Reservoir) are listed critical habitat:

- Designated critical habitat for steelhead – California Central Valley DPS (O*ncorhynchus mykiss irideus* pop. 11) is located along the Lower American River to the Nimbus Dam.
- Designated critical habitat for chinook salmon – Central Valley spring-run ESU (O*ncorhynchus tshawytscha* pop. 11) is located along the Lower American River to Watt Avenue.
- Designated critical habitat for California red-legged frog (*Rana draytonii*) is located south of U.S. highway 50, north off Jenkinson Lake.
- Designated critical habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is located along the banks of the Lower American River.

The CDFW designates critical habitat for mule deer (*Odocoileus hemionus*) (CDFW 2024d). The following areas within the Project area are listed critical habitat:

- The channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake is within designated critical winter habitat for the Mule Deer Range - Region 2, the Grizzly Flat Herd (*Odocoileus hemionus*).
- Much of the area along the South Fork from Kyburz to Folsom is designated as critical winter habitat for the Mule Deer Range - Region 2, the Pacific Herd (*Odocoileus hemionus*). The Project area from the El Dorado Diversion Dam to Folsom Reservoir is within this designated critical winter habitat.

4.4.3 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

Federal Endangered Species Act

Species listed under the federal ESA could be present in or near the Project area. USFWS and NMFS have authority over projects that may result in the "take" of a species federally listed as threatened or endangered under the ESA. Section 9 of the ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Federal regulations define take further to include habitat modification or degradation that would be expected to result in death or injury to listed wildlife. If a project would result in the take of a federally listed species, either an incidental take permit under ESA Section 10(a) or a federal interagency consultation under ESA Section 7 is required before the take may occur. Typically, the project proponent must minimize and compensate for take as a condition of such a permit.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act, first enacted in 1918, implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international protection of migratory birds. The Migratory Bird Treaty Act authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act makes it unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (U.S. Code [USC] Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the Migratory Bird Treaty Act includes several hundred species and includes nearly all native birds.

Clean Water Act Section 404

U.S. Environmental Protection Agency (USEPA)is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) is the primary federal law that governs and authorizes water-quality control activities by EPA and the states. CWA Section 404 requires a project proponent to obtain a permit from the U.S. Army Corps of Engineers USACE before engaging in any activity that involves discharging dredged or fill material into waters of the United States, including wetlands.

Clean Water Act Section 401

USEPA regulates surface water quality in waters of the United States under Section 401 of the federal CWA. CWA Section 401 Water Quality Certification provides states and authorized tribes with an effective tool to help protect the physical, chemical, and biological integrity of water quality, by providing them an opportunity to address the aquatic resource impacts of federally issued permits and licenses (33 USC section 1341). CWA 401 states that no federal permit or license can be issued if a proposed action may result in a discharge to waters of U.S., unless the USEPA/Tribe/State certifies that the discharge is consistent with standards and other water quality goals or waives certification (33 USC section 1341). CWA 401 compliance is required for any project that produces a federal action with construction that could have an impact to surface water quality. In the State of California (State), jurisdictional authority has been delegated to the Regional Water Quality Control Board (Regional Boards).

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Endangered Species Act

The California Endangered Species Act (CESA) directs state agencies to decline approval of projects that would jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of habitat essential to a species' continued existence. Furthermore, the CESA states that reasonable and prudent alternatives must be developed by CDFW together with the project proponent and any state lead agency. These reasonable and prudent alternatives must be consistent with conserving the species while maintaining the project purpose to the greatest extent possible. CESA defines "take" of a species as an activity that would directly or indirectly kill an individual of a species. Unlike the federal ESA's definition, the CESA's definition of take does not include "harm" or "harass." As a result, the threshold for take may be higher under the CESA than under the ESA because the CESA does not necessarily consider habitat modification to be take.

CESA Sections 2081(b) and 2081(c) allow CDFW to issue an incidental take permit for a state-listed threatened and endangered species only if certain criteria are met. Specifically, the take must be incidental to an otherwise lawful activity; the impacts of the authorized take must have been minimized and fully mitigated; and issuance of the permit must not jeopardize the continued existence of a state-listed species.

CDFW maintains a list of species considered threatened and endangered under the CESA. In addition, CDFW maintains lists of candidate species and species of special concern. Candidate species are those species under review for addition to the list of either threatened or endangered species. "Species of special concern" status applies to animals that are not listed under the federal ESA or CESA, but that nonetheless are declining at a rate that could result in listing; it also applies to animals that have historically occurred in low numbers, for which known threats to their persistence currently exist. The designation is intended to result in special consideration for these animals during environmental review.

California Fish and Game Code

Fully Protected Species. Sections 3511, 4700, 5050, and 5515 strictly prohibit the incidental or deliberate take of fully protected species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock; therefore, avoidance measures may be required to avoid take of fully protected species.

Protection of Bird Nests. Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy raptors (e.g., hawks, owls, eagles, falcons), including their nests or eggs.

Lake and Streambed Alteration. Under Section 1602 rivers, streams, and lakes in California are subject to regulation by CDFW. CDFW regulates diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake. As defined by CDFW, a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and that supports fish or other aquatic life.

Porter-Cologne Water Quality Control Act and Section 401 of the Clean Water Act

Under Section 401 of the federal CWA, an applicant for a Section 404 permit must obtain a certificate from the appropriate state agency stating that the intended dredging or filling activity is consistent with the state's water quality standards and criteria. In California, the SWRCB has delegated the authority to grant water quality certification to the nine RWQCBs. The planning area is under the jurisdiction of the Central Valley RWQCB.

Each of the nine RWQCBs must also prepare and periodically update a basin plan in accordance with the Porter-Cologne Water Quality Control Act (Porter-Cologne Act). Each basin plan sets forth water quality standards for surface water and groundwater and actions to control nonpoint and point sources of pollution. These actions seek to achieve and maintain the basin plan standards. Basin plans offer an opportunity to protect waterways and wetlands by establishing water quality objectives.

The RWQCB's jurisdiction includes federally protected waters under CWA Section 401 and state-protected waters under the Porter-Cologne Act. A "water of the state" is defined as any surface water or groundwater, including saline waters, within the boundaries of the state. The RWQCB has the discretion to take jurisdiction over areas not federally protected under Section 401 if they meet the definition of waters of the state. The

RWQCB typically requires the project proponents to mitigate impacts on waters and wetlands to ensure no net loss of functions and values.

The Native Plant Protection Act: CFGC, Section 1900 et seq.

The Native Plant Protection Act (NPPA) (California Fish and Game Code [CFGC], Section 1900 et seq.) was enacted in 1977 and is administered by CDFW. The NPPA prohibits "take" of endangered, threatened, or rare plant species native to California, with the exception of special criteria identified in the CFGC. A "native plant" means a plant growing in a wild uncultivated state which is normally found native to the plant life of the state. Under the CFGC, species become endangered, threatened, or rare when the plants' prospects of survival and reproduction are in immediate jeopardy for one or more causes (CFGC, Section 1900 et seq). "Rare" species can be defined as species that are: broadly disturbed but never abundant where found, narrowly disturbed or clumped yet abundant where found, and/or narrowly disturbed or clumped and not abundant where found. If potential impacts are identified for a proposed project activity, then consultation with CDFW, permitting, and/or other mitigation may be required. Endangered, threatened, and/or rare plant species can be identified through the CNPS CRPR (CNPS 2024).

Federal Energy Regulatory Commission

The District owns and operates Project No. 184, which is licensed by the Federal Energy Regulatory Commission. In compliance with the Project No. 184 Monitoring Program the District monitors many South Fork biological resources, including but not limited to rainbow trout, hardhead and other fish populations, foothill yellow-legged frogs, macroinvertebrates, and riparian composition and recruitment.

Regional and Plans, Policies, Regulations, and Ordinances

El Dorado County General Plan

The Project is proposed by the El Dorado Irrigation District, a special district that supplies water to customers throughout much of El Dorado County. Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis (EDCPD 2004, as amended).

The General Plan's goals and policies related to biological resources include the following:

- **Goal 7.3:** Water Quality and Quantity: Preserve and protect the supply and quality of the County's water resources including the protection of critical watersheds, riparian zones, and aquifers.

    - **Objective 7.3.1:** Preserve and protect the supply and quality of the County's water resources including the protection of critical watersheds, riparian zones, and aquifers.

        - **Policy 7.3.1.1:** Encourage the use of Best Management Practices, as identified by the Soil Conservation Service, in watershed lands as a means to prevent erosion, siltation, and flooding.

        - **Policy 7.3.1.2:** Establish water conservation programs that include both drought tolerant landscaping and efficient building design requirements as well as incentives for the conservation and wise use of water.

    - **Objective 7.3.2:** Maintenance of and, where possible, improvement of the quality of underground and surface water.

        - **Policy 7.3.2.1:** Stream and lake embankments shall be protected from erosion, and streams and lakes shall be protected from excessive turbidity.

        - **Policy 7.3.2.2:** Projects requiring a grading permit shall have an erosion control program approved, where necessary.

    - **Objective 7.3.3**: Protection of natural and man-made wetlands, vernal pools, wet meadows, and riparian areas from impacts related to development for their importance to wildlife habitat, water purification, scenic values, and unique and sensitive plant life.

        - **Policy 7.3.3.1:** For projects that would result in the discharge of material to or that may affect the function and value of river, stream, lake, pond, or wetland features, the application shall include a delineation of all such features. For wetlands, the delineation shall be conducted using the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual.

        - **Policy 7.3.3.3:** The County shall develop a database of important surface water features, including lake, river, stream, pond, and wetland resources

        - **Policy 7.3.3.4:** The Zoning Ordinance shall be amended to provide buffers and special setbacks for the protection of riparian areas and wetlands. The County shall encourage the incorporation of protected areas into conservation easements or natural resource protection areas.

Exceptions to riparian and wetland buffer and setback requirements shall be provided to permit necessary road and bridge repair and construction, trail construction, and other recreational access structures such as docks and piers, or where such buffers deny reasonable use of the property, but only when appropriate mitigation measures and Best Management Practices are incorporated into the project. Exceptions shall also be provided for horticultural and grazing activities on agriculturally zoned lands that utilize "best management practices (BMPs)" as recommended by the County Agricultural Commission and adopted by the Board of Supervisors.

Until standards for buffers and special setbacks are established in the Zoning Ordinance, the County shall apply a minimum setback of 100 feet from all perennial streams, rivers, lakes, and 50 feet from intermittent streams and wetlands. These interim standards may be modified in a particular instance if more detailed information relating to slope, soil stability, vegetation, habitat, or other site- or project-specific conditions supplied as part of the review for a specific project demonstrates that a different setback is necessary or would be sufficient to protect the particular riparian area at issue.

For projects where the County allows an exception to wetland and riparian buffers, development in or immediately adjacent to such features shall be planned so that impacts on the resources are minimized. If avoidance and minimization are not feasible, the County shall make findings, based on documentation provided by the project proponent, that avoidance and minimization are infeasible.

  - **Policy 7.3.3.4:** Rivers, streams, lakes and ponds, and wetlands shall be integrated into new development in such a way that they enhance the aesthetic and natural character of the site while disturbance to the resource is avoided or minimized and fragmentation is limited.

- **Objective 7.3.4:** Protection and utilization of natural drainage pattern

  - **Policy 7.3.4.1:** Natural watercourses shall be integrated into new development in such a way that they enhance the aesthetic and natural character of the site without disturbance.

  - **Policy 7.3.4.2:** Modification of natural stream beds and flow shall be regulated to ensure that adequate mitigation measures are utilized.

- **Objective 7.3.5:** Conservation of water resources, encouragement of water conservation, and construction of wastewater disposal systems designed to reclaim and re-use treated wastewater on agricultural crops and for other irrigation and wildlife enhancement projects.

  - **Policy 7.3.5.4:** Require efficient water conveyance systems in new construction. Establish a program of ongoing conversion of open ditch systems shall be considered for conversion to closed conduits, reclaimed water supplies, or both, as circumstances permit.

- **Goal 7.4:** Wildlife and Vegetation Resources: Identify, conserve, and manage wildlife, wildlife habitat, fisheries, and vegetation resources of significant biological, ecological, and recreational value.

  - **Objective 7.4.2:** Identification and protection, where feasible, of critical fish and wildlife habitat including deer winter, summer, and fawning ranges; deer migration routes; stream and river riparian habitat; lake shore habitat; fish spawning areas; wetlands; wildlife corridors; and diverse wildlife habitat.

    - **Policy 7.4.2.1:** The County will coordinate wildlife and vegetation protection programs with appropriate Federal and State agencies.

    - **Policy 7.4.2.2:** The County shall continue to support the Noxious Weed Management Group in its efforts to reduce and eliminate noxious weed infestations to protect native habitats and to reduce fire hazards.

- **Policy 7.4.2.4:** Protect and preserve wildlife habitat corridors within public parks and natural resource protection areas to allow for wildlife use. Recreational uses within these areas shall be limited to those activities that do not require grading or vegetation removal.

- **Policy 7.4.2.8:** Conserve contiguous blocks of important habitat to offset the effects of increased habitat loss and fragmentation elsewhere in the County through a Biological Resource Mitigation Program (Program). The Program will result in the conservation of:

Habitats that support special status species; Aquatic environments including streams, rivers, and lakes; Wetland and riparian habitat; Important habitat for migratory deer herds; and large expanses of native vegetation.

Habitat Protection Strategy. The Program establishes mitigation ratios to offset impacts to special-status species habitat and special-status vegetation communities within the County. Special-status species include plants and animals in the following categories:

- Species listed or proposed for listing as Threatened or Endangered under the ESA or the CESA;
- Species considered as candidates for listing as Threatened or Endangered under ESA or CESA;
- Wildlife species identified by CDFW as Species of Special Concern;
- Wildlife species identified by USFWS and NMFS as Species of Concern;
- Plants listed as Endangered or Rare under the California Native Plant Protection Act;
- Animals fully protected under the California Fish and Game Code;

Plants that have a CNPS CRPR of 1A (plants presumed extirpated in California and either rare or extinct elsewhere), 1B (plants rare, threatened, or endangered in California and elsewhere), 2A (plants presumed extirpated in California, but more common elsewhere), or 2B (plants rare, threatened, or endangered in California, but more common elsewhere). The CNPS CRPRs are used by both CDFW and USFWS in their consideration of formal species protection under ESA or CESA. With the exception of oak woodlands, which would be mitigated in accordance with the Oak Resources Management. Plan (ORMP) (see General Plan Policy 7.4.4.4), mitigation of impacts to vegetation communities will be implemented in accordance with the table in the plan. Preservation and creation of the following vegetation communities will ensure that the current range and distribution of special-status species within the County are maintained.

Biological Resources Assessment. A site-specific biological resources technical report will be required to determine the presence of special-status biological resources that may be affected by a proposed discretionary project. Vegetation communities and special-status plants shall be mapped and assessed in accordance with the CDFG 2009 Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities and subsequent updates, and the List of Vegetation Alliances and Associations (CDFG 2010) and subsequent updates. Any surveys conducted to evaluate potential presence of special-status wildlife species shall conform to practices recommended by CDFW and/or USFWS at the time of the surveys. The report will include an assessment of direct, indirect and cumulative impacts to biological resources, including vegetation communities, plant and wildlife species and wildlife movement. The report shall include recommendations for:

Pre-construction surveys and avoidance/protection measures for nesting birds; roosting bats; avoidance and minimization measures to reduce impacts related to entrapment, entanglement, injury, or poisoning of wildlife; and avoidance and minimization measures to reduce indirect impacts to wildlife in open space adjacent to a project site. The results of the biological resources technical report shall be used as the basis for establishing mitigation requirements in conformance with this policy and the Oak Resources Management Plan (ORMP, see General Plan Policy 7.4.4.4).

- **Objective 7.4.4:** Protect and conserve forest, oak woodland, and tree resources for their wildlife habitat, recreation, water production, domestic livestock grazing, production of a sustainable flow of wood products, and aesthetic values.

  - **Policy 7.4.4.4:** For all new development projects or actions that result in impacts to oak woodlands and/or individual native oak trees, **including** Heritage Trees, the County shall require mitigation as outlined in the El Dorado County Oak Resources Management Plan (ORMP)

4.4.3 IMPACT ANALYSIS

METHODOLOGY OF ANALYSIS

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to Reservoir 1 WTP and 2) to Jenkinson Lake for either storage or immediate delivery to Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements

to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- The existing infrastructure phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The following subsections describe the methodology for determining impacts to biological resources at affected reservoirs and rivers and the adjacent uplands, where applicable. Hydrologic modeling conducted for the Project was the primary data source of information about potential changes to water levels in reservoirs and in the South

Fork and water temperature changes that could affect biological resources. The evaluation of potential hydrological impacts of the Project is described in detail in EIR Section 4.10, *Hydrology and Water Quality*, and is based on application of quantitative modeling results and qualitative assessments. Section 4.10 describes baseline conditions and Project changes in hydraulic parameters such as flow and storage volume, as well as changes to water temperature expected at Folsom Reservoir and the Lower American River at the Watt Avenue bridge. The relevant technical reports prepared to evaluate the Project's potential hydrological impacts include the following appendices included in this EIR:

- Appendix B1– Quantitative Modeling Assessment Memo
- Appendix B2 – Permit 21112 Change Petition HEC-ResSim Modeling Technical Report
- Appendix B3 – Permit 21112 Change Petition CalSim 3 Modeling Technical Report
- Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

All hydrologic modeling included four scenarios (baseline, project, future baseline, future project) and at least two comparisons between scenarios: baseline versus project and future baseline versus future project conditions. The future baseline was used to identify baseline conditions with future increases in water demands that would occur absent the Project.

The characteristics of the baselines include:

- **Baseline (without the Project):** Current water demands are based on an average water use for all District sources (34,512 acre feet) for the years 2017 to 2021. Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP.

- **Future Baseline (without the Project):** Forecasted future water demands are based on water use projections from the District's 2020 Urban Water Management Plan (UWMP; Table 4-11; El Dorado Irrigation District 2021) for the year 2045 for all District sources (43,320 acre feet). This forecasted increase in water demands would occur with or without the proposed Project. Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP.

The following constraints are also included with Project operations:

- Up to 15,000 AF of Permit 21112 water and up to 15,080 AF of pre-1914 rights water is available for diversion at the El Dorado Diversion Dam for consumptive use.

- Permit 21112 water may be delivered to Forebay Reservoir for delivery to Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to Reservoir A WTP.

- The season of diversion for the proposed Project would be within the season of diversion currently specified in Permit 21112 (i.e., November 1 to July 31). The El Dorado Canal is typically offline for maintenance and does not convey water from October through mid-December. This maintenance outage is assumed to continue and therefore the operational season of diversion at the El Dorado Diversion Dam with the proposed Project is anticipated to be from mid-December to July 31.

Hydrologic Engineering Center Reservoir System Simulation (HEC-ResSim) hydrologic modeling has shown that there would be no effects to reservoir storage or elevations from the proposed Project at District reservoirs upstream of the El Dorado Diversion Dam (Lake Aloha, Caples Lake, Echo Lake, and Silver Lake) or at two of the SMUD reservoirs (Ice House Reservoir and Loon Lake Reservoir) (Appendix B2). Thus, these reservoirs are not discussed further in the analysis below. Under the proposed Project, the first location on the South Fork where District diversions would increase would be at the El Dorado Diversion Dam. The South Fork upstream of the El Dorado Diversion Dam would not be affected by the Project and is not discussed further in the analysis below.

Temperature modeling was used to determine potential Project impacts on water temperatures below Folsom Dam and in the Lower American River at Watt Avenue, a critical point in assessing potential impacts on special-status fish species utilizing this reach for critical parts of their life cycle. Folsom Reservoir provides water to the Lower American River and the Watt Avenue bridge is the location where water temperature targets have been established by the regulatory agencies for Folsom Reservoir releases. The methods and results of this temperature modeling (Kleinschmitt 2024) are detailed in the technical modeling report in Appendix C of this EIR.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, and a more specific threshold (b) developed for the proposed Project, an impact related to biological resources is considered significant if the Project would result in any of the effects identified below.

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

b. Have a substantial adverse population effect on special-status salmonids based on water temperature changes that would affect a substantial number of individuals during sensitive life cycle stages of the species.

c. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

d. 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.

e. 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.

f. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

g. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.4.4 Environmental Impacts and Mitigation Measures

For each of the thresholds of significance, the following analysis examines potential Project impacts for operational impacts with existing infrastructure and current water demands, for operational impacts post construction under future demand scenarios, and for construction related impacts. The two operational scenarios (existing infrastructure and post construction) capture the maximum Project-related changes in reservoir water levels and flows in the South Fork above Folsom Dam that could potentially affect aquatic species or terrestrial species dependent on aquatic resources. However, the analysis for Impact 4.4-2, which assesses potential Project operations effects on special-status salmonids due to water temperature changes in the Lower American River, includes four modeled scenarios, i.e., existing infrastructure and current water demands, existing infrastructure and future water demands, post-construction operations and current water demands, and post-construction operations and future water demands. For this threshold only, the impact assessment warranted a more detailed analysis, as potential water temperature impacts to special-status salmonids may occur with small incremental changes in water temperature.

Impact 4.4.1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

The discussion below describes potential Project operational impacts to habitat and special-status species inhabiting or otherwise dependent on reservoirs and the South Fork under two scenarios: (1) existing infrastructure and current water demand, and (2) post-construction infrastructure and future water demands. The first portion of this discussion describes the Project's operational changes in reservoir storage and surface elevation under these two operational scenarios and then assesses the potential impacts of those changes on aquatic special-status species. The second section describes potential Project operational impacts to aquatic special-status species inhabiting or otherwise dependent on the South Fork under the same two operational scenarios. A more detailed discussion of potential Project changes to reservoirs and flows in the South Fork is provided in EIR Section 4.10, *Hydrology and Water Quality.*

Operational Impacts on Reservoirs with Existing Infrastructure and Current Water Demands

This phase of the Project involves the operation of facilities to divert Permit 21112 water utilizing existing infrastructure Project operations with existing infrastructure and current water demands would result in the following potential changes at reservoirs:

- At Jenkinson Lake the Project is expected to result in a substantial increased minimum elevation and end of month storage and increased average end of month storage and reservoir elevation. These changes would result in more open water habitat and less exposed bank habitat during the driest times of the year. The increased elevations would not, however, encroach on habitats or land above the ordinary high-water mark of the reservoir, and therefore would remain within the normal range of existing operations under the portion of the Project utilizing existing infrastructure.

- At SMUD's Slab Creek Reservoir and Chili Bar Reservoir the Project is expected to have minor, dry year, seasonal decreases and increases in elevation and end of month storage as a result of the changes in the amount of water being returned to the South Fork below the El Dorado Powerhouse and resulting increased

releases made by SMUD from Slab Creek Reservoir and Chili Bar Reservoir in order to meet instream flow requirements. Modeling results show that these two reservoirs operated by SMUD may have a 1-foot decrease in end of month elevation between February and April in dry water years. Project operations are also expected to shift the timing of EID's consumptive diversions at the El Dorado Diversion Dam and allow consumptive diversions to storage to occur earlier in the year, as opposed to EID exercising its pre-1914 consumptive water rights to meet demands later in the year. Therefore, modeling results show that Slab Creek Reservoir and Chili Bar Reservoir may have a 1- to 2-foot increase in end of month elevation between June and September in some critically dry years. Slab Creek Reservoir and Chili Bar Reservoir currently fluctuate constantly depending on storage, diversion, and seasonal fluctuation and would continue to fluctuate in similar ways with reduced return flows below the El Dorado Powerhouse. Therefore, water levels in these reservoirs would remain within the normal range of existing operations under the portion of the Project utilizing existing infrastructure.

- Forebay Reservoir is the re-regulating forebay for these power production flows; as such, it routinely fluctuates in storage and elevation. Changes in end of month storage at Forebay Reservoir would occur during some years, with reductions in storage occurring primarily in January and February and increased storage occurring primarily in June through August (see Appendix B2). All Project-related changes in reservoir surface elevation at Forebay Reservoir would be within the normal range of operations for this facility and water levels would continue to fluctuate as dictated by demands for consumptive use and hydropower generation similar to current conditions.

- At Folsom Reservoir the Project is expected to result in reduced end of the month storage with changes between Project and baseline conditions predicted to be up to 13,000 acre-feet. The reductions in end of the month storage at Folsom Reservoir are expected to occur in fall and winter of below normal years, in winter and early spring of dry years, and in winter, spring, and summer of critically dry years. In addition, storage at Folsom Reservoir is expected to be increased in late spring and fall of dry years. Although the magnitude of these changes is small compared to the total amount of storage in Folsom Reservoir (averaging less than 2 percent by water year type), storage could be reduced by up to 7 percent when considered on a month-by-month basis. Because Folsom Reservoir storage levels and water surface elevations can have large fluctuations in response to system-wide operational decisions, changes in end of month storage at Folsom Reservoir may not be in direct response to Project changes in Folsom Reservoir inflows and may not be of the same magnitude as Project effects. Overall, water levels in Folsom Reservoir would remain within the normal range of existing operations under the portion of the Project utilizing existing infrastructure.

OPERATIONAL IMPACTS ON RESERVOIRS POST-CONSTRUCTION WITH FUTURE WATER DEMANDS

This operational regime involves operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam following construction of the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake that would allow for a maximum rate of diversion and re-diversion of up to 156 cfs.

As described in detail in EIR Section 4.10, *Hydrology and Water Quality*, Project operations post-construction with future water demands are expected to result in the following potential changes at reservoirs:

At Jenkinson Lake Project operations post-construction with future water demands is expected to result in a substantial increased minimum elevation and end of month storage and increased average end of month

storage and reservoir elevation. Without the Project, modeling results show that Jenkinson Lake may be emptied in future baseline conditions in several critically dry years and in years which follow those critically dry years in the attempt to meet the modeled future water demands (see EIR Section 4.10, *Hydrology and Water Quality*). Operation of the Project post-construction would prevent Jenkinson Lake from emptying when meeting future water demands and, in general, would not substantially deviate from the normal range of existing operations.

The Project's hydrologic modeling demonstrates that changes to inflows at SMUD's Slab Creek and Chili Bar Reservoirs resulting from Project operations would not differ substantially from current conditions. These reservoirs, which are used as re-regulating forebays and afterbays to various powerhouses, fluctuate daily as well as seasonally, and are expected to remain within the range of current fluctuations with the Project's postconstruction operations with future water demands (see EIR Section 4.10, *Hydrology and Water Quality*).

Changes in end of month storage at Forebay Reservoir would occur during some years, with reductions in storage occurring primarily in December through April and in July and August, and increased storage occurring in June (see EIR Section 4.10, *Hydrology and Water Quality*). All Project-related changes in reservoir surface elevation at Forebay Reservoir would be within the normal range of operations for this facility and water levels would continue to fluctuate as dictated by demands for consumptive use and hydropower generation similar to current conditions.

Folsom Reservoir storage is expected to be reduced in the fall of wet years, in fall and winter of below normal years, and throughout the year in dry and critically dry years (see EIR Section 4.10, *Hydrology and Water Quality* Table 4.10-44 which shows modeled end of month storage at Folsom Reservoir for Project and baseline conditions with a future level of demand). On average, under Project operations storage is expected to be reduced at Folsom Reservoir in fall of wet years, in fall and winter of below normal years, and throughout the year in dry and critically dry years. However, generally, water levels in Folsom Reservoir would remain within the normal range of existing operations under the post-construction portion of the Project.

Operational Impacts on Special-Status Species in Reservoirs

Storage reservoirs (Jenkinson Lake, Folsom Reservoir) and re-regulating reservoirs (Forebay, Slab Creek and Chili Bar) may provide breeding or foraging habitat for five of the special-status species listed in Appendix D1: bald eagles, northwestern pond turtles, and three special-status fish species: Central California roach, riffle sculpin and hardhead (Stillwater Sciences 2021, EID 2022c). The Project area reservoirs are inaccessible to Chinook salmon, steelhead, lamprey and sturgeon and do not provide suitable breeding or upland habitat for special-status amphibians. The analysis below discusses potential impacts of Project-related changes on bald eagles, northwestern pond turtles and special-status fish species for two scenarios: existing infrastructure with current water demands and post-construction with future water demands.

Bald Eagle

Bald eagles have been recorded nesting near Jenkinson Lake (CDFW 2024a) and any of the Project area reservoirs could attract foraging bald eagles because these reservoirs support fish populations. For all Project reservoirs the changes in water surface elevation, as described in Section 4.10 *Hydrology and Water Quality,* would not adversely affect foraging bald eagles. Bald eagles are highly opportunistic foragers, generally favoring

aquatic habitats where fish are present, and may also feed on waterbirds, small mammals and carrion (Buehler 2022).

Bald eagle foraging opportunities for fish and other prey would still be available in and near the Project area under the scenario of existing infrastructure with current water demands and post-construction with future water demand scenario. Bald eagles are a wide-ranging species that can easily move among reservoirs and along the South Fork to find favorable foraging conditions. Additionally, under both scenarios all Project-related changes in reservoir surface elevations would be within the normal range of existing operations for the affected reservoirs. These water levels would continue to provide similar foraging opportunities that currently exist without the Project, and with some reservoirs, like Jenkinson Lake, foraging opportunities may increase during years when the Project operation would prevent the reservoir from otherwise emptying.

Breeding activities would be unaffected by the relatively modest changes in reservoir elevations. Bald eagles generally nest in large trees or snags near good foraging habitat and in areas relatively free of human development and disturbance (Buehler 2022). Project operational changes to reservoir elevations under either operational scenario would not affect the availability or suitability of existing or future nests sites.

Because the proposed Project operational changes to reservoirs under both the existing infrastructure with current demands and the post-construction with future water demands scenarios would not substantially change reservoir operations, the Project would not have a substantial adverse effect, either directly or through habitat modifications, on bald eagles.

Northwestern Pond Turtle

Northwestern pond turtles have been observed at Forebay Reservoir, but there are no records for their occurrence in Jenkinson Lake, El Dorado Forebay, Slab Creek, Chili Bar, or Folsom Reservoirs (CDFW 2024). However, northwestern pond turtles could occur in these water bodies because potentially suitable habitat may be present. Project operation under both the existing infrastructure with current water demands and post-construction with future water demands scenarios, northwestern pond turtles would not experience substantial adverse effects from the Project due to changes in reservoir surface water elevation, water quality or water temperature changes, as described in EIR Section 4.10 *Hydrology and Water Quality*. Northwestern pond turtles have generalized habitat requirements, occurring in a broad range of water bodies, and minor changes in water surface elevation would not substantially reduce availability of basking sites, foraging opportunities or habitat used for breeding, overwintering or sheltering habitat. Under both scenarios all Project-related changes in reservoir surface elevations would be within the normal range of operations for the affected reservoirs. These water levels would continue to provide similar habitat conditions that currently exist without the Project.

Because the proposed Project operational changes to reservoirs under both the existing infrastructure with current demands and the post-construction with future water demands scenarios would not substantially change reservoir operations, the Project would not have a substantial adverse effect, either directly or through habitat modifications, on northwestern pond turtles.

Special-Status Fish in Reservoirs

Fish communities of Jenkinson Lake and Forebay Reservoir are reported to be composed largely of stocked rainbow trout and other non-natives species, but California roach have been recorded in Folsom Reservoir and

could potentially occur in Jenkinson Lake (Stillwater Sciences 2021). Hardhead and riffle sculpin have been recorded in Folsom, Slab Creek and Chili Bar Reservoirs (Stillwater Sciences 2021, Moyle 2002). Project operation under both the existing infrastructure with current water demands and the post-construction with future water demands scenarios would not result in substantial adverse effects to these special-status fish species due to changes in reservoir surface water elevation, water quality or water temperature changes, as described in EIR Section 4.10 *Hydrology and Water Quality*. Under both scenarios all Project-related changes in reservoir surface elevations would be within the normal range of operations for the affected reservoirs. These water levels would continue to provide similar habitat conditions that currently exist without the Project.

Because the proposed Project operational changes to reservoirs under both the existing infrastructure with current demands and the post-construction with future water demands scenarios would not substantially change reservoir operations, the Project would not have a substantial adverse effect, either directly or through habitat modifications, on California roach, riffle sculpin, and hardhead.

Conclusion – Operational Impacts on Special-Status Species in Reservoirs

Potential Project operational changes to reservoirs with existing infrastructure with current water demands and post-construction with future water demands would not cause substantial direct or indirect adverse effects on special-status species inhabiting or using reservoirs, including bald eagles, northwestern pond turtles, Central California roach, riffle sculpin, and hardhead. Potential impacts to these species from Project operation are **less than significant**, and no mitigation is required.

OPERATIONAL IMPACTS TO RIVER SEGMENTS WITH EXISTING INFRASTRUCTURE AND CURRENT WATER DEMANDS

South Fork above El Dorado Diversion Dam. The Project would cause no change in system operations for the South Fork upstream of the El Dorado Diversion Dam. The District would continue to divert water at the El Dorado Diversion Dam under the Project at the same rate and timing as it does under baseline conditions. Under the portion of the Project utilizing existing infrastructure, water that would otherwise be diverted for non-consumptive hydropower generation would instead be diverted for consumptive purposes. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam (see EIR Section 4.10 *Hydrology and Water Quality*, Table 4.10-6).

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Flow in the South Fork below the El Dorado Diversion Dam would remain unchanged as compared to baseline conditions when the Project is operated with existing infrastructure and current water demands (see EIR Section 4.10 *Hydrology and Water Quality*, Table 4.10-7). The District would continue to divert water at the El Dorado Diversion Dam under the Project at the same rate and timing as it does under baseline conditions.

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse would be reduced by approximately 2 cfs on an average annual basis when the Project is operated with existing infrastructure and current water demands. The maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 73 cfs, expected to occur during February of a critically dry year (during a single month in the 47-year modeling period), and the average reduction in monthly flows during February of critically dry years is 57 cfs (a 24 percent decrease).

At times, Project operations will result in an increase in stream flows as compared to baseline operations due to the District's ability to make consumptive diversions to storage under Permit 21112 earlier in the year, rather than relying upon consumptive diversions under the District's pre-1914 direct diversion rights that would be diverted later in the year. The maximum increase in monthly flow between Project and baseline conditions is projected to be 50 cfs, expected to occur during August of a critically dry year, but the average increase in monthly flows during August of critically dry years is 18 cfs (a 24 percent increase). Reductions in flow between 60 cfs to a maximum of 73 cfs would occur in February or April during a dry year or January through April of critically dry years. Increases in river flow of up to 40 cfs would occur in July and August of critically dry years (see EIR Section 4.10 *Hydrology and Water Quality*, Table 4.10-9). Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches, but these changes would represent an increasingly smaller fraction of the overall flow as tributaries and return flows join the river.

OPERATIONAL IMPACTS TO RIVER SEGMENTS POST-CONSTRUCTION WITH FUTURE WATER DEMANDS

South Fork above El Dorado Diversion Dam. The Project would cause no change in system operations for the South Fork upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam under post-construction operations with future water demands (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39). Although the construction improvements would increase conveyance capacity along the route from the El Dorado Canal to Jenkinson Lake (allowing conveyance capacity to increase from 145 cfs to 156 cfs), the District's upstream operations, including operational releases from the upper watershed, would remain unchanged.

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. During post-construction Project operations, South Fork flow below the El Dorado Diversion Dam is expected to be reduced by about 4 cfs on an average annual basis under post-construction operations with future water demands (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-37). Diversions by EID at the El Dorado Diversion Dam would increase in all years and water year types, with the average monthly diversion rate increasing by up to 11 cfs, which is the difference between the current rate of diversion at the El Dorado Diversion Dam (i.e., 145 cfs) and the increased conveyance capacity and maximum rate of diversion authorized under Project 21112 (i.e., 156 cfs). This increase in diversions causes a corresponding reduction in streamflow below the El Dorado Diversion Dam. Most of the changes in river flow would occur in January through June, although some reductions would occur in December and continue through July and August. In critically dry years, reductions in streamflow would occur primarily in February through June, primarily due to expected diversions to storage to Jenkinson Lake under Permit 21112 (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-37).

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse is expected to be reduced by about 7 cfs on an average annual basis with post-construction operations with future water demands. As shown in EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39, average monthly river flow below the El Dorado Powerhouse can be reduced by as much as 145 cfs, with this largest reduction in flow occurring in February of a critically dry year (a single month during the 47-year modeling period). However, flows can increase by approximately 40 to 50 cfs in June of some below normal, dry, and critically years. Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches, but these changes represent an increasingly smaller fraction of the overall flow as tributaries and return flows join the South Fork. The difference in river flow below the El Dorado Powerhouse between future baseline and Project conditions is related to the change in water use from non-consumptive power generation to consumptive use that

occurs with Project operation. With future water demands, additional water is allocated for consumptive use, more water is transferred to storage in Jenkinson Lake in the winter, and less water is returned to the South Fork in spring and early summer (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39).

Under Project operations, flow is typically reduced below the El Dorado Powerhouse in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through April and August through September in critically dry years. In some years, Project operations would also result in increased return flows below the El Dorado Powerhouse; this would primarily occur in February through May in above normal years, April through June in below normal years, and May through July in dry years and critically dry years (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39), as a result of consumptive demands being met with water previously diverted to storage in Jenkinson Lake and the District's ability to therefore make non-consumptive diversions for power generation during those periods.

Operational Impacts on Special-Status Species in the South Fork American River

The discussion below describes potential Project operational impacts to aquatic special-status species inhabiting or otherwise dependent on the South Fork. The impact analysis addresses potential operational impacts of the Project to Sanford's arrowhead, foothill yellow-legged frog, northwestern pond turtle, Central California roach, riffle sculpin and hardhead. Potential Project operational impacts to special-status salmonids (steelhead trout, winter run, fall-run, and late fall run Chinook salmon) occurring in the Lower American River are addressed below in Impact 4.4-2.

Sanford's Arrowhead

The South Fork mid-elevations such as 2,100 feet to Folsom Lake are within the range of Sanford's arrowhead. No focused surveys for Sanford's arrowhead have been conducted in the Project study area, and there are no known occurrences for this species in the Project area except on the Lower American River between Folsom Reservoir and Watt Avenue in standing or slow-moving water in marshes, ponds or side channels (CDFW 2024). As described in EIR Section 4.10 *Hydrology and Water Quality,* Project operational changes for both existing infrastructure and current water demands and post-construction with future water demand scenarios would result in minor changes in flows and slight increases in temperatures on the main stem of the Lower American River. As discussed in EIR Section 4.10 *Hydrology and Water Quality,* water temperatures in these off-channel water bodies are far more affected by air temperatures, solar radiation, steam shading, and wind sheltering rather than by reductions in streamflow. Minor flow and temperature changes resulting from the Project are within the range of current conditions and would have minimal effects on the off-channel marshes, ponds or side channels that could support Sanford's arrowhead. No Project-related changes are anticipated that would substantially affect sediment deposition or rooting substrates, nutrient availability, or growth rates for Sanford's arrowhead.

Conclusion – Operational Impacts to Sanford's Arrowhead

Project operational changes with existing infrastructure and current water demands and post-construction with future water demands would have a **less-than-significant impact** on the distribution or abundance of Sanford's arrowhead in the Lower American River between Folsom Reservoir and Watt Avenue, and no mitigation is required.

Foothill Yellow-legged Frog

EID's focused surveys for foothill yellow-legged frogs have documented the presence of foothill yellow-legged frogs on the South Fork and its tributaries between the El Dorado Diversion Dam and El Dorado Powerhouse (EID 2022a). Comprehensive protocol level surveys for this species have not been conducted on the South Fork below the El Dorado Powerhouse and there are no CNDDB occurrences recorded in the river segment below the El Dorado Powerhouse (CDFW 2024a). However, because habitat conditions on the main stem of the South Fork and its tributaries may provide potentially suitable habitat for this species in some locations, this impact analysis assumes that foothill yellow-legged frogs could occur in the South Fork both above and below the El Dorado Powerhouse.

Foothill yellow-legged frogs initiate breeding in spring when air and water temperatures increase and streamflows decline. Most observations of breeding in the Sierra Nevada have been recorded in May and early June (Hayes et al. 2016). Breeding happens during a transition between wet and dry seasons at a time when unpredictable flows present a physical threat of scour to egg masses and hatchlings (Hayes et al. 2016). Researchers have speculated that this risky timing may represent a tradeoff so that egg-laying can occur early enough for tadpoles to metamorphose and juveniles to gain mass prior to overwintering (Hayes et al. 2016).

CDFW has identified dams and the altered flow regimes downstream of dams as the most widespread threat to foothill yellow-legged frogs (CDFW 2023). Regulated rivers alter the timing, temperature, duration, frequency, and magnitude of water discharge. Artificial, dam-controlled flow patterns diverge from the natural Mediterranean climate runoff patterns to which the frog's life history is adapted (Kupferberg et al. 2012). This species is especially vulnerable in early life stages, and dam releases have been documented as a main cause of egg mortality in several studies due to the scouring and stranding of egg masses during the foothill yellow-legged frog spring breeding season (Hayes et al., 2016). The discussion below addresses the potential impacts of the Project during the foothill yellow-legged breeding season (May and June) and at other times of the year.

Operational Impacts on Yellow-legged Frogs with Existing Infrastructure and Current Water Demands

South Fork above El Dorado Diversion Dam. Potential Project operational impacts with existing infrastructure and current water demands would cause no change in streamflow upstream of the El Dorado Diversion Dam and therefore would have no impacts on foothill-yellowed frogs that may be present above the El Dorado Diversion Dam (see EIR Section 4.10, *Hydrology and Water Quality*).

South Fork between the El Dorado Diversion Dam and El Dorado Powerhouse. Flow in the South Fork below the El Dorado Diversion Dam would remain unchanged as compared to baseline conditions when the Project is operated with existing infrastructure and current water demands (see EIR Section 4.10, *Hydrology and Water Quality* Table 4.10 7). Project operations would not result in changes to streamflow below the El Dorado Diversion Dam during the egg-laying months of May and June and therefore would have no impact on foothill-yellow legged frogs that may be present.

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types. During the egg-laying months of May and June, no Project-related changes in flows would occur in wet or above normal years. Modeling indicates that the greatest increase in stream flows in this reach would be up to 17 cfs in June in

critically dry water years (see EIR Section 4.10, *Hydrology and Water Quality* Table 4.10--9). This minor flow increase in June would not result in impacts to foothill yellow-legged frogs that may be present because these changes are not of sufficient magnitude to wash away egg masses or tadpoles or otherwise adversely affect breeding activities. Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches, but these changes would represent an increasingly smaller fraction of the overall flow as tributaries and return flows from downstream operators join the river.

Operational Impacts on Yellow-legged Frog Post construction with Future Water Demands

South Fork above El Dorado Diversion Dam. Potential Project operational impacts post-construction with future water demands is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam on an average monthly basis with Project operations (See EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-36) and no adverse effects to foothill yellow-legged frogs.

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. During Project operations, South Fork flow below the El Dorado Diversion Dam is expected to be reduced post-construction by about 4 cfs on an average annual basis when meeting future demands (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-37). Diversions would increase in all years and water year types, with the average monthly diversion rate increasing by up to 11 cfs, which is the difference between the current rate of diversion at the El Dorado Diversion Dam (i.e., 145 cfs) and the restored capacity and maximum rate of diversion authorized under Permit 21112 (i.e., 156 cfs). This increase in diversion causes a corresponding reduction in streamflow below the El Dorado Diversion Dam. Most of the changes in river flow would occur in January through June, although some reductions would occur in December and continue through July and August. In critically dry years, reductions in streamflow would occur primarily in February through June. The 11 cfs reduction in streamflow in critically dry years represents only a 2.7 percent reduction in May monthly average stream flows and 3.3 percent reduction in June monthly average stream flows in critically dry years. See EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-7 for additional details. These minor changes in flow during the egg laying season would not result in impacts to foothill yellow-legged frogs that may be present because these minimal decreases in flow during the breeding season are not of sufficient magnitude to result in stranding and desiccation of egg masses or otherwise affect breeding activities.

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse would be reduced by about 7 cfs on an average annual basis with post-construction operations of the Project while meeting future water demands (2045 projections) (See EIR Section 4.10 *Hydrology and Water Quality*). Under Project operations, flow would typically be reduced below the El Dorado Powerhouse in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through April and August through September in critically dry years. In some years, Project operations would also result in increased return flows; this would primarily occur in February through May in above normal years, April through June in below normal years, and May through July in dry years and critically dry years (See EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39).

As shown in EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39, average monthly river flow below the El Dorado Powerhouse can be reduced by as much as 145 cfs with this largest reduction in flow occurring in February of a critically dry year (a single month during the 47-year modeling period). However, flows can

increase by approximately 40 to 50 cfs in June of some below normal, dry, and critically dry years. In critically dry years these increased June flows would represent a relative difference of 5% (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39). These minor changes in flow during the egg laying season would not result in impacts to foothill yellow-legged frogs that may be present because these minimal decreases in flow during the breeding season are not of sufficient magnitude to result in stranding and desiccation of egg masses or otherwise affect breeding activities. Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches, but these changes represent an increasingly smaller fraction of the overall flow as tributaries and return flows join the river.

Conclusion – Operational Impacts to Foothill Yellow-legged Frog

Project operation with existing infrastructure and current water demands and post-construction with future water demands would result in slight increases or decreases in flows above and below the El Dorado Powerhouse during the foothill yellow-legged frog egg-laying season. Project related increases in flow are not of sufficient magnitude to wash away egg masses or tadpoles during the breeding season. Project-related decreases in flows are so minor that there would be no substantial increased risk of stranding and desiccation of egg masses. Furthermore, the Project would be operated such that minimum flows would be maintained in the South Fork below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license. These minimum flows were specifically established to support beneficial uses and protect aquatic resources, including amphibians.

Project operational changes to the South Fork with existing infrastructure and current water demands and post-construction with future water demands would have a **less-than-significant impact** on foothill yellow-legged frogs, and no mitigation is required.

Special-Status Fish Species

Three special-status fish species, Central California roach, hardhead and riffle sculpin, have been documented in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse and below the El Dorado Powerhouse to Folsom Reservoir (Stillwater Sciences 2021). Increased temperatures or changes in flow could adversely affect these fish species, particularly during warmer summer months. Water temperatures above species-specific thermal tolerance thresholds can elicit an acute stress response in fish, which can lead to mortality. The effect of elevated water temperatures on fish may be further exacerbated by reduced oxygen solubility at higher water temperatures, resulting in less dissolved oxygen available to meet fish respiration needs. Rapid changes in flows can also lead to increased stranding risk if the increases and decreases are rapid and result in changes in water surface elevation that trap fish in shallow areas of the river margins. Stranding may expose fish to degraded water quality, increased predation, confinement or crowding stress, or desiccation and mortality.

Operational Impacts with Existing Infrastructure and Current Water Demands

South Fork above El Dorado Diversion Dam. Project operation with existing infrastructure and current water demands would have no impacts on special-status fish species above the El Dorado Diversion Dam because flows will remain unchanged from current conditions (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-6).

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Project operation with existing infrastructure and current water demands would have no impacts on special-status fish species in the South Fork

below the El Dorado Diversion Dam because flows would remain unchanged from current conditions (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-7).

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse would be reduced by about 2 cfs on an average annual basis and often would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types. In general, average monthly streamflow below the powerhouse would be reduced in January of wet and above normal years, January and February in below normal years, and January through April in dry and critically dry years when compared to baseline conditions (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-9).

The maximum reduction in monthly flow in the South Fork below the El Dorado Powerhouse between Project and baseline conditions is projected to be up to 73 cfs in the winter and is expected to occur during February of a critically dry year (during a single month in the 47-year modeling period). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 50 cfs, expected to occur during August of a critically dry year, but the average increase in monthly flows during August of critically dry years is 18 cfs (a 24 percent increase) (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-9).

Reductions in flow of 60 – 73 cfs would occur in February or April during a dry year or January through April of critically dry years. Increases in river flow of 40 cfs would occur in July and August of critically dry years, but the average increase in monthly flows during August of critically dry years is 18 cfs (a 24 percent increase) (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-9). The largest increases in river flow (40 to 50 cfs) would occur in July and August of critically dry years (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-9). Although flow reductions can represent a substantial fraction of the flow in the South Fork below the El Dorado Diversion Dam and the El Dorado Powerhouse (e.g., 24 percent average reduction in February in critically dry years), the Project would be operated such that minimum flows would be maintained in the South Fork below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license. These minimum flows were specifically established to support beneficial uses and protect aquatic resources, including fish.

As discussed in EIR Section 4.10 *Hydrology and Water Quality*, Impact 4.10-2, changes in flows resulting from Project operations with existing infrastructure and current water demands are expected to have minimal effects on temperature in the South Fork. Equilibrium water temperatures for the South Fork would be highly influenced by ambient air temperatures, shading, and inflows from seeps or springs, all of which would be unaffected by Project operations, and therefore the temperature changes associated with changes in diversions and flows would be minor. Changes in flows resulting from Project operations with existing infrastructure and current water demands would not have substantial adverse effects on special-status fish species that might occur in the South Fork below the El Dorado Powerhouse because minimum required flows established to protect aquatic resources would be maintained at all times. Furthermore, the Project would result in minor decreases in flows during the snowmelt runoff period but would increase flows during periods of low flow and warmer ambient air temperatures, potentially benefitting native fish populations by reducing water temperatures during summers of critically dry years (Stillwater Sciences 2021). Changes in flows and temperature would be minimal and would not have substantial adverse effects on California roach, hardhead and riffle sculpin.

Operational Impacts Post-construction with Future Water Demands

South Fork above El Dorado Diversion Dam. The Project is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam with Project operations (see EIR Section 4.10 *Hydrology and Water Quality*, Table 4.10 36) and therefore no effect on special-status fish species.

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. The South Fork flow below the El Dorado Diversion Dam to the El Dorado Powerhouse is expected to be reduced post-construction by about 4 cfs on an average annual basis when meeting future water demands (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-37). Diversions would increase in all years and water year types, with the average monthly diversion rate increasing by up to 11 cfs, which is the difference between the current rate of diversion at the El Dorado Diversion Dam (i.e., 145 cfs) and the restored capacity and maximum rate of diversion authorized under Permit 21112 (i.e., 156 cfs). This increase in diversion causes a corresponding reduction in streamflow below the El Dorado Diversion Dam and upstream of the El Dorado Powerhouse. Most of the changes in the South Fork flow in this section would occur January through June in all water year types, although some reductions would occur in December and continue through July and August. In critically dry years, reductions in streamflow would occur primarily in February through June. Project-related changes in flows and temperature between the El Dorado Diversion Dam and the El Dorado Powerhouse would be minimal and would not have substantial adverse effects on California roach, hardhead and riffle sculpin.

South Fork below El Dorado Powerhouse. Flows in the South Fork below the El Dorado Powerhouse would be reduced by about 7 cfs on an average annual basis with post-construction operations of the Project while meeting future water demands (2045 projections). Flow is typically reduced below the El Dorado Powerhouse in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through April and August through September in critically dry years. In some years, Project operations would also result in increased return flows; this would primarily occur in February through May in above normal years, April through June in below normal years, and May through July in dry years and critically dry years (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39). Average monthly river flow below the El Dorado Powerhouse can be reduced by as much as 145 cfs, with this largest reduction in flow occurring in February of a critically dry year (during a single month in the 47-year modeling period). However, flows can increase by approximately 40 to 50 cfs in June of some below normal, dry, and critically dry years.

The maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 145 cfs, expected to occur during February of a critically dry year (a single month during the 47-year modeling period), but the average reduction in monthly flows during February of critically dry years is 82 cfs (a 35 percent reduction). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 47 cfs, expected to occur during June of a below normal year, but the average increase in monthly flows during June of below normal years is 20 cfs (a 2.1 percent increase) (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39). Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches, but these changes represent an increasingly smaller fraction of the overall flow as tributaries and return flows from downstream operators join the river.

As described above, operation of the Project is expected to both increase and decrease flows in the South Fork American River below the El Dorado Powerhouse. For example, flow would be reduced by 35 percent in February of critically dry years in the South Fork below the El Dorado Powerhouse, with the average flow being reduced from 237 cfs to 155 cfs during Project operations. Flow would be increased by 5 percent in June of critically dry years, increasing the average flow from 262 cfs to 275 cfs. Overall, the range in flows expected with Project operations would remain within the current levels seen under existing conditions, and the minimum flow would remain the same (e.g., a minimum monthly flow of 35 cfs is predicted for baseline conditions during the 47-year modeling period in August 1997, a critically dry year; flows during this month remain the same with Project operations; see Appendix B2). Although flow reductions with Project operations can represent a substantial fraction of the flow in the South Fork American River below the El Dorado Powerhouse (e.g., 35 percent average reduction in February in critically dry years), this is partially offset by the increased flows during summer months in critically dry years. In addition, the Project would be operated such that minimum flows would be maintained in the South Fork below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license. The Project would result in minor decreases in flows during the snowmelt runoff period but would increase flows during periods of low flow and warmer ambient air temperatures, potentially benefitting native fish populations by reducing water temperatures during summers of critically dry years (Stillwater Sciences 2021). Changes in flows and changes in temperature would be minimal and would not have substantial adverse effects on California roach, hardhead and riffle sculpin.

Conclusion – Operational Impacts to Special-Status Fish Species in the South Fork

Project operational changes to the South Fork under existing infrastructure with current water demands or post-construction with future water demands would not result in substantial adverse changes to flow or water temperature and would have a **less-than-significant impact** on Central California roach, hardhead and riffle sculpin, and no mitigation is required.

Northwestern Pond Turtle

Northwestern pond turtles could potentially occur in the South Fork although there are only three records in the CNDDB documenting their presence in the vicinity of the South Fork (CDFW 2024a). This species typically prefers slow-moving waters and is more likely to occur in tributaries to the South Fork rather than the main stem of the river. However, because no focused surveys have been conducted for this species in the Project study area, this impact analysis assumes that northwestern pond turtles could occur in the South Fork.

Project Operational Impacts on Northwestern Pond Turtles with Existing Infrastructure and Current Water Demands

South Fork above El Dorado Diversion Dam. Project operations with existing infrastructure and current water demands would have no impacts on northwestern pond turtle above the El Dorado Diversion Dam because flows will remain unchanged from current conditions (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-6).

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Flow in the South Fork below the El Dorado Diversion Dam would remain unchanged as compared to baseline conditions when the Project is operated with existing infrastructure and current water demands (see EIR Section 4.10 *Hydrology and Water*

Quality Table 4.10 7) and therefore would have no impacts on northwestern pond turtles that might be present between the El Dorado Diversion Dam and El Dorado Powerhouse.

South Fork below the El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse would be reduced by about 2 cfs on an average annual basis and often would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-9). The minor Project-related changes in flows are not of sufficient magnitude to result in adverse effect on northwestern pond turtles that might be present below the El Dorado Powerhouse.

Operational Impacts on Northwestern Pond Turtles Post-construction with Future Water Demands

South Fork above El Dorado Diversion Dam. Post-construction Project operations with future water demands would have no impacts on northwestern pond turtle upstream of the El Dorado Diversion Dam because flows will remain unchanged from current conditions (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-26).

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. The South Fork flow below the El Dorado Diversion Dam to the El Dorado Powerhouse is expected to be reduced post-construction by about 4 cfs on an average annual basis when meeting future demands (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-37). As described above, flows in the South Fork below the El Dorado Powerhouse would be reduced by about 7 cfs on an average annual basis with post-construction operations of the Project while meeting future water demands. Flow is typically reduced below the El Dorado Powerhouse in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through April and August through September in critically dry years. In some years, Project operations would also result in increased return flows; this would primarily occur in February through May in above normal years, April through June in below normal years, and May through July in dry years and critically dry years (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39). The minor Project-related changes in flows would not substantially reduce foraging opportunities or basking sites for northwestern pond turtles, and would not substantially affect habitat used for breeding, overwintering, or sheltering. Project-related changes in flows are not of sufficient magnitude to have an adverse effect on northwestern pond turtles that might be present between the El Dorado Diversion Dam and El Dorado Powerhouse.

South Fork below El Dorado Powerhouse. Average monthly river flow below the El Dorado Powerhouse can be reduced by as much as 145 cfs with this largest reduction in flow occurring in February of a critically dry year (a single month during the 47-year modeling period). The 145 cfs reduction, an approximately 35 percent decrease, is projected to occur very infrequently during Project operations. Flows can also increase by approximately 40 to 50 cfs in June of some below normal, dry, and critically dry years. In most years Project operations would result in relatively minor increases and decreases in flows (see EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-39). These minor Project-related changes in flows would not substantially reduce foraging opportunities or basking sites for northwestern pond turtles, and would not substantially affect habitat used for breeding, overwintering, or sheltering. Therefore, there would be no substantial adverse effect on northwestern pond turtles that might be present below the El Dorado Powerhouse.

Conclusion – Operational Impacts on Northwestern Pond Turtles

Project operational changes to the South Fork under either existing infrastructure with current water demands or post-construction with future water demands would not result in substantial adverse changes to foraging opportunities or basking sites for northwestern pond turtles, would not substantially affect habitat used for breeding, overwintering, or sheltering, and would have a **less-than-significant impact** on northwestern pond turtle, and no mitigation is required.

Conclusion – Operational Impacts on Special-Status Species in the South Fork

Potential Project operational changes to flows in the South Fork with existing infrastructure with current water demands and post-construction with future water demands would not cause substantial direct or indirect adverse effects on special-status species, including Sanford's arrowhead, foothill yellow-legged frog, northwestern pond turtle, Central California roach, riffle sculpin and hardhead. Potential impacts to these species from Project operation are **less than significant**, and no mitigation is required.

CONSTRUCTION IMPACTS: SPECIAL-STATUS SPECIES

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs. Anticipated construction activities may include vegetation and tree removal and road improvements and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because detailed information regarding these future infrastructure improvements is not available at this time, a project-level analysis is not possible, and these Project elements are covered at a programmatic level of analysis only. These future improvements would require subsequent project-level environmental review once sufficient design details are known.

Ground disturbing construction activities are anticipated both along the El Dorado Canal, and along the channel that conveys water from the Hazel Creek tunnel outlet to Jenkinson Lake, as shown in EIR Section 3, *Project Description*, Figure 3-6. As a result, construction could have adverse effects, through potential direct or indirect impacts, on special-status species and their habitats. In addition to aquatic species, these areas were assessed for project effects on terrestrial special-status species resulting from construction. Eleven special-status wildlife species and 15 special-status plant species could occur in or adjacent to the Project area where construction activities may occur. Furthermore, the numerous trees, shrubs, ruderal areas, and structures in the Project area could provide suitable nesting substrate for migratory birds.

The discussion below describes potential impacts of Project construction on special-status plants, wildlife, and migratory birds and, where potentially significant impacts are identified, mitigation measures to reduce these impacts to less than significant.

Special-Status Plant Species

Construction activities could potentially result in direct or indirect effects on eight special-status plant species. No federal or State-listed plant species are known to occur in or near the Project study area, but the plant species listed below meet the definition of endangered, rare, or threatened species under CEQA Guidelines section 15380, subdivisions (b) and (d). These include plants tracked by the CNPS as California Rare Plants Rank (CRPR) 1B (plants rare, threatened, or endangered in California and elsewhere, and 2B (plants rare, threatened or endangered in California but more common elsewhere). The following CRPR 1B or 2B species could potentially occur in the Project area (see Appendix D1 for detailed information on their listing status and habitat):

- Upswept Moonwort
- Pleasant Valley Mariposa-Lily
- Sierra Arching Sedge
- Mud Sedge
- Saw-Toothed Lewisia
- Stebbins' Phacelia
- Yellow Bur Navarretia
- Brownish Beaked-Rush

Potential direct impacts on these special-status plant species would include removal of plants during construction or clearing and grading that could result in the loss of the plants as well as native seed banks or alteration of soil conditions rendering the site no longer suitable to support the plants. Changes to topography and drainage patterns also could reduce suitability of the habitat to support special-status plants. Potential indirect impacts include dust from construction activities that may reduce photosynthetic capacity or inhibit reproduction by coating leaves and reproductive structures. Indirect impacts could also result from the creation of conditions favorable for the invasion of weedy exotic species that outcompete native species, including special-status plants. Potential direct and indirect impacts that permanently affect a substantial number of CNPS 1B or 2B plants or entire populations would be considered **potentially significant**. The following mitigation measures will avoid, minimize or mitigate potentially significant construction impacts on special-status plant species.

Mitigation Measure 4.4-1: Conduct Preconstruction Special-status Plant Surveys and Implement Avoidance and Minimization Measures

Before the start of any Project construction activity, focused special-status plant surveys shall be conducted by a qualified botanist in the Project construction footprint, including areas used for staging and access, and within 100 feet of the boundaries of these areas. The Project footprint is defined as all areas that could potentially be subject to temporary or permanent ground-disturbing activities. Surveys shall be conducted at an appropriate time of year during which the species are likely to be detected, generally during the blooming period. Surveys will follow current CDFW guidelines, *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018).

If no special-status plant species are detected during special-status plant surveys of construction areas and surrounding buffers, no impacts on special-status plants would occur. The results of the survey shall be documented in a technical report and kept on file at the District. No further actions would be required.

If special-status plants are found in the survey area but not in the Project footprint, the District shall delineate the area as an environmentally sensitive area (ESA) on project plans and protect the plants in place during construction using temporary fencing to protect plants from disturbance. The integrity of the ESA fencing shall be maintained and periodically inspected throughout construction. Following completion of construction, the ESA fencing shall be removed.

If special-status plant populations are documented in the Project footprint and cannot be avoided with an ESA buffer, the District shall develop and implement a Biological Resources Mitigation Plan (BRMP) to minimize and compensate for the loss of special-status plant species. The BRMP will be developed in consultation with CDFW before construction activities begin in areas containing special-status plant species. The BRMP will provide protocols for preserving and replacing plants with a 1B and 2B CRPR rank (or others, if appropriate) and will include appropriate compensation measures determined through consultation with CDFW, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures to be implemented if the initial mitigation fails. The BRMP shall include, but not be limited to the following implementation options:

- Salvaging of and relocation of plant(s) to appropriate habitat areas outside of project ground disturbance;
- Collection of seeds or propagules from special-status plants that would be affected by construction related ground disturbance for establishment in a protected area;
- Collection of and relocation of soil from ground disturbance areas to nearby areas of suitable habitat in the immediate vicinity of special-status plant occurrences to preserve the soil seed bank;
- Use of removed soil for revegetation and postconstruction grading to maintain the soil seed bank and re-establishment of the disturbed population onsite following construction.

The performance standard for successful implementation of the BRMP shall be a documented no net loss of special-status plant populations that are temporarily or permanently affected by Project construction. Monitoring and reporting protocols outlined in the BRMP will be used to assess success. Contingency measures outlined in the BRMP will be used if initial monitoring indicated that BRMP implementation may fall short of specific performance standards. The BRMP will also indicate when mitigation will be considered successful and complete, and when monitoring and reporting may cease.

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Before the start of any Project construction activity, the District shall develop, in consultation with a qualified biologist[4], a Project-specific worker environmental awareness program (WEAP). The WEAP

[4] Qualified biologists shall have knowledge of and experience with the special-status species and sensitive biological resources that could potentially occur in the Project study area.

will identify the special-status species and other sensitive biological resources found in or near the Project site or known to occur on or near the Project site, and will describe the best management practices and avoidance, minimization and mitigation measures that must be implemented to prevent, minimize, or compensate for potential impacts to these resources. The WEAP will also describe specific conditions of any Project permits from regulatory agencies (if applicable) and any mitigation measure commitments affecting Project construction practices such as preconstruction surveys, avoidance buffers, required monitoring, etc.

The WEAP will initially be presented to the construction team and workers at Project construction kickoff. Printed handouts and other materials, if deemed appropriate, will be distributed and used for future reference by the construction team. Following Project kickoff, the Contractor construction foreperson, or predetermined alternate Contractor designee, will be responsible for making sure that other workers on the Project receive WEAP training as they come onto the Project. A roster of WEAP-trained construction workers will be maintained in the Project construction office and made available for review by regulatory agencies, the District, or other responsible parties, as required by the Project's Mitigation Monitoring and Reporting Program or Project permits.

Mitigation Measure 4.4-3: Reduce the Spread and Introduction of Invasive Noxious Weeds.

To reduce the spread and introduction of weeds, the following measures shall be implemented:

- All Project-related equipment and vehicles will be decontaminated of weeds and soils prior to arrival at the Project construction site.
- Topsoil, mulch, and seed used in Project-related activities (e.g. restoration, reseeding, erosion control, and soil stabilization) shall be certified weed-free.
- Construction equipment and materials arriving onsite will be inspected for proper weed free conditions by a qualified person-designated by the District.

The following mitigation measure shall also be implemented:

Mitigation Measure 4.3-1b: Implement a Dust and Emissions Control Plan

Significance After Mitigation:

Implementing Mitigation Measure 4.4-1 would avoid and minimize the Project's potential impacts on special-status plants by protecting or replacing impacted special-status plant populations in or near the Project footprint. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction, and Mitigation Measure 4.4-3 would avoid potential impacts associated with the spread or introduction of invasive weeds. Mitigation Measure 4.3-1b (Implement a Dust and Emissions Control Plan) would avoid potential impacts to plants due to deposition of dust from construction activities. Potential impacts to special-status plant species would be reduced to **less than significant with mitigation incorporated**.

Special-Status Wildlife Species

Most of the special-status wildlife species described in Appendix D1 do not occur in areas potentially affected by Project construction because these species are either out of the species' range or no suitable habitat is present. No special-status fish species occur in the Project construction area because no suitable aquatic habitat is available. The discussion below describes potential impacts to seven wildlife species that have some potential to occur in the Project construction area or immediate vicinity. In addition, potential impacts on nesting migratory birds are discussed below.

- Monarch Butterfly
- Foothill Yellow-legged Frog
- Northwestern Pond Turtle
- American Goshawk
- Bald Eagle
- California Spotted Owl
- Willow Flycatcher

Monarch Butterfly

Construction activities could potentially result in direct or indirect effects on the monarch butterfly and its associated habitat. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they only lay eggs on milkweed plants, the specific host for their larvae. Project construction could crush or remove milkweed plants and associated flowering plants that could support monarch butterflies or otherwise negatively affect site suitability for this species. Project construction that resulted in permanent loss of a substantial portion of regional monarch butterfly habitat would be considered **potentially significant**.

Mitigation Measures 4.4-4. Conduct Preconstruction Milkweed Surveys and Implement Avoidance and Minimization Measures

Before the start of any Project construction activity, a qualified biologist shall conduct a habitat assessment for suitable monarch butterfly habitat in the Project's construction footprint, including areas used for staging and access, and within 100 feet of the boundaries of these areas. The survey will be conducted in all potentially suitable habitats for monarch butterflies in the Project construction footprint and the 100-foot buffer area. The survey may be conducted concurrently with the special-status plant survey described in Mitigation Measure 4.4-1.

If no milkweed plants or suitable monarch butterfly habitat are detected during the surveys, no impacts on monarch butterflies would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If monarch butterfly habitat in the form of milkweed plants is found in the survey area but not in the Project footprint, the District shall delineate the area as an ESA on project plans and protect it in place using ESA temporary fencing. The integrity of the ESA fencing will be maintained and periodically inspected throughout construction.

If monarch butterfly habitat in the form of substantial milkweed patches occurs in the Project footprint and potential impacts cannot be avoided with an ESA buffer, the District will develop and implement a BRMP in consultation with a qualified biologist to minimize and compensate for the loss of milkweed plants. The BRMP will be developed before construction activities begin in areas containing monarch butterfly habitat in the form of substantial patches of milkweed. The BRMP will describe protocols for preserving and replacing milkweed and other species important to monarch butterflies, as described in *Managing for Monarchs in the West* (Xerces 2018). The BRMP will include methods for implementation of monarch butterfly habitat restoration, success criteria, monitoring and reporting protocols, and contingency measures to be implemented if the initial mitigation fails.

The performance standard for successful implementation of the BRMP will be no net loss of monarch butterfly habitat in the form of milkweed patches that are temporarily or permanently affected by Project construction.

The following mitigation measure shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Significance After Mitigation:

Implementing Mitigation Measure 4.4-4 would avoid and minimize the Project's potential impacts on monarch butterflies by protecting or successfully replacing impacted habitat in the form of milkweed patches in or near the Project footprint. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction. Potential impacts to monarch butterflies and their habitat would be reduced to **less than significant with mitigation incorporated**.

Foothill Yellow-legged Frog and Northwestern Pond Turtle

Potential temporary impacts at Project staging and laydown areas and permanent impacts related to installation of Project components could adversely affect foothill yellow-legged frog and northwestern pond turtle. Potential direct adverse effects of Project construction on these species may include trampling or crushing of adults, juveniles, and eggs in aquatic and terrestrial habitats by foot traffic, vehicles, and/or equipment. Such effects could occur during clearing and grading for staging areas and access roads and installation of Project components.

During construction, physical harm or mortality could occur as individuals may be found moving along or taking cover in terrestrial habitat near water bodies. Temporary increases in noise levels from equipment mobilization, trenching, grading, and earthmoving, as well as increased levels of human movement could disrupt the sheltering, foraging, basking, and movement of individuals. In addition, aquatic life in waterways could be affected if water quality is affected by sediment from construction or accidental spills of fuel or lubricants. Dewatering activities and/or construction of a stream bypass may be needed during construction. Rip-rap or other materials would be placed in the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake where water velocities are expected to increase to prevent excess erosion of the channel bed or bank.

Improvement/stabilization areas would need to be isolated from the creek during construction and may require dewatering. A stream bypass may also be needed at channel crossings where new culverts or bridges are

constructed. Erosion could occur at the point of discharge from the dewatering and where water is returned to the creek after being conveyed through a construction bypass. Proposed dewatering activities could adversely affect foothill yellow-legged frogs or northwestern pond turtles. Project construction that resulted in substantial adverse effects and/or loss of foothill yellow-legged frogs or northwestern pond turtles or their habitats would be **potentially significant**.

Mitigation Measure 4.4-5: Conduct Surveys for Foothill Yellow-legged Frogs and Implement Avoidance and Minimization Measures.

Before the start of any Project construction activity, the District shall conduct preconstruction surveys for all areas of Project-related ground disturbance that could support foothill yellow-legged frogs. The surveys shall include a habitat assessment as described in *A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog (Rana boylii*) (Seltenrich and Pool 2002).

If no suitable habitat for foothill yellow-legged frogs is documented during the surveys, no impacts would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If the habitat assessment indicates suitable foothill yellow-legged frog habitat is present in the Project construction area, Visual Encounter Surveys (VES) and site assessments will be conducted as described in Seltenrich and Pool (2002). If the VES indicated presence of egg masses, tadpoles, juveniles or subadults/adults in areas that could be adversely affected by Project construction activities, the District will develop a BRMP in consultation with CDFW and USFWS to avoid, minimize and mitigate potential Project impacts before construction activities begin. The District will also consult with CDFW and USFWS to determine if a State or federal incidental take permit (ITP) may be required for construction. The BRMP will describe avoidance and minimization measures, habitat restoration, if necessary, success criteria, monitoring and reporting protocols, and contingency measures or compensatory mitigation to be implemented if the initial mitigation fails. The performance standard for the successful implementation of the BRMP shall be complete avoidance of take of foothill yellow-legged frog and no net loss of foothill yellow-legged frog habitat.

If dewatering or a stream bypass is required during construction, the District shall prepare and implement a Dewatering Plan or Stream Bypass Plan, as described in Mitigation Measure 4.10-5, (Prepare and Implement a Dewatering and/or Stream Bypass Plan) in EIR Section 4.10 *Hydrology and Water Quality*. The Dewatering Plan will describe the methods to be used for dewatering, the location of the dewatering, the estimated amount of water, the discharge locations, the BMPs and avoidance and minimization measures to be implemented during dewatering, and any erosion protection measures needed at the point of discharge. The Dewatering Plan or Stream Bypass Plan will be provided to CDFW prior to construction as component of the Streambed Alteration Agreement (see Mitigation Measure 4.4-12 below).

The following mitigation measures shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Mitigation Measure 4.10-1 Stormwater Management during Construction

Mitigation Measure 4.9-1a Comply with all Regulations on the Transport and Use of Hazardous Materials

Mitigation Measure 4.9-1b Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation

Mitigation Measure 4.4-12 Obtain a Streambed Alternation Agreement from CDFW and Implement all Agreement Conditions.

Significance After Mitigation (Foothill Yellow-Legged Frog):

Implementing Mitigation Measure 4.4-5 would avoid, minimize and mitigate the Project's potential impacts on foothill yellow-legged frogs by protecting this species during construction, avoiding take, and replacing impacted habitat in or near the Project footprint, or by providing compensatory mitigation for habitat, if necessary. Mitigation Measure 4.4-5 would also ensure that consultation regarding the need for an ITP occurs, and that a CDFW-approved Dewatering Plan or Stream Bypass Plan is implemented. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction. In addition, implementation of water quality protection measures including Mitigation Measure 4.10-1 (Stormwater Management during Construction), Mitigation Measure 4.9-1a (Comply with all Regulations on the Transport and Use of Hazardous Materials) and Mitigation Measure 4.9-1b (Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation) would avoid and minimize potential water quality impacts that could adversely affect foothill yellow-legged frogs. Potential Project impacts on foothill yellow-legged frogs and their habitat would be reduced to **less than significant with mitigation incorporated**.

Mitigation Measure 4.4-6: Conduct Surveys for Northwestern Pond Turtles and Implement Avoidance and Minimization Measures.

Before the start of any Project construction activity, the District shall conduct preconstruction surveys in all areas of Project ground disturbance that could support northwestern pond turtles. The surveys will include a habitat assessment as described in *Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion (USGS 2006).*

If no suitable habitat for northwestern pond turtles is detected during the surveys, no impacts would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If the habitat assessment indicates suitable habitat for northwestern pond turtle is present in the Project area, visual surveys shall be conducted as described in USGS 2006 to assess aquatic and upland habitat. If the visual surveys indicate the presence of northwestern pond turtles in areas that could be adversely affected by Project construction activities, the District will develop a BRMP to avoid, minimize and mitigate potential Project impacts. The District will develop the BRMP and appropriate compensation measures, if needed, before construction activities begin. The BRMP will describe implementation of avoidance and minimization measures, avoidance of take, habitat restoration, if necessary, success criteria, monitoring and reporting protocols, and contingency measures or compensatory mitigation to be implemented if the initial mitigation fails. The performance standard for the successful implementation of

the BRMP shall be complete avoidance of take of northwestern pond turtles and no net loss of northwestern pond turtle habitat.

The following mitigation measures shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Mitigation Measure 4.10-1 Stormwater Management during Construction

Mitigation Measure 4.9-1a Comply with all Regulations on the Transport and Use of Hazardous Materials

Mitigation Measure 4.9-1b Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation

Significance After Mitigation (Northwestern Pond Turtle):

Implementing Mitigation Measure 4.4-6 would avoid, minimize and mitigate the Project's potential impacts on northwestern pond turtles by protecting this species during construction, replacing impacted habitat in or near the Project footprint, or by providing agency-approved mitigation as appropriate. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction. In addition, following water quality protection measures Mitigation Measure 4.10-1 (Stormwater Management during Construction), Mitigation Measure 4.9-1a (Comply with all Regulations on the Transport and Use of Hazardous Materials) and Mitigation Measure 4.9-1b (Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation) would avoid and minimize potential water quality impacts that could adversely affect northwestern pond turtles. Potential Project impacts to northwestern pond turtles and their habitat would be reduced to **less than significant with mitigation incorporated**.

Raptors

Three special-status raptors (American goshawk, bald eagle, and California spotted owl) could potentially nest in or near the Project construction area. Raptor nests are protected under the Migratory Bird Treaty Act and by Section 3503.5 of the California Fish and Game Code. Potential direct construction-related impacts on nesting birds could include destruction of nests or eggs from vegetation trimming, tree removal, and grading. Visual or auditory disturbance from construction noise and human presence could result in nest abandonment or failure by deterring birds from preferred nest and foraging sites, and/or distracting adults from tending to their eggs or young. These potential impacts on nesting special-status raptors would be **potentially significant**.

Mitigation Measure 4.4-7: Conduct Preconstruction Surveys for Special Status Raptors and Implement Avoidance and Minimization Measures.

Before the start of any Project construction activity, the District will conduct preconstruction surveys as described below in all areas subject to potential direct impacts or indirect disturbance associated with Project construction.

4.4-7a. A qualified biologist will conduct preconstruction surveys as described in the *Northern Goshawk Inventory and Monitoring Technical Guide* (USFS 2006). This protocol requires two visits,

the first to be conducted during the nestling stage (generally late May through late June or early July), and the second during the fledgling stage (late June through mid-August).

If no active goshawk nests are detected, no impacts would occur to nesting goshawks. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If an active nest is detected the nest will be mapped and a buffer will be established around the nest. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, as described in ICF International and H.T. Harvey and Associates 2013, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers).

4.4-7b. A qualified biologist will conduct preconstruction surveys as described in the *Protocol for Evaluating Bald Eagle Habitat and* Populations *in California* (Garcia and Associates & PG&E 2004). Initial bald eagle nest searches shall be conducted when eagles are most likely to be found at nest sites and as early in the breeding season as possible (late February through March). Additional surveys shall be conducted in mid-nesting season (late April through May) and late in the season (early June to early July).

If no active bald eagle nests are detected, no impacts would occur to nesting bald eagles. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If an active nest is detected the nest will be mapped and a non-disturbance buffer will be established around the nest. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, as described in ICF International and H.T. Harvey and Associates 2013, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers).

4.4-7c. A qualified biologist will conduct preconstruction surveys consistent with methods described in the *Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls (USFWS 2012*) or other currently accepted protocol. The surveys shall occur between March 15 and August 31 or within the timeframe defined in the most current accepted protocol.

If no active spotted owl nests are detected, no impacts would occur. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If an active spotted owl nest is detected the nest will be mapped and a non-disturbance buffer will be established around the nest for the duration of nesting. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, as described in ICF International and H.T. Harvey and Associates 2013, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers).

The following mitigation measure shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Significance After Mitigation:

Implementing Mitigation Measures 4.4-7a, b and c would avoid and minimize the Project's potential impacts on nesting American goshawks, bald eagles and California spotted owls by protecting nests of these species during construction with non-disturbance buffers. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction and that nest monitoring occurs as required. Potential Project impacts to nesting American goshawks, bald eagles and California spotted owls would be reduced to **less than significant with mitigation incorporated**.

Willow Flycatcher

Willow flycatchers could potentially nest in Project construction areas. Potential direct construction-related impacts on nesting willow flycatchers could include destruction of nests or eggs from vegetation trimming, tree removal, and grading. Visual or auditory disturbance from construction noise and human presence could also potentially result in nest abandonment or failure by deterring birds from preferred nest and foraging sites, and/or distracting adults from tending to their eggs or young. These potential impacts on nesting willow flycatchers would be **potentially significant**.

Mitigation Measure 4.4-8: Conduct Preconstruction Surveys for Willow Flycatcher and Implement Avoidance and Minimization Measures.

Before the start of any construction activities a qualified biologist shall assess the areas subject to potential Project construction impacts and disturbance to determine if suitable willow flycatcher nesting habitat (i.e., dense willow thickets near standing water, wet meadows) is present.

If suitable nesting habitat for willow flycatchers is present, a qualified biologist will conduct preconstruction surveys consistent with *A Willow Flycatcher Survey Protocol for California* (Bombay et al. 2003). This protocol requires a minimum of two separate surveys, one conducted between June 15 – 25 and one during either June 1 – 14 or June 26 – July 15.

If no willow flycatcher nesting activity is detected, no impacts would occur to nesting willow flycatchers. The results of the survey shall be documented in a technical report kept on file at the District, and no further actions would be required.

If an active nest is detected the nest will be mapped and a non-disturbance buffer will be established around the nest. The extent of the buffer shall be determined by a qualified biologist based on the expected extent of noise or construction disturbance, as described in ICF International and H.T. Harvey and Associates 2013, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers). The ESA buffer will be delineated with highly visible fencing that will be monitored and maintained until the young have fledged from the nest. Periodic monitoring of the nest will occur as described in ICF International and H.T. Harvey and Associates (2013). The monitoring biologist shall have the authority to stop work if there is evidence that

proposed construction activity might result in harassment (e.g., discouraging adult birds from incubation or feeding young) that could jeopardize survival of eggs, young, or fledglings.

The following mitigation measure shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Significance After Mitigation:

Implementing Mitigation Measures 4.4-8 would avoid and minimize the Project's potential impacts on nesting willow flycatchers by protecting nests during construction with non-disturbance buffers and nest monitoring. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction and that nest monitoring occurs as required. Potential Project impacts to nesting willow flycatchers would be reduced to **less than significant with mitigation incorporated**.

Nesting Migratory Birds

The Project area could support nesting migratory birds that are not special-status species, but that are protected by the federal Migratory Bird Treaty Act and by California Fish and Game Code Section 3503, which prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Potential construction-related impacts on nesting birds include destruction of nests or eggs because of vegetation trimming, tree removal, and grading. During construction, temporary increases in noise levels from equipment mobilization, trenching, grading, and earthmoving, as well as increased levels of human movement could disrupt the nesting and foraging behavior of migratory birds. These types of disturbances could result in nest abandonment or failure by deterring birds from preferred nest and foraging sites, and/or distracting adults from tending to their eggs or young. These impacts would be **potentially significant.**

Mitigation Measure 4.4-9: Conduct Preconstruction Surveys for Nesting Birds and Implement Avoidance and Minimization Measures.

If possible, conduct vegetation removal from approximately September 1 to February 28) to avoid the bird breeding season (March 1 through August 31). If construction activities are initiated outside the bird breeding season, then no pre-construction nesting survey shall be required.

If Project construction occurs during the bird breeding season (March 1 through August 31), a qualified biologist shall conduct preconstruction nest surveys no more than 7 days before the start of construction. The survey would cover the Project footprint, including areas used for staging and access, and a 500- foot buffer beyond the boundaries of these areas. If an active nest (defined as a bird building a nest, sitting on a nest, carrying food to young, etc.) is found, non-disturbance ESA buffer will be delineated with highly visible flagging that will be periodically monitored and maintained until the young have fledged from the nest. The extent of the buffer shall be determined by a qualified biologist based on consideration of the species, the expected extent of noise or construction disturbance, as described in ICF International and H.T. Harvey and Associates 2013, ambient levels of noise and other disturbances, and line of sight between the nest and the disturbance (e.g., topographic or other visual barriers). The following mitigation measure shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Significance After Mitigation:

Implementing Mitigation Measure 4.4-9 would avoid and minimize the Project's potential impacts on nesting migratory birds by protecting nests with non-disturbance buffers during construction. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that protection measures are implemented and monitored throughout construction and that nest monitoring occurs as required. Potential Project impacts to nesting migratory birds would be reduced to **less than significant with mitigation incorporated**.

Special-Status Bat Species

Special-status bat species potentially occurring in the Project area include fringed myotis and Townsend's big-eared bat. Trees, rock outcroppings or other structures in the Project area may offer appropriate habitat features to support bat maternity roosts or hibernacula of Fringed myotis, Townsend's big-eared bat, and of other bat species. These bat habitat features include snags or trees that may decay in a way that creates cavities or large crevices and rock outcroppings that provide cavities or fissures. Roost sites are important habitat features for bats and can be a limiting resource for bat populations. Staging and construction activities could result in physical harm or mortality to bats and roosts. Temporary increases in noise levels from equipment mobilization, trenching, grading, and earthmoving, as well as increased levels of human movement could flush bats from shelters and roosts. Tree and vegetation removal, grading, rock scaling, and demolition of existing structures could adversely affect fringed myotis or Townsend's big-eared bats. If construction activities occur during the maternity season (May 1 to August 31) or overwintering season (November 1 to March 15) when these species are less mobile and able to escape danger, injury or mortality to bats could occur and roost habitat could be lost. These impacts could be **potentially significant**.

Mitigation Measure 4.4-10: Conduct Preconstruction Habitat Assessment for Bats and Implement Avoidance and Minimization Measures.

Before the start of any Project construction activity, a qualified biologist will conduct a preconstruction habitat assessment in and within 100 feet of the Project footprint. The assessment will be conducted in early spring and will evaluate whether suitable habitat for bat maternity roosts is present. Construction is not expected to occur during the overwintering season due to the elevation constraints for the Project. If highly suitable habitat for maternity roosts is present in an area that will be subject to vegetation removal and ground disturbing activities, removal of the highly suitable roost habitat will be conducted outside of the maternity season (May 1 to August 31) to avoid harm to the species. If a highly suitable roost tree or structure is to be removed, trees and/or structures surrounding the roost habitat should be removed first, allowing any bats that may be present time to leave the area. A qualified biologist will be present during removal of the habitat tree or structure supporting the potential bat roost.

The following mitigation measure shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Significance After Mitigation:

Implementing Mitigation Measure 4.4-10 would avoid and minimize the Project's potential impacts on bat maternity roosts by assessing whether bat roosts are present, and by conducting activities that could disturb any maternity roosts found during the survey outside of the maternity season. Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction and that maternity roosts are protected as required. Potential Project impacts to bats would be reduced to **less than significant with mitigation incorporated**.

Conclusion – Construction Impacts on Special-Status Species

Project construction could result in some potentially significant impacts to special-status plant and wildlife species, including plant species upswept moonwort, Pleasant Valley mariposa-lily, Sierra arching sedge, mud sedge, saw-toothed lewisia, Stebbins' phacelia, yellow bur navarretia, and brownish beaked-rush; and wildlife species monarch butterfly, foothill yellow-legged frog, northwestern pond turtle, American goshawk, bald eagle, California spotted owl, and willow flycatcher, as well as nesting birds and special-status bat species. However, with the mitigation discussed above, these impacts would be reduced to a **less-than-significant level**.

Impact 4.4-2. Have a substantial adverse population effect on special-status salmonids based on water temperature changes that would affect a substantial number of individuals during sensitive life cycle stages of the species?

This section describes potential Project impacts from water temperature changes on special-status salmonids inhabiting the Lower American River between Nimbus Dam and the Watt Avenue bridge. The discussion below considers potential impacts to Central Valley steelhead, Central Valley fall-run chinook, Central Valley late fall-run chinook, Central Valley winter-run chinook, and Central Valley spring-run chinook from temperature changes due to Project operations, with specific focus on fall-run chinook and Central Valley steelhead.

ADDITIONAL METHODOLOGY

Overview of Analytical Approach

The analysis of potential impacts to special-status salmonids from water temperature changes due to Project operations consisted of four steps:

1. **Temperature modeling**. Water temperature in the Lower American River was modeled using a two-dimensional hydrodynamic and water quality model, CE-QUAL-W2 (Appendix C). This modeling provided information on potential water temperature changes due to Project operations for every month for each water year type (wet, above normal, below normal, dry and critically dry) for 40 years of modeled temperature data (1975 to 2014).

2. **Determining Potential Species Presence**. Steelhead juveniles could occur in the Lower American River throughout the year. None of the four runs of chinook salmon are present year-round in the Lower American River but rather occur there at different times of the year depending on life stage (i.e., adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts). This species presence information provided the basis for

analyzing the Project's potential water temperature effects on salmonid life stages for every month of each water year type.

3. **Assessing Temperature Tolerances**. Maximum temperature tolerances for each life stage were used to evaluate potential Project effects on the special-status salmonids present (or potentially present) in the Lower American River for every month of each water year type. The temperature tolerance information was compiled from laboratory and field studies that analyzed the effects of water temperatures on critical physiological processes and crucial behaviors for life stages of special-status salmonids.

4. **Ranking of Potential Effects**. Based on known temperature tolerances for special-status salmonids the potential effects of water temperature changes on each life stage were assessed by month for each water year type. The potential effects were then ranked as negligible, low, moderate or high. These rankings helped to inform the conclusions regarding potential Project impacts from water temperature changes and whether they could affect a substantial number of individuals during sensitive life cycle stages of each species.

These four analytical steps are further described below. Please see Appendix D-3 *Analysis of the Effects of Water Temperature Changes on Special-Status Salmonids,* for additional details about temperature modeling, how species presence was determined, the sources of information for assessing temperature tolerances, and the effects of water temperature changes on special-status salmonids that have been recorded in the Lower American River.

Temperature Modeling

Water temperature in the Lower American River was modeled using a two-dimensional hydrodynamic and water quality model, CE-QUAL-W2 (Appendix C). Baseline temperatures for the river and changes in water temperature were modeled for the following Project operations: (1) existing infrastructure operations and current water demands (Baseline vs. Project), (2) existing infrastructure operations and future water demands (Future Baseline vs. Future Project), (3) post-construction operations with current water demands (Baseline vs. Project) and (4) post-construction operations with future water demands (Future Baseline vs. Future Project).

The impact analysis is based on a comparison of average monthly water temperatures under baseline conditions and with Project operations. Please see Section 4.4, *Hydrology and Water Quality* and Appendix C of this Draft EIR for details on how the monthly baseline temperatures and Project-related temperature changes were calculated.

Three scenarios were developed to evaluate potential effects to special-status salmonids due to Project-related changes in water temperature modeled for the Lower American River at Watt Avenue. Baseline water temperature and change in water temperature were evaluated by month and water year type for each of the three scenarios, as described below.

- **Scenario 1 (Average Condition).** In the first scenario, modeled water temperatures at Watt Avenue were averaged by month and water year type to calculate average monthly water temperature under baseline conditions and change in average monthly temperature associated with the Project. Scenario 1 provides an indication of how conditions are expected to change on average with Project operations for each water year type.

- **Scenario 2 (Warmest Baseline).** In the second scenario, modeled water temperatures at Watt Avenue were selected when baseline conditions were highest for each month and water year type. Project-related changes in water temperature were also selected for the corresponding month and water year type. Scenario 2 provides an indication of what types of Project-related changes are expected to occur when baseline temperatures are highest.

- **Scenario 3 (Greatest Change).** In the third scenario, modeled water temperatures at Watt Avenue were selected when Project-related operations resulted in the greatest water temperature increases for each month and water year type. Scenario 3 provides an indication of the type of conditions expected when maximum changes could occur due to Project operations.

Data was analyzed for each of these three scenarios for each of the Project operational regimes i.e., (1) existing infrastructure operations and current water demands (Baseline vs. Project), (2) existing infrastructure operations and future water demands (Future Baseline vs. Future Project), (3) post-construction operations with current water demands (Baseline vs. Project) and (4) post-construction operations with future water demands (Future Baseline vs. Future Project).

Determining Species Presence

A review of published data (CNDDB 2024; Day and Morris 2023) was the starting point for determining when each life stage (adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts) of these special-status salmonids were present in the Lower American River. Lower American River Smolt Trap data recorded between 2013 and 2023 in the Lower American River (Day and Morris 2023), the *Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of The Central Valley Project and State Water Project* (NMFS 2019), the *Endangered Species Act Section 7(a)(2) Programmatic Biological Opinion on the Long-Term Operation of the Central Valley Project and State Water Project* (NMFS 2024a), and discussion with CDFW staff (Burson pers. com. 2024) provided additional information. The Lower American River Smolt Trap is located in the Lower American River near the Watt Avenue bridge. It is typically in operation from January to June of a given year (depending on streamflow constraints) and uses length-by-date measuring criteria and genetic testing to determine which species of chinook are present (Day and Morris, 2023). Table 4.4-2 shows the potential presence of special-status salmonids in the Lower American River between Nimbus Dam and Watt Avenue bridge by month and life stage.

Table 4.4-2. Potential Presence of Special-Status Salmonids in the Lower American River between Nimbus Dam and Watt Avenue bridge

Species Potentially Present in the Lower American River	Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Central Valley fall-run chinook salmon	Adults (Upstream Migration)	N	N	N	N	N	Y	Y	Y	P	P	Y	Y
	Spawners	N	N	N	N	N	N	N	N	Y	P	P	Y
	Eggs/Alevin	Y	Y	N	N	N	N	N	N	N	Y	P	P
	Juveniles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
	Smolts	N	N	Y	Y	Y	Y	Y	N	N	N	N	N
Central Valley late fall-run chinook salmon	Adults (Upstream Migration)	Y	Y	Y	Y	N	N	N	N	N	Y	Y	P
	Spawners	Y	P	P	Y	N	N	N	N	N	N	N	N
	Eggs/Alevin	Y	Y	P	P	Y	Y	N	N	N	N	N	N
	Juveniles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Smolts	Y	P	P	Y	Y	N	N	N	N	N	Y	Y
Central Valley winter-run chinook salmon	Adults (Upstream Migration)	Y	Y	P	Y	Y	Y	Y	N	N	N	N	Y
	Spawners	N	N	N	Y	P	P	Y	Y	N	N	N	N
	Eggs/Alevin	N	N	N	N	Y	P	P	Y	Y	N	N	N
	Juveniles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Smolts	Y	P	P	Y	Y	N	N	N	N	N	Y	Y
Central Valley spring-run chinook salmon	Adults (Upstream Migration)	N	N	Y	Y	P	P	Y	Y	N	N	N	N
	Spawners	N	N	N	N	N	N	N	Y	P	Y	N	N
	Eggs/Alevin	N	N	N	N	N	N	N	N	Y	P	Y	N
	Juveniles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Smolts	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y
Central Valley steelhead	Adults (Upstream Migration)	N	N	N	N	N	N	N	Y	P	P	Y	N
	Spawners	Y	P	P	Y	N	N	N	N	N	N	N	Y
	Eggs/Alevin	Y	Y	P	P	Y	N	N	N	N	N	N	N
	Juveniles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Smolts	N	N	Y	Y	Y	Y	N	N	N	N	N	N

Source: Yoshiyama et al. 1998, Zillig et al. 2022, Williams 2006; Hearn et al. 2014
Y = in the system; P = peak activity; N = not in system
Note: Life stages shown in grey have no confirmed presence in the Project area.

Information from these traps and other published sources indicate that fall run chinook greatly outnumber any other salmonids in the Lower American River, with 1.4 million individuals recorded in the past decade. Central Valley steelhead are the second most abundant salmonid, with over 4,300 total individuals detected in the Lower American River Smolt Trap since 2013 (Day and Morris, 2023).

The Lower American River Smolt Trap data also provide evidence for the presence of winter run, spring run, and late fall run chinook in the Lower American River near the Watt Avenue bridge. However, these species occur at far Lower numbers than fall run chinook and steelhead (Day and Morris, 2023). Since 2013, smolt trap data documented a combined total of 330 winter run chinook, and 75 spring run chinook. Forty-one late fall run chinook have been captured in the Lower American River Smolt Trap, but no individuals have been recorded since 2016. Spring run and winter run chinook are generally considered to be strays in the Lower American River (Burson pers. com. 2024). Because numbers for these three salmonid species are so low and because no published data is available to confirm that these runs are naturally occurring and natal to the Lower American River, the effects analyses for these species focus on the juveniles and smolts that may be entering the Project area to find rearing habitat, refugia, or feeding opportunities rather than all life cycle stages.

Assessing Temperature Tolerances

Table 4.4-3 shows optimal temperature ranges published by the National Marine Fisheries Service (NMFS 2019, NMFS 2024b) for the different life stages of the special-status salmonids. However, river temperatures often do not meet optimal values under baseline conditions. Therefore, maximum temperatures tolerances were developed for the Project based on published values associated with both laboratory experimentation and in-situ measurements, which, in some cases, expanded upon the values provided by NMFS. Table 4.4-4 shows the 7-day, daily average maximum temperature tolerances used in the analysis. These maximum temperature tolerances were used to evaluate potential Projects effects on different life stages of the special-status salmonids present (or potentially present) in the Lower American River between Nimbus Dam and Watt Avenue bridge.

Table 4.4-3. Optimal Temperature Ranges for Chinook and Steelhead

Salmonid	Egg/Alevin Incubation	Juvenile	Smolt Migration	Adult Migration	Spawning Initiation
Chinook	6.1 – 12.2°C	12.2 – 18.8°C	12.8 – 16.1°C	3.3 – 17.8°C	5.5 – 13.9°C
Chinook	43 – 45°F	54 – 66°F	55 – 61°F	38 – 64°F	42 – 57°F
Steelhead	7.2 – 11.1°C	7.2 – 20.5°C	12.2 – 12.7°C	3.9 – 18.9°C	3.9 – 11.1°C
Steelhead	45 – 52°F	45 – 69°F	54 –55°F	39 – 66°F	39 – 52°F

Source: NMFS 2019

Note: Both the NMFS 2019 and 2024 Biological Opinions provide information on optimum temperatures and thresholds for chinook and steelhead. The NMFS 2019 document provided more specific temperature tolerances and therefore was the source of information for this table.

°C = degrees Celsius

°F = degrees Fahrenheit

Table 4.4-4. Maximum Temperature Tolerances for Special-Status Salmonids (the 7-day, daily average maximum temperature)

Salmonid	Adult Migrating	Adult Holding	Spawner	Egg/Alevin	Juveniles	Smolt
Fall-run chinook salmon	20°C	16°C	14°C	12°C	16°C	19°C
Late fall-run chinook salmon	20°C	16°C	14°C	12°C	16°C	19°C
Winter-run chinook salmon	20°C	16°C	16°C	12°C	15.5°C	19°C
Spring-run chinook salmon	21°C	16°C	16°C	13°C	16°C	19°C
Central Valley steelhead	20°C	20°C	16°C	10°C	19°C	21°C

Source: McCullough 1999, Moyle et al. 2017, Myrick and Cech 2004, NMFS 2019.

Note: Life stages shown in grey have no confirmed presence in the Project area.

°C = degrees Celsius

Ranking of Potential Impacts

The data compiled for the water temperature three scenarios were evaluated independently to assess the extent to which Project related temperature changes might adversely affect each life stage of special-status salmonids; potential impacts were then ranked according to the criteria described below. The rankings considered the effects of temperature changes on critical physiological processes such as reduced gamete production, developmental defects, increased metabolic demands or decreased metabolic efficiency, reduced growth rates, and susceptibility to disease. The rankings also assessed the potential for water temperature changes to alter crucial behaviors, such as the timing of spawning or outmigration. The effects rankings were applied conservatively to cover the worst-case temperature scenarios for sensitive life stages.

To evaluate potential Project impacts, temperature model output was aggregated by month, and the change in monthly temperature between baseline and Project conditions was evaluated by month and water year type. Changes in monthly water temperature in the Lower American River at Watt Avenue were also compared to temperature tolerances (see *Assessing Temperature Tolerances* above). When modeled changes in monthly temperature were greater than 0.2°C, these changes were further evaluated based on the three water temperature scenarios described above: Scenario 1: Average Condition, Scenario 2: Warmest Temperature and Scenario 3: Greatest Change. Changes in temperatures less than or equal to 0.2°C are at or below the accuracy of calibrated temperature measurement equipment (USGS 2023).

Potential effects to special-status salmonids during critical stages of their life cycle that could result in impacts to a substantial number of individuals were ranked according to the following criteria:

None: Project operations result in no increase in water temperature from baseline conditions.

Negligible: Project operations that increase water temperature from baseline conditions by less than or equal to 0.2°C are negligible. Changes in temperatures that are less than or equal to 0.2°C are at or below the accuracy of calibrated temperature measurement equipment (see EIR Section 4.10, *Hydrology and Water Quality*). Changes in temperatures that are less than or equal to 0.2°C would not be expected to result in adverse effects to any life stage because these minor changes would have little to no effect on critical physiological processes or crucial behaviors for sensitive life stages. There is little to no potential for these effects to result in reduced survival or reproduction for a substantial number of individuals.

Low: Project operations that increase water temperature greater than 0.2°C and occur when the baseline temperatures may already be causing thermal stress to sensitive life stages and further incremental temperature increases associated with the Project could result in changes to critical physiological processes or crucial behaviors for sensitive life stages. However, depending on the frequency, timing and magnitude of these temperature changes there is a low potential for these effects to result in reduced survival or reproduction for a substantial number of individuals.

Moderate: Project operations that increase water temperature greater than 0.2°C and occur when baseline temperature conditions are already causing thermal stress for sensitive life stages and further incremental temperature increases associated with the Project could result in changes to critical physiological processes or crucial behaviors for sensitive life stages. Depending on the frequency, timing and magnitude of these temperature changes there is moderate potential for these effects to result in reduced survival or reproduction for a substantial number of individuals.

High: Project operations that increase water temperature more than 0.5°C and occur when baseline temperature conditions already cause thermal stress that result in changes to critical physiological processes or alter crucial behaviors. Depending on the frequency, timing and magnitude of these temperature changes there is high potential for reduced survival or reproduction for a substantial number of individuals.

These ranking criteria are intended to act as an initial screening procedure to identify changes in water temperature associated with the proposed Project that may pose potentially significant impacts to specific life history stages of special status salmonid species in the Lower American River. Low, moderate, and high rankings are evaluated using the threshold of significance to determine the level of significance for CEQA purposes:

The following Project operational regimes were analyzed for the five special-status salmonids that could occur in the Lower American River: (1) operations with existing infrastructure and current water demands (Baseline vs. Project), (2) operations with existing infrastructure and future water demands (Future Baseline vs. Future Project), (3) post-construction operations with current water demands (Baseline v. Project) and (4) post-construction operations with future water demands (Future Baseline vs. Future Project). The effects of Project related water temperature changes on all life stages (adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts) of Central Valley fall run chinook salmon and Central Valley steelhead are discussed in this section (see Tables 4.4-4 – 4.4-11). Select life history stages for Central Valley late fall-run chinook, Central Valley winter-run chinook, and Central Valley spring-run chinook are also discussed in this section. Tables D3-1 through D3-20 in Appendix D3, *Analysis of the Effects of Water Temperature Changes on Special-Status Salmonids*, provide additional details on the potential effects of Project related temperature changes on all life stages of special-status salmonids.

Overview of Effects of Increased Water Temperature on Salmonids

Potential effects on steelhead, fall run chinook and other salmonids from increased water temperatures include changes in the timing of life history processes such as spawning and migration, increased mortality, and for adults and spawners, reduction in the quality, number, or size of embryos. Warmer water temperatures may also reduce swimming efficiency and increase metabolic demands for metamorphosis, resulting in reduced energy stores that lead to lower gamete quality, and smaller gamete size and abundance, and potential increases in pre-spawn mortality (Martins et al., 2011). Increased stream temperatures can deleteriously affect salmonids across life stages in a variety of ways: warmer water exacerbates the spread of pathogens, disease, and contaminants, and increases predation rates of eggs, embryos, and fry (Windell et al., 2017). Quigley and Hinch (2006) found that when experimentally raising stream temperatures in the laboratory by as little as 0.4ºC, whole body cortisol levels of juvenile chinook increased between 116% to 253% compared to controls. Continued production of cortisol can cause reductions in growth and disease resistance in salmonids (Redding et al., 1984). When salmonids are exposed to temperatures above their thermal optimum, only minor increases in temperature can result in substantial increases in mortality (Brett 1958).

Water temperature may also affect changes in behavior and timing of life history processes. Adults may delay upstream migration (Moyle et al., 2017), experience higher pre-spawn mortality (Bowerman et al., 2021) or produce fewer and smaller embryos resulting in reduced egg to juvenile survival (FitzGerald et al., 2021). Juveniles are also affected by warm water temperatures, which increase metabolic demands and reduce individual growth rates (Windell et al., 2017). Smolts may also delay outmigration if temperatures increase past their thermal optimums (Mantua et al., 2009). When water temperatures increase past the point of an individual's thermal optimum, salmonids will search for cooler patches, provided by groundwater inflow (Railsback and Harvey, 2023), stream-side vegetation that creates shading (Linnansaari et al., 2023), or pockets of cold water released from dams (Sutton et al., 2007). These cold-water refuges can provide considerable relief to temperature-stressed individuals, and act as a behavioral thermoregulation whereby individuals move within the habitat to avoid warmer waters and the resulting reduced fitness (Snyder et al., 2022).

Stream temperatures peak during the summer months and will affect different salmonids at different life stages. For example, spring-run chinook will experience higher thermal stress than fall-run chinook during adult holding and egg incubation, but fall-run chinook are most affected during adult upstream migration (FitzGerald et al., 2021). Phenotypic plasticity may allow for various runs to shift migration timings to avoid temperature stress, but

the delaying of key life-cycle processes may result in the hybridization of overlapping runs (FitzGerald et al., 2021). Winter-run chinook can avoid high temperatures by migrating earlier in the year using winter precipitation and spring snowmelt, and their offspring may outmigrate more rapidly to avoid rearing in warmer streams (Zillig et al., 2022). In short, the only way for salmonids to avoid temperature stress in warming rivers is to find cold water refuge, delay critical life cycle processes, or, in the case of juveniles, outmigrate prior to peak water temperatures.

These potential adverse effects were considered in assessing and ranking the level of potential Project-related temperature impacts on all life stages of fall run chinook and steelhead and critical life stages of other salmonids in the Lower American River between Nimbus Dam and Watt Avenue.

FALL RUN CHINOOK SALMON

Central Valley fall-run chinook are the most abundant of all special-status salmonids in the Project area, with over 125,000 individuals detected on average per year at the Lower American River Smolt Trap since 2013 (Day and Morris, 2023). Adult fall-run chinook begin their upstream migration from the ocean in June, with peak migration occurring in December, and spawning between September and December (Yoshiyama et al., 1998). Eggs and alevin develop between October to February, and juveniles begin emerging in December. Smolt outmigration typically peaks in January to February, but individuals may still be outmigrating[5] as late as June. These individuals are present in the Lower American River at Watt Avenue every year at high abundances and constitute a distinct, natal, and hatchery-supported population.

Operational Impacts on Fall Run Chinook with Existing Infrastructure and Current Water Demands

For fall-run chinook, the Project's operational potential effects with existing infrastructure and current water demands are negligible or low for all three temperature scenarios (Average Condition, Warmest Baseline, and Greatest Change) and in all water years except for migrating and holding adults in June, July and September of critically cry years. The potential effects are considered low for smolts and juveniles because they can develop thermal plasticity[6] when reared in warm water and can therefore tolerate higher temperatures. In addition, they are able to outmigrate earlier to avoid thermal stress.

Potential Project effects are considered moderate for migrating and holding adults in Scenario 3 (Greatest Change) in June (20.9°C baseline temperature, 0.3°C Project increase), July (18.7°C baseline temperature, 0.2°C Project increase), and September (20.6°C baseline temperature, 0.5°C Project increase). Some adults would already be under temperature stress, and additional increases in temperature may cause them to delay migrating or cause reductions in gamete size, quality, or abundance. June and July are relatively early for migrating adults to enter the system and therefore a comparatively small portion of the population would potentially be affected during these months.

[5] Outmigration in anadromous fish refers to the migration of juvenile fish from freshwater habitats, where they are born and initially develop, to the ocean or saltwater environments, where they will grow to adulthood.

[6] Thermal plasticity in anadromous fish refers to their ability to adapt physiologically and behaviorally to varying temperature conditions in their environment. It involves changes in metabolic rates, cardiovascular performance, and other physiological traits to cope with temperature fluctuations.

Table 4.4-5 provide an evaluation of potential effects on each life stage of fall-run chinook in the Lower American River at Watt Avenue bridge from changes in water temperature modeled for Project operations assuming current water demands and the use of existing infrastructure.

Operational Impacts on Fall Run Chinook with Existing Infrastructure with Future Water Demands

Project operation could have negligible effects under Scenarios 1 (Average Condition) and 2 (Warmest Baseline). For Scenario 3 (Greatest Change) holding adults would experience moderate effects in dry and critically dry years, and spawners could also be moderately affected in critically dry years. Smolts and juveniles could experience low effects during dry and critically dry years. The effect was considered low rather than moderate because when smolts and juveniles are reared in warm water they can tolerate higher temperatures, and because they are able to outmigrate earlier to avoid thermal stress (Myrick and Cech 2004).

Table 4.4-6 provides an evaluation of potential effects on each life stage of Fall-Run Chinook salmon in the Lower American River at Watt Avenue bridge from changes in water temperature modeled for Project operations assuming future water demands and the use of existing infrastructure.

Operational Impacts on Fall Run Chinook Post Construction with Current Water Demands

Project operations would have negligible effects for Scenario 1 (Average Condition), and low or negligible effects in Scenario 2 (Warmest Baseline). For Scenario 3 (Greatest Change), holding adults are the only life stage to potentially experience moderate effects in summers of critically dry years. Holding adults, which have a 7-day, daily average maximum temperature of 16°C, could be affected in June (20.9°C baseline temperature, 0.3°C Project increase), July (18.7°C baseline temperature, 0.2°C Project increase), and September (20.6°C baseline temperature, 0.5°C Project increase). Because some adults would already be under temperature stress, particularly in June and September, the increased temperatures could cause reductions in gamete size, quality, or abundance for holding adults. Effects are considered moderate rather than low because of the potential for holding adults to be affected by increased temperatures in both June and September.

Table 4.4-7 provides an evaluation of potential effects on each life stage of fall-run chinook in the Lower American River at Watt Avenue bridge due to changes in water temperature modeled for post-construction Project operations assuming current water demands.

Operational Impacts on Fall Run Chinook Post Construction with Future Water Demands

Project operations would have potential negligible effects on all life stages for Scenario 1 (Average Condition). For Scenarios 2 (Warmest Baseline) and 3 (Greatest Change), modeling indicates that eggs and alevin could experience “moderate” effects due to a 0.23ºC temperature increase in November of a single wet year over the 40-year modeling period. This 0.23ºC impact is just outside the minimum threshold for temperature measuring devices (the lowest threshold assumed to be applicable for the impact analysis) and would occur very infrequently.

Table 4.4-5: Potential Effects from Change in Water Temperature to Fall-Run Chinook in the Lower American River Monthly Water Temperature at Watt Avenue, Existing Infrastructure [Baseline vs. Project]

Scenario 1	Average	Condition	Water Year Type									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	T°C Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	None	None	None	None	Negligible	None	None	None	Negligible
Adult Holding	<16	Jun-Dec	None	None	None	None	None	Negligible	None	None	None	Negligible
Spawner	<14	Late Sep-Dec	None	None	None	None	None	None	None	None	None	None
Egg/Alevin	<12	Oct-Feb	None	None	None	None	None	None	None	None	None	None
Juveniles	<16	Dec-Oct	None	None	None	None	None	Negligible	None	None	None	Negligible
Smolt	<19	Mar-Jul	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest**	**Baseline**	**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	T°C Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June	**Low[1]**
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	Oct	Negligible	None	Negligible	June	**Low[2]**
Spawner	<14	Late Sep-Dec	None	Negligible	None	None	Oct	Negligible	None	Negligible	None	Negligible
Egg/Alevin	<12	Oct-Feb	None	Negligible	None	None	Oct	Negligible	None	Negligible	None	Negligible
Juveniles	<16	Dec-Oct	None	None	None	Negligible	Oct	Negligible	None	Negligible	June	**Low[3]**
Smolt	<19	Mar-Jul	None	None	None	Negligible	None	None	None	None	June	**Low[4]**
Scenario 3	**Greatest**	**Change**	**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	T°C Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June, July, Sep	**Moderate[1]**
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	Oct	Negligible	June	Negligible	June, July, Sep	**Moderate[2]**
Spawner	<14	Late Sep-Dec	None	Negligible	None	None	Oct	Negligible	None	Negligible	Sep	**Low[5]**
Egg/Alevin	<12	Oct-Feb	None	None	None	None	Oct	Negligible	None	Negligible	Nov	Negligible
Juveniles	<16	Dec-Oct	None	Negligible	None	Negligible	Oct	Negligible	June	Negligible	June, July, Sep	**Low[6]**
Smolt	<19	Mar-Jul	None	None	None	Negligible	None	Negligible	None	Negligible	June, July	**Low[7]**

Sources: Temperature effects – Moyle et al. 2017, NMFS 2019, Myrick and Cech 2004. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Low[1]. Modeled baseline temperature in June is 20.9ºC and temperature increased by 0.3ºC due to the Project. Some adults may already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance. This potential effect is considered low because the magnitude of the temperature increase is relatively small (0.3ºC), and because the temperature increase occurs at the beginning of the migratory season when only a small proportion of the population may be present.
- Low[2]. Modeled baseline temperature in June is 20.9ºC and temperature increased by 0.3ºC due to the Project. Adults would already be under temperature stress, and this may cause reductions in gamete size, quality, or abundance. The effect is considered low because the magnitude of the temperature increase is relatively small (0.3ºC) and because the temperature increase occurs at the beginning of the holding season when only a comparatively small portion of the population may be present.
- Low[3]. Modeled baseline temperature in June is 20.9ºC and temperature increased by 0.3ºC due to the Project. Some individuals would be experiencing decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness effects; research by Myrick and Cech (2004) shows that juveniles reared in warm water can tolerate higher temperatures. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC) and because of the thermal plasticity shown by juveniles reared in warm water.
- Low[4]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Some individuals would be experiencing decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness effects; research by Myrick and Cech (2004) shows that smolts reared in warm water can tolerate higher temperatures. Individuals may also outmigrate early in response to temperature stress. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC) and because of the thermal plasticity shown by juveniles reared in warm water. Individuals may also outmigrate early in response to temperature stress.
- Moderate[1]. Modeled baseline temperature in June is 20.9ºC, 21.4ºC in July, and 20.6ºC in September. Temperature increases due to the Project are 0.3ºC in June and July, and 0.5ºC in September. Some adults would already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance. Increased temperatures could occur during more than one month in the migratory season. June and July are relatively early for migrating adults to enter the system and therefore a comparatively small portion of the population would potentially be affected.
- Moderate[2]. Modeled baseline temperature in June is 20.9ºC, 21.4ºC in July, and 20.6ºC in September. Temperature increases due to the Project are 0.3ºC in June and July, and 0.5ºC in September. Some holding adults would already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance. Increased temperatures could occur during more than one month in the migratory season. June and July are relatively early for migrating adults to enter the system and therefore a comparatively small portion of the population would potentially be affected.
- Low[5]. Modeled baseline temperature in September is 20.6ºC and temperature increased by 0.5ºC due to the Project. Spawners would already be under temperature stress, and the increased temperature may cause pre-spawn mortality, spawning delays, or reductions in gamete size, quality, or abundance. The effect is considered low because the temperature increase occurs before the peak of spawning, and therefore a relatively small number of individuals would be affected..
- Low[6]. Modeled baseline temperature in June is 20.9ºC, 21.4ºC in July, and 20.6ºC in September. Temperature increases due to the Project are 0.3ºC in June and July, and 0.5ºC in September. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC). Some juveniles may experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness effects; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperatures. Also, individuals may outmigrate early in response to temperature stress.
- Low[7]. Modeled baseline temperature in June is 20.9ºC and 21.4ºC in July. Temperature increases due to the Project are 0.3ºC in both months. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC). Some smolts may experience decreased metabolic efficiency, reduced growth rates, struggle to metamorphose, or delay outmigration entirely, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness effects; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperatures. Also, individuals may outmigrate early in response to temperature stress.

Table 4.4-6: Potential Effects from Change in Water Temperature to Fall-Run Chinook in the Lower American River Monthly Water Temperature at Watt Avenue, Existing Infrastructure [Future Baseline vs. Future Project]

Scenario 1	Average Condition		Water Year Type									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<16	Jun-Dec	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Spawner	<14	Late Sep-Dec	None	None	None	None	None	Negligible	None	None	None	Negligible
Egg/Alevin	<12	Oct-Feb	None	None	None	None	None	Negligible	None	None	None	Negligible
Juveniles	<16	Dec-Oct	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Smolt	<19	Mar-Jul	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest Baseline**		**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	Oct	**Negligible**	June	Negligible	None	Negligible
Spawner	<14	Late Sep-Dec	None	Negligible	None	None	Oct	**Negligible**	None	Negligible	None	None
Egg/Alevin	<12	Oct-Feb	Nov	Negligible	None	None	Oct	**Negligible**	None	Negligible	None	None
Juveniles	<16	Dec-Oct	None	None	None	Negligible	None	Negligible	June	Negligible	None	Negligible
Smolt	<19	Mar-Jul	None	None	None	Negligible	None	None	None	Negligible	None	Negligible
Scenario 3	**Greatest Change**		**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June	**Low[2]**
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	August	**Moderate[1]**	June, Oct	**Moderate[2]**
Spawner	<14	Late Sep-Dec	None	Negligible	None	None	None	Negligible	None	Negligible	Oct	**Moderate[3]**
Egg/Alevin	<12	Oct-Feb	Nov	Negligible	None	None	None	Negligible	None	Negligible	Oct	**Not Applicable[1]**
Juveniles	<16	Dec-Oct	None	Negligible	None	Negligible	None	Negligible	August	**Low[1]**	June, Oct	**Low[3]**
Smolt	<19	Mar-Jul	None	None	None	Negligible	None	Negligible	None	Negligible	June	**Low[4]**

Sources: Temperature effects – Moyle et al. 2017, NMFS 2019, Myrick and Cech 2004. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Moderate[1]. Modeled baseline temperature in August is 19.9ºC and Project increased temperature by 0.5ºC. Many adults would already be under temperature stress, and this may cause reductions in gamete size, quality, or abundance. Warming is expected to occur during the middle of this life stage.
- Low[1]. Modeled baseline temperature in August is 19.9ºC and Project increased temperature by 0.5ºC. Some individuals could experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness effects. Individuals may also outmigrate early in response to temperature stress. Effects are considered low rather than moderate because of the thermal plasticity shown by juveniles; research by Myrick and Cech (2004) shows that juveniles and smolts reared in warm water develop thermal plasticity and can tolerate warmer temperatures.
- Low[2]. Modeled baseline temperature in June is 20.8ºC and Project increased temperature by 0.3ºC. Effects are considered low because the 0.3ºC temperature increase is relatively small (0.3ºC). Some adults may already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance.
- Moderate[2]. Modeled baseline temperature in June is 20.8ºC and 18.1ºC in October, and the increased temperature due to the Project is 0.3ºC and 0.8ºC, respectively. Many adults would already be under temperature stress, and may cause reductions in gamete size, quality, or abundance. More than one month is expected to be affected by warmer water during the holding season which included the 0.8˚C increase.
- Moderate[3]. Modeled baseline temperature in October is 18.1ºC and increased temperature is 0.8ºC. Many spawners would already be under temperature stress, and this may cause pre-spawn mortality, cause individuals to delay spawning, or cause reductions in gamete size, quality, or abundance. Warming is expected to occur in the middle of spawning season.
- Not applicable[1]. Modeled baseline temperature in October is 18.1ºC and Project increased temperature by 0.8ºC. All eggs/alevin would already be under extreme temperature stress and are unlikely to survive the baseline temperatures, therefore a 0.8ºC increase is unlikely to result in additional mortality.
- Low[3]. Modeled baseline temperature in June is 20.8ºC and 18.1ºC in October, and the increased temperature due to the Project is 0.3ºC and 0.8ºC, respectively. Effects to juveniles in June are considered low because the temperature increase in June is relatively small (0.3ºC). Some individuals could experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperatures. Individuals may also outmigrate early in response to temperature stress.
- Low[4]. Modeled baseline temperature in June is 20.8ºC and Project increased temperature by 0.3ºC...Effects are considered low because the 0.3ºC temperature increase is relatively small (0.3ºC). Some individuals may experience decreased metabolic efficiency, reduced growth rates, struggle to metamorphose, or delay outmigration entirely. Some individuals already acclimated to warmer temperatures may show no reduced fitness; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperatures.

Table 4.4-7: Potential Effects from Change in Water Temperature to Fall-Run Chinook in the Lower American River Monthly Water Temperature at Watt Avenue, Post-Construction [Baseline vs. Project]

Scenario 1	Average Condition		Water Year Type									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	None	None	None	None	Negligible	None	None	None	Negligible
Adult Holding	<16	Jun-Dec	None	None	None	None	None	Negligible	None	None	None	Negligible
Spawner	<14	Late Sep-Dec	None	None	None	None	None	None	None	None	None	None
Egg/Alevin	<12	Oct-Feb	None	None	None	None	None	None	None	None	None	None
Juveniles	<16	Dec-Oct	None	None	None	None	None	Negligible	None	None	None	Negligible
Smolt	<19	Mar-Jul	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest Baseline**		**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically	Dry
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June	**Low[1]**
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	Oct	Negligible	None	Negligible	June	**Low[2]**
Spawner	<14	Late Sep-Dec	None	None	None	Negligible	Oct	Negligible	None	Negligible	None	Negligible
Egg/Alevin	<12	Oct-Feb	None	None	None	None	Oct	Negligible	None	Negligible	Oct	Negligible
Juveniles	<16	Dec-Oct	None	Negligible	None	Negligible	Oct	Negligible	None	Negligible	June	**Low[3]**
Smolt	<19	Mar-Jul	None	None	None	None	None	None	None	Negligible	June	**Low[4]**
Scenario 3	**Greatest Change**		**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June, Sep	**Low[5]**
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	Oct	Negligible	June	Negligible	June, Sep	**Moderate[2]**
Spawner	<14	Late Sep-Dec	None	Negligible	None	Negligible	Oct	Negligible	None	Negligible	Sep	**Low[6]**
Egg/Alevin	<12	Oct-Feb	None	Negligible	None	Negligible	Oct	Negligible	None	Negligible	Oct, Nov	Negligible
Juveniles	<16	Dec-Oct	None	Negligible	None	Negligible	Oct	Negligible	June	Negligible	June, Sep	**Low[7]**
Smolt	<19	Mar-Jul	None	None	None	None	None	Negligible	None	Negligible	June	**Low[8]**

Sources: Temperature effects – Moyle et al. 2017, NMFS 2019, Myrick and Cech 2004. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Low[1]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Some adults may already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC).
- Low[2]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Many adults would already be under temperature stress, and this may cause reductions in gamete size, quality, or abundance. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC).
- Low[3]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Some individuals could experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity and may show no reduced fitness effects; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperatures. Also, individuals may outmigrate early to in response to temperature stress. Effects are considered low because potential effects would occur to a relatively small percentage of the population due to of the thermal plasticity shown by juveniles reared in warm water (Myrick and Cech 2004) and because early outmigration allows some individuals to in response to temperature stress altogether. In addition, effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC).
- Low[4]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Individuals could experience decreased metabolic efficiency, reduced growth rates, struggle to metamorphose, or delay outmigration entirely. Some individuals already acclimated to warmer temperatures may show no reduced fitness effects due to thermal plasticity and tolerance for higher temperatures, as described above (Myrick and Cech 2004). In addition, effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC).
- Low[5]. Modeled baseline temperature in June is 20.9ºC and 20.6ºC in September, and increased temperature due to Project is 0.3ºC and 0.5ºC, respectively. Some adults may already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance.
- Moderate[1]. Modeled baseline temperature in June is 20.9ºC, and 20.6ºC in September and temperature increases due to the Project are 0.3ºC, and 0.5ºC, respectively. Many adults would already be under temperature stress (particularly in June and Sep.) and this may cause reductions in gamete size, quality, or abundance. Effects are considered moderate because of the potential for multiple months being affected within the holding season.
- Low[6]. Modeled baseline temperature in September is 20.6ºC and Project increased temperature by 0.5ºC. Many spawners would already be under temperature stress, and this may cause pre-spawn mortality, delays in spawning, or reductions in gamete size, quality, or abundance.
- Low[7]. Modeled baseline temperature in June is 20.9ºC, and 20.6ºC in September and temperature increases due to the Project are 0.3ºC, and 0.5ºC, respectively. Some individuals could experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures develop thermal plasticity may show no reduced fitness effects; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperatures. Also, individuals may outmigrate early in response to temperature stress.
- Low[8]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC). Individuals could experience decreased metabolic efficiency, reduced growth rates, struggle to metamorphose, or delay outmigration entirely. Some individuals already acclimated to warmer temperatures may show no reduced fitness; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperature

Table 4.4-8 provides an evaluation of potential effects on each life stage of fall-run chinook in the Lower American River at Watt Avenue bridge due to changes in water temperature modeled for Project operations which are expected to occur post-construction assuming future water demands.

Conclusion – Operational Impacts to Fall Run Chinook

Changes in water temperature due to Project operations would potentially have negligible impacts on all life stages of fall-run chinook for most water year types. In dry and critically dry years, holding adults could potentially experience moderate impacts, and spawners could be moderately impacted during dry years. These moderate impacts could manifest as potential delays in migration or reduction in gamete size, quality or abundance. However, this moderate impact to fall-run chinook is projected to occur only once in the modeled 40-year period (see EIR Section 4.10, *Hydrology and Water Quality*, and Appendix D3, *Analysis of the Effects of Water Temperature Changes on Special-Status Salmonids* and is just marginally over the established threshold for moderate impacts. The moderate impact threshold is defined as temperature increases due to Project operations between 0.2ºC to 0.5ºC, and temperatures would increase 0.3ºC in June and July, and 0.5ºC in September during critically dry years. June and July are relatively early for migrating adults to enter the Lower American River system and therefore only a comparatively small portion of the species population would potentially be affected during these months. This potential impact would be considered less than significant because moderate temperature increases would occur infrequently and because only a small portion of the population would potentially be affected.

For most water year types Project operations would have little to no effect on critical physiological processes or crucial behaviors for sensitive life stages of fall-run chinook. The potential moderate impacts that could occur to holding, migrating or spawning adults during dry and critically dry years are not of sufficient magnitude or frequency to substantially decrease survival or reproduction of the species. Water temperature changes from Project operations would not have substantial adverse effects on the population of fall run chinook salmon in the Lower American River and would not result in fall-run chinook salmon populations falling below self-sustaining levels. Temperature impacts of Project operations on fall-run chinook salmon would therefore be **less than significant**, and no mitigation is required.

CENTRAL VALLEY STEELHEAD

Central Valley steelhead are the second most abundant salmonid found within the Lower American River, with over 4,300 total individuals detected in the Lower American River Smolt Trap since 2013 (Day and Morris, 2023). While their abundances are substantially lower than fall-run chinook within the Lower American River, multiple life stages are captured in the Lower American River Smolt Trap (from parr to adult), which is indicative of individuals reproducing within the Lower American River. Steelhead are a distinct, natal, and hatchery-supported population that is actively managed by CDFW at Nimbus Hatchery.

Adult steelhead enter freshwater systems between August and November but spawning Lower American River mainly occurs from December to April (Williams, 2006). Steelhead eggs typically hatch in 30 days, depending on water temperature, with fry emergence occurring between 4 to 6 weeks thereafter (McEwan, 2001). Juveniles emerge in the system from late winter to spring and individuals in the Lower American River typically outmigrate after one year, spending one full summer in freshwater (Myrick and Cech, 2004). Steelhead also have the highest thermal limits of any of the special-status salmonids (NMFS, 2019). '

Table 4.4-8: Potential Effects from Change in Water Temperature to Fall-Run Chinook in the Lower American River Water Temperature at Watt Avenue, Post-Construction [Future Baseline vs. Future Project]

Scenario 1	Average	Condition	Water Year Type									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<16	Jun-Dec	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Spawner	<14	Late Sep-Dec	None	None	None	None	None	Negligible	None	None	None	None
Egg/Alevin	<12	Oct-Feb	None	None	None	None	None	Negligible	None	None	None	None
Juveniles	<16	Dec-Oct	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Smolt	<19	Mar-Jul	None	None	None	None	None	None	None	Negligible	None	Negligible
Scenario 2	**Warmest**	**Baseline**	**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	Oct	**Negligible**	June	**Negligible**	None	Negligible
Spawner	<14	Late Sep-Dec	None	Negligible	None	Negligible	Oct	**Negligible**	None	Negligible	None	Negligible
Egg/Alevin	<12	Oct-Feb	None	Negligible	None	None	Oct	**Negligible**	None	Negligible	None	Negligible
Juveniles	<16	Dec-Oct	None	Negligible	None	Negligible	None	Negligible	June	**Negligible**	None	Negligible
Smolt	<19	Mar-Jul	None	None	None	None	None	None	None	Negligible	None	Negligible
Scenario 3	**Greatest**	**Change**	**Water Year Type**									
Fall Run Chinook			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<16	Jun-Dec	None	Negligible	None	Negligible	None	Negligible	June	Negligible	June	**Low[1]**
Spawner	<14	Late Sep-Dec	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Egg/Alevin	<12	Oct-Feb	None	Negligible	None	Negligible	Oct	Negligible	None	Negligible	None	Negligible
Juveniles	<16	Dec-Oct	None	Negligible	None	Negligible	None	Negligible	June	Negligible[2]	June	**Low[2]**
Smolt	<19	Mar-Jul	None	None	None	None	None	Negligible	None	Negligible	None	Negligible

Sources: Temperature effects – Moyle et al. 2017, NMFS 2019, Myrick and Cech 2004. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Low[1]. Modeled baseline temperature in June is 17.9ºC and Project increased temperature by 0.3ºC. Many adults would already be under temperature stress, and this may cause reductions in gamete size, quality, or abundance. However, the effect is considered low because the temperature increase occurs in the start of the holding season and is unlikely to affect a substantial proportion of the population and because the magnitude of the temperature increase is relatively small (0.3ºC).
- Low[2]. Modeled baseline temperature in June is 17.9ºC and the increased temperature due to the Project is 0.3ºC. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC). Individuals could experience decreased metabolic efficiency, reduced growth rates, struggle to metamorphose, or delay outmigration entirely. Some individuals already acclimated to warmer temperatures may show no reduced fitness; research by Myrick and Cech (2004) shows that smolts and juveniles reared in warm water can tolerate higher temperature.

Operational Impacts on Steelhead with Existing Infrastructure and Current Water Demands

The Project's operational effects with existing infrastructure and current water demands would be negligible for all life stages for Scenario 1 (Average Condition). For Scenario 2 (Warmest Baseline) juveniles could potentially experience low effects in dry years, and for Scenario 3 (Greatest Change) juveniles and smolt could potentially experience low impacts in critically dry years.

Table 4.4-9 provides an evaluation of potential effects on each life stage of steelhead in the Lower American River at Watt Avenue bridge due to changes in water temperature modeled for Project operations assuming current water demands and the use of existing infrastructure.

Operational Impacts on Steelhead with Existing Infrastructure and Future Water Demands

The Project's potential operational effects with existing infrastructure and future water demands would be negligible for all life stages and all scenarios except for Scenario 3 (Greatest Change), when juveniles could experience low effects in dry and critically dry years.

Table 4.4-10 provides an evaluation of potential effects on each life stage of steelhead in the Lower American River at Watt Avenue bridge due to changes in water temperature modeled for Project operations assuming future water demands and the use of existing infrastructure.

Operational Impacts on Steelhead Post Construction with Current Water Demands

The Project's potential operational effects post-construction and with current water demands would be negligible for all life stages except during critically dry years. In critically dry years juveniles could experience low effects under Scenario 2 (Warmest Baseline), and adult migrating, adult holding, and juveniles could experience low effects in Scenario 3(Greatest Change).

Table 4.4-11 provides an evaluation of potential effects on each life stage of steelhead in the Lower American River at Watt Avenue bridge due to changes in water temperature modeled for Project operations which are expected to occur post-construction assuming current water demands.

Operational Impacts on Steelhead – Post Construction with Future Water Demands

The Project's potential operational effects post construction and with future water demands would be negligible for all life stages and all three Scenarios (Average Condition, Warmest Baseline, Greatest Change).

Table 4.4-12 provides an evaluation of potential effects on each life stage of steelhead in the Lower American River at Watt Avenue bridge due to changes in water temperature modeled for Project operations which are expected to occur post-construction assuming future water demands.

Table 4.4-9: Potential Effects from Change in Water Temperature to Steelhead in the Lower American River Monthly Water Temperature at Watt Avenue, Existing Infrastructure [Baseline vs. Project]

Scenario 1	Average Condition		Water Year Type									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	None	None	None	None	Negligible	None	None	None	None
Adult Holding	<20	Aug-Nov	None	None	None	None	None	Negligible	None	None	None	None
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	None
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	None	None	None
Juveniles	<19	Year-round	None	None	None	None	None	Negligible	None	None	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest Baseline**		**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	None	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<20	Aug-Nov	None	Negligible	None	None	None	Negligible	None	Negligible	None	Negligible
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	None	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June	**Low[1]**
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	None	None	Negligible
Scenario 3	**Greatest Change**		**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	None	None	Negligible	None	Negligible	Sep	**Low[2]**
Adult Holding	<20	Aug-Nov	None	Negligible	None	None	None	Negligible	None	Negligible	Sep	**Low[3]**
Spawner	<16	Dec-Apr	None	None	None	None	None	Negligible	None	None	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	Negligible	None	None	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June, July, Sep	**Low[4]**
Smolt	<21	Mar-Jun	None	None	None	None	None	Negligible	None	Negligible	June	**Low[5]**

Source: Temperature effects – NMFS 2019, Myrick and Cech 2005. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Low[1]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Some individuals would be experiencing decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures show a thermal acclimation effect may show no reduced fitness effects; research on thermal acclimation (Myrick and Cech 2005) shows that rearing steelhead at elevated temperatures confers greater tolerance for higher temperatures. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC), because of the thermal tolerance shown by juveniles, and because early outmigration allows some individuals to avoid temperature stress altogether.
- Low[2]. Modeled baseline temperature in September is 20.6ºC and Project increased temperature by 0.5ºC. Some adults may already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance. The 0.5ºC temperature increase is considered a low effect because the individuals experiencing the increase would only be slightly outside their thermal optimums.
- Low[3]. Modeled baseline temperature in September is 20.6ºC and Project increased temperature by 0.5ºC. Some adults may already be under temperature stress, and this may cause reductions in gamete size, quality, or abundance. The 0.5ºC temperature increase is considered a low effect because the individuals experiencing the increase would only be slightly outside their thermal optimums.
- Low[4]. Modeled baseline temperature in June is 20.9ºC, 21.4ºC in July, and 20.6ºC in September and temperature increases due to the Project are 0.3ºC in June and July, and 0.5ºC in September. Some individuals would be experiencing decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures may show no reduced fitness effects; research on thermal acclimation (Myrick and Cech 2005) shows that steelhead reared at elevated temperatures can tolerate a higher critical thermal maximum. Individuals may also outmigrate early to avoid temperature stress. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC), because of the thermal tolerance of steelhead reared in higher temperatures, and because early outmigration allows some individuals to avoid temperature stress altogether.
- Low[5]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Individuals would be experiencing decreased metabolic efficiency, reduced growth rates, struggle to metamorphose, or delay outmigration entirely. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC) and because of the thermal tolerance of steelhead reared in higher temperatures.

Table 4.4-10: Potential Effects from Change in Water Temperature to Steelhead in the Lower American River Monthly Water Temperature at Watt Avenue, Existing Infrastructure [Future Baseline vs. Future Project]

Scenario 1	Average	Condition	Water Year Type									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<20	Aug-Nov	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	None
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	None	None	Negligible
Juveniles	<19	Year-round	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest**	**Baseline**	**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	None	None	Negligible	None	Negligible	None	None
Adult Holding	<20	Aug-Nov	None	Negligible	None	None	None	Negligible	None	Negligible	None	None
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	Negligible	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	Negligible	None	Negligible
Scenario 3	**Greatest**	**Change**	**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Spawner	<16	Dec-Apr	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Egg/Alevin	<10	Jan-May	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	Aug	**Low[1]**	June	**Low[2]**
Smolt	<21	Mar-Jun	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible

Source: Temperature effects – NMFS 2019, Myrick and Cech 2005; Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Low[1]. Modeled baseline temperature in August is 19.9ºC and Project increased temperature by 0.5ºC. Some individuals could experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures may show no reduced fitness effects because when steelhead are reared at higher temperatures they show greater thermal tolerances (Myrick and Cech 2005). Effects are considered low because of the thermal plasticity shown by juveniles and because individuals may outmigrate early to in response to temperature stress.
- Low[2]. Modeled baseline temperature in June is 20.8ºC and Project increased temperature by 0.3ºC. Some individuals could experience decreased metabolic efficiency and reduced growth rates, but individuals already acclimated to warmer temperatures may show no reduced fitness effects. Individuals may also outmigrate early in response to temperature stress. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC) and because of the thermal plasticity shown by juveniles (Myrick and Cech 2005).

Table 4.4-11: Potential Effects from Change in Water Temperature to Steelhead in the Lower American River Monthly Water Temperature at Watt Avenue, Post-Construction [Baseline vs. Project]

Scenario 1	Average Condition		Water Year Type									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	None	None	None	None	Negligible	None	None	None	None
Adult Holding	<20	Aug-Nov	None	None	None	None	None	Negligible	None	None	None	None
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	None
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	None	None	Negligible
Juveniles	<19	Year-round	None	None	None	None	None	Negligible	None	None	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest Baseline**		**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	None	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June	**Low[1]**
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	None	None	Negligible
Scenario 3	**Greatest Change**		**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	Sep	**Low[2]**
Adult Holding	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	Sep	**Low[3]**
Spawner	<16	Dec-Apr	None	Negligible	None	None	None	Negligible	None	None	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	June, Sep	**Low[4]**
Smolt	<21	Mar-Jun	None	None	None	None	None	Negligible	None	Negligible	None	Negligible

Source: Temperature effects – NMFS 2019, Myrick and Cech 2005; Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnotes:

- Low[1]. Modeled baseline temperature in June is 20.9ºC and Project increased temperature by 0.3ºC. Some individuals could experience decreased metabolic efficiency and reduced growth rates. Effects are considered low because the magnitude of the change is small (0.3ºC) and because these conditions would occur infrequently. Furthermore, research on thermal acclimation (Myrick and Cech 2005) shows that steelhead reared at elevated temperatures can tolerate a higher critical thermal maximum. Individuals may also outmigrate early to avoid temperature stress allowing some individuals to avoid temperature stress altogether.
- Low[2]. Modeled baseline temperature in September is 20.6ºC and Project increased temperature by 0.5ºC. Some adults would already be under temperature stress, and this may cause them to delay migrating and may cause reductions in gamete size, quality, or abundance. Effects are considered low because increased temperature is not substantially outside thermal optimums and individuals could delay migration while holding in cooler water.
- Low[3]. Modeled baseline temperature in September is 20.6ºC and Project increased temperature by 0.5ºC. Some adults would already be under temperature stress, and this may cause reductions in gamete size, quality, or abundance. Effects are considered low because the increased temperature is not substantially outside thermal optimums and individuals could delay migration while holding in cooler water.
- Low[4]. Modeled baseline temperature in June is 20.9ºC and 20.6ºC in September, and the increased temperature due to the Project is 0.3ºC and 0.5ºC, respectively. Some individuals may experience decreased metabolic efficiency and reduced growth rates, but research on thermal acclimation (Myrick and Cech 2005) shows that steelhead reared at elevated temperatures can tolerate a higher critical thermal maximum. Individuals may also outmigrate early to avoid temperature stress. Effects are considered low because the magnitude of the temperature increase is relatively small (0.3ºC), because of the thermal tolerance for steelhead reared in higher temperatures and because early outmigration allows some individuals to avoid temperature stress altogether.

Table 4.4-12. Potential Effects from Change in Water Temperature to Steelhead in the Lower American River Water Temperature at Watt Avenue, Proposed Project (Post-Construction) [Future Baseline vs. Future Project]

Scenario 1	Average Condition		Water Year Type									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	None	None	None	None	Negligible	None	None	None	None
Adult Holding	<20	Aug-Nov	None	None	None	None	None	Negligible	None	None	None	None
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	None
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	None	None	Negligible
Juveniles	<19	Year-round	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	None	None	Negligible
Scenario 2	**Warmest Baseline**		**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Spawner	<16	Dec-Apr	None	None	None	None	None	None	None	None	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	None	None	Negligible	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	None	None	Negligible	None	Negligible
Scenario 3	**Greatest Change**		**Water Year Type**									
Steelhead			Wet		Above Normal		Below Normal		Dry		Critically Dry	
Life Stage	TºC Max	Months In Stream	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect	Months Affected	Potential Effect
Adult Migrating	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Adult Holding	<20	Aug-Nov	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Spawner	<16	Dec-Apr	None	Negligible	None	None	None	Negligible	None	Negligible	None	Negligible
Egg/Alevin	<10	Jan-May	None	None	None	None	None	Negligible	None	Negligible	None	Negligible
Juveniles	<19	Year-round	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	Negligible
Smolt	<21	Mar-Jun	None	None	None	None	None	Negligible	None	Negligible	None	Negligible

Source: Temperature effects – NMFS 2019. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Footnote:

Source: Temperature effects – NMFS 2019. Temperature modeling – Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Conclusion – Operational Impacts on Steelhead

Project operations could have negligible impacts on all life stages of Steelhead for most water year types, with little to no effect on critical physiological processes or crucial behaviors for sensitive life stages. In dry or critically dry years, juveniles could potentially experience low impacts. Impacts to juveniles are considered low because juveniles reared in warm water can tolerate higher temperatures, and also because juveniles can outmigrate earlier to avoid thermal stress (Myrick and Cech 2005). The potential temperature changes from Project operations would not be of sufficient frequency or magnitude to result in decreased survival or reproduction and would not have substantial adverse effects on a large number of steelhead or on the population of the species in the Lower American River. Temperature impacts of Project operations on steelhead would therefore be **less than significant**, and no mitigation is required.

LATE FALL RUN, SPRING RUN, AND WINTER RUN CHINOOK

As described above, late fall run, spring run, or winter run chinook have been detected infrequently and in very low numbers in the Lower American River. There is no evidence that these species spawn in the Lower American River or that individuals detected in screw traps are part of a self-sustaining population. The potential effects analysis for these three salmonids therefore focuses on the juveniles and smolts that may be entering the Lower American River to find rearing habitat, refugia, or feeding opportunities. Migratory or holding adults, spawners, or eggs and alevin are not discussed below because there is no published evidence documenting that reproduction or these life stages are naturally occurring in the Lower American River.

Please see Appendix D3 Tables D3.4-1 to D3.4-12 for an evaluation of potential temperature effects of Project operations on late fall run, spring run, and winter run chinook in the Lower American River. These tables describe potential effects to juveniles and smolts of the three salmonids due to modeled changes in water temperature for the following Project operations: (1) operations with existing infrastructure and current water demands, (2) operations with existing infrastructure and future water demands, (3) post-construction operations with current water demands and (4) post-construction operations with future water demands.

Operational Impacts on Late Fall Run, Spring Run, and Winter Run Chinook with Existing Infrastructure and Current Water Demands

Project operational effects on late fall run, spring run, and winter run chinook would be negligible for all life stages for Scenario 1 (Average Condition). For Scenarios 2 (Warmest Baseline) and Scenario 3 (Greatest Change) juveniles for all three species could experience low effects in critically dry years. These potential temperature impacts, however, are not of sufficient magnitude or frequency to result in decreased survival for any stray juveniles that may occur in the Lower American River and would not have substantial adverse effects on a substantial number of individuals or the species populations of late fall run, spring run, and winter run chinook.

Operational Impacts on Late Fall Run, Spring Run, and Winter Run Chinook with Existing Infrastructure And Future Water Demands

Project operational effects on late fall run, spring run, and winter run chinook with existing infrastructure and future water demands would be negligible under Scenario 1 (Average Condition) and Scenario 2 (Warmest Baseline). Low-level effects would occur in dry and critically dry years to juveniles of all species under Scenario 3 (Greatest Change). These potential temperature impacts, however, are not of sufficient magnitude or frequency to result in decreased survival for any stray juveniles that may occur in the Lower American River and would not

have substantial adverse effects on a substantial number of individuals or the species populations of late fall run, spring run, and winter run chinook.

Operational Impacts on Late Fall Run, Spring Run, and Winter Run Chinook Post Construction with Current Water Demands

Project operational effects on late fall run, spring run, and winter run chinook juveniles due to changes in water temperatures during post-construction Project operations with current water demands would be negligible under Scenario 1 (Average Condition). Under Scenario 2 (Warmest Baseline) and Scenario 3 (Greatest Change) in critically dry years juveniles of all three species could experience low level effects. These potential temperature impacts, however, are not of sufficient magnitude or frequency to result in decreased survival for any stray juveniles that may occur in the Lower American River and would not have substantial adverse effects on a substantial number of individuals or the populations of late fall run, spring run, and winter run chinook.

Operational Impacts on Late Fall Run, Spring Run, and Winter Run Chinook Post Construction with Future Water Demands

Project operational effects on late fall run, spring run, and winter run chinook juveniles during post-construction Project operations with future water demands would be negligible under Scenario 1 (Average Condition) and Scenario 2 (Warmest Baseline). Under Scenario 3 (Greatest Change) in critically dry years juveniles of all three species would experience low level effects. These potential temperature impacts, however, are not of sufficient magnitude or frequency to result in decreased survival for any stray juveniles that may occur in the Lower American River and would not have substantial adverse effects on a substantial number of individuals or the species populations of late fall run, spring run, and winter run chinook.

Conclusion – Operational Impacts to Late Fall Run, Spring Run, and Winter Run Chinook Salmon

Temperature changes from Project operations would potentially have negligible impacts on all life stages of on late fall run, spring run, and winter run chinook for most water year types, with little to no effect on critical physiological processes or crucial behaviors for sensitive life stages. There is no evidence that juveniles and smolts of late fall run, spring run, and winter run chinook are natal to the Lower American River. Juveniles in the Lower American River are not likely to be the offspring of a local breeding population but rather, if they are present at all, would be likely strays entering the Lower American River to find rearing habitat, refugia, or feeding opportunities.

In dry or critically dry years any stray juveniles could potentially experience low impacts. Potential impacts to juveniles are considered low because juveniles reared in warm water can tolerate higher temperatures, and because juveniles can outmigrate earlier to avoid thermal stress. The potential low impacts to juveniles from Project related temperature changes in the Lower American River occur only during dry and critically dry years. These low impacts are not of sufficient magnitude or frequency to result in decreased survival for the stray juveniles that may occur in the Lower American River and would not have substantial adverse effects on populations of late fall run, spring run, and winter run chinook. Potential temperature impacts of Project operations on late fall run, spring run, and winter run chinook would be **less than significant**, and no mitigation is required.

Impact 4.4-3. 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 California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

Riparian habitat occurs on the banks of the South Fork where suitable soil, slope and microclimate conditions prevail, such as on sand bars, islands, channels and tributaries to the river. However, dams and highly regulated streamflow have altered channel dynamics and the natural timing and patterns of recruitment needed for seed germination and establishment of willows and other pioneer riparian species. These changes to geomorphic processes and hydrology have, over time, reduced the extent of existing riparian vegetation on the South Fork and elsewhere in the Sierra Nevada and have also reduced opportunities for establishment of new riparian habitat (Kondolf et al. 1996). Riparian vegetation also occurs at Project area reservoirs, but riparian habitats are found mostly where tributaries flow into the reservoirs. Along the reservoir margins the fluctuating water elevations typically create a barren zone that is devoid of riparian vegetation.

The following discussion examines potential Project impacts on riparian habitat and other sensitive natural communities for: (1) operational impacts with existing infrastructure and current water demands; and (2) operational impacts post construction under future demand scenarios. These two operational scenarios (existing infrastructure and post construction) capture the range of Project-related changes in reservoir water levels and flows in the South Fork above Folsom Dam that could potentially affect riparian habitat or other sensitive natural communities. This analysis first addresses operational impacts on reservoirs and then discusses operational impacts on the South Fork. Potential construction impacts on riparian habitat and other sensitive natural communities are also addressed in this section.

OPERATIONAL IMPACTS: RIPARIAN HABITAT AND SENSITIVE NATURAL COMMUNITIES NEAR RESERVOIRS

Existing Infrastructure and Current Water Demands

Jenkinson Lake Reservoir. Under Project operations utilizing existing infrastructure with current water demands, the proposed Project is expected to result in an increased minimum end of month reservoir elevation and increased average end of month reservoir elevation at Jenkinson Lake, as shown in the modeling results (*Appendix B2).* These increases in the minimum reservoir elevation of Jenkinson Lake shown in the modeling (20–41 feet), would result in a fuller reservoir throughout the year, particularly during the summer, increasing water reliability in dry and critically dry years (and subsequent years). A fuller reservoir would result in more open water and less exposed banks during the driest times of the year. The increased elevations would be within the reservoir's normal range of fluctuation and would not encroach on riparian or other sensitive habitats or land above the ordinary high-water mark of the reservoir.

Folsom Reservoir. Project operations utilizing existing infrastructure with current water demands is expected to result in a reduced end of month storage at Folsom Reservoir, with changes between Project and baseline conditions predicted to be up to 13,000 acre-feet, approximately 1.3 % of the reservoir capacity. The reductions in end of the month storage at Folsom Reservoir are expected to occur in fall and winter of below normal years, in winter and early spring of dry years, and in winter, spring, and summer of critically dry years. Folsom Reservoir storage levels and water surface elevations experience large fluctuations in response to system-wide operational decisions. Like many reservoirs, the zone bordering Folsom Reservoir is largely devoid of vegetation. Most of the Project related fluctuations in storage levels would be noticeable in this unvegetated zone only. While the shores

of Folsom Reservoir above the unvegetated area may support limited riparian habitat, these habitats are located above the zone of normal water level fluctuations and would not be affected by Project related decreases or increases in water surface elevation.

Forebay Reservoir. Project operations utilizing existing infrastructure with current water demands are expected to result in seasonal decreases and increases in elevation and end of month storage during some below normal, dry, and critically dry years at Forebay Reservoir. Modeling results show that this reservoir may have a 1- to 4-foot decrease in elevations between January and April and a 1- to 16-foot increase in elevation between June and August (Appendix B2). These changes in reservoir surface elevation are expected to decrease in the wet season and increase in the dry season. Forebay Reservoir operates as re-regulating forebay for power production (i.e., it is not operated to provide seasonal storage) and therefore routinely fluctuates in storage and elevation. Project-related changes in reservoir surface elevation would be within the normal range of operations for this facility and water levels would continue to fluctuate as dictated by demands for consumptive use and hydropower generation similar to current conditions. Riparian vegetation or other sensitive natural communities that may be present near the shores of Forebay Reservoir would not be adversely affected by water surface elevation changes due to Project operations.

Slab Creek Reservoir and Chili Bar Reservoir. Project operations utilizing existing infrastructure with current water demands are expected to result in minor seasonal decreases and increases in elevation and end of month storage at Slab Creek and Chili Bar Reservoirs as a result of the Project changes in the amount of water being returned to the South Fork below the El Dorado Powerhouse. Modeling results show that these two reservoirs operated by SMUD may have a 1-foot decrease in end of month elevation between February and April and a 1- to 2-foot increase in end of month elevation between June and September in some critically dry years (Appendix B2). These changes in flows would occur infrequently and would not be of sufficient magnitude to substantially change processes that affect riparian vegetation or other sensitive natural communities, including geomorphological riverine processes such as erosion, deposition and associated opportunities for seed germination and establishment. Minor changes in reservoir surface elevation would not adversely affect riparian vegetation or sensitive natural communities that may be present along the shores of Slab Creek and Chili Bar reservoirs.

Post-construction with Future Water Demands

Jenkinson Lake. Project operation post construction with future water demands is expected to result in an increased minimum end-of-month reservoir elevation and increased average end-of-month reservoir elevation at Jenkinson Lake as shown in the modeling results (Appendix B2). These increases in the minimum reservoir elevation of Jenkinson Lake would result in a fuller reservoir throughout the year, particularly during the summer, increasing water reliability in dry and critically dry years (and subsequent years). A fuller reservoir would result in more open water and less exposed banks during the driest times of the year. The increased elevations would not encroach on riparian habitats or other sensitive natural communities present above the banks of the reservoir and would not result in adverse effects on riparian habitat or other sensitive natural communities. It may provide more suitable conditions for expanding riparian habitat along the shores in the long term.

Folsom Reservoir. Under Project operations post construction with future water demands, the storage at Folsom Reservoir is expected to be reduced in the fall of wet years, in fall and winter of below normal years, and throughout the year in dry and critically dry years with Project operations. The expected range in storage and

elevation with Project operations would remain within the current levels seen under existing conditions. The magnitude of this reduction is small compared to the total amount of storage in Folsom Reservoir and is not expected to affect any riparian habitat or other sensitive natural communities that may be present on the shores of Folsom Reservoir.

Forebay Reservoir. Forebay Reservoir is a re-regulating forebay for power production flows and therefore routinely fluctuates in storage and elevation. Under Project operations post construction with future water demands, changes in end of month storage at Forebay Reservoir would occur during some years, with reductions in storage occurring primarily in December through April and in July and August, and increased storage occurring in June (see Appendix B2). The expected range in storage and elevation with Project operations would remain within the current levels seen under existing conditions. No Project-related adverse effects would occur to riparian vegetation or other sensitive natural communities that may be present on the shores of Forebay Reservoir.

Slab Creek Reservoir and Chili Bar Reservoir. Slab Creek Reservoir and Chili Bar Reservoir are used as re-regulating forebays and afterbays to various powerhouses. Modeling results for Slab Creek and Chili Bar reservoirs under post-construction Project operations and future water demands show a very small change in end of month reservoir elevations (Appendix G). The expected range in storage and elevation at Slab Creek and Chili Bar reservoirs would remain within the current levels seen under existing conditions. No Project-related adverse effects would occur to riparian vegetation or other sensitive natural communities that may be present on the shores of these reservoirs.

Conclusion – Operational Impacts to Riparian Vegetation and Sensitive Natural Communities near Reservoirs

Project operational changes in reservoir surface elevations would contribute minor variability of increases or decreases to the baseline highly variable pattern of fluctuating reservoir water levels and would not have substantial adverse effects on riparian habitat or other sensitive natural communities. The proposed Project with existing infrastructure and current water demands and post-construction with future water demands would have a **less-than-significant impact** to riparian habitat or other sensitive natural communities that may occur along the shores of reservoirs, and no mitigation is required.

OPERATIONAL IMPACTS: RIPARIAN HABITAT AND SENSITIVE NATURAL COMMUNITIES ON SOUTH FORK RIVER SEGMENTS

Existing Infrastructure and Current Water Demands

South Fork above El Dorado Diversion Dam. The Project is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Therefore, there would be no change in streamflow upstream of the El Dorado Diversion Dam (see EIR Section 4.10, *Hydrology and Water Quality*, Table 4.10-6) and therefore no impacts would occur to riparian vegetation or other sensitive natural communities.

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Under Project operations utilizing existing infrastructure and assuming current water demands, flows are expected to remain unchanged as compared to baseline conditions on the South Fork below the El Dorado Diversion Dam (see EIR Section 4.10, *Hydrology and Water Quality*, Table 4.10-7). Therefore, no Project-related impacts would occur to riparian vegetation or other sensitive natural communities.

South Fork below El Dorado Powerhouse. The South Fork from the El Dorado Powerhouse to Folsom Reservoir is highly regulated and already subject to daily fluctuations in volume and flow due to reservoir releases, diversions, and return flows from power generation. Operation of the Project with existing infrastructure and current water demands would result in slight reductions in South Fork flows downstream of the El Dorado Powerhouse.

Flow in the South Fork below the El Dorado Powerhouse would be reduced by approximately 2 cfs on an average annual basis when the Project is operated with existing infrastructure and current water demands. The maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 73 cfs, expected to occur during February of a critically dry year (a single month in the 47-year modeling period), and the average reduction in monthly flows during February of critically dry years is 57 cfs (a 24 percent decrease). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 50 cfs, expected to occur during August of a critically dry year, but the average increase in monthly flows during August of critically dry years is 18 cfs (a 24 percent increase). Reductions in flow between 60 cfs to a maximum of 73 cfs would occur in February or April during a dry year or January through April of critically dry years. Increases in river flow of up to 40 cfs would occur in July and August of critically dry years (see EIR Section 4.10 *Hydrology and Water Quality*, Table 4.10-9). These changes in flows would occur infrequently and would not be of sufficient magnitude to substantially change processes that affect riparian vegetation or other sensitive natural communities, including geomorphological riverine processes such as erosion, deposition and associated opportunities for seed germination and establishment.

OPERATIONAL IMPACTS ON SOUTH FORK AMERICAN RIVER POST-CONSTRUCTION AND WITH FUTURE WATER DEMANDS

South Fork above El Dorado Diversion Dam. As discussed in detail above and in EIR Section 4.10 *Hydrology and Water Quality,* Project operations post-construction and with future water demands are expected to cause no change in system operations upstream of the El Dorado Diversion Dam and therefore no impacts would occur to riparian vegetation or other sensitive natural communities.

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. The South Fork flow below the El Dorado Diversion Dam is expected to be reduced post-construction by about 4 cfs on an average annual basis when meeting future demands (EIR Section 4.10 *Hydrology and Water Quality* Table 4.10-37). Diversions would increase in all years and water year types, with the average monthly diversion rate increasing by up to 11 cfs, which is the difference between the current rate of diversion at the El Dorado Diversion Dam (i.e., 145 cfs) and the restored capacity and maximum rate of diversion authorized under Project 21112 (i.e., 156 cfs). This increase in diversion causes a corresponding reduction in streamflow below the El Dorado Diversion Dam. Most of the changes in river flow would occur in January through June, although some reductions would occur in December and continue through July and August. In critically dry years, reductions in streamflow would occur primarily in February through June. These changes in flows would occur infrequently and would not be of sufficient magnitude to substantially change processes that affect riparian vegetation, including geomorphological riverine processes such as erosion, deposition and associated opportunities for seed germination and establishment.

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse would be reduced by about 7 cfs on an average annual basis with post-construction operations of the Project while meeting

future water demands (2045 projections). These flow reductions below the El Dorado Powerhouse would typically occur in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through April and August through September in critically dry years. In some years, Project operations would also result in increased return flows; this would primarily occur in February through May in above normal years, April through June in below normal years, and May through July in dry years and critically dry years (EIR Section 4.10 Hydrology and Water Quality Table 4.10-39). Average monthly river flow below the El Dorado Powerhouse can be reduced by as much as 145 cfs with this largest reduction in flow occurring in February of a critically dry year *(during a single month in the 47-year modeling period)*. However, flows can increase by approximately 40 to 50 cfs in June of some below normal, dry, and critically dry years. These changes in flows would occur infrequently and would not be of sufficient magnitude to substantially change processes that affect riparian vegetation *or other sensitive natural communities*, including geomorphological riverine processes such as erosion, deposition and associated opportunities for seed germination and establishment.

Conclusion – Operational Impacts to Riparian Vegetation and Sensitive Natural Communities on the South Fork

Project operational changes to flows would contribute minor variability of increases or decreases to the regulated flows on the South Fork. Compared to baseline conditions, these changes in flows would not result in substantial changes to processes that affect riparian vegetation or other sensitive natural communities, including geomorphological riverine processes such as erosion, deposition and associated opportunities for seed germination and establishment. The proposed Project with existing infrastructure and current water demands and post-construction with future water demands would have a **less-than-significant impact** on riparian habitat or other sensitive natural communities along the South Fork, and mitigation is not required.

CONSTRUCTION IMPACTS: RIPARIAN VEGETATION AND SENSITIVE NATURAL COMMUNITIES

Riparian habitat and possibly other sensitive natural communities may be present along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and along portions of the El Dorado Canal. Project construction activities in these locations would involve vegetation and tree removal and road improvements and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. The exact location and extent of these Project activities are not known at this time and would likely require future CEQA analysis. Therefore, potential construction-related impacts of the Project are covered in this EIR at a programmatic level only.

Temporary impacts related to Project staging and laydown areas and permanent impacts related to installation of Project components could potentially result in removal or trimming of existing vegetation in riparian habitats or other sensitive natural communities. Riparian communities and other sensitive natural communities (if present)

within the Project footprint may be indirectly (i.e., trimmed) or directly (i.e., removed) affected by Project construction, potentially resulting in removal or destruction of riparian habitat or other sensitive natural communities. Because detailed information regarding future infrastructure improvements is not known at this time, these potential Project impacts to riparian habitat and other sensitive natural communities are covered at a programmatic level of analysis only. These future improvements would require subsequent project-level environmental review once sufficient design details are known. Construction impacts to riparian habitat and possibly other sensitive natural communities are **potentially significant**.

The following mitigation measures will reduce potentially significant construction impacts on riparian habitats and other sensitive natural communities.

Mitigation Measure 4.4-11– Map Riparian Habitats and Other Sensitive Natural Communities and Implement Avoidance, Minimization, and Mitigation Measures.

A qualified biologist shall map the location and extent of riparian habitat and any other sensitive natural communities in the Project construction footprint, including areas used for staging and access. The site survey will occur prior to construction and may be conducted concurrently with the special-status plant survey described in Mitigation Measure 4.4-1.

If no riparian habitat or sensitive natural communities are detected during the surveys, no impacts on riparian habitat or sensitive natural communities would occur. The results of the survey shall be documented in a technical report and kept on file at the District. No further actions would be required.

If riparian habitat or sensitive natural communities are found in the Project footprint, the District shall clearly identify these area as ESAs on Project plans and protect the habitat in place during construction, using ESA temporary fencing. The integrity of the ESA fencing shall be maintained and periodically inspected throughout construction.

If impacts cannot be avoided with an ESA buffer, the District shall develop, in consultation with a qualified biologist, and implement a BRMP to minimize and if necessary to compensate for the loss of habitat. The BRMP shall identify ways to restore or compensate for loss of riparian vegetation along the stream that supports wildlife, fish, or other aquatic life and any other sensitive natural community that would be affected by Project construction. Mitigation may be accomplished through onsite restoration, replacement, or enhancement of impacted habitat, or through offsite mitigation at a CDFW-established or approved mitigation bank, if available, or, alternatively, at another established mitigation bank, at a ratio of no less than 1:1.

The performance standard for successful implementation of the BRMP shall be no net loss of riparian habitat or other sensitive natural communities that are temporarily or permanently affected by Project construction.

Mitigation Measure 4.4-12– Obtain a Streambed Alteration Agreement from CDFW and Implement all Agreement Conditions.

The District shall obtain a Streambed Alteration Agreement (SAA) from CDFW subject to Section 1602 of the California Fish and Game Code for proposed construction activities that will affect the bed and bank of a regulated water body such as a natural stream or lake. All conditions of the Streambed

Alteration Agreement shall be implemented as part of Project compliance. Relevant measures of the SAA shall be included in the WEAP training for the Project.

The following mitigation measure shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Significance After Mitigation:

Implementing Mitigation Measure 4.4-11 would avoid and minimize the Project's potential construction impacts on riparian habitat and other sensitive natural communities through a process of mapping, avoidance, restoration, and/or enhancement. Mitigation Measure 4.4-12 would require the District to obtain a SAA and implement all conditions of the SAA. Implementation of Mitigation Measure 4.4-2 (Develop and Implement a Worker Environmental Awareness Program) would ensure that WEAP training is provided to workers and protection measures are implemented and monitored throughout construction. Potential impacts on riparian habitat and other sensitive natural communities from Project construction would be reduced to **less than significant with mitigation incorporated**.

Impact 4.4-4. Have a substantial adverse effect on federally or state protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Project operations under either existing infrastructure and current water demands or post-construction with future demands will not result in removal or fill of federally protected wetlands, nor will Project operations result in hydrological interruptions. Project operations that result in increases or decreases of reservoir storage/surface elevation or in flow in the South Fork would not result in a substantial adverse effect on wetlands that may occur in the vicinity of reservoirs or the South Fork. However, Project construction activities could directly or indirectly affect federally protected wetlands if they occur along the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and along portions of the El Dorado Canal. This impact is **potentially significant**.

The following mitigation measures will avoid, minimize and mitigate potentially significant construction impacts on federally or state protected wetlands.

Mitigation Measure 4.4-13: Map Federally or State Protected Wetlands and Implement Avoidance, Minimization, and Mitigation Measures, and/or Obtain Permits.

A qualified biologist shall map the location of potential wetlands and other waters that may be considered jurisdictional by USACE under Section 404 of the CWA or by the RWQCB under the CWA Section 401 or the state's Porter Cologne Act using methods described in USACE's regulations (33 CFR 328), which require use of the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) along with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). The wetland survey area shall include the Project construction footprint, including areas used for staging and access. The wetland survey will occur prior to construction and may be conducted concurrently with the special-status plant survey described in Mitigation Measure 4.4-1.

If no federally or state protected wetlands are detected during the surveys, no impacts would occur with implementation of water quality protection measures described below. The results of the survey shall be documented in a technical report and kept on file at the District. No further action would be required.

If state or federally protected wetlands are detected during the surveys, the District shall delineate the area as an ESA on Project plans and protect the wetlands during construction, using ESA temporary fencing, with construction buffers and other measures pursuant to applicable rules and regulations. The integrity of the ESA fencing shall be maintained and periodically inspected throughout construction.

If wetlands are found in the Project construction footprint and potential direct impacts cannot be avoided with an ESA buffer, a wetland delineation report for the Project shall be prepared and used for Project permitting. If Project activities would result in the placement of dredged or fill material into "Waters of the U.S.," subject to USACE regulations or "Waters of the State" subject to Regional Water Quality Control Board regulation the District will avoid or reduce such potential impacts to the maximum extent feasible. The District shall obtain a CWA Section 404 permit from the USACE and a CWA Section 401 Water Quality Certification from the RWQCB for any impacts to Waters of the U.S. or Waters of the State, and/or a Waste Discharge Permit for any Waters of the State not subject to federal jurisdiction, but subject to the State's Porter Cologne Act. The District shall comply with all conditions of the Section 404 and 401 permits and/or Waste Discharge Permit requirements.

The following mitigation measures shall also be implemented:

Mitigation Measure 4.4-2: Develop and Implement a Worker Environmental Awareness Program

Mitigation Measure 4.10-1 Stormwater Management during Construction

Mitigation Measure 4.9-1a Comply with all Regulations on the Transport and Use of Hazardous Materials

Mitigation Measure 4.9-1b Prepare and Implement a Hazardous Materials Release Prevention Plan

Significance After Mitigation:

Implementing Mitigation Measure 4.4-13 would avoid and minimize the Project's potential impacts on federally or state protected wetlands through a process of mapping, avoidance, restoration, and enhancement and would require the District to coordinate with USACE and the RWQCB, depending on the protection status of the impacted wetland/other waters, obtain permits, and abide by permit conditions. Implementation of Mitigation Measures 4.4-2, (Develop and Implement a Worker Environmental Awareness Program*)* would ensure that protection measures for protected wetlands and other waters are implemented and monitored throughout construction. Implementing Mitigation Measure 4.10-1 (Stormwater Management during Construction), Mitigation Measure 4.9-1a (Comply with all Regulations on the Transport and Use of Hazardous Materials) and Mitigation Measure 4.9-1b (Prepare and Implement a Hazardous Materials Release Prevention Plan Mitigation) will avoid and minimize impacts to water quality during construction. With implementation of these mitigation measures, potential impacts on federally and state protected wetlands from Project construction would be reduced to **less than significant with mitigation incorporated**.

Impact 4.4-5. 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?

The South Fork and its tributaries provide travel corridors for deer, birds and other resident and migratory wildlife. Within the Project study area, the Pacific Deer Herd resides west of the Sierra Nevada crest in El Dorado and Placer Counties. The herd is delineated by the Rubicon River on the north, the South Fork on the south, and roughly a north-south line above 2,500 feet elevation, paralleling Highway 49 between Placerville and Georgetown. (CDFW 2018, Hinz 1981).

Project operations under either existing infrastructure and current water demands or post-construction with future demands will result in minor increases and decreases in flows and reservoir levels that will not affect movement of deer or other resident or migratory wildlife, nor will it impede the use of native wildlife nursery sites. However, Project construction activities could potentially result in temporary effects on the movement of fish or wildlife species, or the use of native wildlife nursery sites. Direct effects from human presence during construction could hinder wildlife movement between foraging, water, shelter, nesting or nursery habitats. Dewatering during construction could expose fish and other aquatic organisms to increased predation. However, these effects would be confined to a relatively small area in the vicinity of active Project construction activities and would be temporary and therefore would not interfere substantially with fish or wildlife movement, established wildlife corridors, or impede the use of wildlife nursery sites.

Because any potential direct or indirect impacts on the movement of native resident or migratory fish or wildlife species and established native resident or migratory wildlife corridors would be temporary and only potentially occur during Project construction activities, this effect would be **less than significant**, and mitigation is not required.

Impact 4.4-6. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Project area is not subject to any local ordinances protecting biological resources, such as a tree preservation policy or ordinance. Therefore, there would be **no impact** related to such policies or ordinances from operation or construction of the proposed Project.

Impact 4.4-7. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Project area is not within the boundaries of an adopted Habitat Conservation Plan, or Natural Community Conservation Plan. The portion of the Project area below Nimbus Dam is part of the American River Parkway which is managed by the Sacramento County Regional Parks in accordance with the recently adopted *American River Parkway Natural Resources Management Plan* (Sacramento County Regional Parks 2023). This plan serves as a guidance document for management of recreation and natural resources of the American River Parkway. Construction of the Project would not conflict with guidelines in the *American River Parkway Natural Resources Management Plan* or with any other approved local, regional, or state habitat conservation plan. There would be **no impact** to any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

4.5 CULTURAL RESOURCES

This section provides an analysis of potential impacts on known and unknown cultural resources associated with the implementation of the proposed Project. The analysis includes a description of the existing baseline conditions in the Project area, cultural resource identification efforts in the CEQA Study Area, associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria. Although impacts related to human remains are typically analyzed in a cultural resources section, unanticipated discovery of human remains in the Project area may also potentially be Native American and would be considered a Tribal Cultural Resource; impacts associated with Tribal Cultural Resources are discussed in Section 4.18, "Tribal Cultural Resources."

4.5.1 EXISTING CONDITIONS

Cultural resources include districts, sites, buildings, structures, or objects generally older than 50 years and considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. They include prehistoric (precontact) resources and historic-period resources. Archaeological resources are locations where human activity has measurably altered the earth or left deposits of prehistoric or historic-period physical remains (e.g., stone tools, bottles, former roads, house foundations). Historical (or built environment) resources include standing buildings (e.g., houses, barns, outbuildings, cabins) and intact structures (e.g., dams, bridges, roads, districts), or landscapes. A cultural landscape is defined as a geographic area (including both cultural and natural resources and the wildlife therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

The Project area encompasses areas within and near the South Fork of the American River from Kyburz, California to Folsom Reservoir (Exhibit 3.4, Existing Water Supply Infrastructure [South Fork American River]) as well as the El Dorado Canal, Hazel Creek Tunnel, and the channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake (Exhibit 3.6, Project Construction Alignment).

For the purposes of this analysis, a CEQA Study Area for cultural resources was developed to identify potential Project impacts to known cultural resources. The CEQA Study Area was defined as the three sections that may be subject to construction activities, including two segments of the El Dorado Canal and the channel that conveys water from the Hazel Creek tunnel to Jenkinson Lake, plus a buffer of approximately 200 feet to consider adjacent cultural resources that could be impacted by construction activities A buffer of approximately 200 feet was chosen due to the topography and dense forestation along the canal alignment. The Project area is generally located on the west slope of the Sierra Nevada mountain range and is characterized by forested slopes of the rugged South Fork of the American River canyon beginning at approximately 4,000 feet elevation at the El Dorado Diversion Dam (approximately 1.5 miles west of the town of Kyburz) and terminating at Jenkinson Lake at approximately 3,600 feet elevation. Much of the land along the canal between the El Dorado Diversion Dam and Jenkinson Lake is undeveloped land that is densely forested along both sides.

An overview of the baseline environmental setting is provided below. This information is provided as context within which to interpret the cultural resources identified in and around the Project area.

CULTURAL CONTEXT

The Project area is situated at the intersection of the Nisenan and Washoe spheres of influence and cultural resources identified near the Project area are associated with historic-era sites, buildings, and structures. While no precontact sites were identified near the Project Area, brief overviews of the Nisenan and Washoe precontact lifeways are provided below, followed by historic-era themes of the Project area. Information about the contemporary Tribes of the Project area is discussed in Section 4.18 "Tribal Cultural Resources."

Nisenan

The Nisenan territory included the drainages of the Yuba, Bear, and American rivers, and the lower drainages of the Feather River, extending from the crest of the Sierra Nevada to the banks of the Sacramento River. According to Bennyhoff (1961:204–209), the southern boundary with the Miwok was probably a few miles south of the American River, bordering a shared area used by both Miwok and Nisenan groups that extended to the Cosumnes River. It appears that the foothills Nisenan distrusted the valley peoples but had a mostly friendly relationship with the Washoe to the east. Elders recall intergroup marriage and trade, primarily involving the exchange of acorns for fish procured by the Washoe (Wilson 1972:33).

Several political divisions in the Nisenan territory, constituting tribelets, each had headmen (Huk) or headwomen (Mayan) in the larger villages. However, the relative levels of influence in these larger population centers are unknown. All of these larger villages were located in the foothills. More substantial and permanent Nisenan villages generally were not established on the valley plain between the Sacramento River and the foothills, although this area was used as a rich hunting and gathering ground. One tribelet consisted of people occupying the territory between the Bear River and the Middle Fork American River. According to Kroeber (1925:831), the larger villages could have had populations exceeding 500 individuals, although small settlements consisting of 15–25 people and extended families were common. No village sites have been identified near the Project area along the South Fork of the American River (Wilson and Towne 1978: 388).

Washoe

The core of Washoe territory extended from Honey Lake on the north, to the West Walker River on the south, and from the Pine Nut Range on the east, west to the Sierra Nevada crest. Northerners (Wel mel ti) used areas from Eagle Valley north to Honey Lake; southerners (Hunga lel ti) occupied the area south of Woodfords; and valley dwellers (Pau wa lu) wintered in the Truckee Meadows (Nevers 1976). The presence of Washoe place names on the western slope of the Sierra Nevada and ethnographic accounts of seasonal rounds extending from the edges of Yosemite Valley north to the town of Colusa (Freed 1966; d'Azevedo 1986), indicate that seasonal rounds extended well beyond the core territory, and may have encompassed a large portion of the current Project area.

The Washoe, a hunter-gatherer society, combined the techniques of foragers, who moved to a resource patch and ranged out from the residential base daily to gather, and those of collectors, who gathered specific resources in organized groups and stored food for at least part of the year, making fewer residential moves than foragers as defined by Binford (Binford 1980). The Washoe lived in dispersed winter villages and consumed stored foods gathered by organized groups (pine nut harvests, game drives). Washoe groups fished together in the spring, but split into small family parties during the summer, occupying forager-type bases and moving from one resource patch to another. In the fall, accounts indicate that trips to western slopes to procure acorns occurred frequently. Elders recount making family trips to the Placerville area to collect acorns (Rucks 1995:113).

HISTORICAL CONTEXT

The Project area is in El Dorado County, one of the original 27 counties created when California became a State in 1850. Originally, the county's boundaries included parts of present-day Amador, Alpine, and Placer counties. By 1919, California adopted the current boundary lines that are marked to the east by the State of Nevada and to the west by Sacramento and Placer counties. The American and Cosumnes rivers form the County's northern and southern boundaries. The original county seat was the town of Coloma, but in 1857, it was moved to Placerville (Baxter and Allen 2006; Waechter et al. 2003).

This section presents a summary of the historical themes represented by the historic-era resources subjected to National Register of Historic Places (NRHP)/ California Register of Historical Resources (CRHR) evaluation. These include lumber, mining, water conveyance, transportation, and ranching.

Lumber

Lumber operations in the Sierra Nevada foothills began in 1849 at Sutter's Mill in Coloma, which ironically led to the Gold Rush and intensification of lumber operations to support mining and associated developments and resulted in substantial changes to the forest. Logging and the attendant facilities increased because of technological development and as the demand for wood products escalated. George and Fred Phippen constructed a sawmill in the 1930s at the south end of the Project area, but the mill was inundated in 1952 with the creation of Jenkinson Lake.

El Dorado Canal

The El Dorado Canal, which was completed by the El Dorado Water and Deep Gravel Mining Company in 1876, is in the Project area (Starns 2004). Civil engineer Francis A. Bishop designed the canal, which proved to be a great deal more challenging than anticipated because of the rugged terrain, characterized by granite domes and steep mountain slopes. To meet the challenges posed by the landscape, Bishop planned to lay flume segments on foundations of dry-laid granite and rubble bench walls wherever possible, instead of building costly, high-maintenance timber trestles. The rock walls were expected to maintain the hydraulic gradient necessary to convey water along the steep mountain slopes of the canyon.

This was a labor-intensive endeavor and, to fill the need, Bishop hired an array of skilled workers, white foreman, and Chinese labor crews. The Chinese laborers, many of whom had previous construction experience working on various construction projects in the western United States, performed the brunt of the manual labor that was required to build the canal system, including the rock walls.

Water was needed for mining activities. After the ditch systems had been established, temporary dams were constructed by miners, while more permanent dams for hydroelectric power were built starting in the 1870s. This dam construction progressed, with larger dams and more modern construction methods to keep up with population growth. Hydroelectric development intensified considerably over time, resulting in a broad network of facilities.

The El Dorado Canal conveyed water to mines in Placerville and Coon Hollow until they were sold to the Sierra Water Supply Company in 1907; Sierra Water Supply intended to develop the system for hydroelectric development. However, the company encountered financial problems and sold the system to the San Francisco–Oakland Terminal Power Company in 1912, which dissolved four years later. Western States Gas and Electric

Company, a precursor to Pacific Gas & Electric Company (PG&E), subsequently purchased the system. In 1919, El Dorado Water Company, the predecessor of the El Dorado Irrigation District (EID or District), purchased the lower sections of the system, and the District made arrangements to purchase the remainder of the system in 1997 (Starns 2004:190). A complete historical context of the El Dorado Canal can be found in Volume II of "Archeological Survey and Historical Research Report on the El Dorado Canal, El Dorado County, California," (Glover et al 1991).

Transportation

By the 1860s, the South Fork of the American River Canyon had become one of California's major transportation corridors. Although immigrant wagon trains coming into California had been critical in establishing the river canyon as an important migration route across the Sierra Nevada, it was the eastward-bound traffic to the Mother Lode mines in the 1850s, and to Nevada during the great rush to the Comstock Mines between 1859 and 1864 that established it as an important commercial artery for traffic of all types. Several early toll franchises vied with each other to carry traffic along segments of the roadway, later established as Old US 50.

One route taken by freighters was the Ogilby Grade Road, which traverses the Project area. Laid out in 1860, the route ran from Union Hill along the south ridge of the canyon and then descended gently down to the river east of Esmeralda Creek. Robert Ogilby later built a second, lower-elevation version of this important road, which remained popular through the Bonanza era on the Comstock. The Ogilby Road alignment paralleled and later was transected by the route of the El Dorado Canal (Supernowicz and Petershagen 1993:11-49 in Hildebrandt et al. 2003).

INFORMATION CENTER RECORDS SEARCH

AECOM conducted a records search on February 2, 2024 (NCIC File No. ELD-24-23) of pertinent cultural resources information curated by the North Central Information Center (NCIC) of the California Historical Resources Information System (CHRIS), located at California State University, Sacramento. The records search included reviews of previously-conducted studies and known cultural resources within the Project area and a 1/4 mile radius. Resources reviewed included the National Register of Historic Places, California Register of Historical Resources, the California Inventory of Historic Resources (1976), California Historical Landmarks (1996), California Points of Historical Interest (1992 and updates), the Built Environment Resource Database, and historic General Land Office and U.S. Geological survey maps.

A total of 13 known cultural resources were identified within the Project area (including the El Dorado Canal and associated components) and an additional 52 known cultural resources within the 1/4-mile radius in the records search. Nearly half (23) of the 52 cultural resources within 1/4-mile radius were north of the American River and/or Highway 50 and would not be directly or indirectly impacted by the Project. Of the remaining 29 cultural resources within 1/4-mile radius, six were located within the buffer of approximately 200 feet and were drawn into the CEQA Study Area. The remaining 23 were located outside of the CEQA Study Area and would not be directly or indirectly impacted by the Project. See Table 4.5-1 for a complete list of the 19 known cultural resources identified in the CEQA Study Area.

The NCIC assigned the El Dorado Canal, and associated water conveyance and hydroelectric resources, one Primary Number (P-09-000599). This includes several dry laid granite flume bench walls, associated ditches, rock retaining walls, flume segments, buildings, surge tanks, forebay and associated structures. The individual

components vary in levels of recordation, evaluation, and significance determination, but the resources within in the CEQA Study Area are summarized in Table 4.5-1.

Other known cultural resources within the CEQA Study Area include a former mill site that is inundated by Jenkinson Lake, the man-made Jenkinson Lake, a spring, a prospect pit, several canal construction camps, wagon and road segments, roadway rock wall segments, a historic-age bridge that has since been demolished, and the 1,400-acre Sly Park historic district with built environment resources but that has not been formally determined as a historic district.

SUMMARY OF PREVIOUS CULTURAL RESOURCE INVESTIGATIONS ON THE EL DORADO CANAL

Portions of the El Dorado Canal system has been the subject of more than two dozen cultural resources studies and surveys. To date, the most comprehensive surveys and recordation of the El Dorado Canal occurred in 1990s and during the Federal Energy Regulatory Commission (FERC) relicensing process for the El Dorado hydroelectric system in the early 2000s.

In 1990, archeology and built environment inventory and evaluation reports of the El Dorado Canal were commissioned by PG&E. Glenn Caruso, Cultural Resources Management, prepared the archaeological site record of the canal (CA-ELD-511-H), and Laurence H. Shoup of Archaeological-Historical Consultants, prepared the historic overview and significance evaluation. It is significant to consider that both Caruso and Shoup focused their efforts on major features of the El Dorado Canal system from the El Dorado Diversion Dam to the El Dorado Forebay. Thus, the upper storage reservoirs, the Forebay itself, the conduit to the powerhouse, and the powerhouse itself were excluded from the 1990s surveys. Caruso recorded the diversion dam, ditch segments of the canal, wooden flumes, siphons, spillways, tunnels, and pipes on the canal (Waechter et al 2003: 59-60).

Shoup's evaluation of the El Dorado Canal stated that "the entire El Dorado Canal from the intake to the forebay is one appropriate unit of analysis. This unit as a whole has a separate history." Shoup concluded that the El Dorado Canal system "as a whole" no longer retained sufficient integrity to its potential period of significance (1922-1940) for it to be considered eligible for listing in the NRHP. While his intent was to evaluate only the canal section, he inferred that major modifications to the siphons, tunnel construction projects, abandonment of canal segments, and redesign of many key character-defining features of the old 1870s hydraulic mining canal and the 1922-1924 hydroelectric power canal undertaken over the years of operation by Western States Gas & Electric (and its successor PG&E) had rendered the canal insignificant as a historic property. The California State Historic Preservation Officer (SHPO) concurred with this finding in 1991 (Waechter et al 2003: 59-60).

Table 4.5-1. Cultural Resources in the CEQA Study Area

Trinomial and/or Primary Number	Cultural Resource Type	Name	Description	NRHP Status	Crosses or Adjacent to Construction Improvements
CA-ELD-511H; P-09-000599	Built Environment	El Dorado Canal	Canal system and associated water conveyance resources originally built in 1870s, Subsequent alterations in 1920s, 1930s, and modern updates	Determined Ineligible for NRHP by California State Historic Preservation Officer (SHPO) in 1991 and 2008	Yes, this is the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-511H; P-09-000599	Built Environment	Plum Creek Flume Bench Walls	Dry laid granite blocks and rubble (Contributor to the El Dorado Rock Wall Discontiguous District)	Determined Eligible for NRHP by SHPO in 1993, 2008	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-511H; P-09-000599	Built Environment	Flume 8 Bench Walls	Dry laid granite blocks and rubble (Contributor to the El Dorado Rock Wall Discontiguous District)	Determined Eligible for NRHP by SHPO in 1993, 2008	Yes, part of the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-511H; P-09-000599	Built Environment	Flume 41 Bench Walls	Dry laid granite blocks and rubble (Contributor to the El Dorado Rock Wall Discontiguous District)	Determined Eligible for NRHP by SHPO in 1993, 2008	Yes, part of the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-511H; P-09-000599	Built Environment	Flume 45 Bench Walls	Dry laid granite blocks and rubble (Contributor to the El Dorado Rock Wall Discontiguous District)	Determined Eligible for NRHP by SHPO in 1993, 2008	Yes, part of the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-511H; P-09-000599	Built Environment	Intake Area Storage Buildings and Pump House (Diversion Dam)	Buildings	Determined Ineligible for NRHP by SHPO in 2008	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
P-09-1797H	Built Environment	Spring Site	Circular pit with outlet channel	Unevaluated	Yes, adjacent to the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake

Trinomial and/or Primary Number	Cultural Resource Type	Name	Description	NRHP Status	Crosses or Adjacent to Construction Improvements
P-09-1815	Historical Archaeology	Phippens-West Lumber Mill Site	Ruins of lumber mill, usually inundated by Jenkinson Lake	Recommended Ineligible (2007)	Yes, crosses the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake
P-09-1896	Built Environment	Jenkinson Lake (a.k.a. Sly Park Reservoir)	Reservoir boundary only	Recommended Eligible for CRHR (2007)	Yes, crosses the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake
CA-ELD-2091H; P-09-003181	Built Environment	Sly Park Historic District	1,400-acres; Sly Park Reservoir/Jenkinson Lake, dam, dike, tunnel, quarry, road segments, buildings, damtender's house	Recorded as a district, but no determination of NRHP or CRHR eligibility	Yes, crosses the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake
CA-ELD-723H; P-09-003309	Built Environment	Lower Ogilby Grade	5.2 mile segment with construction material scattered along route	Recommended treat as Eligible	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-723H; P-09-003309	Built Environment	Upper Ogilby Grade	6.1 mile segment with construction material scattered along route	Recommended treat as Eligible	Yes, crosses the canal that the Project would utilize to convey Permit 21112 water
P-09-004245	Built Environment	Ogilby Road Grade Rock Walls	Three segments of rock wall: 61', 15', and small scattered sections all near Flume 45 Bench Walls	Unevaluated, but recommended treat as Eligible as part of P-09-003309	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-2227H; P-09-003453	Built Environment; Historical Archaeology	Pacific Gas & Electric Company Ditch Camp 1	Buildings, cottage foundation	Determined Ineligible for NRHP in 2008	Yes, crosses the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-2229H; P-09-003455	Built Environment	Pacific Gas & Electric Company Ditch Camp 2	Buildings and structures	Determined Ineligible in 2008	Yes, crosses the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-2228H; P-09-003454	Historical Archaeology	Pacific Gas & Electric Company Ditch Camp 4	Cottage foundation, cookhouse dugout, structure pads	Unevaluated	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water

Trinomial and/or Primary Number	Cultural Resource Type	Name	Description	NRHP Status	Crosses or Adjacent to Construction Improvements
CA-ELD-2230H; P-09-003456	Historical Archaeology	Pacific Gas & Electric Company Ditch Camp 3	Structural remains, trash dump	Unevaluated	Yes, Adjacent to the canal that the Project would utilize to convey Permit 21112 water
P-09-003676	Historical Archaeology	Western States Gas & Electric Company's Construction Camp C	Pads for mess hall and bath house	Unevaluated	Yes, crosses the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-2720H; P-09-004253	Historical Archaeology	Western States Gas & Electric Company's Construction Camp P	Privy pit, bath house, depressions, dugout structure, trash	Unevaluated	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
CA-ELD-2722H; P-09-004255	Historical Archaeology	Western States Gas & Electric Company's Construction Camp N	Two bath house pits, each filled with modern trash	Unevaluated	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
P-09-004265	Historical Archaeology	Western States Gas & Electric Company's Old Ditch Camp 5	No historic features or artifacts, except a road segment	Determined Ineligible for NRHP in 2008	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
P-09-004262	Historical Archaeology	1922 Wagon Road	Wagon road segment	Unevaluated	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
P-09-005394	Historical Archaeology	Prospect pits	Prospect pits	Unevaluated	Yes, adjacent to the canal that the Project would utilize to convey Permit 21112 water
P-09-005395	Historical Archaeology	Road to Diamond Springs to Carson Valley	Road segment	Unevaluated	Yes, crosses the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake
P-09-005724	Built Environment	Bridge 25C-0092 – **DEMOLISHED**	Bridge replaced in 2019	Ineligible	Not Applicable[c]

Notes: Compiled by AECOM from NCIC File No. ELD-24-23, CRHR 2007, NRHP 2008
CRHR = California Register of Historical Resources
NCIC -= North Central Information Center
NRHP = National Register of Historic Places
SHPO = California State Historic Preservation Officer

In 2000, the District applied to the FERC to continue operation and maintenance of its 21-megawatt hydroelectric system that utilizes the El Dorado Canal, designated as FERC Project 184. As part of the licensing process, the District hired Far Western Anthropological Group, Inc. (Far Western) and JRP Historical Consulting, LLC (JRP) to prepare an inventory and recordation reports to identify cultural resources within the project Area of Potential Effects (APE) as the first phase of Section 106 compliance cultural resources investigation (Waechter et al 2003: I, 1).

The project APE for Project 184 was defined as the FERC licensing boundary, any adjacent areas reasoned to have high sensitivity for cultural resources that could potentially be impacted by the project, and canal access roads. The discontiguous APE consisted of the "Upper System" storage reservoirs, the "Middle System" which is the canal from the intake at the Diversion Dam to the forebay (includes the Project area), and the "Lower System" between the forebay and El Dorado Powerhouse. In relation to the El Dorado Canal, the APE/FERC licensing boundary generally ranged from 50 to 400 feet on both sides of aboveground portion of the entire canal (Waechter et al 2003: p. 3-12).

Between 2000 and 2002, the entire canal APE and access roads were walked by archaeologists walking transects of 15 meters or less. Crew members revisited all but one of the previously recorded archaeological sites, both within and in proximity to the canal, resulting in 100 percent coverage of the canal APE (Waechter et al 2003: 9-11, 62-63). The entire canal APE was surveyed by JRP architectural historians in July and October 2002. The canal between the intake at the Diversion Dam to the forebay was previously recorded in 1990 by Caruso. Associated buildings with the canal, like the Intake Area, Storage Buildings, and Pumphouse at the El Dorado Diversion Dam, were not recorded in 1990 by Caruso, therefore associated canal buildings or structured in the APE that were constructed before 1957 were recorded by JRP in 2002. JRP also has recorded resources related to a historic sawmill operation located just upstream from the El Dorado Diversion Dam (and outside the Canal Study Area), and several structures at various ditch camps or construction camps (some inside the Canal Study Area) (Waechter et al 2003: 89). The results of the survey, historical context of FERC Project 184, and potential impacts to cultural resources were reported out in the three volume *Proposed Relicensing of the El Dorado Hydroelectric Project. FERC Project 184: Volume I Report and Appendices,* September 2003.

JRP also resurveyed flume bench foundation walls, Flume Bench Walls 8, 24-25, 41, 45, 48, and at Plum Creek Canyon, and Alder Creek Canyon (Flume Bench Walls 8, 41, 45, and the Plum Creek Canyon Flume Bench Walls are within the Canal Study Area). The flume bench walls were built in the 1870s and were found eligible for listing in the NRHP as a discontiguous district by Shoup in 1990 for their association with the Chinese (Criteria A and C, Ethnic Heritage) and as an important example of late nineteenth-century engineering (Criterion C, Engineering/Technology). The SHPO disagreed with Criterion A eligibility, but suggested that they may be eligible under Criterion C, if it could be proven that there was something distinctively "Chinese" about the construction methods used in building the rock walls, or under engineering/technology if the walls embodied "certain distinguishing attributes that define the property type and meet an appropriate level of integrity as well" (Hildebrandt et al. 2003: 54-55). In response to the SHPO's suggestion, in 1993 JRP resurveyed the flume bench foundation walls, conducted additional research, and determined that Flume Bench Walls 8, 24-25, 41, 45, 48, and at Plum Creek Canyon, and Alder Creek Canyon possessed distinguishing attributes and sufficient integrity to warrant listing in the NRHP under Criterion C (Engineering/Technology), as the El Dorado Rock Wall Discontinuous District, and the SHPO concurred with these recommendations in 1993 (Waechter et al 2003: 60). As part of the survey effort in 2002, JRP revisited and updated records for Flume Bench Walls 8, 24-25, 41, 45,

48, and at Plum Creek Canyon, and Alder Creek Canyon on Department of Parks and Recreation (DPR) 523 forms.

In tandem with the preparation of the *Proposed Relicensing of the El Dorado Hydroelectric Project. FERC Project 184: Volume I Report and Appendices*, Far Western also prepared a *Historic Properties Management Plan* (HPMP) for the District as part of its federal Section 106 compliance for management and treatment of significant cultural resources. At the time of preparation, not all of the cultural resources identified during the 2000-2002 survey had been evaluated; therefore, the HPMP provided generalized mitigation measures to reduce impacts to potential historic properties and that specific mitigation measures would be developed in consultation with FERC, SHPO, the Forest Service, and participating Native American tribes (Hildebrandt et al. 2003: i). A discussion of the NRHP-eligibility status of the Upper and Lower Ogilby Road grades (P-09-003309) was provided in the HPMP which stated that until the entire road system was evaluated as a potential contributor to the proposed Highway 50 transportation corridor historic district, both grades should be treated as potentially significant historic properties and managed as such (Hildebrandt et al. 2003: 55). The Ogilby Road Grade Rock Walls (P-09-004245) were not discussed in the HPMP, but the DPR 523 form prepared by JRP in 2002 for the *Proposed Relicensing of the El Dorado Hydroelectric Project. FERC Project 184: Volume I Report and Appendices*, stated that the rock walls on the Lower Ogilby Grade are associated with the construction and operation of Ogilby Road. Therefore, it appears that the Ogilby Road Grade Rock Walls (P-09-004245) should also be treated as a potentially significant historic property (JRP 2002).

Garcia and Associates (2004) conducted a cultural resource investigation for the Hazel Creek Tunnel failure zone, drainage path, two access roads, and a disposal area. The tunnel failure zone included the collapsed tunnel, a staging area, a vehicle turnaround, and the tree removal area. The drainage path is the channel that conveys water exiting the Hazel Creek tunnel and connecting to Jenkinson Lake. Field survey of the project area did not indicate the presence of any type of cultural resources, prehistoric or historic. The tunnel itself does not qualify as a cultural resource because of its recent origin (completed December 1, 1988).

Lastly, in 2008, PAR Environmental Services, Inc. prepared a *National Register of Historic Places Evaluation, FERC 184 Hydroelectric System* (PAR 2008). Largely relying on the previous recordations prepared by JRP in 2002, PAR concluded that the entire FERC 184 system, which includes the Silver Lake Dam (and Lake Tender's cabin, Caples Lake Dam, Echo Dam, Echo Conduit, El Dorado intake/diversion dam, Alder Creek Siphon, El Dorado Forebay Dam, El Dorado Canal (flumes, spillways, tunnels, and siphons), Ditch Camps 1, 2, and 5, El Dorado Penstock, and the El Dorado Powerhouse), was not eligible for listing in the NRHP as a historic district, or individually. As part of the report, PAR reiterated NRHP-eligibility of the Lake Aloha Dam and the El Dorado Rock Wall Discontinuous District. The SHPO concurred with these findings (SHPO 2008 Aug 11).

Historical Resources Identified

After reviewing the NCIC record search results, and previous cultural resource inventory and evaluation reports, including the HPMP, of the 19 resources located in the CEQA Study Area, the only historical resources are Flume Bench Walls 8, 41, 45, and at Plum Creek Canyon (P-09-000599), and the Ogilby Road grades (P-09-003309) and the associated Ogilby Road Grade Rock Walls (P-09-004245). There are no previously identified resources associated with the channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake.

4.5.2 REGULATORY SETTING

This section discusses the federal, state regulations and local policies and objectives, particularly those in the El Dorado County (County) General Plan that related to agricultural resources and are relevant to the Project.

FEDERAL

National Historic Preservation Act of 1966

Enacted in 1966, the National Historic Preservation Act (NHPA) declared a national policy of historic preservation and instituted a multifaceted program, administered by the Secretary of the Interior, to encourage the achievement of preservation goals at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the NRHP, established the position of State Historic Preservation Officer and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the purposes of the NHPA, assisted Native American tribes in preserving their cultural heritage, and created the Advisory Council on Historic Preservation (ACHP).

Section 106 of the National Historic Preservation Act

Section 106 of the NHPA states that federal agencies with direct or indirect jurisdiction over federally funded, assisted, or licensed undertakings must take into account the effect of the undertaking on any historic property that is included in or eligible for inclusion in the NRHP, and that the ACHP must be afforded an opportunity to comment on such undertakings through a process outlined in 36 CFR Part 800. The Section 106 process involves the identification of significant historic and archaeological resources ("historic properties") within an APE, the determination of whether the undertaking will cause an adverse effect on historic properties, and the resolution of those adverse effects through execution of a Memorandum of Agreement. In addition to the ACHP, interested members of the public – including individuals, organizations, and agencies (such as the California Office of Historic Preservation) – are provided with opportunities to participate in the process.

National Register of Historic Places

The NRHP was established by the NHPA of 1966 as "an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2).

The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

The formal criteria (36 CFR 60.4) for determining NRHP eligibility are as follows:

1. The property is at least 50 years old (however, properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP);

2. It retains integrity of location, design, setting, materials, workmanship, feeling, and associations; and

3. It possesses at least one of the following characteristics:

   Criterion A — Is associated with events that have made a significant contribution to the broad patterns of history (events).

   Criterion B — Is associated with the lives of persons significant in the past (persons).

   Criterion C — Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction (architecture).

   Criterion D — Has yielded, or may be likely to yield, information important in prehistory or history (information potential).

Cemeteries, birthplaces, graves of historic figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, and properties that are primarily commemorative in nature are not considered eligible for the NRHP unless they satisfy certain conditions. In general, a resource must be at least 50 years old to be considered for the NRHP, unless it satisfies a standard of exceptional importance.

A project is considered to have a significant impact when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. These seven aspects of integrity are described as:

- **Location.** Integrity of location refers to whether a property remains where it was originally constructed or was relocated.
- **Design.** Integrity of design refers to whether a property has maintained its original configuration of elements and style that characterize its plan, massing, and structure. Changes made after original construction can acquire significance in their own right.
- **Setting.** Integrity of setting refers to the physical environment surrounding a property that informs the characterization of the place.
- **Materials.** Integrity of materials refers to the physical components of a property, their arrangement or pattern, and their authentic expression of a particular time period.
- **Workmanship.** Integrity of workmanship refers to whether the physical elements of a structure express the original craftsmanship, technology and aesthetic principles of a particular people, place, or culture at a particular time period.
- **Feeling.** Integrity of feeling refers to the property's ability to convey the historical sense of a particular time period.
- **Association.** Integrity of association refers to the property's significance defined by a connection to a particular important event, person, or design.

Listing in the NRHP does not entail specific protection or assistance for a property but it does guarantee consideration in planning for federal or federally-assisted projects, eligibility for federal tax benefits, and qualification for federal historic preservation assistance. Additionally, project effects on properties listed in the NRHP must be evaluated under CEQA.

The National Register Bulletin series was developed to assist evaluators in the application of NRHP criteria. For example, National Register Bulletin #36 provides guidance in the evaluation of archaeological site significance. If a property cannot be placed within a particular theme or time period, and thereby lacks "focus," it will be unlikely to possess characteristics which would make it eligible for listing in the NRHP. Evaluation standards for linear features (such as roads, trails, fence lines, railroads, ditches, and flumes) are considered in terms of four related criteria that account for specific elements that define engineering and construction methods of linear features: (1) size and length, (2) presence of distinctive engineering features and associated properties, (3) structural integrity, and (4) setting. The highest probability for NRHP eligibility exists in the intact, longer segments, where multiple criteria coincide.

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act of 1990 sets provisions for the inadvertent discovery and/or intentional removal of human remains and other cultural items from federal and tribal lands. It clarifies the ownership of human remains and sets forth a process for repatriation of human remains and associated funerary objects and sacred religious objects to the Native American groups claiming to be lineal descendants or culturally affiliated with the remains or objects. It requires any federally funded institution housing Native American remains or artifacts to compile an inventory of all cultural items within the museum or with its agency and to provide a summary to any Native American tribe claiming affiliation.

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires public agencies to consider the effects of their actions on "historical resources," and "unique archaeological resources." Pursuant to Public Resources Code (PRC) Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether projects would have effects on unique archaeological resources.

Historical Resources

"Historical resource" is a term with a defined statutory meaning (PRC Section 21084.1; State CEQA Guidelines Sections 15064.5[a] and [b]). Under State CEQA Guidelines Section 15064.5(a), historical resources include the following:

1) A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the CRHR (PRC Section 5024.1).

2) A resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g), will be presumed to be historically or culturally significant. Public agencies must treat any such resource as

significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3) Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the CRHR (PRC Section 5024.1).

4) The fact that a resource is not listed in or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to PRC Section 5020.1[k]), or identified in a historical resources survey (meeting the criteria in PRC Section 5024.1[g]) does not preclude a lead agency from determining that the resource may be a historical resource as defined in PRC Sections 5020.1(j) or 5024.1.

Unique Archaeological Resources

CEQA also requires lead agencies to consider whether projects will affect unique archaeological resources. PRC Section 21083.2(g) states that "unique archaeological resource" means 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 one or more 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.

California Register of Historical Resources

All properties in California that are listed in or formally determined eligible for listing in the NRHP are also listed in the CRHR. The CRHR is a listing of State of California resources that are significant in the context of California's history. It is a Statewide program with a scope and with criteria for inclusion similar to those used for the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR.

A historical resource must be significant at the local, state, or national level under one or more of the criteria defined in the California Code of Regulations Title 15, Chapter 11.5, Section 4850 to be included in the CRHR. The CRHR criteria are tied to CEQA because any resource that meets the criteria below is considered a significant historical resource under CEQA. As noted above, all resources listed in or formally determined eligible for listing in the NRHP are automatically listed in the CRHR.

The CRHR uses four evaluation criteria:

Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

Criterion 2. Is associated with the lives of persons important to local, California, or national history.

Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of a master; or possesses high artistic values.

Criterion 4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Similar to the NRHP, a historical resource must meet one of the above criteria and retain integrity to be listed in the CRHR.

Government Code Sections 6254(r) and 6254.10

These sections of the California Public Records Act were enacted to protect archaeological sites from unauthorized excavation, looting, or vandalism. Section 6254(r)explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Section 6254.10 specifically exempts from disclosure "records that relate to archaeological site information and reports, maintained by, or in the possession of the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a Native American tribe and a state or local agency."

Discovery of Human Remains, Health and Safety Code Sections 7050 and 7052

Health and Safety Code Section 7050.5 declares that, in the event of the discovery of human remains outside of a dedicated cemetery, all ground disturbance must cease, and the county coroner must be notified. Section 7052 establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives.

Of particular note to cultural resources is subsection I), which requires the coroner to contact the Native American Heritage Commission (NAHC) within 24 hours if discovered human remains are determined to be Native American in origin. After notification, NAHC would follow the procedures outlined in PRC Section 5097.98, which include notification of most likely descendants (MLD), if possible, and recommendations for treatment of the remains. The MLD would have 24 hours after notification by the NAHC to make their recommendation (PRC Section 5097.98). In addition, knowing or willful possession of Native American human remains or artifacts taken from a grave or cairn is a felony under State law (PRC Section 5097.99).

LOCAL

El Dorado County General Plan

The Project is proposed by the El Dorado Irrigation District (District), a special district that supplies water to customers throughout much of the County. Pursuant to Government Code sections 53091(D) and (I), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply to with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis (EDCPD 2004, as amended). The General Plan's goals and guidelines related to cultural resources include the following:

- **Goal 7.5:** Ensure the preservation of the County's important cultural resources.
  - **Objective 7.5.1:** Creation of an identification and preservation program for the County's cultural resources
    - **Policy 7.5.1.1:** The County shall establish a Cultural Resources Ordinance. This ordinance shall provide a broad regulatory framework for the mitigation of impacts on cultural resources (including historic, prehistoric and paleontological resources) by discretionary projects. This Ordinance should include (but not be limited to) and provide for the following:

      A. Appropriate (as per guidance from the Native American Heritage Commission) Native American monitors to be notified regarding projects involving significant ground-disturbing activities that could affect significant resources.

      B. A 100-foot development setback in sensitive areas as a study threshold when deemed appropriate.

      C. Identification of appropriate buffers, given the nature of the resources within which ground-disturbing activities should be limited.

      D. A definition of cultural resources that are significant to the County. This definition shall conform to (but not necessarily be limited to) the significance criteria used for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) and Society of Vertebrate Paleontology.

      E. Formulation of project review guidelines for all development projects.

      F. Development of a cultural resources sensitivity map of the County.

- **Policy 7.5.1.2:** Reports and/or maps identifying specific locations of archaeological or historical sites shall be kept confidential in the Planning Department but shall be disclosed where applicable.

- **Policy 7.5.1.3:** Cultural resource studies (historic, prehistoric, and paleontological resources) shall be conducted prior to approval of discretionary projects. Studies may include, but are not limited to, record searches through the North Central Information Center at California State University, Sacramento, the Museum of Paleontology, University of California, Berkeley, field surveys, subsurface testing, and/or salvage excavations. The avoidance and protection of sites shall be encouraged.

- **Policy 7.5.1.4:** Promote the registration of historic districts, sites, buildings, structures, and objects in the National Register of Historic Places and inclusion in the California State Office of Historic Preservation's California Points of Historic Interest and California Inventory of Historic Resources.

- **Policy 7.5.1.5:** Cultural Resources Preservation Commission shall be formed to aid in the protection and preservation of the County's important cultural resources. The Commission's duties shall include, but are not limited to:

  A. Assisting in the formulation of policies for the identification, treatment, and protection of cultural resources (including historic cemeteries) and the curation of any artifacts collected during field collection/excavation;

  B. Assisting in preparation of a cultural resources inventory (to include prehistoric sites and historic sites and structures of local importance);

  C. Reviewing all projects with identified cultural resources and making recommendations on appropriate forms of protection and mitigation; and

  D. Reviewing sites for possible inclusion in the National Register of Historic Places, California Register, and other State and local lists of cultural properties.

  The County shall request to become a Certified Local Government (CLG) through the State Office of Historic Preservation. Certification would qualify the County for grants to aid in historic preservation projects. The Cultural Resources Preservation Commission could serve as the Commission required for the CLG program.

- **Policy 7.5.1.6:** The County shall treat any significant cultural resources (i.e., those determined California Register of Historical Resources/National Register of Historic Places eligible and unique paleontological resources), documented as a result of a conformity review for ministerial development, in accordance with CEQA standards.

- **Objective 7.5.3:** Recognition of the value of the County's prehistoric and historic resources to residents, tourists, and the economy of the County, and promotion of public access and enjoyment of prehistoric and historic resources where appropriate.

- **Policy 7.6.1.1C:** Maintaining areas of importance for outdoor recreation including areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes including those providing access to lake shores, beaches and rivers and streams; and areas which serve as links between major recreation and open space reservations including utility easements, banks of rivers and streams, trails and scenic highway corridors (EDCPD 2004, as amended).

4.5.3 IMPACT ANALYSIS

METHODOLOGY

Assessment of potential impacts on significant cultural resources in the CEQA Study Area is based on the existing information provided in the NCIC records search, *Proposed Relicensing of the El Dorado Hydroelectric Project, FERC Project 184: Volume I Report and Appendices* (Waechter et al. 2003), *Proposed Relicensing of the El Dorado Hydroelectric Project (FERC Project 184) Historic Properties Management Plan* (Hildebrandt et al. 2003), and *NRHP Evaluation Report for EID's FERC 184 Hydroelectric System* (PAR 2008). Measures to mitigate significant impacts are provided, where appropriate.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements

to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure) pre-construction, construction, and operational impacts (post-construction).

- The existing infrastructure phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the Project would have a potentially significant impact related to cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;
- Disturb any human remains, including those interred outside of formal cemeteries.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Far Western prepared generalized mitigation measures to reduce impacts to potential historic properties (historical resources, archaeological resources, and human remains) as part of FERC Project 184 in the 2003 *Historic Properties Management Plan* (HPMP) as part of Section 106 compliance, based on seven mitigation measures outlined in the FERC (2002) guidelines, and recommended methods that are consistent the with Forest Service management document developed by Jackson et al. (1994).

The seven mitigation measures included:

1. Avoidance;
2. Stabilization and Protection;
3. Data Recovery;
4. Treatment of Unanticipated Discoveries;
5. Treatment of Human Remains;
6. Monitoring Protocols; and
7. Public Interpretation.

These mitigation measures are used as the basis for the mitigation measures for Project construction, including those associated with the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake that was not included in the HPMP and are analyzed at a program level in this EIR. After the exact location and extent of Project activities are known, more project-specific mitigation measures can be identified that are commensurate with identified impacts to historical resources.

Impact 4.5-1. Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not include new development that would involve ground disturbance. Therefore, this phase would not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, and there would be **no impact.**

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree

removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Flume Bench Walls 8, 41, 45, and at Plum Creek Canyon along the El Dorado Canal (P-09-000599) were determined to be contributors to the NRHP-eligible El Dorado Wall Discontiguous District in 1993 and reaffirmed in 2008. Stabilization of the rock wall at Flume 41 as part of a flume replacement project resulted in an adverse effect determination by the SHPO. Historic American Buildings Survey/Historic American Engineering Record documentation was prepared as mitigation for the adverse effect and in compliance with a Memorandum of Understanding among the District, SHPO, Federal Energy Regulatory Commission, and the Eldorado National Forest. Similarly, the District is going to be replacing/stabilizing the Flume 45 rock wall as part of a flume replacement project and is currently preparing an EIR for this project which will have its own impact determinations and mitigation measures.

While no work is proposed for the Project on the Flume Bench Walls, they are located within the CEQA Study Area. Due to the proximity to the El Dorado Canal, there is potential to damage the Flume Bench Walls by physical impact, or vibration, from construction equipment and vehicles. If damage occurs to the Flume Bench Walls during project construction activities, the impacts on these historical resources would be **potentially significant**.

For the purposes of the programmatic level analysis of construction improvements in this EIR, all newly documented resources that may be identified during cultural resources investigations and the previously documented Ogilby Road grades (P-09-003309) and the associated Ogilby Road Grade Rock Walls (P-09-00d4245) will be assumed to qualify for historical resources. These features are located within the CEQA Study Area and could be potentially damaged during construction activities by alteration, physical impact, and/or vibration during construction activities. If damage occurs to the road grades or rock walls during project construction activities, the impacts on these historical resources would be **potentially significant.**

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not include new development that would involve ground disturbance. Therefore, this phase would not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, and there would be **no impact**.

Mitigation Measures

Mitigation Measure 4.5-1a: Identification of Cultural Resources

Project activities would have the potential to affect cultural resources if the construction activity would directly disturb, destroy, or remove all or part of a resource including built environment resources. In addition, some resources may be affected if activity adjacent to their location may directly affect the setting, feeling, or association of the resource.

Prior to the start of construction activities, the District shall retain a qualified cultural resources specialist to conduct a cultural resources inventory of all Project areas that could be affected by construction. Previously identified resources shall be revisited and assessed for any changes since the last inventory and any newly identified resources shall be inventoried. The results of the inventory shall be documented in a report that also recommends suitable avoidance and minimization measures for the Project. These measures shall be incorporated into construction plans.

Mitigation Measure 4.5-1b: Implement Appropriate Avoidance and Protection Measures for Cultural Resources

Resources documented during the cultural resources inventory called for in Mitigation Measure 4.5-1a in the Project construction zones shall be clearly marked for avoidance prior to construction to prevent damage by physical impact of construction equipment and/or vehicles. The established avoidance zones shall be fenced or otherwise clearly marked in the field and shall be maintained throughout the duration of the construction period. If avoidance zone fencing or marking is disturbed during construction, the avoidance area shall be monitored by a spotter until the fencing can be replaced. Protective fencing shall remain in place for the entire duration of construction and shall be removed once construction is complete.

Mitigation Measure 4.5-1c: Cultural Resource Awareness Training

The District shall provide cultural resources awareness training for workers prior to beginning Project construction. The District shall have a qualified archaeologist prepare training materials (i.e., printed handouts) that provide information on the following topics:

1) How to recognize cultural resources, including prehistoric and historic artifacts
2) How to comply with the avoidance and minimization measures for cultural resources
3) What to do if artifacts are encountered in the Project area

4) Information on other measures relevant to cultural resources
5) Information on regulations and applicable civil and criminal penalties for violations.

The training shall initially be presented to key Project personnel at the Project kickoff. Printed handouts shall be distributed and used for future reference by Project personnel. Project personnel that are trained during the Project kickoff shall be responsible for making sure that other workers on the Project receive the training before initiating on-site work. A roster of trained Project personnel shall be maintained in the Project construction office and made available for review by regulatory agencies, if needed. This training may be conducted in coordination with the tribal cultural resource awareness training (MM TRIB-2), biological resources awareness training (MM BIO-2), and paleontological resources awareness training (MM GEO-2).

Mitigation Measure 4.5-1d: Proper Handling of Inadvertent Discovery of Cultural Resources

If cultural resources are encountered during construction, compliance with federal and State regulations and guidelines regarding the treatment of cultural resources and/or human remains shall be required.

1 If potential prehistoric or historic-period archaeological resources are encountered during Project implementation, all construction activities within 100-feet shall halt and the District shall be notified.

2 A qualified archaeologist, defined as one meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology, shall inspect the findings as soon as practicable following discovery and report the results of the inspection to the District.

3 If the identified archaeological resource is determined to be prehistoric, the District and qualified archaeologist shall coordinate with and solicit input from a culturally affiliated Native American Tribal Representative regarding significance and treatment of the resource as a potential Tribal Cultural Resource. Any Tribal Cultural Resources discovered during Project work shall be treated in consultation with the tribe, with the goal of preserving in place with proper treatment. See MM TRIB-1, TRIB-2, and TRIB-3 for more discussion of tribes and culturally sensitive areas.

4 If the District determines that the resource qualifies as a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines) and that the Project has potential to damage or destroy the resource, mitigation shall be implemented in accordance with PRC Section 21083.2 and CEQA Guidelines Section 15126.4. Consistent with CEQA Guidelines Section 15126.4(b)(3), mitigation shall be accomplished through either preservation in place or, if preservation in place is not feasible, data recovery through excavation.

5 If preservation in place is feasible, this may be accomplished through one of the following means: (1) modifying the construction plan to avoid the resource; (2) incorporating the resource within open space; (3) capping and covering the resource before building appropriate facilities on the resource site; or (4) deeding the resource site into a permanent conservation easement.

6 If avoidance or preservation in place is not feasible, a qualified archaeologist shall prepare and implement a detailed treatment plan to recover the scientifically consequential information from and

about the resource, which shall be reviewed and approved by the District prior to any excavation at the resource site.

Treatment of unique archaeological resources shall follow the applicable requirements of PRC Section 21083.2, including creation of a treatment plan. Treatment for most resources shall consist of (but shall not be limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim of targeting the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the Project. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and State repositories, libraries, and interested professionals.

Significance after Mitigation

Implementation of Mitigation Measures 4.5-1a through 4.5-1d would reduce potentially significant impacts resulting from inadvertent damage or destruction of historical resources during construction to a **less-than-significant** level through inventory, and avoidance and mitigation, worker awareness training and measures for inadvertent discovery of cultural resources as outlined in Mitigation Measure 4.5-1a through 4.5-1d.

Impact 4.5-2. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064?

Precontact archaeological resources may include, but are not limited to flaked stone tools (projectile point, biface, scraper, etc.) and debitage (flakes) made of chert, obsidian, etc., ground stone milling tools and fragments (mortar, pestle, handstone, millingstone, etc.), faunal (non-human) bones, fire-affected rock, dark middens (domestic dump waste), house pit depressions, and human interments. Historic-era archaeological resources may include but are not limited to cut (square) nails, containers or miscellaneous hardware, glass fragments, cans with soldered seams or tops, ceramic or stoneware objects or fragments, milled or split lumber, and trash dumps.

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve ground disturbance; therefore, it would not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064. Thus, there would be **no impact**.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek

Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Although no "unique archaeological resources," as defined by CEQA, have been documented in the vicinity of the Project construction alignment, the potential exists for unrecorded cultural resources to be present. No subsurface testing has been conducted in this area, and cultural resources may be buried and not visible on the surface. Therefore, the potential exists for buried cultural resources to be unearthed or otherwise discovered during ground-disturbing and construction activities. If such resources were determined to be unique or historic, this construction-related impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not include new development that would involve ground disturbance. Therefore, this phase would not cause a substantial adverse change in the significance of an archaeological resource pursuant to as defined in Section 15064.5, and there would be **no impact**.

Mitigation Measures

The following mitigation measures shall be implemented to avoid adverse change to significant archeological resources:

Mitigation Measure 4.5-1a: Identification of Cultural Resources

Mitigation Measure 4.5-1b: Implement Appropriate Avoidance and Protection Measures for Cultural Resources

Mitigation Measure 4.5-1c: Cultural Resource Awareness Training

Mitigation Measure 4.5-1d: Proper Handling of Inadvertent Discovery of Cultural Resources

Significance after Mitigation

Implementation of Mitigation Measure 4.5-1a through 4.5-d requires that specified procedures be followed for inventory, protection, worker training and inadvertent discovery of cultural resources. Implementation of these measures would reduce potentially significant impacts resulting from inadvertent damage or destruction of unknown cultural resources during construction to a **less-than-significant** level through inventory, and avoidance and mitigation, worker awareness training and measures for inadvertent discovery of cultural resources as outlined in Mitigation Measure 4.5-1a through 4.5-1d.

Impact 4.5-3. Would the project disturb any human remains, including those interred outside of formal cemeteries?

Because Native American human remains qualify as a Tribal Cultural Resource, this potential impact is discussed in section 4.18 ‘Tribal Cultural Resources.’

4.6 ENERGY

This section analyzes potential impacts to energy resources associated with implementation of the proposed Project. This analysis includes a description of the existing baseline conditions, the associated regulatory framework, including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.6.1 EXISTING CONDITIONS

In California, energy consumption is divided into four primary sectors: transportation, industrial, commercial, and residential. Figure 4.6-1 summarizes California's energy consumption by end-use sector (EIA 2023a).

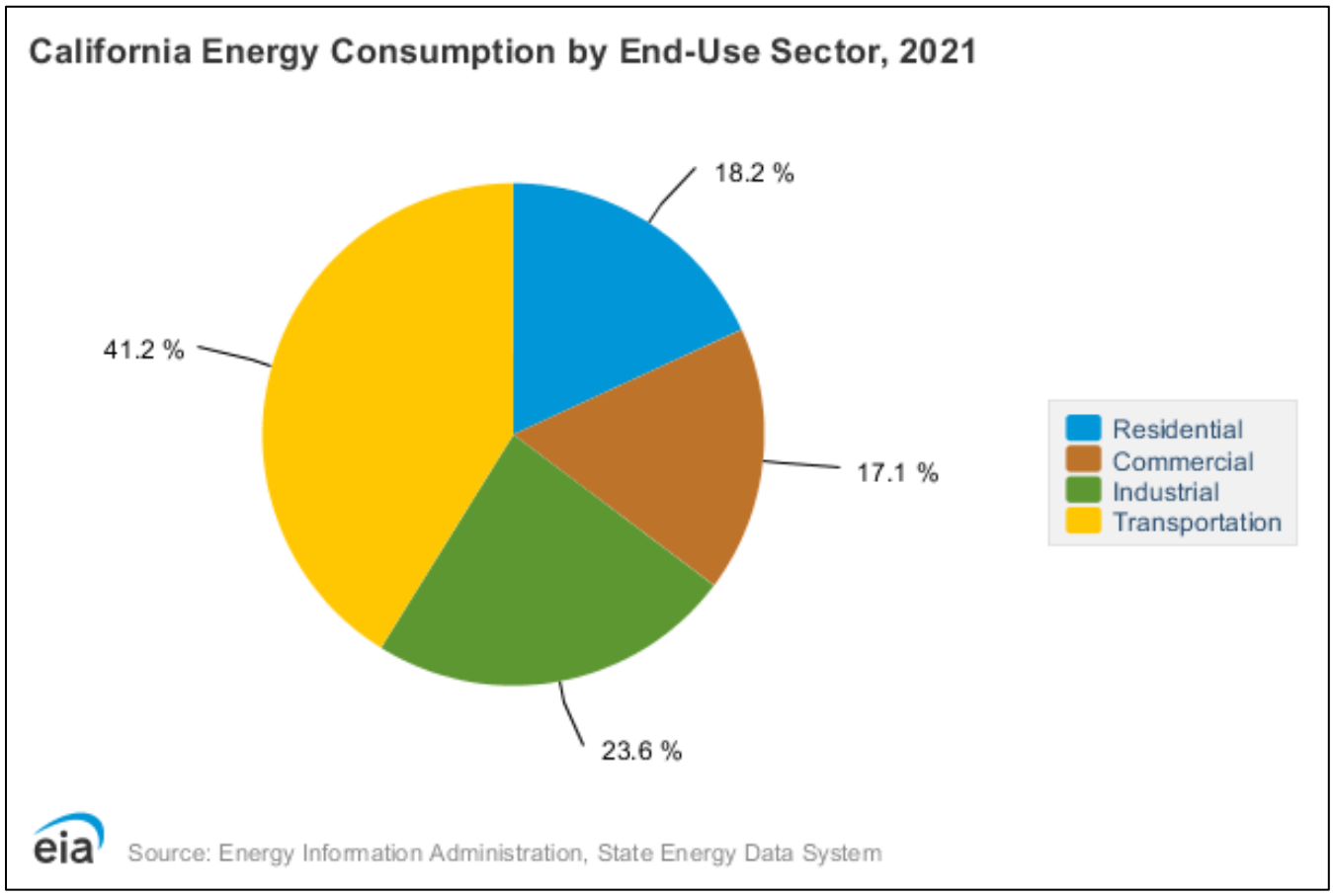


Figure 4.6-1. California Energy Consumption by End-Use Sector

ENERGY SOURCES

California

In 2022, California generated a total of 287,220 gigawatt-hours of electricity, of which approximately 155,747 gigawatt-hours were generated from renewables (CEC 2023a). Table 4.6-1 summarizes California's energy mix by fuel type.

Table 4.6-1. California Energy Mix by Fuel Type

Fuel Type	Total California Energy Mix (Gigawatt-hours)	Total California Power Mix (%)
Coal	6,170	2.2
Natural Gas	104,495	36.4
Oil	65	0.0
Other (Waste Heat/Petroleum Coke)	315	0.1
Nuclear	26,366	9.2
Large Hydroelectric	26,528	9.3
Unspecified	20,428	7.1
Total Thermal and Non-Renewables	*121,473*	*45.8*
Biomass	6,162	2.2
Geothermal	13,412	4.7
Small Hydroelectric	3,230	1.1
Solar	48,950	17.0
Wind	31,099	10.8
Total Renewables	*155,747*	*54.2*
Total System Energy	**287,220**	**100.0**

Source: CEC 2023a

Notes: Hydroelectric power in California is broken down into two categories: large hydroelectric power, which are facilities larger than 30 megawatts, and small hydroelectric power. Small hydroelectric power plants qualify as renewable energy under the Renewables Portfolio Standard (discussed in more detail in Section 4.6.2 below) and large hydroelectric plants are not considered renewable.

In California, water and energy use are closely connected. California's water system uses energy to pump, convey, treat, and heat water. Water is also required for hydropower generation, thermoelectric power plants, and oil and gas extraction. Improving water use efficiency can reduce energy consumption; conversely, improving energy efficiency can reduce impacts on water supply and quality. As such, this section also briefly describes El Dorado Irrigation District's energy consumption and provides an overview of the existing hydroelectric generation at the powerhouses located on the South Fork American River.

El Dorado Irrigation District (District or EID)

As described previously, energy is required to produce, treat, and deliver water. For example, the District's facilities at Folsom Reservoir currently operate using pumps in series, with pumps drawing raw water, and then additional booster pumps conveying the raw water to the El Dorado Hills water treatment plant (WTP), where energy is required to treat water, and, finally, additional pumps and related energy are required to deliver water to consumers. The District also conveys water via gravity flow, which does not require energy for delivering the water. For example, water diverted at the El Dorado Diversion Dam is conveyed to Reservoir 1 WTP via gravity flow through the El Dorado Canal and water is delivered to Reservoir A WTP via gravity flow through the El Dorado Canal to the Hazel Creek Tunnel to Jenkinson Lake. Energy is required to treat water at Reservoir 1 WTP and Reservoir WTP; however, unlike the El Dorado Hills WTP, Reservoir 1 WTP and Reservoir A WTP can deliver treated water via gravity to the District's entire service area. In June 2021, the District adopted the 2020 Urban Water Management Plan, which includes summaries of the annual net energy consumed for all water management processes: diversion, conveyance, storage, treatment, distribution, and in-conduit hydropower generation within the distribution system. In 2020, the District consumed 12,965,929 kilowatt-hours of energy (EID 2021). Based on the total volume of water diverted for consumptive uses (36,159 acre-feet) as reported in

the EID 2020 Water Diversion Report, the District's energy intensity is 359 kilowatt-hours per acre-foot (EID 2021).

The District is primarily located in two major watersheds, the South Fork American River and the North Fork of the Cosumnes River. Since the Project location encompasses areas within and near the South Fork American River from Kyburz, California to Folsom Reservoir, including Jenkinson Lake, the discussion below briefly describes the hydroelectric power production at the powerhouses on the South Fork American River operated by the Sacramento Municipal Utility District (SMUD) and the District.

Hydroelectric Power Generation along South Fork American River

Hydroelectric power production at the powerhouses on the South Fork American River operated by the SMUD include the Camino Powerhouse, Jaybird Powerhouse, Jones Fork Powerhouse, Loon Lake Powerhouse, Robbs Peak Powerhouse, Union Valley Powerhouse, White Rock Powerhouse, and Chili Bar Powerhouse. The District operates the El Dorado Powerhouse. Hydroelectric generation from El Dorado Powerhouse is sold to Pioneer Community Energy, a local not-for-profit electricity provider.

Sacramento Municipal Utility District

SMUD delivers electricity to an approximately 900-square-mile area within Sacramento County, serving approximately 1.5 million people (SMUD 2023). In 2022, SMUD's service area consumed approximately 10,662 gigawatt-hours of electricity (CEC 2024a). SMUD provides power from a variety of sources: nuclear, large hydroelectric, natural gas, and renewable energy resources such as wind, geothermal, biomass, solar, and small hydroelectric. Table 4.6-2 presents the electric generation power mix for the various SMUD plans based on its 2022 Power Content Label (CEC 2023b).

Table 4.6-2. SMUD 2022 Power Content Label

Energy Resources	SMUD General Mix	Greenergy Partner Plus	Greenergy CA/Local	SolarShares Commercial/ Neighborhood
Biomass & Biowaste	1.6%	0.0%	0.0%	0.0%
Geothermal	3.8%	0.0%	0.0%	0.0%
Eligible Hydroelectric	0.8%	0.0%	0.0%	0.0%
Solar	2.8%	52.6%	95.0%	100.0%
Wind	14.7%	32.4%	5.0%	0.0%
Large Hydroelectric	25.4%	15.0%	0.0%	0.0%
Natural Gas	45.6%	0.0%	0.0%	0.0%
Nuclear	1.6%	0.0%	0.0%	0.0%
Other	0.1%	0.0%	0.0%	0.0%
Unspecified Power	3.6%	0.0%	0.0%	0.0%

Source: CEC 2023b

Pioneer Community Energy

Pioneer Community Energy is a local not-for-profit provider of electricity. Pioneer Community Energy was formed in 2017, joining the other California Community Choice Aggregators (CCAs) in providing energy to more than 11 million customers across the state. Pioneer provides electricity to Auburn, Colfax, Lincoln, Rocklin, Loomis and most of unincorporated Placer County, as well as most of unincorporated El Dorado County and the

City of Placerville. Pioneer Community Energy provides power from a variety of sources: nuclear, large hydroelectric, and renewable energy resources such as wind, geothermal, biomass, solar, and small hydroelectric. Table 4.6-3 presents the electric generation power mix for the Pioneer Community Energy plans based on its 2022 Power Content Label (CEC 2023c).

Table 4.6-3. Pioneer Community Energy 2022 Power Content Label

Energy Resources	Base Plan	Green100
Biomass & Biowaste	0.6%	
Geothermal	6.1%	
Eligible Hydroelectric	2.7%	21.6%
Solar	11.5%	28.4%
Wind	23.3%	50.0%
Large Hydroelectric	1.3%	
Natural Gas	0.0%	
Nuclear	27.6%	
Unspecified Power	27.0%	

Source: CEC 2023c

ENERGY USE FOR TRANSPORTATION

As shown in Figure 4.6-1, transportation, inclusive of on-road and off-road (e.g., construction equipment, off-road trucks) vehicles, is the largest energy-consuming sector in California, accounting for approximately 41 percent of all energy use in the state. Californian's have more registered motor vehicles and travel more vehicle miles than residents in any other state (EIA 2023b). The types of transportation fuel used have become diversified in California and elsewhere. Historically, gasoline and diesel fuel accounted for nearly all demand; now, however, numerous options are available, including ethanol, natural gas, electricity, and hydrogen. Despite advancements in alternative fuels and clean-vehicle technologies, gasoline and diesel remain the primary fuels used for transportation in California, with 13.6 billion gallons of gasoline consumed and 3.6 billion gallons of diesel consumed in 2022 (CEC 2023d, 2023e).

4.6.2 REGULATORY SETTING

The federal, state, and local regulatory background of energy plans, policies, regulations, and laws is presented below. Generally, these plans, policies, regulations, and laws do not directly apply to the Project, but are presented to provide context to the regulatory framework.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Energy Policy and Conservation Act of 1975

The Energy Policy and Conservation Act of 1975 established the first fuel economy standards for on-road motor vehicles sold in the United States. The National Highway Traffic and Safety Administration is responsible for establishing standards for vehicles and revising the existing standards. The Corporate Average Fuel Economy program was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. Environmental Protection Agency (EPA) administers the testing program that generates the fuel economy data.

National Energy Act of 1978

The National Energy Act of 1978 includes the Public Utility Regulatory Policies Act (Public Law 95-617), Energy Tax Act (Public Law 95-318), National Energy Conservation Policy Act (Public Law 95-619), Power Plant and Industrial Fuel Use Act (Public Law 95-620), and Natural Gas Policy Act (Public Law 95-621).

The intent of the National Energy Act was to promote greater use of renewable energy, provide residential consumers with energy conservation audits to encourage slower growth of electricity demand, and promote fuel efficiency. The Public Utility Regulatory Policies Act created a market for nonutility electric power producers to permit independent power producers to connect to their lines and to pay for the electricity that was delivered.

The Energy Tax Act promoted fuel efficiency and renewable energy through taxes and tax credits. The National Energy Conservation Policy Act required utilities to provide residential consumers with energy conservation audits and other services to encourage slower growth of electricity demand.

Federal Power Act 16 U.S.C. §§ 797(e) and 808

The Federal Power Act (FPA) is the primary federal statute governing the wholesale transmission and sale of electric power, as well as the regulation of hydroelectric power (Congressional Research Service [CRS] 2020). The Act is divided into a few discrete Parts. Part I (16 U.S.C. §§ 791-823d), initially enacted in 1920 as the Federal Water Power Act, created the Federal Power Commission (FPC) and gave the new agency the authority to regulate the construction, operation, and maintenance of nonfederal hydroelectric power generation. Part II (16 U.S.C. §§ 824-824w) authorized the FPC to regulate the interstate transmission and wholesale sale of electricity. Congress transferred the authorities and responsibilities of the FPC under FPA Parts I and II from the FPC to the Federal Energy Regulatory Commission (FERC) pursuant to the Department of Energy Organization Act of 1977 (91 Stat. 565; 42 U.S.C. § 7101).

The FERC licenses and regulates the construction and operation of non-federal hydropower projects under the FPA. The District owns and operates the El Dorado Hydroelectric Project (Project No. 184) under a license with FERC.

Energy Policy Acts of 1992 and 2005

The Energy Policy Act of 1992 was enacted to reduce dependence on imported petroleum and improve air quality by addressing all aspects of energy supply and demand, including alternative fuels, renewable energy, and energy efficiency. This law requires certain federal, state, and local government and private fleets to purchase alternative fuel vehicles. The act also defines “alternative fuels” to include fuels such as ethanol, natural gas, propane, hydrogen, electricity, and biodiesel.

The Energy Policy Act of 2005 was enacted on August 8, 2005. This law set federal energy management requirements for energy-efficient product procurement, energy savings performance contracts, building performance standards, renewable energy requirements, and use of alternative fuels. The Energy Policy Act of 2005 also amends existing regulations, including fuel economy testing procedures.

Energy Independence and Security Act of 2007

Signed into law in December 2007, the Energy Independence and Security Act was enacted to increase the production of clean renewable fuels; increase the efficiency of products, buildings, and vehicles; improve the federal government's energy performance; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The Energy Independence and Security Act included the first increase in fuel economy standards for passenger cars since 1975. The act also included a new energy grant program for use by local governments in implementing energy-efficiency initiatives, as well as a variety of green building incentives and programs.

Executive Order 14057

On December 8, 2021, President Biden signed Executive Order 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability. The executive order affirms that it is the policy of the United States that the Federal Government leads by example to achieve a carbon pollution-free electricity sector by 2035 and net-zero emissions economy-wide by no later than 2050. Through a whole-of-government approach, the United States will demonstrate how innovation and environmental stewardship can protect our planet, safeguard Federal investments against the effects of climate change, respond to the needs of all of America's communities, and expand American technologies, industries, and jobs. The executive order set greenhouse gas (GHG) reduction targets and sustainability goals for federal agencies, including but not limited to 100 percent carbon-free electricity on a net annual basis by 2030, zero-emission vehicle acquisitions, and climate resilient infrastructure.

Renewable Fuel Standard Program

Created by the Energy Policy Act of 2005, which amended the Clean Air Act, the Renewable Fuel Standard Program established requirements to replace certain volumes of petroleum-based fuels with renewable fuels. The four renewable fuel types accepted as part of the Renewable Fuel Standard Program are biomass-based diesel, cellulosic biofuel, advanced biofuel, and total renewable fuel. The 2007 Energy Independence and Security Act expanded the program and its requirements to include long-term goals of using 36 billion gallons of renewable fuels and extending annual renewable-fuel volume requirements to year 2022. "Obligated parties" such as refiners and importers of gasoline or diesel fuel must meet specific blending requirements for the four renewable fuel types. EPA implements the program in consultation with U.S. Departments of Agriculture and Energy. The obligated parties are required to demonstrate their compliance with the Renewable Fuel Standard Program.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Senate Bills 1078 and 107, Executive Orders S-14-08 and S-21-09, and Senate Bills 350 and 100

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Executive Order S-14-08 expanded the state's Renewables Portfolio Standard to 33 percent renewable power by 2020. Executive Order S-21-09 directs the California Air Resources Board, under its AB 32 authority, to enact regulations to help the state meet its Renewables Portfolio Standard goal of 33 percent renewable energy by 2020.

The 33 percent-by-2020 goal and requirements were codified in April 2011 with SB X1-2. This new Renewables Portfolio Standard applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Consequently, PG&E, which would be the electricity provider for the proposed project, must meet the 33 percent goal by 2020. SB 350 (2015) increased the renewable-source requirement to 50 percent by 2030. This was followed by SB 100 in 2018, which further increased the Renewables Portfolio Standard to 60 percent by 2030 and added the requirement that all state's electricity come from carbon-free resources by 2045.

Senate Bill 606 and Assembly Bill 1668

On May 31, 2018, Governor Brown signed SB 606 and Assembly Bill (AB) 1668 which build on the ongoing efforts to "make water conservation a California way of life." SB 606 and AB 1668 emphasize efficiency and stretching existing water supplies in cities and on farms. These bills emphasize that efficient water use is the most cost-effective way to achieve long term conservation goals, as well provide the water supply reliability needed to adapt to the longer and more intense droughts climate change is causing in California. Specifically, the bills call for creation of new urban efficiency standards for indoor use, outdoor use, and water lost to leaks, as well as any appropriate variances for unique local conditions. Each urban retail water agency will annually, beginning November 2023, calculate its own objective, based on the water needed in its service area for efficient indoor residential water use, outdoor residential water use, commercial, industrial and institutional (CII) irrigation with dedicated meters, and reasonable amounts of system water loss, along with consideration of other unique local uses (i.e., variances) and "bonus incentive," or credit, for potable water reuse, using the standards adopted by the State Water Resources Control Board (SWRCB 2018).

Regional and Local Plans, Policies, Regulations, and Ordinances

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> "Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code."

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply with the plans and policies of the County and uses these plans and policies as a metric for formulating an impact analysis. While there are no regional and local plans, policies, regulations, or ordinances directly related to energy that are applicable to the Project, some ordinances would reduce energy consumption indirectly (e.g., sustainability practices). As such, El Dorado County's ordinances related to energy are presented below.

El Dorado County Construction and Demolition Debris Recycling

On February 23, 2016, the County of El Dorado Board of Supervisors adopted a new Construction and Demolition Debris Recycling Ordinance (Chapter 8.43), which mandates that at least 50 percent of construction & demolition debris generated from permitted projects be diverted from being landfilled.

4.6.3 IMPACT ANALYSIS

METHODOLOGY

The evaluation of potential impacts on energy was based on application of quantitative modeling results and qualitative assessments...

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3, Project Description, of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the

programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- The existing infrastructure phase of the Project includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

The following constraints are also included with Project operations.

- Up to 15,000 AF of Permit 21112 water and up to 15,080 AF of pre-1914 rights water is available for diversion at the El Dorado Diversion Dam for consumptive use.

- Permit 21112 water may be delivered to Forebay Reservoir for delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

- The season of diversion for the proposed Project would be within the season of diversion currently specified in Permit 21112 (i.e., November 1 to July 31). The El Dorado Canal is typically offline for maintenance and does not convey water from October through mid-December. This maintenance outage is assumed to continue into the future and therefore the operational season of diversion at the El Dorado Diversion Dam with the proposed Project is anticipated to be from mid-December to July 31.

Baseline and Project Scenarios

The District is electing to use both a current and future baseline as the basis for evaluating potential impacts of the Project for water-dependent resource categories including hydropower generation. The use of a future baseline is necessary to identify which impacts are associated with the Project as compared to which impacts are associated with future increases in water demands that would otherwise occur absent the Project.

The characteristics of each baseline include:

- **Current baseline (without the Project):** Current water demands are based on 5-year average (2017 – 2021) water use for all District customers (34,512 AF). Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for diversion at the El Dorado Diversion Dam for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP.

- **Future baseline (without the Project):** Forecasted future demands based on water use projections from the District's 2020 Urban Water Management Plan (UWMP; Table 4-11; EID 2021) for the year 2045 for all District sources (43,320 AF). This forecasted increase in water demands would occur with or without the proposed Project. Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for diversion at the El Dorado Diversion Dam for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP.

Due to the differing water demands between the current baseline and future baseline scenarios, the modeling output and likewise potential impacts associated with each may differ. This results in four different Project scenarios:

- Project with existing infrastructure and current water demands compared to the current baseline
- Project with post-construction operations and current water demands compared to the current baseline
- Future Project with existing infrastructure and future water demands compared to the future baseline
- Future Project with post-construction operations and future water demands compared to future baseline

ResSim Hydrological Modeling

The Hydrologic Engineering Center Reservoir System Simulation (HEC-ResSim; or ResSim) software, developed by the USACE's Institute for Water Resources, was used to model operations of the South Fork American River system with and without the proposed Project. The assumptions and operational rules included in the ResSim model for the proposed Project are described in detail in Appendix B2 to this EIR. The ResSim model was used to forecast Project operations, for the analysis in this EIR, by evaluating system conditions observed over a 46-year study period (water years 1975 to 2021).

The evaluation of potential impacts on energy was based, in part, on application of these quantitative modeling results. Hydropower generation at both District facilities (*i.e.,* El Dorado Powerhouse) and SMUD facilities (*i.e.,* Camino Powerhouse, Jaybird Powerhouse, Jones Fork Powerhouse, Loon Lake Powerhouse, Robbs Peak Powerhouse, Union Valley Powerhouse, White Rock Powerhouse, and Chili Bar Powerhouse) were estimated for baseline and Project conditions using the ResSim model as described in Appendix B1, Quantitative Assessment Modeling, and Appendix B2, HEC-ResSim Modeling Technical Report. ResSim provides output units of power in megawatt hours (MWh) for the hydropower facilities. Hydropower generation for Slab Creek Powerhouse was

not included in the Res Sim output because flow and power generation were the same for baseline and Project conditions. Change in hydropower generation between baseline and Project conditions were estimated by month and water year type for each location. In addition, change in average annual hydropower generation between baseline and Project conditions were also estimated using ResSim. Results from individual facilities were aggregated to evaluate changes to hydropower generation at District and SMUD facilities as a whole.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project would have a potentially significant impact related to energy if it would:

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

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.6-1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations and maintenance activities, such as periodic inspections and repairs, associated with the Project utilizing existing infrastructure is anticipated to remain similar to existing conditions. Therefore, energy consumption associated with the Project utilizing existing infrastructure is anticipated to remain similar to existing conditions.

As described in Section 3.6.3, operation of facilities utilizing existing infrastructure also includes water treatment facilities at Reservoir 1 WTP and Reservoir A WTP. As described in Section 3.6.4, the Reservoir 1 and Reservoir A WTPs have sufficient physical capacity to treat the consumptive water made available under the Project. In addition, the proposed Project would not, itself, result in an increase in water demand and therefore would not result in changes to energy consumption required for water treatment at the WTPs.

Adding an additional authorized upstream point of diversion would enable the District to divert water higher in the system and deliver Permit 21112 water to customers at lower elevations via gravity flow (i.e., no increased pumping). This would allow the District to meet demands throughout the District's service area without excessive use of energy. Therefore, Project operations with existing infrastructure would not result in an inefficient, unnecessary, or wasteful consumption of energy resources. There would be **no impact**.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal

between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings.

Future construction related to the Project would consume energy in the form of diesel and gasoline fuels to power construction-related equipment and on-road vehicles for the required infrastructure improvements. However, the increase would be limited because the work would be temporary and would not require a substantial long-term use of energy. The specific infrastructure requirements and related project-level details, such as size and scale of the infrastructure to be constructed, construction schedule, equipment fleet, construction worker crew estimates, and demolition and grading quantities are not yet known. Thus, energy consumption from the required infrastructure improvements cannot be quantified at this time. Furthermore, the District is not subject to local regulations to control construction-related energy impacts. Therefore, this impact would be **potentially significant**.

Mitigation Measures

Mitigation Measure 4.6-1: Implement Energy-Efficent Construction Practices.

During construction of any Project elements associated with infrastructure improvements for the Project, the District or its contractor(s) shall require and implement the following energy-efficient construction practices during construction:

- Improve fuel efficiency from construction equipment and vehicles:
    - Minimize idling time either by shutting equipment and vehicles off when not in use or reducing the time of idling to no more than 5 minutes (as required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.
    - Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
    - Train equipment operators in proper use of equipment.
    - Use the proper size of equipment for the job.
    - Use equipment with new technologies (repowered engines, electric drive trains) as feasible and applicable for the equipment types required by the construction activities.
- Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines) as feasible and applicable for the equipment types required by the construction activities.
- Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power as feasible and applicable based on the location of the construction activities.

Mitigation Measure 4.6-2: Comply with all Regulations Related to Energy Use during Construction

The District and any Contractors shall comply with all federal, state, and local plans, policies, ordinances rules, and regulations related to energy use during construction. For example, as required and applicable, any construction and demolition waste, including vegetation and soils from land clearing, would be appropriately reused, recycled, or diverted from disposal, as required by the El Dorado County Construction and Demolition Debris Recycling Ordinance (Title 8, Chapter 8.43). The regulations and codes related to energy use include those monitored by the state and/or local jurisdictions including the El Dorado County Environmental Management Department.

Significance after Mitigation

Implementation of Mitigation Measures 4.6-1 and 4.6-2 would ensure that Project construction activities implement energy-efficient practices during construction, such as maintaining and properly tuning all construction equipment in accordance with the manufacturer's specifications and minimizing the idling time of construction equipment and vehicles, and compliance with energy related regulations. These required practices would limit wasteful and unnecessary energy consumption and ensure compliance with regulations. Therefore, short-term energy consumption during Project construction activities would not be inefficient, unnecessary or wasteful and this impact would be **less than significant with mitigation.**

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs. Operational and maintenance activities, such as equipment use or vehicle trips for maintenance work, associated with post-construction operational conditions is anticipated to remain similar to existing conditions. Therefore, operational and maintenance related energy consumption associated with the improvements is anticipated to remain similar to existing conditions.

As described previously, the WTPs have sufficient physical capacity to treat the consumptive water made available under the Project. In addition, the proposed Project would not, itself, result in an increase in water demand and therefore would not result in changes to energy consumption required for water treatment at the WTPs. Furthermore, as described in Section 3.4, long-term water supply planning forecasts (including the District's 2024 Water and Recycled Water Master Plan and the El Dorado County Water Agency 2014 West Slope Update to the Water Resources Development & Management Plan) indicate that a portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills and at a higher elevation than is currently being served (Figure 3-2). Delivering water to these higher elevation areas of the District's service area would require extensive energy-intensive pumping of raw water from Folsom Reservoir and treated water from the El Dorado Hills WTP. As a more efficient alternative, the Project would allow Permit 21112 water to be diverted at the District's existing El Dorado Diversion Dam near Kyburz and then delivered to customers at lower elevations via gravity flow (i.e., no increased pumping) to meet demands throughout the District's service area without excessive use of energy.

Furthermore, as detailed in Section 3.5, long-term water supply planning documents show that the District will have increased water demand throughout its service area. The District seeks to meet future water demands efficiently and reliably by using the most economical option for water conveyance and delivery that is primarily

gravity-fed and with a diversion point that is close to its place of use. Therefore, the Project (post-construction) would not result in an inefficient, unnecessary, or wasteful consumption of energy resources. This impact would be **less than significant**.

Impact 4.6-2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

As discussed in Section 4.6.1, the District and SMUD currently operate several powerhouses along the South Fork American River that generate hydroelectricity. As described in more detail in Section 4.8.2, California has prepared a series of Scoping Plans that establish the framework of action for California to reduce energy consumption, increase energy-efficiency, and support decarbonization of the electricity sector, with the overall goal of decreasing statewide emissions per AB 32, SB 32, and AB 1279. As acknowledged in the 2022 Scoping Plan, much of the State's success to date in reducing GHG emissions is due to decarbonization of the electricity sector through implementation of the RPS and SB 100. One of the pillars identified in the 2022 Scoping Plan is continued decarbonization of the electricity sector, which calls for using energy more efficiently and replacing fossil-fueled energy generation with renewable and zero-carbon power resources, including solar, wind, energy storage, geothermal, biomass, and hydroelectric power. Therefore, the CARB Scoping Plans and Senate Bills 350 and 100 (discussed in Section 4.6.2), are the applicable state plans for renewable energy and energy efficiency.

To implement the Project, the District would reduce the amount of water diverted for hydropower generation by the amount designated for consumptive use under a modified Permit 21112. These modifications would reduce the amount of water available for powerhouses on the South Fork American River to generate electricity, resulting in an overall reduction in electricity generation by these facilities. While changes in operations would not directly increase energy consumption, the operational changes could induce compensating changes elsewhere in the interconnected energy grid. The compensating changes could cause an indirect increase in energy consumption sourced by non-renewable resources.

It is important to note that the actual pattern of diversion under the proposed Project would vary depending on a variety of system conditions (e.g., infrastructure conveyance capacity, hydrologic availability, regulatory requirements such as water right conditions and FERC license conditions, demands at Reservoir 1 WTP and Reservoir A WTP, and available storage and forecasted carry-over storage in Jenkinson Lake). Because these variables change from year to year and/or month to month, the diversion pattern with the Project will also vary subject to these variables. As shown in Table 4.6-4 below, the largest reduction in hydroelectric generation potential can be seen under the modeled conditions for the critically dry hydrologic condition. However, under other hydrologic conditions the Project's diversion could result in an overall increase in hydroelectric generation at the El Dorado Powerhouse (operated by the District). Therefore, since hydroelectric generation is largely dependent on temporal factors, this analysis considered the frequency of the various hydrologic conditions in order to evaluate the energy impact from the potential change in hydroelectric generation. From the 47 years of modeling data, approximately 14 of those years (or 30 percent) were classified as critically dry years, 6 years (13 percent) were classified as dry years; 9 years (19 percent) were classified as below normal years; 3 years (6 percent) were classified as above normal years; and 15 years (32 percent) were classified as wet years. For additional details, refer to Appendix B2, HEC-ResSim Modeling Technical Report, and Section 3.6.6, Project Hydrologic Modeling. Therefore, for the purposes of this analysis, average annual precipitation conditions, as provided by the ResSim model, were used to evaluate the typical annual changes to hydroelectric generation by utility under the two operational Project phases

Table 4.6-4. Changes in Hydroelectric Generation by Hydrologic Condition (MWh/year)

Phase	Baseline Conditions	Average Annual		Wet		Above Normal		Below Normal		Dry		Critically Dry	
		EID	SMUD	EID	SMUD	EID	SMUD	EID	SMUD	EID	SMUD	EID	SMUD
Operational Impacts (Existing Infrastructure)	Current Baseline (2022)	-2,350	-1,324	-227	-190	-356	-221	625	-65	-1,462	-729	-7,344	-3,844
Operational Impacts (Existing Infrastructure)	Future Baseline (2045)	-6,700	-3,110	-1,191	-1,287	-2,311	-800	-1,084	-873	-7,277	-3,459	-16,907	-6,847
Operational Impacts (Post-Construction)	Current Baseline (2022)	871	-1,448	3,245	-287	3,487	-225	4,385	-147	1,761	-655	-4,872	-4,133
Operational Impacts (Post-Construction)	Future Baseline (2045)	-3,874	-3,275	1,643	-1,019	1,042	-895	2,577	-823	-4,462	-3,560	-14,734	-7,658

Source: Zanjero 2024

EID = El Dorado Irrigation District

MWh/year = megawatt-hours per year

SMUD = Sacramento Municipal Utility District

Notes:

Water year type based on unimpaired runoff in the American River below Folsom Lake published in the California Department of Water Resources (DWR) Bulletin 120 "Report of Water Conditions in California."

Operational Impacts (Existing Infrastructure)

Under the current baseline (2022 conditions), the District's El Dorado Powerhouse generates approximately 90,417 MWh per year; while SMUD generates approximately 1,842,502 MWh per year across its powerhouses (Camino, Jaybird, Jones Fork, Loon Lake, Robbs Peak, Union Valley, White Rock, and Chili Bar). Compared to the current baseline (2022 conditions), Project operations with existing infrastructure are anticipated to result in an annual hydroelectric generation reduction of 2,350 MWh (a 2.6 percent reduction) at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 1,324 MWh (a 0.07 percent reduction) across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD[1]. Additional details are available in Appendix B2, HEC-ResSim Modeling Technical Report. However, as a point of reference for context, the reduction in hydroelectric power generation resulting from implementation of the Project with existing infrastructure under the current baseline would represent 0.001 percent of the 2022 total system electric generation in California (287,220 Gigawatt hours) and 0.002 percent of the 2022 total system renewable electric generation in California (155,747 Gigawatt hours).

Under the future baseline (2045 conditions), the District's El Dorado Powerhouse would generate approximately 87,019 MWh per year; while SMUD would generate approximately 1,841,078 MWh per year across its powerhouses (Camino, Jaybird, Jones Fork, Loon Lake, Robbs Peak, Union Valley, White Rock, and Chili Bar). Compared to future baseline (2045 conditions), Project operations with existing infrastructure are anticipated to result in an annual hydroelectric generation reduction of 6,700 MWh (a 7.7 percent reduction) at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 3,110 MWh (a 0.2 percent reduction) across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD. Additional details are available in Appendix B2, HEC-ResSim Modeling Technical Report.

However, as a point of reference for context, the reduction in hydroelectric power generation resulting from implementation of the Project with existing infrastructure under the future baseline would represent 0.002 percent of the estimated future (2045) total system electric generation in California (505,507 Gigawatt hours).[2]

Although the Project with the existing infrastructure would slightly reduce the amount of hydroelectric energy generation, any additional electricity generation would be supplemented through existing or already-committed resources available in the region's electricity grid and as approved by the California Public Utilities Commission (CPUC). Since the utilities are already increasing their procurement of energy from renewable energy sources in order to meet RPS requirements, and utilities' energy sources would increasingly be sourced from renewable sources, the slight reduction in hydroelectric production resulting from the proposed Project with existing infrastructure would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements.

As detailed in Section 3, Project Description, the Project would increase the District's operational flexibility and reliability of the water delivery system in the event of constraints, supply reductions, or emergencies. This would not conflict with the overarching goals of SB 606 and AB 1668, which note that water supply reliability is needed to adapt to the longer and more intense droughts. Furthermore, as noted above, Project operations with existing

[1] The remaining powerhouses would not see a reduction in hydroelectricity generation.

[2] The estimated future (2045) total system electric generation in California is a simplified calculation based on the California Air Resources Board's 2022 Scoping Plan that electricity demand would increase by 76 percent by 2045 compared to the 2022 electricity demand due to increased population and electrification of other sectors. Per SB 100, the state's electricity will come from carbon-free resources by 2045; thus, the estimated future (2045) total system electric generation is assumed to be from renewables.

infrastructure would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements and therefore would not conflict with or obstruct the 2022 Scoping Plan, SB 350 or SB 100. Therefore, the proposed Project would not conflict with a state or local plan for renewable energy or energy efficiency. This impact would be **less than significant**.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project activities are not known at this time.

As discussed in Impact 4.6-1, construction activities would require both direct and indirect use of energy resources. With implementation of Mitigation Measure 4.6-1 and 4.6-2, construction activities would be required to implement energy-efficient construction practices, consistent with El Dorado County AQMD and statewide rules and regulations. Energy standards such as those in the Energy Policy Act of 2005 promote strategic planning intended to reduce the consumption of fossil fuels, increase the use of renewable resources, and enhance energy efficiency. In general, these regulations and policies specify strategies for reducing fuel consumption and increasing fuel efficiency and energy conservation. Implementation of Mitigation Measure 4.6-2 requires construction activities to conform to applicable state and local plans, policies, and regulations related to energy use. For example, as required and applicable, any construction and demolition waste, including vegetation and soils from land clearing, would be appropriately reused, recycled, or diverted from disposal, as required by the El Dorado County Construction and Demolition Debris Recycling Ordinance (Title 8, Chapter 8.43). Without these measures, potential conflicts could occur with applicable state or local plans established for renewable energy or energy efficiency and this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

Under the current baseline (2022 conditions), the District's El Dorado Powerhouse generates approximately 90,417 MWh per year; while SMUD generates approximately 1,842,502 MWh per year across its powerhouses (Camino, Jaybird, Jones Fork, Loon Lake, Robbs Peak, Union Valley, White Rock, and Chili Bar). Under the current baseline (2022 conditions), Project operations with proposed modifications are anticipated to result in an increase in annual hydroelectric generation of 871 MWh (a 1 percent increase) at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 1,448 MWh (a 0.08 percent reduction) across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD. Additional details are available in Appendix B2, HEC-ResSim Modeling Technical Report. However, as a point of reference for context, the reduction in hydroelectric power generation resulting from implementation of the Project post-construction would represent 0.0002 percent of the 2022 total system electric generation in California

(287,220 Gigawatt hours) and less than 0.0004 percent of the 2022 total system renewable electric generation in California (155,747 Gigawatt hours).

Under the future baseline (2045 conditions), the District's El Dorado Powerhouse would generate approximately 87,019 MWh per year; while SMUD would generate approximately 1,841,078 MWh per year across its powerhouses (Camino, Jaybird, Jones Fork, Loon Lake, Robbs Peak, Union Valley, White Rock, and Chili Bar). Under the future baseline (2045 conditions), Project operations with proposed modifications are anticipated to result in an annual hydroelectric generation reduction of 3,874 MWh (a 4.5 percent reduction) at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 3,275 MWh (a 0.2 percent reduction) across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD. Additional details are available in Appendix B2, HEC-ResSim Modeling Technical Report.

However, as a point of reference for context, the reduction in hydroelectric power generation resulting from implementation of the Project post-construction under the future baseline would represent 0.001 percent of the estimated future (2045) total system electric generation in California (505,507 Gigawatt hours).[3]

Although the Project with the proposed modifications would slightly reduce the amount of hydroelectric energy generation, any additional electricity generation would be supplemented through existing or already-committed resources available in the region's electricity grid and as approved by the CPUC. Since the utilities are already increasing their procurement of energy from renewable energy sources in order to meet RPS requirements, and utilities' energy sources would increasingly be sourced from renewable sources, the slight reduction in hydroelectric production resulting from the proposed Project post-construction operations would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements. Therefore, Project operations with proposed modifications would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements and therefore would not conflict with or obstruct the 2022 Scoping Plan, SB 350 or SB 100.

As detailed in Section 3, Project Description, the Project would increase the District's operational flexibility and reliability of the water delivery system in the event of constraints, supply reductions, or emergencies. This would not conflict with the overarching goals of SB 606 and AB 1668 which note that water supply reliability is needed to adapt to the longer and more intense droughts. Furthermore, with these proposed modifications, water could be diverted from higher elevations under Permit 21112 and then delivered to customers at lower elevations via gravity flow (i.e., no increased pumping) to meet demands throughout the District's service area in an energy-efficient manner.

Therefore, the proposed Project post-construction operations would not conflict with a state or local plan for renewable energy or energy efficiency. This impact would be **less than significant**.

[3] The estimated future (2045) total system electric generation in California is a simplified calculation based on the California Air Resources Board's 2022 Scoping Plan that electricity demand would increase by 76 percent by 2045 compared to the 2022 electricity demand due to increased population and electrification of other sectors. Per SB 100, the state's electricity will come from carbon-free resources by 2045; thus, the estimated future (2045) total system electric generation is assumed to be from renewables.

Mitigation Measures

Mitigation Measure 4.6-1: Implement Energy-Efficent Construction Practices

Mitigation Measure 4.6-2: Comply with all Regulations Related to Energy Use during Construction

Significance after Mitigation

Implementation of Mitigation Measure 4.6-1 would ensure that Project construction activities implement energy-efficient practices during construction, such as maintaining and properly tuning all construction equipment in accordance with the manufacturer's specifications and minimizing the idling time of construction equipment and vehicles. These practices would limit wasteful and unnecessary energy consumption. In addition, implementation of Mitigation Measure 4.6-2 would require Project construction activities to be consistent with state or local plans for renewable energy and energy efficiency because it would require the District and all Contractors to comply with state and local regulations related to energy use during construction. Together, implementation of these mitigation measures would reduce potential conflicts with any applicable state or local plans established for renewable energy or energy efficiency to **less than significant with mitigation incorporated**.

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4.7 GEOLOGY AND SOILS/PALEONTOLOGICAL RESOURCES

This section provides an analysis of potential impacts on geology, soils, and paleontological resources associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.7.1 EXISTING CONDITIONS

REGIONAL GEOLOGY

The Project encompasses areas within and near the South Fork American River (South Fork) from the El Dorado Diversion Dam in Kyburz, California at approximately 3,910 feet AMSL to Folsom Reservoir at approximately 466 feet AMSL. The proposed project is located within the geomorphic province of the Sierra Nevada, which is a northwest trending mountain range that extends for 400 miles in length, and 40 to 100 miles in width. In a regional geomorphic context, the Sierra Nevada province is bounded by the Cascade Range to the north, by the Basin and Range Province on the east, the intersection of the Transverse Ranges and the Mohave Desert Provinces to the south, and the Great Valley Province to the west. Sierra Nevada bedrock consists of varied rock types and geological ages, from Paleozoic metamorphic to Holocene sedimentary and volcanic rock. Figure 4.7-1 shows a geologic map along the Project alignment (Wagner et al. 1981).

The geologic history of the Sierra Nevada can be divided into three broad phases. During the first phase in the Paleozoic Era (570-245 million years ago), sediments and volcanic ejecta (ash deposits similar to those laid down by the eruption of Mount Saint Helens) that were destined to become the metamorphic rocks of the Sierra Nevada, were deposited in an ancient ocean. In the second phase, during the Mesozoic Era (245-64 million years ago), molten rock intruded and metamorphosed the Paleozoic rocks far below the Earth's surface. When cooled, these became the granitic rocks of the Sierra Nevada Batholith. By the earliest part of the Cenozoic Era (65 million years ago to the present), tectonic forces led to uplift and tilting of the range, resulting in the stripping away of miles of the earth's crust through erosion, eventually exposing the granitic and metamorphic rocks we now see in the Sierra. Later during the Cenozoic, west-flowing rivers cut valleys into ancestral Sierra Nevada. The newly formed landscape was then filled by volcanic debris and lava ejected from volcanoes along and east of the crest of the range. Within the last 3 to 4 million years as uplift continued, rivers cut new canyons. Ice age glaciers during Pleistocene time (2 million to 11,000 years ago) put the finishing touches on the spectacular Sierra Nevada landscape of today (Spittler and Wagner 1988).

LOCAL GEOLOGY

As shown on Figure 4.7-1, the Project, including the construction area, is located in multiple geologic formations including Mehrten Formation, Valley Springs Formation, Unidfferentiated Paleozoic rocks, Mesozoic Granitic Rocks, and Gabbroic Rocks. Specific geologic conditions at the locations where the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would occur are not known at this time.

Hydrology in the area has significantly contributed to the geologic formations in the Sierra Nevada. The hydrologic and geologic study area encompasses areas within and near the South Fork from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. It includes the South Fork American River basin and segments of

adjacent river basins which contribute flow to, or receive flow from, the South Fork American River. The South Fork can be divided geologically into three distinct reaches, the Upper, Middle, and Lower.

- The Upper reach is the stretch between Chili Bar and the town of Coloma and contains the narrowest and steepest section of the Project area. Canyon sides rise almost from the river's edge to heights of 600 to 800 feet above the river, within a horizontal distance of only four to six tenths of a mile; average slopes are greater than 35 percent.

- The Middle reach is about 1 mile above Coloma, the canyon walls open up and the gradient subsides to between 10 and 15 percent. Alluvial terraces border the river throughout most of this reach.

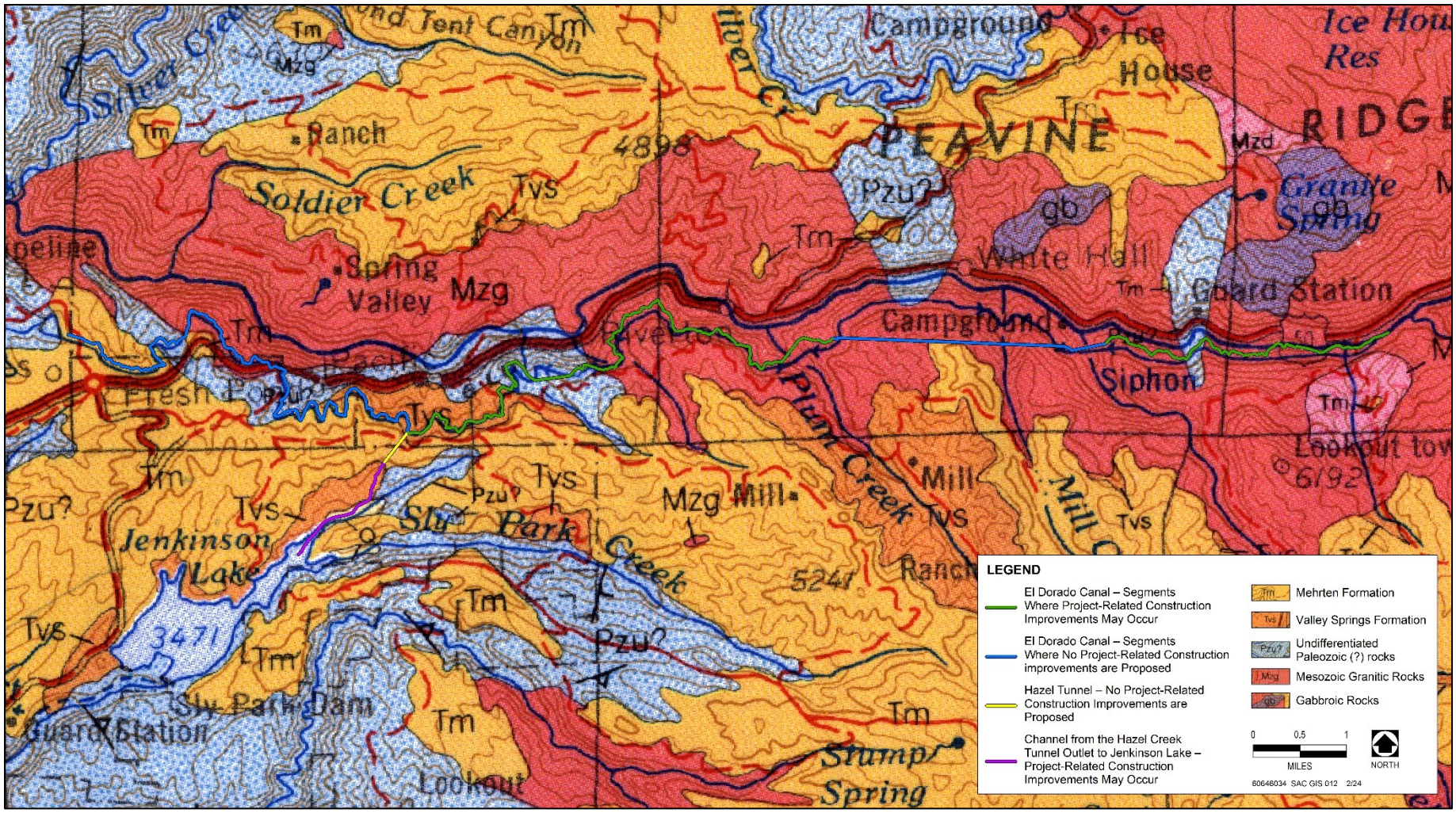
- Finally, the Lower reach is between Clark Mountain and Folsom Lake, the topography of the river corridor begins to resemble that of the first segment. It differs mainly in that the canyon is not as narrow and canyon sides are somewhat lower than the upper reach, rising some 400 to 600 feet above the river. Slopes average between 20 and 25 percent. The bedrock underlying this stretch is by far the hardest of the river, comprised mainly of chert, gabbro, and amphibolite.

The geology and topography combined with river flow contribute to the rapids that make this area an attractive whitewater resource area. For more information on recreation resources, please see Chapter 4.16 "Recreation" of this Draft EIR.

Fault Ground Rupture

Surface rupture is an actual cracking or breaking of the ground along a fault during an earthquake. Structures built over a fault can be damaged or destroyed if the ground ruptures. Surface ground rupture along faults is generally limited to a linear zone a few yards wide. The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) was created to prohibit the location of structures designed for human occupancy across the traces of active faults, thereby reducing the loss of life and property from an earthquake. The Project area is not considered seismically active. Active faults are those with evidence of displacement during the Holocene period (less than 10,000 years in age). El Dorado County lies between two seismically active regions in the western United States. Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles west of the County. Eastern El Dorado County borders the Basin and Range province that entails most of Nevada and western Utah. This area is riddled with active faults that are responsible for and form the boundary between each basin or valley and the neighboring mountain range.

The District's service area includes a portion of the Foothills Fault System, which consists of a series of northwest-trending faults of pre-Quaternary and Quaternary age (over 1.6 million years in age). The nearest fault zone listed under the Alquist-Priolo Act is the West Tahoe-Dollar Point Fault Zone located south of Lake Tahoe in El Dorado County, approximately 15 miles east of the Project site (U.S. Geological Survey 2022).



Source: Wagner et al. 1981

Figure 4.7-1 Geologic Map of the Region

Fault Seismic Ground Shaking

The Foothills Fault System is the dominant structural feature of the western Sierra Nevada. The steeply dipping to vertical component faults that make up this system trend northwest through an area approximately 200 miles long and 30 miles wide, from Mormon Bar (east of Merced) in the south to Lake Almanor in the north. The East and West Branches of the Bear Mountains Fault Zone are two of the largest fault zones in the Foothills Fault System. No seismic hazard zones have been delineated in the proposed Project area under the Seismic Hazard Mapping Act. Multiple Pre-quaternary faults bisect the Project alignment, however, these have been inactive for over 1.6 million years and are likely to remain inactive. The El Dorado County Local Hazard Mitigation Plan identifies El Dorado County as being moderately vulnerable to earthquakes (El Dorado County 2018).

The intensity of ground shaking depends on the distance from the earthquake epicenter to the site, the magnitude of the earthquake, site soil conditions, and the characteristics of the source. Specific geologic conditions at the locations where the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would occur are not known at this time. As part of design and engineering of these future improvements, geologic studies may be performed to determine the presence or extent of soil conditions.

Ground Failure

Ground failure refers to any consequence of ground shaking that affects the stability of the ground, such as earthquake triggered landslides and liquefaction. Landslides are defined by the movement of a mass of rock, debris, or earth down a slope. Landslides can be initiated on slopes that are already on the verge of movement. Strong earthquake ground shaking greatly increases the likelihood of landslides where the landscape is susceptible to these types of ground failure. If the ground is saturated with water, particularly following heavy rainfall, the shaking will result in more landslides than normal. Other factors that may increase the risk of landslide in the event of an earthquake include snowmelt, changes in water level, stream erosion, changes in ground water, or disturbance by human activities.

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. Factors determining the liquefaction potential are soil type, the level and duration of seismic ground motions, the type and consistency of soils, and the depth to groundwater. Loose sands and peat deposits, along with recent Holocene age deposits, are more susceptible to liquefaction, while older deposits of clayey silts, silty clays, and clays deposited in freshwater environments are generally stable under the influence of seismic ground shaking.

Soils

Based on the 2023 Natural Resources Conservation Service (NRCS) Soil Survey, there are 23 different soil series present surrounding the Project area, in the region known as the El Dorado National Forest Area (See Figure 4.7-2 below) (NRCS 2023).

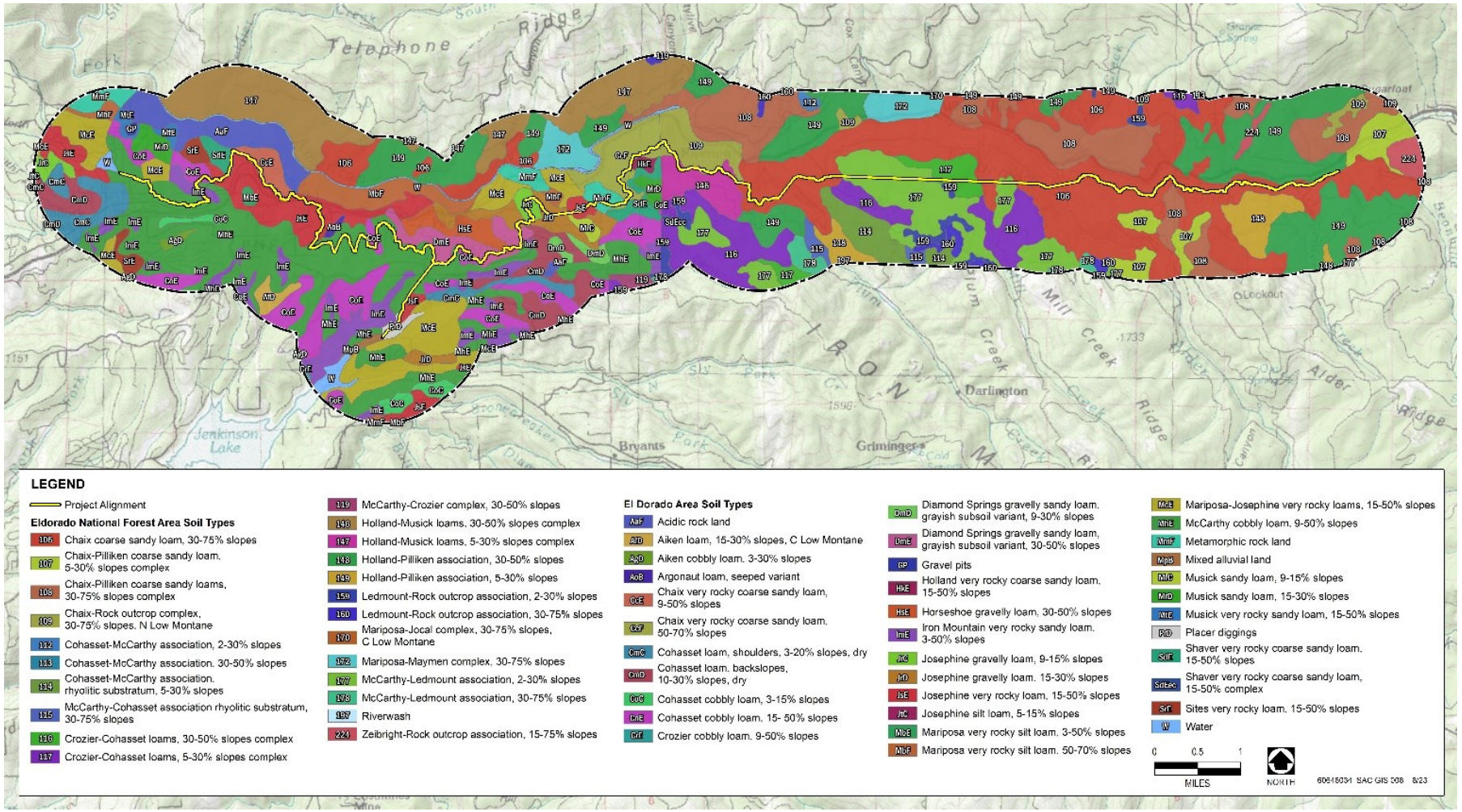


Figure 4.7-2 El Dorado National Forest Area Soil Types

Expansive Soils

Expansive soil are soils that undergo substantial volume changes (shrink or swell) in response to changes in moisture content (El Dorado County 2007). Linear extensibility is the method used by the NRCS to determine the shrink-swell potential of soils. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3 percent, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed in areas with expansive soils.

Table 4.7-1 shows all soils within the areas that may require construction of Project improvements. Most of these soils have a low shrink-swell potential, while some of them have moderate shrink-swell potential. To be considered expansive, soils must have a plasticity index of 15 or greater, have more than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), have more than 10 percent of the soil particles be less than 5 micrometers, and have an expansion index greater than 20.

Table 4.7-1 Soils along the Project Construction Alignment

Map Unit Name	Symbol	Hydric Rating	Linear Extensibility	Shrink-Swell Potential	Plasticity Index
El Dorado National Forest Area					
Chaix coarse sandy loam, 30-75% slopes	106	Nonhydric	1.5	Low	0.0
Chaix-Rock outcrop complex, 30-75% slopes, N Low Montane	109	Nonhydric	1.0	Low	7.0
Holland-Musick loams, 30-50% slopes complex	146	Nonhydric	3.5	Moderate	7.0
Holland-Pilliken association, 5-30% slopes	149	Nonhydric	2.8	Low	8.1
Ledmount-Rock outcrop association, 2-30% slopes	159	Nonhydric	1.5	Low	5.0
McCarthy-Ledmount association, 2-30% slopes	177	Nonhydric	1.5	Low	3.3
Chaix very rocky coarse sandy loam, 9-50% slopes	CcE	Nonhydric	1.5	Low	0.0
Chaix very rocky coarse sandy loam, 50-70% slopes	CcF	Nonhydric	1.5	Low	0.0
Cohasset cobbly loam, 15- 50% slopes	CoE	Nonhydric	3.6	Moderate	8.5
Diamond Springs gravelly sandy loam, grayish subsoil variant, 30-50% slopes	DmD	Nonhydric	1.5	Low	5.7
Holland very rocky coarse sandy loam, 15-50% slopes	HkE	Nonhydric	2.7	Low	7.5
Horseshoe gravelly loam, 30-50% slopes	HsE	Nonhydric	3.0	Moderate	15.4
Iron Mountain very rocky sandy loam, 3-50% slopes	ImE	Nonhydric	1.5	Low	5.0
Josephine gravelly loam, 9-15% slopes	JrC	Nonhydric	3.6	Moderate	12.2
Josephine gravelly loam, 15-30% slopes	JrD	Nonhydric	3.6	Moderate	12.2
Josephine very rocky loam, 15-50% slopes	JsE	Nonhydric	3.6	Moderate	12.2
Mariposa-Josephine very rocky loams, 15-50% slopes	McE	Nonhydric	1.9	Low	9.2
McCarthy cobbly loam, 9-50% slopes	MhE	Nonhydric	1.5	Low	2.5
Metamorphic rock land	MmF	Nonhydric	n/a	Moderate	n/a
Mixed alluvial land	MpB	Nonhydric	1.5	Low	7.5
Placer diggings	PrD	Predominantly Nonhydric	1.5	Low	0.0
Shaver very rocky coarse sandy loam, 15-50%	SdE	Nonhydric	1.5	Low	2.0

Paleontological Resources

The Society of Vertebrate Paleontology (SVP) has guidance for assessing and mitigating paleontological resources that could potentially be impacted from land development. This guidance is included in SVP's Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. As part of the assessment process for paleontological resources, the SVP guidance groups rock units into a high, undetermined, low, or no potential category for containing significant paleontological resources. These categories then determine the level of mitigation required, or further assessment prior to construction, for adequate protection or salvage of paleontological resources (SVP 2010).

The California Geological Survey was reviewed to determine the potential for paleontological resources within the Project area. As shown in Figure 4.7-1, the Project construction alignment contains Mehrten Formation, Valley Springs Formation, Unidfferentiated Paleozoic rocks, Mesozoic Granitic Rocks, and Gabbroic Rocks. All of the rock formations within the Project alignment have the potential to contain paleontological resources

4.7.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

Clean Water Act

The Clean Water Act (CWA, 33 USC 1344) primarily regulates waters of the United States. Further description of the Clean Water Act including its application to biological and hydrological resources is described in Sections 4.4 and 4.10 (Biological Resources and Hydrology and Water Quality). However, the CWA focuses on sediment control in two aspects. First, the United States Army Corps of Engineers (USACE) administers Section 404, which regulates the discharge of fill into waters of the United States. Secondly, the CWA applies to stormwater discharges, where erosion control is an integral part of achieving permit compliance (CWA, 33 USC 1344).

Earthquake Hazards Reduction Act

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program. To accomplish this goal, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was substantially amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives.

The mission of the NEHRP includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through postearthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency as the lead agency of the program and assigns several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and the U.S. Geological Survey.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (Public Resources Code Sections 2621–2630) 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. 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 project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazard Mapping Act

The Seismic Hazard Mapping Act governs the responsibilities of city, county, and state agencies in identifying and mapping seismic hazard zones and mitigating seismic hazards to protect public health and safety in accordance with the provisions of the California Public Resources Code, Division 2. Geology, Mines and Mining, Seismic Hazards Mapping – Chapter 7.8. The intent of this publication is to delineate zones where earthquakes could cause hazardous ground shaking and ground failure, including liquefaction and landslides. Currently, zones near the San Andreas Fault in the urban centers of the Greater San Francisco Bay Area and Los Angeles have been delineated. Local cities and counties within these zones regulate building construction in order to minimize loss associated with these seismic hazards.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) has jurisdiction under National Pollutant Discharge Elimination System (NPDES) Statewide General Construction Stormwater Discharge Permit (General Permit) (Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ), for construction projects that disturb greater than one acre or have the potential to impair water quality. The permit is required regardless of the time of year construction occurs and requires: a Notice of Intent to be submitted; a Stormwater Pollution Prevention Plan (SWPPP) to be developed and implemented; and monitoring to be conducted. The SWPPP must contain best management practices (BMP), other measures to prevent pollution, and a construction timeline. The SWPPP shall demonstrate compliance with erosion and sediment control standards and identify responsible parties. Furthermore, a BMP maintenance program is required by the SWPPP, which should include proper installation and regularly scheduled inspections to ensure the effectiveness of specific BMPs. The Project's construction activities would require development of a SWPPP and inspection schedule under this permit (SWRCB 2023).

California Building Standards Code, California Code of Regulations Title 24

The California Building Standards Commission is responsible for coordinating, managing, adopting, and approving building codes in California. The State of California provides minimum standards for building design through the California Building Standards Code (CBC) (California Code of Regulations Title 24). Where no other building codes apply, Chapter 29 of the CBC also regulates excavation, foundations, and retaining walls. The CBC applies to building design and construction in the state and is based on the Federal Uniform Building Code

used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with numerous more detailed or more stringent regulations.

The state earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. The CBC requires an evaluation of seismic design that falls into Categories A–F (where F requires the most earthquake-resistant design) for structures designed for a project site. The CBC philosophy focuses on "collapse prevention," meaning that structures are designed for prevention of collapse for the maximum level of ground shaking that could reasonably be expected to occur at a site. Chapter 16 of the CBC specifies exactly how each seismic design category is to be determined on a site-specific basis through the site-specific soil characteristics and proximity to potential seismic hazards.

Appendix Chapter J of the CBC regulates grading activities, including drainage and erosion control and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

California Code of Regulations, Title 14, Section 15064.5

CEQA includes in its definition of historical resources "any object [or] site …that has yielded or may be likely to yield information important in prehistory" (14 CCR 15064.5[3]), which is typically interpreted as including fossil materials and other paleontological resources. More specifically, destruction of a "unique paleontological resource or site or unique geologic feature" constitutes a significant impact per CEQA Guidelines Appendix G. Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources relative to a project; assessment of potential impacts on significant or unique resources; and development of mitigation measures for potentially significant impacts, which may include monitoring combined with data recovery excavation and/or avoidance.

Regional and Local Plans, Policies, Regulations, and Ordinances

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.*

As a special district with equal authority, the District is exempt from following the goals and policies described in the County's General Plan and Zoning Ordinance (El Dorado County 2019). However, the District aims to comply with the goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to geology and soils include the following:

- **Objective 7.12: Erosion/Sedimentation** - Minimize soil erosion and sedimentation.

- **Policy 7.1.2.1:** Development or disturbance of slopes over 30 percent shall be restricted. Standards for implementation of this policy, including but not limited to exceptions for access, reasonable use of the parcel, and agricultural uses shall be incorporated into the Zoning Ordinance.

- **Policy 7.1.2.2:** Discretionary and ministerial projects that require earthwork and grading, including cut and fill for roads, shall be required to minimize erosion and sedimentation, conform to natural contours, maintain natural drainage patterns, minimize impervious surfaces, and maximize the retention of natural vegetation. Specific standards for minimizing erosion and sedimentation shall be incorporated into the Zoning Ordinance.

- **Policy 7.1.2.3:** Enforce Grading Ordinance provisions for erosion control on all development projects and adopt provisions for ongoing, applicant-funded monitoring of project grading.

- **Objective 7.3.1: Water Resources Protection**- Preserve and protect the supply and quality of the County's water resources including the protection of critical watersheds, riparian zones, and aquifers.

    - **Policy 7.3.1.1: Encourage the use of Best Management Practices, as identified by the Soil Conservation Service, in watershed lands as a means to prevent erosion, siltation, and flooding.**

- **Objective 7.3.2: Water Quality**- Maintenance of and, where possible, improvement of the quality of underground and surface water.

    - **Policy 7.3.2.1: Stream and lake embankments shall be protected from erosion, and streams and lakes shall be protected from excessive turbidity.**

Grading, Erosion, and Sediment Control Ordinance

The Grading, Erosion, and Sediment Control Ordinance contained in the El Dorado County Code of Ordinances Chapter 15.14 regulates grading activity in the unincorporated area of El Dorado County to safeguard life, limb, health, property and public welfare; to avoid pollution of watercourses; and to ensure that the intended use of a graded site is consistent with the following: the El Dorado County General Plan; any Specific Plans adopted thereto; the adopted Stormwater Management Plan; California Fire Safe Standards; any applicable El Dorado County ordinances, including the Zoning Ordinance; and the California Building Code. The ordinance determines the administrative procedures for issuing permits and the approval of plans and inspections of grading construction in accordance with the El Dorado Grading, Erosion and Sediment Control Chapter of the Design and Improvement Standards Manual adopted by the El Dorado County Board of Supervisors (El Dorado County 2010).

4.7.3 Impact Analysis

Methodology

The evaluation of potential impacts on geology, soils, and paleontological resources were primarily based on the review of data from the California Department of Conservation (DOC) California Earthquake Hazards Zone Application (2021) and soil survey data from the U.S. Natural Resources Conservation Service (NRCS) (2023). The information obtained from these sources was summarized to present the existing conditions and reviewed to identify potential environmental impacts, based on the thresholds of significance presented in this section.

Impacts associated with geology, soils, seismicity, and paleontological resources that could result from Project construction and operational activities were evaluated qualitatively based on known site conditions and expected construction practices.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various other water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant [WTP] and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek and then to Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would

result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure) pre-construction, construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project would result in a significant impact on geology, soils, or paleontological resources if the Project would:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death, involving rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map or based on other substantial evidence of a known fault, strong seismic ground shaking, liquefaction, or seismically-induced 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 Table 18-1-B of the Uniform Building Code (1994), 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; or

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.7-1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death, involving rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map or based on other substantial evidence of a known fault, strong seismic ground shaking, liquefaction, or seismically-induced landslides?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

No seismic hazard zones have been delineated in the proposed Project area under the Seismic Hazard Mapping Act. The Project area is not considered seismically active. The nearest Alquist-Priolo fault zone is 15 miles east (U.S. Geological Survey 2022). As no seismic hazards or active faults have been identified in the vicinity of the Project alignment, operations with existing infrastructure would not cause potential substantial adverse effects, including the risk of loss, injury, or death, related to such hazards. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts

than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

As discussed above, the Project area is not considered seismically active. The nearest Alquist-Priolo fault zone is 15 miles east. Therefore, construction of improvements would not directly or indirectly cause potential substantial adverse effects related to seismicity, including the risk of loss, injury, or death, related to such hazards. Therefore, **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

As discussed above, the Project area is not considered seismically active. As no seismic hazards or active faults have been identified in the vicinity of the Project alignment, post-construction operations would not cause potential substantial adverse effects, including the risk of loss, injury, or death, related to such hazards. Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.7-2. Result in substantial soil erosion or the loss of topsoil?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not change flows in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. There would be reductions in flow in the South Fork below the El Dorado Powerhouse because water that is currently used for hydropower purposes and returned to the South Fork would instead be used for consumptive uses and not returned to the South Fork. Operations with existing infrastructure does not require ground disturbance. Therefore, there would only be minor hydrologic changes associated with operations with existing infrastructure and these changes would not result in substantial soil erosion or the loss of topsoil, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of

temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

The anticipated construction activities described above would require ground disturbance (e.g., excavation, backfill, grading, rock scaling and/or slope stabilization). These activities could cause soil erosion or loss of topsoil due to disturbance from use of construction vehicles and equipment for grading, trenching, and tree removal. Therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post construction operations would allow diversions at the El Dorado Diversion Dam to increase from 145 cfs (current capacity of the El Dorado Canal) to 156 cfs (authorized capacity of the El Dorado Canal), which would result in up to 11 cfs decrease in flow in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. There would also be reductions in flow in the South Fork below the El Dorado Powerhouse because water that is currently used for hydropower purposes and returned to the South Fork would instead be used for consumptive uses and not returned to the South Fork. Post-construction operations do not require any ground disturbing activities. Therefore, there would only be minor hydrologic changes associated with post-construction operations and these changes would not result in substantial soil erosion or the loss of topsoil. Thus, there would be **no impact**.

Mitigation Measures

Mitigation Measure 4.7-1: Stormwater Management During Construction

The District shall develop and implement a Water Pollution Control Plan (WPCP) or Stormwater Pollution Prevention Plan (SWPPP) during construction. A site-specific WPCP will be required if

disturbed areas are less than one acre. Compliance with the Construction General Permit, including the development and implementation of a SWPPP, will be required if disturbed areas are one or more acres. The construction site BMPs listed below will be included in the WPCP or SWPPP, as applicable.

- Spill prevention and control
- Stabilized construction entrance/exit
- Material delivery and storage
- Solid waste management
- Stockpile management
- Storm drain inlet protection
- Street sweeping and vacuuming
- Vehicle and equipment maintenance, cleaning, and fueling
- Concrete waste management
- Silt fencing, fiber rolls, or gravel bags
- Hydroseeding

The District shall ensure the SWPPP is prepared by a certified Qualified SWPPP Developer (QSD) and implemented consistent with all applicable requirements. The plan will then be implemented at the construction site by the construction contractor and monitored by a Qualified SWPPP Practitioner (QSP).

Significance After Mitigation

Mitigation Measure 4.10-1 requires the implementation of approved BMPs and the preparation and implementation of a WPCP or SWPPP. As such, erosion by runoff from active construction areas would be minimized and substantially avoided. Impacts related to erosion and loss of topsoil from active construction areas would be less than significant with mitigation incorporated.

Impact 4.7-3. 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?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

As this phase would not involve ground disturbance activities, operations with existing infrastructure would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse associated with geologic unit or soil that is unstable. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal

and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

The anticipated construction activities described above would require ground disturbance (e.g., excavation, backfill, grading, rock scaling and/or slope stabilization). The specific geologic conditions at the locations where the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would occur are not known at this time. If construction activities were to occur on unstable geologic units or soils, the ground disturbance activities could cause on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. Because the presence of unstable geologic units or soils within areas of proposed construction are unknown, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

As this phase would not involve ground disturbance activities, post-construction operations would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse associated with geologic unit or soil that is unstable. Therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.7-2: Perform Geotechnical Studies and Implement Design Recommendations

During design and engineering of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, the District shall conduct

geotechnical studies of the proposed construction footprint. These studies shall be conducted by certified professional engineers and/or geologists and be focused on identifying any expansive soils, unstable geologic units, unstable soils, and soils that could become unstable due to the Project. The findings of these studies shall be summarized in a report and, as necessary, shall include measures to reduce any risks relating to soil instability and expansive soils, including on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse during or after construction. The District shall consider all recommendations provided in the geotechnical report in the final design of the improvements.

Significance After Mitigation

Mitigation Measure 4.7-2 requires geotechnical studies be performed to determine the presence or extent of soil conditions that could become unstable as a result of construction. Design and engineering of proposed improvements would consider recommendations regarding prevention of on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse during or after construction. Thus, implementing Mitigation Measure 4.7-2 would reduce this impact to **less than significant with mitigation incorporated.**

Impact 4.7-4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

As discussed under Impact 4.7-3, the specific geologic conditions (including the presence of expansive soils) along the alignment are unknown. However, because this phase of the Project would utilize existing infrastructure and conveyance routes, no physical improvements would be required. Because this phase does not include the construction of any structures, this phase would not create substantial direct or indirect risks to life or property. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance

capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

As discussed under Impact 4.7-3, the specific geologic conditions at the locations where the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would occur are not known at this time. A preliminary review of the soils within areas of proposed construction was conducted as part of this analysis. To be considered expansive, soils must have a plasticity index of 15 or greater, have more than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), have more than 10 percent of the soil particles be less than 5 micrometers, and have an expansion index greater than 20. Although the size of each soil's components is unknown, the only soil to have a plasticity index greater than 15 is Horseshoe gravelly loam, 30-50% slopes, which is present along the El Dorado Canal. Because there is potential for expansive soils to exist within the areas of proposed construction and because the specific geologic conditions are unknown, the Project's impacts related to expansive soils is **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

As discussed under Impact 4.7-3, the specific geologic conditions (including the presence of expansive soils) along the alignment are unknown. However, post-construction operations do not include construction activities. Because this phase does not include the construction of any structures, this phase would not create substantial direct or indirect risks to life or property. Therefore, **no impact** would occur.

Mitigation Measures

Implement Mitigation Measure 4.7-2: Perform Geotechnical Studies and Implement Design Recommendations

Significance After Mitigation

Mitigation Measure 4.7-2 requires geotechnical studies be performed to determine the presence or extent of expansive soils within the areas of proposed construction. These projects would implement any recommendations regarding avoidance of direct or indirect risks related to expansive soils. Implementing Mitigation Measure 4.7-2 would reduce this impact to **less than significant with mitigation incorporated.**

Impact 4.7-5. 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?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

These operations would not involve the use of or construction of septic tanks or alternative wastewater disposal systems, nor would they involve residential use requiring disposal of waste water. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction of these improvements would not use or construct septic tanks or alternative wastewater disposal systems, nor would they involve residential use requiring disposal of waste water. Therefore, **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

This phase of operations would not use or construct septic tanks or alternative wastewater disposal systems, nor would it involve residential use requiring disposal of waste water. Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.7-6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

The South Fork American River is considered a unique geologic feature and is composed of Sierra Nevada Batholith. The geology within and surrounding the South Fork is unique because of its unique formation story and because the topography and hydrology have significantly contributed to the geologic formations in the area. Operations with existing infrastructure would not change flows in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. There would be reductions in flow in the South Fork below the El Dorado Powerhouse because water that is currently used for hydropower purposes and returned to the South Fork would instead be used for consumptive uses and not returned to the South Fork. Operations with existing infrastructure does not require ground disturbance. Therefore, there would only be minor hydrologic changes associated with operations with existing infrastructure and these changes would not directly or indirectly destroy a unique paleontological resource. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that

conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction activities would primarily occur on previously disturbed land within the existing alignment of conveyance facilities. Ground disturbing activities in previously disturbed areas are not expected to result in accidental damage to or destruction of unique paleontological resources. However, ground disturbing activities occurring on undisturbed soils along the Project alignment could result in accidental damage to or destruction of unique paleontological resources if paleontological resources are present. As discussed above and shown in Figure 4.7-1, the Project construction alignment contains Mehrten Formation, Valley Springs Formation, Unidfferentiated Paleozoic rocks, Mesozoic Granitic Rocks, and Gabbroic Rocks. All of the rock formations within the Project alignment have the potential to contain paleontological resources. Because construction may occur on previously undisturbed land, there is the potential for paleontological resources to be present, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The South Fork American River is considered a unique geologic feature and is composed of Sierra Nevada Batholith. The geology within and surrounding the South Fork is unique because of its unique formation story and because the topography and hydrology have significantly contributed to the geologic formations in the area. Post construction operations would allow diversions at the El Dorado Diversion Dam to increase from 145 cfs (current capacity of the El Dorado Canal) to 156 cfs (authorized capacity of the El Dorado Canal), which would result in up to 11 cfs decrease in flow in the South Fork between the El Dorado Diversion Dam and the El Dorado Powerhouse. There would also be reductions in flow in the South Fork below the El Dorado Powerhouse because water that is currently used for hydropower purposes and returned to the South Fork would instead be used for consumptive uses and not returned to the South Fork. Post-construction operations do not require any ground disturbing activities. Therefore, there would only be minor hydrologic changes associated with post-construction operations and these changes would not directly or indirectly destroy a unique paleontological resource, site, or unique geologic feature. Therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.7-3a: Paleontological Resources Awareness Training

The District shall provide paleontological awareness training for workers prior to beginning Project construction activities. The District shall have a qualified paleontologist prepare training materials (i.e., printed handouts) that provide information on the following topics:

- How to recognize paleontological resources
- What to do if paleontological resources are suspected or encountered in the Project area
- Information on avoidance and other measures relevant to paleontological resources
- Confidentiality and appropriate treatment of paleontological resources
- Information on regulations and applicable civil and criminal penalties for violations

The training shall initially be presented to key Project personnel at the Project kickoff. Printed handouts shall be distributed and used for future reference by Project personnel. Project personnel that are trained during the Project kickoff shall be responsible for making sure that other workers on the Project receive the training before initiating on-site work. A roster of trained Project personnel shall be maintained in the Project construction office and made available for review by regulatory agencies, if needed.

Mitigation Measure 4.7-3b: Proper Handling of the Unanticipated Discovery of Paleontological Resources or Unique Geologic Features

If paleontological resources (i.e., fossils) and/or unique geologic features are encountered during construction, compliance with federal regulations (16 USC Chapter 1C, Sections 470aa through 470aaa-11) and guidelines (SVP guidelines) regarding the treatment of such resources shall be required. If paleontological resources or unique geologic features are encountered during ground disturbing activities, work within 100 feet of the discovery shall be halted until the District notifies a qualified geologist or paleontologist to evaluate the significance of the find. If the find is determined to be significant, the District shall determine the appropriate avoidance measures or other appropriate mitigation in consultation with a qualified geologist or paleontologist and landowner, such as site salvage. Significant paleontological resources recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified paleontologist according to current professional standards. The SVP provides guidelines on assessment and mitigation of adverse impacts to paleontological resources.

Significance After Mitigation

Implementation of Mitigation Measure 4.7-3a, and 4.7-3b would reduce the Project's construction-related impacts on unique paleontological resources to a less-than-significant level because construction workers would be alerted to the possibility of encountering paleontological resources and, in the event that resources were discovered, fossil specimens would be recovered and recorded and would undergo appropriate curation. Therefore, the overall potential for the proposed Project to have a significant impact on paleontological resources is **less than significant with mitigation incorporated**.

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4.8 GREENHOUSE GAS EMISSIONS

This section analyzes the potential greenhouse gas (GHG) impacts associated with implementation of the proposed Project. This analysis includes a description of the existing baseline conditions, the associated regulatory framework, including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.8.1 EXISTING CONDITIONS

GREENHOUSE GASES

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals, and plants; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following are GHGs that are widely accepted as the principal contributors to human-induced (i.e., anthropogenic) global climate change:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)
- Nitrogen trifluoride (NF_3)

Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4 is the main component of natural gas and is associated with agricultural practices and landfills. N_2O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a byproduct of various industrial processes associated with aluminum production and the manufacturing of semiconductors. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment, and in semiconductor manufacturing. NF_3 is used in the electronics industry during the manufacturing of consumer items, including photovoltaic solar panels and liquid-crystal-display (i.e., LCD) television screens.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2. The GWP of a GHG is based on several factors, including the relative effectiveness

of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main GHGs that have been attributed to human activity include CH_4, which has a GWP of 28—this means that 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 28 tons of CO_2. N_2O has a GWP of 265 (IPCC 2013). Thus, GHGs with lower emissions rates than CO_2 may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). The concept of CO_2-equivalents (CO_2e) is used to account for the different GWPs of GHGs based on their potential to absorb infrared radiation.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables, it is understood by scientists who study atmospheric chemistry that more CO_2 is emitted into the atmosphere than is sequestered (i.e., captured and stored) by ocean uptake, vegetation, and other forms of sequestration. GHG emissions related to human activities have been determined as "extremely likely" to be responsible (indicating 95 percent certainty) for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (CARB 2014a). The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or microclimate. By its nature, evaluation of GHG emissions under CEQA is a cumulative analysis.

GHG Emission Sources

GHG emissions contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, electric utility, residential, commercial, and agricultural categories.

For purposes of accounting for and regulating GHG emissions, sources of GHG emissions are grouped into emission categories (sometimes called "sectors"). California Air Resources Board (CARB) identifies the following main GHG emission categories that account for most anthropogenic (human-caused) GHG emissions generated within California:

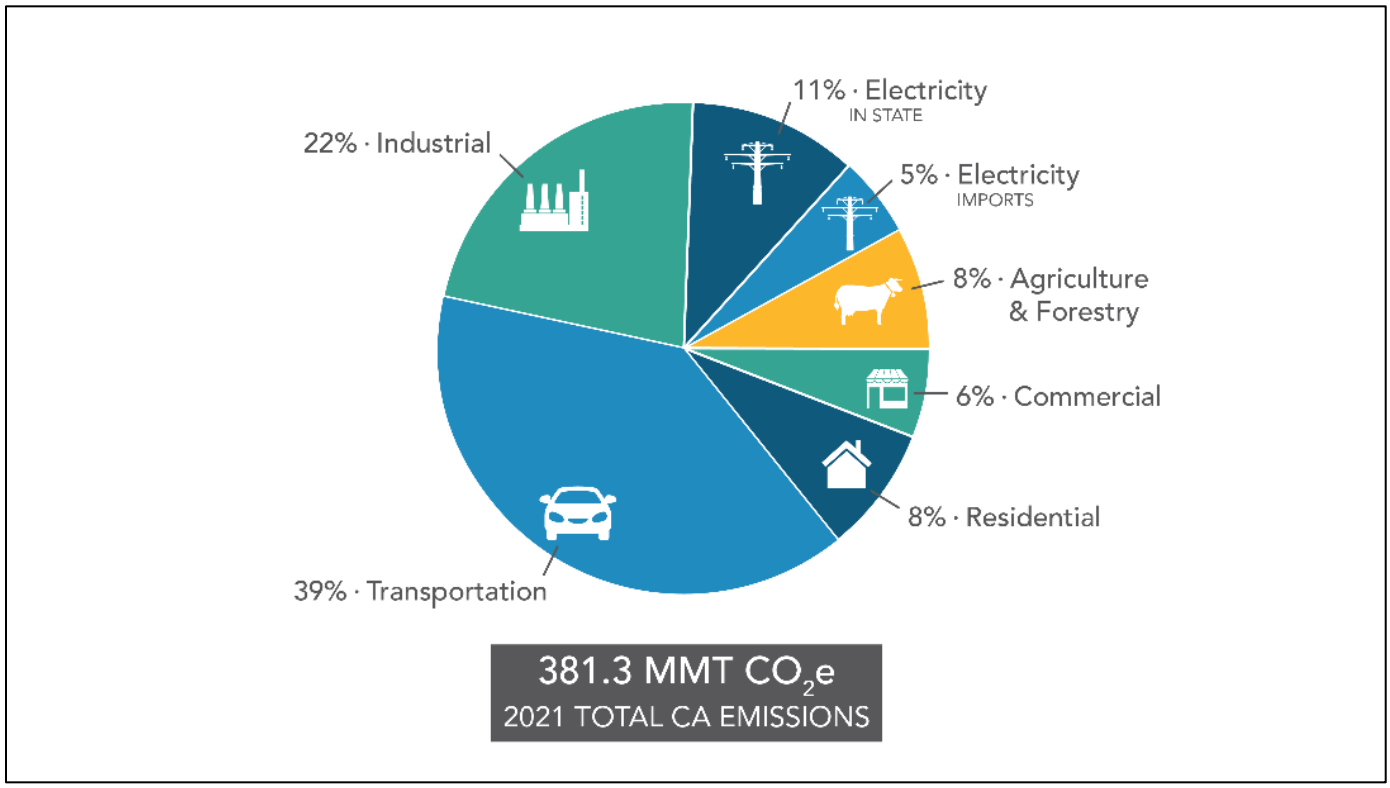
- *Transportation:* On-road motor vehicles, recreational vehicles, aviation, ships, and rail
- *Electric Power:* Use and production of electrical energy
- *Industrial:* Mainly stationary sources (e.g., boilers and engines) associated with process emissions
- *Commercial and Residential:* Area sources, such as landscape maintenance equipment, fireplaces, and consumption of natural gas for space and water heating
- *Agriculture:* Agricultural sources that include off-road farm equipment; irrigation pumps; crop residue burning (CO_2); and emissions from flooded soils, livestock waste, crop residue decomposition, and fertilizer volatilization (CH_4 and N_2O)
- *High GWP:* Refrigerants for stationary and mobile-source air conditioning and refrigeration, electrical insulation (e.g., SF_6), and various consumer products that use pressurized containers

- *Recycling and Waste:* Waste management facilities and landfills; primary emissions are CO_2 from combustion and CH_4 from landfills and wastewater treatment

GHG Emissions Inventories

California

CARB performs an annual GHG inventory for emissions of the six major GHGs. California produced 381.3 million metric tons (MMT) CO_2e in 2021 (CARB 2023). As shown in Figure 4.8-1, combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2021, accounting for 39 percent of total GHG emissions in the state. The transportation category was followed by the industrial and electric power (including in-state and out-of-state sources) categories, which account for 22 and 16 percent of the state's total GHG emissions, respectively (CARB 2023).



Source: CARB 2023

Figure 4.8-1 2022 California GHG Emissions by Economic Sector

4.8.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

The United States Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA). The Supreme Court of the United States ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs.

Greenhouse Gas Findings under the Federal Clean Air Act

On December 7, 2009, EPA signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—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.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industries or other entities, this action was a prerequisite to finalizing EPA's *Greenhouse Gas Emission Standards for Light-Duty Vehicles*.

GHG Emission Standards for Light-Duty and Heavy-Duty Vehicles

On May 7, 2010, the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* were published in the Federal Register (EPA and NHTSA 2010). Phase 1 of the emissions standards required vehicles from model years 2012 through 2016 to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, which is equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements (EPA and NHTSA 2010).

On August 28, 2012, the U.S. Department of Transportation (USDOT) and EPA issued a joint Final Rulemaking requiring additional federal GHG and fuel economy standards for Phase 2 of the emissions standards for model year 2017 through 2025 passenger cars and light-duty trucks. The standards would require these vehicles to meet an estimated combined average emissions level of 163 grams of CO_2 per mile in model year 2025, which is equivalent to 54.5 miles per gallon if the improvements were made solely through fuel efficiency. However, on April 2, 2018, EPA issued a Mid-term Evaluation Final Determination, which finds that the model year 2022 through 2025 emissions standards are not appropriate and should be revised. This Mid-term Evaluation was not a final agency action; rather, this determination led to the rule making of the Safer Affordable Fuel Efficient (SAFE) Vehicle Rule (EPA 2018). The SAFE Vehicle Rule was made effective on June 29, 2020. However, on January 20, 2021, President Biden signed an Executive Order directing consideration of labor unions, States, and industry views to propose suspension, revision, or rescindment of the SAFE Vehicles Rule (The White House 2021). On December 21, 2021, the National Highway Traffic Safety Administration (NHTSA) finalized the Corporate Average Fuel Economy Preemption rulemaking to withdraw its portions of the SAFE Part One Rule (NHTSA 2021).

On March 31, 2022, the NHTSA finalized Corporate Average Fuel Economy Standards for model years 2024 through 2026. The final rule established standards that would require an industry-wide fleet average of approximately 49 miles per gallon for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025, and 10 percent annually for model year 2026 (NHTSA 2022).

In addition to the standards for light-duty vehicles, USDOT and EPA adopted complementary standards to reduce GHG emissions and improve the fuel efficiency of heavy-duty trucks and buses on September 15, 2011. The

Phase 1 standards together form a comprehensive heavy-duty national program for all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds for model years 2014 through 2018. The standards were phased in with increasing stringency in each model year from 2014 through 2018. The EPA standards adopted for 2018 represented an average per-vehicle reduction in GHG emissions of 17 percent for diesel vehicles and 12 percent for gasoline vehicles (EPA and NHTSA 2011). Building on the success of the Phase 1 standards, EPA and NHTSA finalized Phase 2 standards for medium- and heavy-duty vehicles through model year 2027. The Phase 2 standards are expected to lower CO_2 emissions by approximately 1.1 billion metric tons (MT).

On July 28, 2023, NHTSA announced new proposal for CAFE standards for passenger cars and light trucks built in model years 2027 through 2032, and new fuel efficiency standards for heavy-duty pickup trucks and vans built in model years 2030 through 2035. If finalized, the proposal would require an industry fleet-wide average of approximately 58 miles per gallon for passenger cars and light trucks in model year 2032, by increasing fuel economy by 2 percent year over year for passenger cars and by 4 percent year over year for light trucks. For heavy-duty pickup trucks and vans, the proposal would increase fuel efficiency by 10 percent year over year. These standards have not been adopted at this time and NHTSA held a public hearing on its proposal in September 2023.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA).

Assembly Bill 1493

Assembly Bill (AB) 1493, signed in July 2002, requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the EPA Administrator granted a CAA waiver of preemption to California. This waiver allowed California to implement its own GHG emissions standards for motor vehicles, beginning with model year 2009. This waiver was revoked in 2019 due to the SAFE Part One Rule; however, in 2021, the California's authority under the Clean Air Act to implement its own emission standards and zero emission vehicle sales mandate was restored under the 2021 Corporate Average Fuel Economy Preemption. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017 through 2025.

Executive Order S-3-05

Executive Order S-3-05, signed in June 2005, proclaimed that California is vulnerable to the impacts of climate change. Executive Order S-3-05 declared that increased temperatures could reduce the Sierra Nevada's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emissions targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The statewide GHG emissions in 2000 were approximately 466 MMT CO_2e (CARB 2023). In 2010, overall statewide GHG emissions were approximately 453 MMT CO_2e, exceeding the 2010 goal established by Executive Order S-3-05 (CARB 2014b).

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 required that CARB approve a statewide GHG emissions limit. AB 32 also identifies CARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target. CARB approved 431 MMT CO_2e as the 2020 emission limit with the approval of the First Update to the Scoping Plan on May 22, 2014, described in more detail below. In 2014, statewide GHG emissions dropped below the 2020 GHG limit and have remained below the limit since that time (CARB 2023).

Executive Order S-1-07

Executive Order S-1-07, which was signed by then California Governor Arnold Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at more than 40 percent of statewide emissions. Executive Order S-1-07 established a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020.

Senate Bill 97

SB 97 required the Governor's Office of Planning and Research to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010. In response to SB 97, the California Natural Resources Agency (CNRA) adopted amendments to the State CEQA Guidelines that require evaluation of GHG emissions or the effects of GHG emissions.

Executive Order B-30-15

In April 2015, Governor Brown issued an executive order establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emissions reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and Governor Brown's Executive Order S-03-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the executive order aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

Senate Bill 32 and Assembly Bill 197

In September 2016, Executive Order B-30-15 was codified into statute by Senate Bill (SB) 32, establishing the statewide GHG reduction target of at least 40 percent below 1990 levels by 2030. The companion bill to SB 32, AB 197, provides additional direction to CARB on the adoption of strategies to reduce GHG emissions. For example, it requires annual posting of GHG, criteria, and toxic air contaminant data, requires protection of the State of California's most affected and disadvantaged communities, and directs CARB, in the development of each scoping plan, to identify the range of projected air pollution and GHG emissions reductions and the cost-effectiveness for each emissions reduction measure.

Assembly Bill 1279

AB 1279, signed on September 16, 2022, declares the policy of the state both to achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions

thereafter, and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below the 1990 levels. The bill requires CARB to work with relevant state agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals and to identify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies in California, as specified.

CARB Climate Change Scoping Plans

In December 2008, CARB adopted its *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (CARB 2008). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of California's GHG inventory. CARB further acknowledges that decisions about how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors.

CARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. CARB approved the First Update to the Climate Change Scoping Plan: Building on the Framework in June 2014 (CARB 2014a). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020.

In November 2017, CARB released the 2017 Climate Change Scoping Plan, which establishes a framework of action for California to reduce statewide emissions by 40 percent by 2030, compared to 1990 levels per SB 32 (CARB 2017). The 2017 Scoping Plan builds upon the framework established by the 2008 Scoping Plan and the 2014 Scoping Plan Update, while also identifying new, technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets.

In November 2022, CARB released the 2022 Scoping Plan Update (CARB 2022). The 2022 Scoping Plan lays out a path to achieve carbon neutrality by 2045 or earlier, outlining a technologically feasible, cost-effective, and equity-focused path to achieve the state's climate target. This plan extends and expands upon these earlier plans with a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, as directed by AB 1279. This plan also takes the unprecedented step of adding carbon neutrality as a science-based guide and touchstone for California's climate work. The plan outlines how carbon neutrality can be achieved by taking bold steps to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the state's natural and working lands and using a variety of mechanical approaches.

Executive Orders B-18-12, B-29-2015, and B-37-16

While these regulations are specific to water conservation and water efficiency, these regulations are described due to the water-energy nexus (i.e., saving water also saves energy, which reduces GHG emissions). On April 25, 2012, Governor Edmund Brown issued Executive Order B-18-12 establishing water consumption reduction goals by directing state agencies and departments to reduce their overall water use by 10 percent by 2015 and 20 percent by 2020 against a 2010 baseline. In April 2015, Governor Edmund Brown then issued Executive Order B-29-2015 calling for actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response and invest in technologies that will make California more drought resilient. For the first time in state history, the Governor directed the State Water Resources Control Board to implement mandatory

water reductions in cities and towns across California to reduce water usage by 25 percent through February 2016, as compared to the amount used in 2013. This was followed by Executive Order B-37-16, signed in May 2016, which set forth actions to use water more wisely, eliminate water waste, strengthen local drought resilience, and improve agricultural water use efficiency and drought planning.

Senate Bills 1078 and 107, Executive Orders S-14-08 and S-21-09, and Senate Bills 350 and 100

California's Renewables Portfolio Standard (RPS) was established in 2002 under SB 1078 and accelerated in 2006 under SB 107, by requiring that 20 percent of electricity retail sales be served by renewable energy sources by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33 percent by 2020, and on November 17, 2008, then Governor Schwarzenegger signed Executive Order S-14-08 requiring retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020. In April 2011, SB X1-2 codified Executive Order S-14-08, setting the new RPS targets at 20 percent by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020 for all electricity retailers. Governor Brown signed SB 350 in October 2015, which extended the RPS target by requiring retail sellers to procure 50 percent of their electricity from renewable energy resources by 2030. This was followed by SB 100 in 2018, which further increased the RPS target to 60 percent by 2030 along with the requirement that all California's electricity come from carbon-free resources by 2045.

Regional and Local Plans, Policies, Regulations, and Ordinances

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> "Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code."

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply with the plans and policies of the County and uses these plans and policies as a metric for formulating an impact analysis. El Dorado County's plans and policies related to GHG emissions and climate change are presented below.

El Dorado County Local Hazard Mitigation Plan

In April 2019, El Dorado County adopted the El Dorado County Local Hazard Mitigation Plan (El Dorado County 2018). The Local Hazard Mitigation Plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 in order for El Dorado County to be eligible for the Federal Emergency Management Agency's Pre-Disaster Mitigation and Hazard Mitigation Grant programs. The County conducted a risk assessment that identified and profiled hazards that pose a risk to the County, assessed the County's vulnerability to these hazards, and examined the capabilities in place to mitigate them. The plan identifies that floods, levee failures, wildfires, and severe weather are among the hazards that can have a significant impact on the County. Based on the risk assessment, the goals and objectives related to GHG emissions and climate change include the following:

Goal 1: Minimize risk and vulnerability of El Dorado County to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, public health and safety, and the environment:

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts from climate change

El Dorado County Climate Vulnerability Assessment

In May 2023, El Dorado County released the public review draft of the County of El Dorado Climate Vulnerability Assessment (El Dorado County 2023). The County's Climate Vulnerability Assessment addresses how people, property, critical infrastructure, and key economic and natural assets are vulnerable to climate change. The Climate Vulnerability Assessment is organized into four key sections: exposure identification, asset inventory, vulnerability assessment, and adaptive capacity assessment. Drought and water supply changes was identified as a secondary climate hazard in the County.

El Dorado County Air Quality Management District

The El Dorado County Air Quality Management District (AQMD) does not currently have established thresholds or policies for construction and operational related GHG emissions.

4.8.3 IMPACT ANALYSIS

METHODOLOGY

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek and then to Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson

Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. However, because detailed information regarding these future infrastructure improvements is not known at this time, a project-level analysis is not possible. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts. However, in order to disclose what potential impacts the proposed Project could have on GHG emissions, the District is providing information for comparable past projects for illustrative purposes in this EIR, as discussed in the impact analysis sections below. To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- The operational existing infrastructure phase of the Project includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

- The operational post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

As detailed in Section 4.3, the El Dorado County AQMD is the primary agency responsible for air quality regulation. At this time, El Dorado County does not have any adopted quantitative guidelines or thresholds for GHG emission impacts. However, the El Dorado County AQMD was part of the committee of air districts in the Sacramento Region involved in the development of the Sacramento Metropolitan Air Quality Management District (SMAQMD) GHG threshold of 1,100 MT CO_2e per year for the construction phase of projects (SMAQMD 2021). However, because only limited information is currently available for Project construction improvements, emissions from such improvements cannot be quantified at this time and construction related GHG impacts are analyzed qualitatively.

As identified previously, because the timing for implementing potential construction-related improvements to allow for the diversion of up to 156 cfs is unknown, two operational regimes for the diversion of Permit 21112 water at the El Dorado Diversion Dam are considered in this EIR: 1) existing infrastructure operations; and 2) post-construction operations.

As described previously, the Project involves implementation of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam. These improvements would occur along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet. Because these facilities rely mainly on gravity to convey water, the Project could substantially reduce energy consumption and the costs of water conveyance and delivery when compared to the current point of diversion for Permit 21112 at Folsom Reservoir, which relies primarily on pumping to divert and distribute water. Maintenance activities, such as periodic inspections and repairs, at the El Dorado Diversion Dam, El Dorado Canal, Forebay Reservoir, Jenkinson Lake, Hazel Creek Tunnel, Main Pipeline, and other existing facilities would continue to occur as it is currently undertaken. Therefore, operational and maintenance related GHG emissions associated with the improvements are anticipated to remain similar to existing conditions.

Furthermore, as described in Section 3.6.3, the Project would utilize two existing water treatment facilities (i.e., Reservoir 1 WTP and Reservoir A WTP). Water treated at Reservoir 1 WTP and Reservoir A WTP are combined to serve the entire District service area. With the proposed Project, Permit 21112 water would be diverted from the South Fork at the El Dorado Diversion Dam into the El Dorado Canal. From there, Permit 21112 water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP. The District currently delivers its pre-1914 water rights to Forebay Reservoir for consumptive use via Reservoir 1 WTP and hydropower uses via El Dorado Powerhouse, and to Reservoir A WTP via Jenkinson Lake for consumptive use. As described in Section 3.6.4, the Reservoir 1 and Reservoir A WTPs have sufficient physical capacity to treat the consumptive water made available under the Project. In addition, the Project is designed to meet future projected water demands by relying primarily on gravity flow conveyance from Reservoir 1 and Reservoir A WTPs, rather than relying on increased pumping and conveyance from Folsom Reservoir to meet future water demands. As such, electricity consumption and the associated GHG emissions at the WTPs would remain similar to existing conditions.

However, to implement the proposed Project, the District would reduce the amount of water diverted at the El Dorado Diversion Dam for power generation by the amount designated for consumptive use under a modified Permit 21112. As such, the Project may reduce the volume of water available for hydropower generation at powerhouses on the South Fork American River, resulting in an overall reduction in hydropower electricity generation by these facilities. While these changes in hydropower operations would not directly increase GHG emissions, the operational changes could induce compensating changes elsewhere in the interconnected energy grid. The compensating changes could cause indirect increases in GHG emissions from other power plants that rely on fossil fuels.

As such, this analysis quantitatively evaluates the potential GHG emissions impacts associated with changes to hydroelectric generation under the two operational regimes described above based on the anticipated flow changes at the surrounding powerhouses as shown by the hydrologic modeling. The actual pattern of diversion under the proposed Project would vary depending on a variety of system conditions (e.g., infrastructure conveyance capacity, hydrologic availability, regulatory requirements such as water right conditions and Federal Energy Regulatory Commission (FERC) license conditions, demands at Reservoir 1 WTP and Reservoir A WTP, and available storage and forecasted carry-over storage in Jenkinson Lake). Because these variables change from year to year and/or month to month, the Project's specific diversions will also vary subject to these variables. However, for the purposes of this analysis, hydrologic conditions as provided by the ResSim model were used to evaluate the typical annual changes to hydroelectric generation. For additional details, refer to Section 3.6.6, Project Hydrologic Modeling and Appendix B - Modeling Technical Memorandum.

Although a reduction in hydroelectric generation does not necessarily mean that that same quantity of electricity generation would be generated by non-renewable energy sources (i.e., the reduced hydroelectric generation could be compensated by another renewable energy source), this analysis quantified the potential GHG impacts by multiplying the estimated reduction in hydroelectric generation (in megawatt-hours [MWh] per year) by the applicable utility's GHG intensity factor for their general electricity mix. For the powerhouses operated by the SMUD, the change in hydroelectric generation was multiplied by 446 pounds CO_2e per MWh, SMUD's 2022 general power mix GHG intensity factor as reported on the 2022 Power Content Label (CEC 2023a). For the El Dorado Powerhouse, which is owned and operated by El Dorado Irrigation District, the analysis assumed El Dorado Irrigation District sells this electricity generation to Pioneer Community Energy, a California joint powers authority. As such, the change in hydroelectric generation at the El Dorado Powerhouse was multiplied by 343 pounds CO_2e per MWh, Pioneer Community Energy's base service GHG intensity factor as reported on the 2022 Power Content Label (CEC 2023b). Modeling assumptions and calculations are included in Appendix E.

As described previously, El Dorado County AQMD has not adopted quantitative guidelines or thresholds for GHG emission impacts. This analysis reviewed guidelines and thresholds prepared by other air quality districts. The SMAQMD has identified operational land use screening levels tables for project sizes equivalent to 1,100 MT CO_2e per year (SMAQMD 2021). Similarly, Placer County Air Pollution Control District (PCAPCD) has adopted a 1,100 MT CO_2e per year de minimis level to be applied to a project's operational phase. According to the PCAPCD, for a land use project, it can be considered as less than cumulatively considerable if its operational phase GHG emissions are equal to or less than 1,100 MT CO_2e per year. This analysis utilizes the 1,100 MT CO_2e per year screening level threshold recommended by SMAQMD and PCAPCD to evaluate the Project's operational GHG emissions impacts. It is not the District's intent to adopt this threshold as a mass emissions limit for other projects, but rather to provide this additional information to put the proposed Project's generated GHG emissions in the appropriate statewide context and consider the proposed Project's impacts pursuant to CEQA.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project will have a potentially significant impact related to GHG emissions if it 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?

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.8-1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Operational Impacts (Existing Infrastructure)

This phase of the Project includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline. Table 4.8-1 presents the hydroelectric generation changes and potential changes in GHG emissions as compared to the current baseline for this phase of the Project for each water year type as shown by the hydrologic modeling.

Table 4.8-1. Existing Infrastructure (Baseline vs Project): Hydroelectric Generation Changes by Powerhouse and Water Year Type and Associated GHG Emissions

Condition	Powerhouse	Utility	Wet	Above Normal	Below Normal	Dry	Critically Dry	Average Annual
Operations with Current Water Demands (2022)	El Dorado Powerhouse (MWh/year)	Pioneer Community Energy	-227	-356	625	-1,462	-7,344	-2,350
	Camino Powerhouse (MWh/year)	SMUD	82	2	103	-85	-239	-36
	Jaybird Powerhouse (MWh/year)		67	4	127	3	-223	-20
	Union Valley Powerhouse (MWh/year)		31	0	26	-5	-90	-12
	White Rock Powerhouse (MWh/year)		-359	-214	-191	-589	-3,039	-1,145
	Chili Bar Powerhouse (MWh/year)		-11	-13	-130	-53	-253	-111
Subtotal	*Change in Hydroelectric Generation at SMUD Powerhouses* (MWh/year)		*-190*	*-221*	*-65*	*-729*	*-3,844*	*-1,324*
	GHG Emissions (MT CO_2e)		**74**	**100**	**-84**	**375**	**1,920**	**633**

Source: Changes in power generation obtained from modeling conducted by Zanjero in 2024; GHG emissions calculated by AECOM in 2024.
Notes: GHG = greenhouse gas; MT CO_2e = metric tons carbon dioxide equivalent; MWh/year = megawatt-hours per year; SMUD = Sacramento Municipal Utility District.
Water year type based on unimpaired runoff in the American River below Folsom Lake published in the California Department of Water Resources (DWR) Bulletin 120 "Report of Water Conditions in California."

Compared to the current baseline operations, Project operations with existing infrastructure are anticipated to result in an annual hydroelectric generation reduction of 2,350 MWh at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 1,324 MWh across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD based on the average annual hydrologic condition. As described above, this potential reduction in hydroelectric generation was multiplied by Pioneer Community Energy and SMUD GHG intensity electricity factors, respectively, to estimate the potential increase in emissions if this reduction in electricity were compensated by the utility's general power mix instead. Compared to the current baseline operations for the average annual hydrologic condition, Project operations with existing infrastructure would result in a potential increase of 633 MT CO_2e per year. However, as shown in Table 4.8-1, the potential change in hydroelectric generation is highly dependent on the hydrologic condition. For example, under a critically dry hydrologic condition, Project operations with existing infrastructure would be anticipated to result in an annual hydroelectric generation reduction of 7,344 MWh at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 6,847 MWh across the powerhouses owned and operated by SMUD. Therefore, under the critically dry hydrologic condition, Project operations with existing infrastructure would result in a potential increase of 1,920 MT CO_2e per year. On the other hand, under below normal hydrologic conditions, Project operations with existing infrastructure would be anticipated to result in an increase in annual hydroelectric generation of 625 MWh at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 65 MWh across the powerhouses owned and operated by SMUD. Under the below normal hydrologic condition, Project operations with existing infrastructure would result in a potential decrease (i.e., reduction in GHG emissions) of 84 MT CO_2e per year. Therefore, since hydroelectric generation, and thereby potential impacts to GHG emissions, is largely dependent on hydrologic conditions, this analysis considered the frequency of the various hydrologic conditions in order to evaluate the GHG emissions impact from the potential change in hydroelectric generation. From the 47 years of modeling data, approximately 14 of those years (or 30 percent) were classified as critically dry years, 6 years (13 percent) were classified as dry years, 9 years (19 percent) were classified as below normal years, 3 years (6 percent) were classified as above normal years, and 15 years (32 percent) were classified as wet years. Therefore, while Project operations with existing infrastructure could result in changes to hydroelectric generation that would result in an exceedance of the 1,100 MT CO_2e screening threshold under critically dry conditions (30 percent of the 47 years of modeling data), the potential change in hydroelectric generation and associated emissions under all other years (70 percent of the 47 years of modeling data) would be below the 1,100 MT CO_2e screening threshold.

Because GHGs have long atmospheric lifetimes and mix globally in the atmosphere and given the nature of environmental consequences from GHGs and global climate change (i.e., impacts of GHG emissions occur long after emissions are generated and can affect climate change globally, far from the source of emissions), CEQA requires that lead agencies evaluate the impacts of GHG emissions on a cumulative basis. Since the potential change in hydroelectric generation is largely dependent on temporal factors and system conditions (e.g., infrastructure conveyance capacity, hydrologic availability, regulatory requirements such as water right conditions and FERC license conditions, demands at Reservoir 1 WTP and Reservoir A WTP, and available storage and forecasted carry-over storage in Jenkinson Lake), assessing emissions on an average annual basis allows for a more comprehensive analysis of the potential GHG emissions impacts that captures these fluctuations in hydroelectric generation over the lifetime of the Project. Therefore, this analysis utilizes the average annual conditions to inform the significance determination. As such, and as described previously, under the average annual hydrologic condition, Project operations with existing infrastructure would result in an average annual increase of 633 MT CO_2e per year when compared to current baseline conditions. In addition, as described above

in Section 4.8.2, SB 100 requires that renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045. Over time, as utilities increase their renewable and zero-carbon resources to meet RPS requirements, the general power mix that would replace the reduced hydroelectric generation would result in less GHG emissions than presented here. Therefore, the reduction in the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 21112, would not result in an increase in GHG emissions that would exceed the screening level threshold of 1,100 MT CO_2e.

Table 4.8-2 presents the hydroelectric generation changes and potential changes in GHG emissions as compared to the future baseline for this phase of the Project for each water year type as shown by the hydrologic modeling.

Table 4.8-2. Existing Infrastructure (Future Baseline vs Future Project): Hydroelectric Generation Changes by Powerhouse and Water Year Type and Associated GHG Emissions

Condition	Powerhouse	Utility	Wet	Above Normal	Below Normal	Dry	Critically Dry	Average Annual
Operations with Future Water Demands (2045)	El Dorado Powerhouse (MWh/year)	Pioneer Community Energy	-1,191	-2,311	-1,084	-7,277	-16,907	-6,700
	Camino Powerhouse (MWh/year)	SMUD	-86	30	-86	-103	162	-7
	Jaybird Powerhouse (MWh/year)		-66	43	-80	6	277	50
	Union Valley Powerhouse (MWh/year)		-33	9	-38	-22	49	-5
	White Rock Powerhouse (MWh/year)		-1,026	-837	-595	-3,048	-6,778	-2,903
	Chili Bar Powerhouse (MWh/year)		-76	-45	-74	-292	-557	-245
Subtotal	*Change in Hydroelectric Generation at SMUD Powerhouses* (MWh/year)		*-1,287*	*-800*	*-873*	*-3,459*	*-6,847*	*-3,110*
	GHG Emissions (MT CO_2e)		**0**	**0**	**0**	**0**	**0**	**0**

Source: Changes in power generation obtained from modeling conducted by Zanjero in 2024; GHG emissions calculated by AECOM in 2024.
Notes: GHG = greenhouse gas; MT CO_2e = metric tons carbon dioxide equivalent; SMUD = Sacramento Municipal Utility District; MWh/year = megawatt-hours per year.
Water year type based on unimpaired runoff in the American River below Folsom Lake published in the California Department of Water Resources (DWR) Bulletin 120 "Report of Water Conditions in California."

Compared to the future baseline (2045 conditions), Project operations with existing infrastructure are anticipated to result in an annual hydroelectric generation reduction of 6,700 MWh at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 3,110 MWh across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD. As described previously, pursuant to SB 100, by 2045, utilities will be required to supply 100 percent of electric retail sales to end-use customers from renewable energy and zero-carbon resources. Therefore, under the future baseline (2045 conditions), although there would be a reduction in the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 2112, the slight reduction in hydroelectric production resulting from the proposed Project would not result an increase in reliance on fossil fuels to supplement the reduction as utilities would be required to have sufficient renewable energy sources in order to meet RPS. Therefore, under the future baseline (2045 conditions), Project operations with existing infrastructure would not result in an increase in GHG emissions. As described in more detail in Impact 4.8-2 below, this Project would also not preclude utilities from procuring renewable energy and meeting RPS milestone requirements.

Therefore, the reduction in the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 21112, would not result in an increase in GHG emissions. This impact would be **less than cumulatively considerable**.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project activities are not known at this time.

Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Construction-related exhaust GHG emissions would be generated from construction equipment, construction workers' commutes, and construction material hauling. Because the details of Project construction requirements are unknown at this time, it is not possible to accurately determine the type and intensity of use of construction equipment that would be required, nor details associated with excavation quantities, material hauling, the typical number of construction workers or other similar Project specifics. Therefore, potential construction-related GHG emissions cannot be accurately quantified at this time. However, in order to disclose what potential GHG emissions impacts the proposed Project could have, the District is providing information for comparable past projects for illustrative purposes in this EIR.

The District routinely conducts infrastructure improvements along the El Dorado Canal and other water conveyance facilities that are comparable in size and scope to the construction activities associated with the proposed Project. The types of construction activities (e.g., vegetation removal, demolition of existing structures, localized excavation and backfill, grading, placement of concrete, slope and channel stabilization, construction of conveyance structures, and site restoration), as well as the types of construction equipment utilized for these types of infrastructure projects are likewise similar. These past projects can therefore provide a useful metric to illustrate the potential GHG emissions impacts associated with construction activities for future infrastructure improvements under the proposed Project. While these past projects provide insight into the potential GHG

emissions impacts that would be associated with the proposed Project, a subsequent project-level analysis would be performed prior to implementation of infrastructure improvements associated with the proposed Project and appropriate mitigation described herein would be implemented as necessary to ensure potential impacts are reduced to a less than significant level to the extent feasible.

The GHG emissions analysis is provided for the following recent comparable infrastructure projects:

- Sly Park Intertie Improvements Project (EID 2024)
- Upper Main Ditch Piping Project (EID 2018a)
- Flumes 38, 39/40, 44 and Canal Replacement Project (EID 2018b)

A detailed GHG emissions analysis was performed for each project. The analysis incorporated estimates for the types of construction equipment to be used, construction crew size, worker and vendor vehicle haul trips, and construction schedule. The GHG emissions analysis for each project was based on these project-specific estimates and assumptions that were then used as inputs to the California Emission Estimator Model (CalEEMod). The unmitigated emissions modeling demonstrates that GHG emissions would not exceed the 1,100 MT CO_2e screening level threshold discussed previously for the three comparable projects. Additional details for each project and the results of the CalEEMod analysis are provided below.

Sly Park Intertie Improvements Project

The Sly Park Intertie (SPI) Improvements Project involves the replacement of approximately 6 miles of an existing 22- to 24-inch diameter steel pipeline, which extends between the District's Reservoir 1 Water Treatment Plant and Reservoir A Water Treatment Plant and continues to the Sly Park Hills Tank. The SPI Project would replace the SPI with a new pipeline and also include installation of a new pump station and associated appurtenances. Key construction activities would include site preparation and vegetation clearing, excavation and removal of the existing pipeline, placement of bedding materials as required, placement of the new sections of piping (typically 20- to 40-foot sections), backfilling and compaction of the trench, placement of appurtenances such as isolation valves, blow-offs, air relief valves and manways along the pipeline, and restoration of the disturbed area. Additionally, a new pump station, electrical service, and backup power supply generator would be constructed at Reservoir A Water Treatment Plant. Construction is planned to occur over a period of approximately 18-months. As a pipeline replacement, post-construction operation of the pipeline is anticipated to be similar to existing conditions. However, the project includes the operation of a new pump station and backup generator. The backup generator was assumed to operate up to 100 hours per year for scheduled maintenance. Therefore, there is an analysis of both construction-related emissions and operations-related emissions. Construction of the SPI Improvements Project would generate approximately 857 MT CO_2e and operational activities would result in approximately 64 MT CO_2e per year[1].

Upper Main Ditch Piping Project

The Upper Main Ditch Piping Project involved the conversion of an earthen lined ditch to a 3-mile buried 42-inch pipe. The pipeline connects the El Dorado Forebay to the Reservoir 1 Water Treatment Plant. The project includes appurtenant facilities such as tying into the outlet pipe downstream of the Forebay Reservoir Valve House and

1 Construction and operational emissions associated with the Sly Park Intertie Improvement Project obtained from Table 3.8-1 and Table 3.8-2, respectively, from the Sly Park Intertie Improvements Project Environmental Impact Report (EID 2024).

improvements to the inlet facility at the Water Treatment Plant. Project activities include tree removal, excavation and trenching for pipeline placement, grading and compaction, and placement of appurtenances such as isolation valves, blow-offs, air relief valves and manways along the pipeline. Construction related activities were estimated to occur over 12-months (approximately 30 weeks), spread over two construction seasons, during the annual ditch outage that typically occurs each fall and winter. Operational activities were considered to be similar to existing conditions and therefore, no operations-related analysis was necessary to conclude that there would be no long-term GHG emissions impacts. Construction activities associated with the Upper Main Ditch Piping Project would generate approximately 319 MT CO_2e[2].

Flumes 38, 39/40, 44, and Canal Replacement Project

The Flumes 38, 39/40, 44, and Canal Replacement Project involved the conversion of approximately 1,200 feet of wooden flumes to concrete structures and relining of approximately 1,900 feet of concrete canal. Project activities include tree and vegetation removal, demolition of the existing facilities, grading, hillside stabilization, and construction of mechanically stabilized earth walls to support the new concrete conveyances, improvements to the canal bench, and application of air-placed concrete to the existing segments of the canal and conversion of wooden flume structures to pre-cast or air-placed concrete canal or box culvert. Construction related activities were estimated to occur in two phases over 11-months with phase 1 occurring August and December in the first year and phase 2 occurring July to December during the second year. Operational emissions were not modeled because there was no increase in capacity of the conveyance. The construction-related GHG emissions for phase 1 and phase 2 of the Flumes 38, 39/40, 44, and Canal Replacement Project were estimated to be approximately 471 MT CO_2e and 234 MT CO_2e, respectively[3].

The analysis of these three comparable projects illustrates that projects of similar size and scope to the proposed Project would not exceed the 1,100 MT CO_2e annual threshold. Moreover, not all proposed Project construction activities would be occurring concurrently. Therefore, it is reasonable to assume that based on the nature of the anticipated construction and the District's analysis of similar construction projects, that impacts of the proposed Project would not exceed the 1,100 MT CO_2e annual threshold. Additionally, the analyses for these projects are based on unmitigated emissions modeling. The proposed Project includes mitigation measures that would further help minimize potential GHG emissions impacts. Mitigation Measure 4.8-1 requires the District conduct a detailed quantification of all Project-related construction emissions and implement best management practices to reduce construction-related emissions so that daily emissions do not exceed the 1,100 MT CO_2e annual threshold. Although the best available evidence indicates the Project's potential GHG emissions impacts would be less than significant even without mitigation, a definitive determination of significance is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

[2] Construction-related emissions associated with the Upper Main Ditch Piping Project obtained from Table 3.7-2 from the Upper Main Ditch Piping Project Environmental Impact Report (EID 2018a).

[3] Construction-related emissions associated with the Flumes 38, 39/40, 44, and Canal Replacement Project obtained from Table 8 from the Flumes 38, 39/40, 44, and Canal Replacement Project Initial Study and Mitigated Negative Declaration (EID 2018b).

Mitigation Measures

Mitigation Measure 4.8-1: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed applicable thresholds.

Prior to construction of any Project elements associated with infrastructure improvements for the Project, the District or its contractor(s) shall quantify construction related GHG emissions for all Project-related construction activities. Emissions calculations shall quantify emissions from all construction-related sources, including but not limited to construction equipment use and vehicle trips (i.e., worker commutes, vendor trips, and haul trucks). Emissions shall be compared to the threshold of 1,100 MT CO_2e per year, or a more recent threshold adopted by El Dorado County AQMD available at the time of the analysis.

Should modeled emissions exceed this performance standard, the District shall revise the construction requirements for the proposed infrastructure improvements to incorporate measures to reduce construction-related emissions below applicable thresholds. Measures may include, but are not limited to the following:

- Improve fuel efficiency from construction equipment:
    - Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 5 minutes (as required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.
    - Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
- Train equipment operators in proper use of equipment.
- Use the proper size of equipment for the job.
- Use equipment with new technologies (repowered engines, electric drive trains) as feasible and applicable for the equipment types required by the construction activities.
- Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines) as feasible and applicable for the equipment types required by the construction activities.
- Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power as feasible and applicable based on the location of the construction activities.

Significance after Mitigation

Mitigation Measure 4.8-1 requires the District conduct a detailed quantification of all Project-related construction emissions and implement specified best management practices to reduce construction-related emissions so that emissions do not exceed the 1,100 MT CO_2e annual threshold. While the information

from comparable past projects and implementation of Mitigation Measures 4.8-1 indicates that potential construction-related GHG emissions impacts associated with the proposed Project would be less than significant, this impact conclusion is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Table 4.8-3 presents the hydroelectric generation changes and potential changes in GHG emissions compared to the current baseline for this phase of the Project for each water year type as shown by the hydrologic modeling.

Table 4.8-3. Post-Construction (Current Baseline vs Project): Hydroelectric Generation Changes by Powerhouse and Water Year Type and Associated GHG Emissions

Condition	Powerhouse	Utility	Wet	Above Normal	Below Normal	Dry	Critically Dry	Average Annual
Operations with water Demands (2022)	El Dorado Powerhouse (MWh/year)	Pioneer Community Energy	3,245	3,487	4,385	1,761	-4,872	871
	Camino Powerhouse (MWh/year)	SMUD	82	2	113	-10	-244	-26
	Jaybird Powerhouse (MWh/year)		67	4	136	3	-232	-21
	Union Valley Powerhouse (MWh/year)		31	0	30	-5	-92	-12
	White Rock Powerhouse (MWh/year)		-453	-217	-289	-594	-3,296	-1,271
	Chili Bar Powerhouse (MWh/year)		-14	-14	-137	-49	-269	-118
Subtotal	*Change in Hydroelectric Generation at SMUD Powerhouses* (MWh/year)		-287	-225	-147	-655	-4,133	-1,448
	GHG Emissions (MT CO_2e)		**-447**	**-497**	**-652**	**-141**	**1594**	**157**

Source: Changes in power generation obtained from modeling conducted by Zanjero in 2024; GHG emissions calculated by AECOM in 2024.
Notes: GHG = greenhouse gas; MT CO_2e = metric tons carbon dioxide equivalent; MWh/year = megawatt-hours per year; SMUD = Sacramento Municipal Utility District
Water year type based on unimpaired runoff in the American River below Folsom Lake published in the California Department of Water Resources (DWR) Bulletin 120 "Report of Water Conditions in California."

Under the current baseline (2022 conditions), Project operations following construction of improvements are anticipated to result in an increase in annual hydroelectric generation of 871 MWh at the El Dorado Powerhouse and a total annual hydroelectric generation reduction of 1,448 MWh across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD based on the average annual hydrologic condition. As described above, this potential change in hydroelectric generation was multiplied by Pioneer Community Energy and SMUD GHG intensity electricity factors, respectively, to estimate the potential change in emissions if this electricity generation were compensated by the utility's general power mix instead (i.e., a mix of renewable and nonrenewable energy resources). Under the current baseline, Project operations following construction of improvements would result in a potential increase of 157 MT CO_2e per year based on the average

annual hydrologic condition. However, as described previously, the potential change in hydroelectric generation is highly dependent on the hydrologic condition. For example, although the critically dry hydrologic condition would result in an overall decrease in hydroelectric generation and result in a potential increase of 1,594 MT CO_2e if this electricity generation were compensated by the utility's general power mix instead, all other hydrologic conditions would result in an overall increase in hydroelectric generation. In other words, under the wet, above normal, below normal, and dry hydrologic conditions, post-construction Project operations would result in a potential reduction in GHG emissions, if this electricity were otherwise generated by the utility's general power mix instead. Therefore, while post-construction Project operations could result in changes to hydroelectric generation that would result in an exceedance of the 1,100 MT CO_2e screening threshold under critically dry conditions (30 percent of the 47 years of modeling data), the potential change in hydroelectric generation and associated emissions under all other years (70 percent of the 47 years of modeling data) would result in a reduction in GHG emissions. Therefore, and as described above, this analysis utilizes the average annual conditions to inform the significance determination, which would result in a potential increase of 157 MT CO_2e per year when compared to current baseline conditions. In addition, as described in Section 4.8.2 above, SB 100 requires that renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045. Therefore, over time as utilities increase their renewable and zero-carbon resources to meet RPS requirements, the utilities' general mix that would replace the reduced hydroelectric generation would result in less GHG emissions than presented here. As such, the reduction in the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 21112, would not result in an increase in GHG emissions that would exceed the screening level threshold of 1,100 MT CO_2e.

Table 4.8-4 presents the hydroelectric generation changes and potential changes in GHG emissions under the future baseline for this phase of the Project for each water year type as shown by the hydrologic modeling.

Table 4.8-4. Post-Construction (Future Baseline vs. Future Project): Hydroelectric Generation Changes by Powerhouse and Water Year Type and Associated GHG Emissions

Condition	Powerhouse	Utility	Wet	Above Normal	Below Normal	Dry	Critically Dry	Average Annual
Operations with Future Water Demands (2045)	El Dorado Powerhouse (MWh/year)	Pioneer Community Energy	1,643	1,042	2,577	-4,462	-14,734	-3,874
	Camino Powerhouse (MWh/year)	SMUD	11	52	-34	-32	-7	-6
	Jaybird Powerhouse (MWh/year)		10	75	-19	7	50	20
	Union Valley Powerhouse (MWh/year)		4	15	-22	-27	-10	-8
	White Rock Powerhouse (MWh/year)		-990	-979	-668	-3,187	-7,100	-3,028
	Chili Bar Powerhouse (MWh/year)		-54	-58	-80	-321	-591	-253
Subtotal	*Change in Hydroelectric Generation at SMUD Powerhouses* (MWh/year)		-1,019	-895	-823	-3,560	-7,658	-3,275
	GHG Emissions (MT CO_2e)		**0**	**0**	**0**	**0**	**0**	**0**

Source: Changes in power generation obtained from modeling conducted by Zanjero in 2024; GHG emissions calculated by AECOM in 2024.
Notes: GHG = greenhouse gas; MT CO_2e = metric tons carbon dioxide equivalent; MWh/year = megawatt-hours per year; SMUD = Sacramento Municipal Utility District
Water year type based on unimpaired runoff in the American River below Folsom Lake published in the California Department of Water Resources (DWR) Bulletin 120 "Report of Water Conditions in California."

Compared to the future baseline (2045 conditions), post-construction Project operations are anticipated to result in an annual hydroelectric generation reduction of 3,874 MWh at the District's El Dorado Powerhouse and a total annual hydroelectric generation reduction of 3,275 MWh across the Camino, Jaybird, Union Valley, White Rock, and Chili Bar Powerhouses owned and operated by SMUD based on the average annual hydrologic condition. As described previously, pursuant to SB 100, by 2045, utilities will be required to supply 100 percent of electric retail sales to end-use customers from renewable energy and zero-carbon resources. Therefore, under the future baseline (2045 conditions), although there would be a reduction in the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 2112, the slight reduction in hydroelectric production resulting from the proposed Project would not result an increase in reliance on fossil fuels to supplement the reduction, as utilities would be required to have sufficient renewable energy sources in order to meet RPS. Therefore, under the future baseline (2045 conditions), post-construction Project operations would not result in an increase in GHG emissions. This Project would also not preclude utilities from procuring renewable energy and meeting RPS milestone requirements.

As such, the reduction in the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 21112, would not result in an increase in GHG emissions. Therefore, this impact would be **less than cumulatively considerable**.

Impact 4.8-2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Operational Impacts (Existing Infrastructure)

As described in Section 4.8.2, California has prepared a series of Scoping Plans that establish the framework of action for California to reduce statewide emissions per AB 32, SB 32, and AB 1279. As acknowledged in the 2022 Scoping Plan, much of the State's success to date in reducing GHGs is due to decarbonization of the electricity sector as a result of the RPS and SB 100 implementation. One of the pillars identified in the 2022 Scoping Plan is continued decarbonization of the electricity sector, which calls for using energy more efficiently and replacing fossil-fueled generation with renewable and zero-carbon resources, including solar, wind, energy storage, geothermal, biomass, and hydroelectric power.

As described previously, to implement the proposed modification to Permit 21112, the District would reduce the amount of water diverted for power generation by the amount designated for consumptive use under a modified Permit 21112. These modifications may reduce the ability for powerhouses in the South Fork American River to generate electricity, resulting in an overall reduction in electricity generation by these facilities. While changes in operations would not directly increase GHG emissions, the operational changes could induce compensating changes elsewhere in the interconnected energy grid. The compensating changes could cause indirect increases in GHG emissions from other power plants that rely on fossil fuels. However, as described in Impact 4.8-1, the Project's potential increase in GHG emissions under the average annual hydrologic condition for the current and future baselines would not exceed the 1,100 MT CO_2e annual screening threshold and would not be cumulatively considerable. Furthermore, as an additional point of reference for context, the reduction in hydroelectric power generation resulting from implementation of the Project with existing infrastructure under the current baseline would represent 0.001 percent of the 2022 total system electric generation in California (287,220 Gigawatt hours) and approximately 0.002 percent of the 2022 total system renewable electric generation in California (155,747 Gigawatt hours).

Although the Project with the existing infrastructure would slightly reduce the amount of hydroelectric energy generation, any additional electricity generation would be supplemented through existing or already-committed resources available in the region's electricity grid and as approved by the California Public Utilities Commission (CPUC). In 2022, energy supplied by SMUD for their base plan consisted of approximately 24 percent eligible renewable sources, 25 percent large hydroelectric, 46 percent natural gas, 4 percent unspecified power, and less than 1 percent each of nuclear other power sources (CEC 2023a). In 2022, energy supplied by Pioneer Community Energy for their base plan consisted of approximately 44 percent eligible renewable sources, 1 percent large hydroelectric, 28 percent nuclear, and 27 percent unspecified power (CEC 2023b). Since the utilities are already increasing their procurement of energy from renewable energy sources in order to meet RPS requirements, the slight reduction in hydroelectric production resulting from the proposed Project would not result in a substantial increase in reliance on fossil fuels. This Project would also not preclude utilities from procuring renewable energy and meeting RPS milestone requirements. In addition, the replacement sources would be required to comply with CARB programs and mandatory reporting requirements, such as Cap-and-Trade, to achieve state-wide goals for GHG emissions. Furthermore, the CEC acknowledges that hydroelectric energy supply is highly variable and dependent on available water supply and recognizes that increased development of renewable electric generation is likely to replace a large portion of hydroelectricity (CEC 2015). Therefore, the Project would not conflict with the goals and objectives of the 2022 Scoping Plan or SB 100.

In addition, as described in Section 3.4, long-term water supply planning forecasts (including the District's 2013 Integrated Water Resources Master Plan and the El Dorado County Water Agency 2014 West Slope Update to the Water Resources Development & Management Plan) indicate that a portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills and at a higher elevation (Figure 3-2). Delivering water to these higher elevation areas of the District's service area would require extensive energy-intensive pumping of raw and treated water from the Folsom Reservoir area, which would lead to an increase in GHG emissions. Therefore, the District proposes to petition the SWRCB to modify Permit 21112 to allow an additional upstream point of diversion on the South Fork at the District's existing El Dorado Diversion Dam near Kyburz and an additional place of storage and point of re-diversion storage at Jenkinson Lake. With the additional upstream point of diversion, water could be diverted from higher elevations under Permit 21112 and then delivered to customers at lower elevations via gravity flow to meet demands throughout the District's service area without excessive use of energy and associated GHG emissions. As described in the 2008, 2014, and 2017 Scoping Plans, since water delivery is very energy-intensive, implementing programs that reduce the need for electricity to move and treat water can reduce GHG emissions in the electricity sector. Therefore, the Project would not conflict with Scoping Plan goals and objectives.

Based on the estimated GHG emissions and the requirements in place for existing energy sources to comply with federal and state programs, this Project would not conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This impact would be **less than significant.**

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet

current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project construction activities are not known at this time. However, as described in Impact 4.8-1, Mitigation Measure 4.8-1 requires the District conduct a detailed quantification of all Project-related construction emissions and implement specified best management practices to reduce construction-related emissions so that emissions do not exceed the 1,100 MT CO_2e annual threshold.

As described in Section 4.8.3, in response to AB 32, SB 32, and AB 1279, CARB has approved a series of Climate Change Scoping Plans and Scoping Plan updates. While the Scoping Plan updates do include measures that would indirectly address GHG emissions associated with construction activities, including the phasing in of cleaner technology for diesel engine fleets (including construction equipment) and Low Carbon Fuel Standard, successful implementation of these measures predominantly depends on the development of laws and policies at the state level. It is therefore assumed that any requirements or policies formulated under the mandates of AB 32, SB 32, or AB 1279 that would be applicable to the Project, either directly or indirectly, would be implemented consistent with statewide policies and laws. Although the specific timing for implementing potential construction-related improvements to allow for the diversion of up to 156 cfs is unknown, construction activities, including on-road and off-road construction equipment fleets, would be required to comply with rules and regulations applicable to construction activities at the time of the construction activities. Therefore, construction activities would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. This impact would be **less than significant.**

Operational Impacts (Post-Construction)

As described above for operational impacts (existing infrastructure), the proposed modifications to Permit 2112 may reduce the ability for powerhouses in the South Fork American River to generate electricity, resulting in an overall reduction in electricity generation by these facilities. While changes in operations would not directly increase GHG emissions, the operational changes could induce compensating changes elsewhere in the interconnected energy grid. The compensating changes could cause indirect increases in GHG emissions from other power plants that rely on fossil fuels. However, as described in Impact 4.8-1, the potential increase in GHG emissions under the current and future baselines would not exceed the 1,100 MT CO_2e annual screening threshold and would not be cumulatively considerable. Furthermore, as an additional point of reference for context, the reduction in hydroelectric power generation resulting from implementation of the Project post-construction would represent 0.0002 percent of the 2022 total system electric generation in California (287,220 Gigawatt hours) and less than 0.0004 percent of the 2022 total system renewable electric generation in California (155,747 Gigawatt hours). Therefore, for the same reasons described above for operational impacts (existing infrastructure), the slight reduction in hydroelectric production resulting from the proposed Project would not result in a substantial increase in reliance on fossil fuels. This Project would also not preclude utilities from procuring renewable energy and meeting RPS milestone requirements. Thus, the Project would not conflict with the goals and objectives of the 2022 Scoping Plan or SB 100.

In addition, as described in Section 3.4, long-term water supply planning forecasts (including the District's 2013 Integrated Water Resources Master Plan and the El Dorado County Water Agency 2014 West Slope Update to the

Water Resources Development & Management Plan) indicate that a portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills and at a higher elevation (Figure 3-2). Delivering water to these higher elevation areas of the District's service area would require extensive energy-intensive pumping of raw and treated water from the Folsom Reservoir area, which would lead to an increase in GHG emissions. Therefore, the District proposes to petition the SWRCB to modify Permit 21112 to allow an additional upstream point of diversion on the South Fork at the District's existing El Dorado Diversion Dam near Kyburz and an additional place of storage and point of re-diversion storage at Jenkinson Lake. With the additional upstream point of diversion and these proposed modifications, water could be diverted from higher elevations under Permit 21112 and then delivered to customers at lower elevations via gravity flow to meet demands throughout the District's service area without excessive use of energy and associated GHG emissions. As described in the 2008, 2014, and 2017 Scoping Plans, since water delivery is very energy-intensive, implementing programs that reduce the need for electricity to move and treat water can reduce GHG emissions in the electricity sector. Therefore, the Project would not conflict with Scoping Plan goals and objectives.

Based on the estimated GHG emissions and the requirements in place for existing power plants and energy sources to comply with federal and state programs, this Project would not conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This impact would be **less than significant.**

Mitigation Measures

No mitigation is required.

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4.9 HAZARDS AND HAZARDOUS MATERIALS

This section provides an analysis of potential impacts related to hazards and hazardous materials associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.9.1 EXISTING CONDITIONS

PROJECT SETTING

The Project area is located within and near the South Fork of the American River from Kyburz, California to Folsom Reservoir (Exhibit 3.4, Existing Water Supply Infrastructure (South Fork American River) as well as the El Dorado Canal, Hazel Creek Tunnel, and the channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake (Exhibit 3.6, Project Construction Alignment).

SCHOOLS

The Project area is located within the Pollock Pines Elementary School District, Silver Fork School District, and the El Dorado Union High School District (El Dorado County 2015). The Pollock Pines Elementary School District operates one elementary school (kindergarten through fourth grade), and one middle school (fifth through eighth grade). The Silver Fork School District operates one school (kindergarten through eighth grade). The El Dorado Union High School District operates four high schools. The nearest school to the Project construction alignment is Silver Fork School at 1325 School Road in Kyburz, California, located approximately 0.75 miles northeast of the western segment of the El Dorado Canal.

HAZARDOUS MATERIALS SITES

The Cortese list, which is compiled pursuant to Government Code Section 65962, is used to comply with CEQA requirements and provides a list of the known locations of hazardous material release sites. The EnviroStor database, which is managed by the Department of Toxic Substances Control (DTSC), is used to determine the proximity of a project to the nearest hazardous materials site. Several hazardous waste sites are located in the EID service area and are generally located within developed areas, such as in Placerville and Diamond Springs, and along major highways or roadways, including Highway 50 and State Route 49. These hazardous waste sites include leaking underground storage tanks, well water contamination, and former mine and sawmill operations (DTSC 2023, SWRCB 2023). Ultramafic and serpentine rocks are associated with naturally occurring asbestos (NOA). Asbestos occurrences and ultramafic rock outcropping are identified in portions of western El Dorado County (El Dorado County 2015).

The area of proposed construction contains no sites listed on the Cortese list, nor any sites that would be eligible for listing based on the criteria outlined in Government Code Section 65962. The nearest DTSC hazardous site to the areas of proposed construction is the Hazel Creek Mine which is located along Hazel Creek approximately 0.1 mile east from the channel that conveys water from the outfall of Hazel Creek Tunnel to Jenkinson Lake. This DTSC hazardous site is located on the opposite side of Hazel Creek from the channel that would be improved under the proposed Project. This site is designated as an evaluation site that has the potential to adversely affect

water quality and detection monitoring program has been implemented (DTSC 2023, SWRCB 2023). This is also the SWRCB hazardous site closest to the areas of proposed construction.

EMERGENCY RESPONSE AND EMERGENCY EVACUATION PLANS

The Project area, and the District as a special district providing water and wastewater utility in the area, are covered in the 2006 El Dorado County Operational Area Emergency Operations Plan (EOP) as identified in the Local Regulatory Framework below.

WILDLAND FIRE RISK

The severity of wildland fires is influenced primarily by vegetation, topography, and weather (temperature, humidity, and wind). The California Department of Forestry and Fire Protection (CAL FIRE) hazard severity scale defined in the Regulatory Framework below considers vegetation, climate, and slope to evaluate the level of wildfire hazard in a SRA. CAL FIRE designates three levels of Fire Hazard Severity Zones (Moderate, High, and Very High) to indicate the severity of fire hazard in a particular geographical or SRA area.

The Project is within areas designated as a State Responsibility Area (SRA) and Federal Responsibility Area (FRA) and within the SRA that is protected by the Amador-El Dorado CAL FIRE unit and is considered to have a Very High fire hazard severity rating (CAL FIRE 2023). The State of California is responsible for fire prevention and suppression in those areas. Other parts of the Project area are within an FRA and the U.S. Forest Service is responsible for fire prevention and suppression in those areas. However, all fire agencies in El Dorado County work cooperatively together to suppress wildland fires (EDLAFCO 2011). Fire hazard zoning is used to indicate both the likelihood for a fire (e.g., prevalence of fuels) and the potential for damage (e.g., proximity to residences).

4.9.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Resources Conservation and Recovery Act

The Resources Conservation and Recovery Act (RCRA) set up the federal regulatory program for hazardous substances and gives the United States Environmental Protection Agency (USEPA) the authority to regulate the generation, transport, treatment, and disposal of hazardous substances in a “cradle to grave” system. Under the RCRA, USEPA regulates the generation, transportation, treatment, storage, and disposal of hazardous substances. This regulatory system includes tracking all generators of hazardous waste.

1984 Hazardous and Solid Waste Amendment Act

RCRA was amended by the 1984 Hazardous and Solid Waste Amendment Act, which prohibited the use of certain techniques for the disposal of certain hazardous wastes (USEPA 2023a). The Emergency Planning and Community Right-to-Know Act of 1986 imposes safety requirements to protect local communities in the event of accidental release of hazardous substances. The requirements provide measures so that the risks from interaction with hazardous materials, such as handling, storage, and disposal, are mitigated or prevented. This law protects human health and the environment if the unintended release of hazardous materials was to occur (USEPA 2023b). EPA has delegated fulfillment of many of the RCRA’s requirements to the DTSC.

Clean Air Act

Regulations under the Clean Air Act (CAA) (42 USC 7401 et seq. as amended) are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a threshold quantity or greater of listed regulated substances to develop a risk management plan, including hazard assessments and response programs to prevent accidental releases of listed chemicals.

Hazardous Materials Transportation Act

The transport of hazardous materials is regulated by the U.S. Department of Transportation (DOT) under Hazardous Materials Transportation Act (HMTA). To accomplish this, the Federal Aviation Administration, Federal Motor Carrier Safety Administration, Federal Railway Administration, Pipeline and Hazardous Materials Safety Administration, and the U.S. Coast Guard have been given authority to enforce hazardous material transport regulations (DOT 2021).

Occupational Safety and Health Administration

The Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration (OSHA), which is responsible for protecting the health of workers, such as during the handling of hazardous materials. OSHA has created regulations to set federal standards of workplace safety including exposure limits, mandatory workplace training, accident and injury reporting, and safety procedures. These regulations are recorded in the Code of Federal Regulations (CFR) Title 29.

Federal Power Act 16 U.S.C. §§ 797(e) and 808 (2000)

The Federal Power Act (FPA) is the primary federal statute governing the wholesale transmission and sale of electric power, as well as the regulation of hydroelectric power (CRS 2020). The Federal Energy Regulatory Commission (FERC) licenses and regulates the construction and operation of non-federal hydropower projects under the FPA. The District owns and operates the El Dorado Hydroelectric Project (Project No. 184) under a license with FERC. The District, as the Licensee of Project No. 184 is responsible to comply with the articles and conditions contained in the FERC license, including the following condition relevant to hazardous materials:

Condition No. 15 – Hazardous Substances Plan: The plan establishes the District's responsibilities for the handling of hazardous materials within the FERC boundary (EID 2008).

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Hazardous Waste Control Act

The Hazardous Waste Control Act created the State hazardous waste management program. It is similar to, but more stringent than, the Federal RCRA program. The act is implemented by regulations contained in Title 26 of the California Code of Regulations (CCR), which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) is responsible for creating and enforcing environmental regulations within California. Within CalEPA is the DTSC, which was formed under the Hazardous Waste Control Act. The DTSC is responsible for regulating hazardous waste, remediating existing contamination, and identifying ways to reduce production of hazardous wastes. DTSC can delegate enforcement responsibilities to local jurisdictions.

Cortese List Government Code Section 65962

Government Code Section 65962 was enacted in 1985 and was amended in 1992. It is used as a planning document to comply with CEQA and requires information about locations of hazardous materials release sites. It states that through the combined efforts of the DTSC, the Department of Public Health, the State Water Resources Control Board (SWRCB) and local enforcement agencies, a list of potential hazardous areas and sites will be compiled and remain up to date (at a minimum annually updated). The list is consolidated by the Secretary for Environmental Protection and is distributed to each city and county in which sites on the list are located. The list can be found on the DTSC's data management system known as EnviroStor.

California Occupational Safety and Health Administration

The California Occupational Safety and Health Administration (Cal-OSHA) is responsible for enforcing workplace safety regulations and requirements in California, including hazardous materials requirements recorded under CCR Title 8. These regulations include requirements for safety training, availability of safety equipment, accident and illness prevention programs, warnings about hazardous substance exposure, and preparation of emergency action and fire prevention plans.

Cal-OSHA also enforces hazard-communication program regulations that contain training and information requirements. Such requirements include procedures for identifying and labeling hazardous substances, communicating information about hazardous substances and their handling, and preparing health and safety plans to protect workers and employees at hazardous waste sites. Under the hazard-communication program, employers must make Material Safety Data Sheets available to employees and document employee information and training programs.

California Emergency Services Act

The California Emergency Services Act provides the basic authority for conducting emergency operations following a proclamation of emergency by the governor and/or appropriate local authorities. Local government and district emergency plans are considered to be extensions of the California Emergency Plan, established in accordance with the Emergency Services Act.

The California Emergency Management Agency (Cal OES) is the state agency responsible for establishing emergency response and spill notification plans related to hazardous materials accidents. Cal OES regulates

businesses by requiring specific businesses to prepare an inventory of hazardous materials (CCR Title 19). Cal OES is also the lead state agency for emergency management and is responsible for coordinating the state-level response to emergencies and disasters. The Inland Region of Cal OES has responsibility for areas served by the District.

Fire Protection

California state fire safety regulations apply to SRAs during the time of year designated as having hazardous fire conditions. California Department of Forestry and Fire Protection (CAL FIRE) has developed a fire hazard severity scale that considers vegetation, climate, and slope to evaluate the level of wildfire hazard in all SRAs. An SRA is defined as the part of the state where CAL FIRE is primarily responsible for providing basic wildland fire protection assistance. Areas under the jurisdiction of other fire protection services are considered to be Local Responsibility Areas (LRAs) or on Federal lands are considered FRAs.

During the fire hazard season, these regulations include: (a) restrict the use of equipment that may produce a spark, flame, or fire; (b) require the use of spark arrestors on any equipment that has an internal combustion engine; (c) specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and (d) specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas. CAL FIRE has primary responsibility for fire protection within SRAs.

Regional and Local Plans, Policies, Regulations, and Ordinances

El Dorado County General Plan

The Project is proposed by the El Dorado Irrigation District (the District), a special district that supplies water to customers throughout much of El Dorado County. Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning requirements, as stated below:

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy facilities that are subject to Section 12808.5 of the Public Utilities Code. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.*

As a special district with equal authority, the District is exempt from the goals and policies within El Dorado County's General Plan and Zoning Ordinance that are listed below. However, the District aims to comply with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis (El Dorado County 2019). The General Plan's goals and policies related to hazards and hazardous materials include the following:

- **Goal 6.1:** Coordination - A coordinated approach to hazard and disaster response planning.
    - **Objective 6.1.1:** El Dorado County Multi-Jurisdictional Local Hazard Mitigation Plan—The El Dorado County Multi-Jurisdictional Local Hazard Mitigation Plan shall serve as the implementation program for this Goal.

- **Policy 6.1.1.1:** The El Dorado County Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) shall serve as the implementation program for the coordination of hazard planning and disaster response efforts within the County and is incorporated by reference into this Element. The County will ensure that the LHMP is updated on a regular basis to keep pace with the growing population.

► **Goal 6.2:** Fire Hazards - Minimize fire hazards and risks in both wildland and developed areas.

- **Objective 6.2.1:** Defensible Space—All new development and structures shall meet "defensible space" requirements and adhere to fire code building requirements to minimize wildland fire hazards.

  - **Policy 6.2.1.1:** Implement Fire Safe ordinance to attain and maintain defensible space through conditioning of tentative maps and in new development at the final map and/or building permit stage.

  - **Policy 6.2.1.2:** Coordinate with the local Fire Safe Councils, California Department of Forestry and Fire Protection, and federal and state agencies having land use jurisdiction in El Dorado County in the development of a countywide fuels management strategy.

- **Objective 6.2.2:** Limitations to Development—Regulate development in areas of high and very high fire hazard as designated by the California Department of Forestry and Fire Prevention Fire Hazard Severity Zone Maps.

  - **Policy 6.2.2.1:** Fire Hazard Severity Zone Maps shall be consulted in the review of all projects so that standards and mitigation measures appropriate to each hazard classification can be applied. Land use densities and intensities shall be determined by mitigation measures in areas designated as high or very high fire hazard.

  - **Policy 6.2.2.2:** The County shall preclude development in areas of high and very high wildland fire hazard or in areas identified as "urban wildland interface communities within the vicinity of Federal lands that are a high risk for wildfire," as listed in the Federal Register of August 17, 2001, unless such development can be adequately protected from wildland fire hazard, as demonstrated in a Fire Safe Plan prepared by a Registered Professional Forester (RPF) and approved by the local Fire Protection District and/or California Department of Forestry and Fire Protection.

- **Objective 6.2.3:** Adequate Fire Protection—Application of uniform fire protection standards to development projects by fire districts.

  - **Policy 6.2.3.1:** As a requirement for approving new development, the County must find, based on information provided by the applicant and the responsible fire protection district that, concurrent with development, adequate emergency water flow, fire access, and firefighting personnel and equipment will be available in accordance with applicable State and local fire district standards.

  - **Policy 6.2.3.2:** As a requirement of new development, the applicant must demonstrate that adequate access exists, or can be provided to ensure that emergency vehicles can access the site and private vehicles can evacuate the area.

- **Policy 6.2.3.4:** All new development and public works projects shall be consistent with applicable State Wildland Fire Standards and other relevant State and federal fire requirements.

- **Objective 6.2.4:** Area-Wide Fuel Management Program—Reduce fire hazard through cooperative fuel management activities.

  - **Policy 6.2.4.1:** Discretionary development within high and very high fire hazard areas shall be conditioned to designate fuel break zones that comply with fire safe requirements to benefit the new and, where possible, existing development.

  - **Policy 6.2.4.2:** The County shall cooperate with the California Department of Forestry and Fire Protection and local fire protection districts to identify opportunities for fuel breaks in zones of high and very high fire hazard either prior to or as a component of project review.

- **Objective 6.6.1:** Regulation of Hazardous Materials—Regulate the use, storage, manufacture, transport, and disposal of hazardous materials in accordance with State and Federal regulations.

  - **Policy 6.6.1.1:** The Hazardous Waste Management Plan shall serve as the implementation program for management of hazardous waste in order to protect the health, safety, property of residents and visitors, and to minimize environmental degradation while maintaining economic viability.

  - **Policy 6.6.1.2:** Prior to the approval of any subdivision of land or issuing of a permit involving ground disturbance, a site investigation, performed by a Registered Environmental Assessor or other person experienced in identifying potential hazardous wastes, shall be submitted to the County for any subdivision or parcel that is located on a known or suspected contaminated site included in a list on file with the Environmental Management Department as provided by the State of California and federal agencies. If contamination is found to exist by the site investigations, it shall be corrected and remediated in compliance with applicable laws, regulations, and standards prior to the issuance of a new land use entitlement or building permit.

El Dorado Hazardous Waste Management Plan

The El Dorado Hazardous Waste Management Plan serves as the implementation program for hazardous waste management in El Dorado County in order to protect residents, visitors, property, and the environment (El Dorado County 1990).

El Dorado County Code

El Dorado County Ordinance Code Chapter 8.38 regulates any person that would handle, store, use, transport, process or dispose of a hazardous material, hazardous waste, or extremely hazardous waste. Requirements under Chapter 8.38 include disclosure of hazardous materials release, possible hazardous materials inspection, and prevention of possible environmental impacts due to hazardous material.

Certified Unified Program Agency

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at

the local government level by Certified Unified Program Agencies (CUPAs). At the local level, a CUPA is responsible for addressing impacts from hazardous waste to ensure compliance with the requirements set by the Certified Unified Program. The CUPA acts as a central regulatory agency for project permits and compliance enforcement (CalEPA 2024). The El Dorado County Department of Environmental Management, Hazardous Waste Division, is approved by CalEPA as the CUPA for El Dorado County.

As of January 1, 2013, all existing businesses that store threshold quantities of hazardous materials or hazardous waste are required to annually update their hazardous materials information on California Environmental Reporting System (CERS) (El Dorado County 2024).

Community Wildfire Protection Plan

The El Dorado County Fire Safe Council has developed a Community Wildfire Protection Plan (CWPP) based on the requirements of the Healthy Forest Restoration Act of 2003, which identifies measures that protect and restore forest land and the 2010 Federal Land Assistance Management and Enhancement (FLAME) Act, which lead to the development of a cohesive strategy of interagency cooperation to address wildfire problems. The CWPP coordinates with the Local Hazard Mitigation Plan (LHMP) on wildfire issues. The CWPP provides educational opportunities for the public to understand the complex issues of fire and fuels and to engage in the decision-making process for community safety. (Fire Safe Council 2017).

El Dorado County Multi-Jurisdiction Local Hazard Mitigation Plan

As described under the El Dorado County General Plan, the El Dorado County Multi-Jurisdictional Local Hazards Mitigation Plan (LHMP) provides a risk assessment of all potential natural and selected human-caused hazards and identifies all potential types of disaster likely to occur in El Dorado County, including wildland fire. One purpose of the LHMP is to minimize the magnitude of potential wildfire disasters (El Dorado County 2018).

El Dorado County Operational Area Emergency Operations Plan

The 2006 El Dorado County Operational Area Emergency Operations Plan (EOP) is intended to guide the County in meeting the compliance requirements of the California Emergency Services Act, the Standardized Emergency Management System (SEMS), and the federal National Incident Management System (NIMS). The El Dorado County Operational Area EOP addresses El Dorado County's planned response to extraordinary emergency situations associated with natural disasters, technological (man-made) emergencies, acts of war and terrorism. The operational concepts reflected in the plan focus on large-scale emergencies and disasters that often generate situations requiring planned and coordinated responses by multiple disciplines, agencies, and jurisdictions. The plan is split into four federally defined phases: preparedness, response, recovery, and prevention.

The EOP states that it is expected that primary water sources could be compromised due to damage to their treatment plants, pump stations and/or the pipelines that distribute potable water. There will be high potential for contamination in open ditch systems during flooding, landslide, and disease outbreak.

The plan defines a hazardous materials incident as the result of an uncontrolled release of a hazardous substance(s) during storage or use from a fixed facility, residence, and agricultural operation or during transport. Because of the multitude of hazardous substances being transported, incidents are more likely to occur along highways. Fixed facilities also have occurrences of hazardous materials incidents. However, stringent facility

safety requirements help to limit these occurrences at fixed facilities. Command fixed facilities include manufacturing, industrial, retail, bulk fuel storage, water and wastewater treatment facilities.

The EOP identifies the District as a Principal Agency responsible for initial response to District utility systems during the following emergency events: wildland fire, severe weather, flooding, utility failure, HAZMAT event, dam/levee failure, landslide/avalanche, building fire/explosion, earthquake, civil disturbance, national security threat, terrorism, transportation mass casualty incident, public health threat, school emergency, and agricultural emergencies. Utilities, such as the District, are also identified in the EOP as having a supporting role in evacuation alerting, public information, scene management and a shared role in situational analysis and public information in the emergency events that they have the responsibility for initial response to utility systems.

4.9.3 IMPACT ANALYSIS

METHODOLOGY

This analysis considers the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from implementing the Project and identifies the primary pathways that these hazardous materials could expose individuals or the environment to health and safety risks. As discussed above, compliance with applicable federal, state, and local health and safety laws and regulations would generally protect the health and safety of the public. Local and state agencies would be expected to continue to enforce applicable requirements as required by law.

The following reports and databases documenting potential hazardous conditions in the Project area were reviewed for this analysis:

- Available data, including the SWRCB GeoTracker database, DTSC EnviroStor database, and the EPA EnviroMapper database
- Literature, including documents published by EID and county, state, and federal agencies
- Applicable elements from the El Dorado County General Plan

The information obtained from these sources was reviewed to characterize existing conditions and to evaluate the significance of potential environmental effects, based on the criteria identified below.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant [WTP] and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay

Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek and then to Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Section 3.6.4. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, an impact related to hazards and hazardous materials is considered significant if the project would result in any of the effects identified below.

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment;

b) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

c) 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;

d) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area;

e) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;

f) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

ENVIRONMENTAL IMPACTS

Impact 4.9-1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not increase transport, use, or disposal of hazardous materials compared to existing operations. Therefore, this phase would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials, or through reasonably

foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment, and **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Hazardous materials would be used in minor amounts during construction. Construction-related activities would involve use of hazardous materials, such as fuels (gasoline and diesel fuel), oils, hydraulic fluids, lubricants, and cleaners (which could include solvents and corrosives in addition to soaps and detergents) or exposure to lead-based paints. Construction workers and the general public could be exposed to hazards and hazardous materials as a result of improper storage, handling, or use during construction activities; transportation accidents; or fires, explosions, or other emergencies. Construction workers could also be exposed to hazards associated with accidental releases of hazardous materials, which could result in adverse health effects. Therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not increase transport, use, or disposal of hazardous materials compared to existing operations. Therefore, the Project would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment, and **no impact** would occur.

Mitigation Measures

Implement 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials

The District and any Contractors shall comply with all federal, state, and local plans, policies, ordinances rules, and regulations regarding the transport and use of hazardous materials. These include, but are not limited to, the following:

- 49 CFR 173, 49 CFR 177, and CCR Title 26, Division 6
- CCR Titles 8 and 22,
- The Uniform Fire Code
- Section 25100, Division 20 of the California Health and Safety Code
- Cal EPA's Unified Program

These regulations and codes are monitored by the state and/or local jurisdictions, including the El Dorado County Environmental Management Department.

Implement 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan

- For construction activities located within the FERC boundary, the District shall require the Contractor to follow the Project No. 184 Hazardous Substances Plan. For construction activities not located in the FERC boundary, the District shall prepare a Hazardous Materials Release Prevention Plan to reduce the risk of exposure to hazards due to the handling of hazardous materials during construction. Throughout construction, the construction contractor shall be responsible for following the plan and implementing the action plan in the event of a spill. The plan shall identify control measures to prevent the release of hazardous materials, as well as a detailed action plan to respond to an incidental spill in compliance with all local, State, and federal regulations relating to the handling and disposal of hazardous materials. The plan shall include, but would not be limited to, the following:

- Containment and cleanup equipment (e.g., absorbent pads, mats, socks, granules, drip pans, shovels, and lined clean drums) shall be at the staging areas and construction sites for use, as needed.

- Staging areas where refueling, storage, and maintenance of equipment occur shall not be located within 100 feet of drainages to reduce the potential for contamination by spills.

- Construction equipment shall be maintained and kept in good operating condition to reduce the likelihood of line breaks or leakage.

- No refueling or servicing shall be done within 25 feet of a waterway and without absorbent material (e.g., absorbent pads, mats, socks, pillows, and granules) or drip pans underneath to contain spilled

material. If these activities result in an accumulation of materials on the soil, the soil shall be removed and properly disposed of as hazardous waste.

- If a spill is detected, construction activities shall immediately cease in the area, and the procedures described in the plan shall be immediately enacted to safely contain and remove spilled materials.
- Hazardous waste shall not be stored or accumulated within the Project area. All contaminated materials shall be classified as hazardous waste and disposed of in accordance with all local, State, and federal regulations.
- Spill areas shall be restored to pre-spill conditions, as practicable.
- Spills shall be documented and reported to the District and appropriate resource agency personnel.

Implement 4.9-1c: Implement Mitigation Measure 4.10-1: Stormwater Management During Construction

The District shall develop and implement a Water Pollution Control Plan (WPCP) or Stormwater Pollution Prevention Plan (SWPPP) during construction. A site-specific WPCP will be required if disturbed areas are less than one acre. Compliance with the Construction General Permit, including the development and implementation of a SWPPP, will be required if disturbed areas are one or more acres. The construction site BMPs listed below will be included in the WPCP or SWPPP, as applicable.

- Spill prevention and control
- Stabilized construction entrance/exit
- Material delivery and storage
- Solid waste management
- Stockpile management
- Storm drain inlet protection
- Street sweeping and vacuuming
- Vehicle and equipment maintenance, cleaning, and fueling
- Concrete waste management
- Silt fencing, fiber rolls, or gravel bags
- Hydroseeding

The District shall ensure the SWPPP is prepared by a certified Qualified SWPPP Developer (QSD) and implemented consistent with all applicable requirements. The plan will then be implemented at the construction site by the construction contractor and monitored by a Qualified SWPPP Practitioner (QSP).

Significance After Mitigation

Implementation of Mitigation Measure 4.9-1a would reduce impacts related to hazards for construction workers and the general public because it would require the District and all contractors to comply with federal, state, and local hazardous materials regulations and codes whose purpose is to ensure safe handling and disposal of hazardous materials. Implementation of Mitigation Measure 4.9-1b would further reduce the potential for accidental release of hazardous materials by identifying control measures to prevent the release of hazardous materials, as well as a detailed action plan to respond to an incidental spill. Finally, implementation of Mitigation

Measure 4.9-1c would ensure that hazardous materials are not released through stormwater runoff into the environment in the event of upset and/or accident conditions. Together, implementation of these three mitigation measures would reduce potential hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment to **less than significant with mitigation incorporated**.

Impact 4.9-2. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not increase use of hazardous materials compared to current operations. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs. Construction activities would not occur within 0.25 miles of an existing or planned school. Therefore, **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

These operations would not increase use of hazardous materials compared to current operations. Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.9-3. 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?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

The existing facilities associated with the Project are not located on known or designated hazardous waste sites (DTSC 2023, SWRCB 2023). Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction activities would primarily occur at existing facilities within the existing conveyance alignment that are not located on a known or designated hazardous waste site. The nearest DTSC hazardous site is the Hazel Creek Mine, a DTSC hazardous site that is located on the opposite side of Hazel Creek, approximately 0.1 miles east of the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. This site is designated as an evaluation site that has the potential to adversely affect water quality; however, detection monitoring program has been implemented (DTSC 2023, SWRCB 2023). In addition, given the distance of this site from the nearest construction area, it would be unlikely to be disturbed by the proposed infrastructure improvements. Therefore, there would be **no impact**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations involves operation of improved facilities that would primarily be located within the same alignment as existing facilities, which are not located on known or designated hazardous waste sites (DTSC 2023, SWRCB 2023). Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.9-4. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

These operations would not involve new development designed for human occupancy or other activities that would locate people within an airport land use plan or within 2 miles of a public or public use airport. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

The construction phase would not involve new development designed for human occupancy. Construction activities would temporarily locate workers to staging and work areas along the El Dorado Canal and the channel

that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. However, the nearest aviation facility, Swansboro County Airport, is located over 10 miles from these construction areas. Therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area, and **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

These operations would not involve new development designed for human occupancy or other activities that would locate people within an airport land use plan or within 2 miles of a public or public use airport. Therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area, and **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.9-5. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not increase vehicle trips compared to existing operations and would not alter the transportation network. Therefore, this phase of the Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, and **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation

of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would generate vehicle trips from trucks delivering equipment and materials and workers traveling to and from construction site. This would temporarily increase vehicle trips on local roads, such as Sly Park Road and Highway 50. In addition, construction activities could involve temporary lane closures that would further impede local traffic. These conditions could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

These operations would not increase vehicle trips compared to existing operations and would not alter the transportation network. Therefore, this phase of the Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, and **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.9-2: Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)

Prior to construction, the construction contractor and/or the District shall prepare a traffic control plan. The traffic control plan shall contain detailed measures in order to ensure acceptable levels of traffic flow, emergency response notification and response times, and public and school bus transit coordination and detours. The Plan shall include at a minimum: discussion of expected construction schedule and locations, traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. The construction contractor and/or the District shall implement the traffic control plan during construction activities associated with the project.

Significance After Mitigation

Mitigation Measure 4.9-2 would require the preparation and implementation of a traffic control plan (Mitigation Measure 4.17-1). This plan would include traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. Implementation of Mitigation Measure 4.9-2 would reduce the risk that the potential Project would interfere with an adopted emergency response plan or emergency evacuation plan to **less than significant with mitigation incorporated**.

Impact 4.9-6. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve activities that contribute to increased fire risk. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts

than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be located in a forested/wildland area that is designated as a Very High fire hazard severity rating (CAL FIRE 2023). Construction activities for these improvements could increase fire risk through unintended release of sparks or heat from construction equipment onto nearby flammable material. Construction activities could involve vegetation clearing and ground disturbance in sloped areas. The amount of vegetation cleared in these areas would not be substantial, and remaining vegetation adjacent to the conveyance lines would be sufficient to retain soils and minimize the potential for downslope or downstream flooding or landslides as a result of post-fire slope instability, runoff, or other drainage changes. Project construction activities may increase the risk of wildland fire in the area; therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The post-construction phase of the Project would not create a fire hazard for the Project area because it would not involve activities that contribute to increased fire risk. Therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.9-3: Implement Mitigation Measure 4.20-1: Prepare and Implement a Fire Safety Plan.

The District shall require the Project contractor to prepare a Fire Safety Plan prior to construction. This plan shall be implemented by the Contractor during all construction activities. The plan shall describe the preventative measures for fire protection , fire-related roles and responsibilities of construction personnel, procedures for evaluating weather conditions during which fire risk is elevated (and identify conditions under which activities would cease due to elevated fire conditions), equipment required to prevent fire and respond to fire immediately, relevant emergency services agency contacts, and other measures taken to reduce fire risk, responsibilities of the work crews during construction.

Significance After Mitigation

Implementation of Mitigation Measure 4.20-2: Prepare and Implement a Fire Safety Plan would reduce wildfire risks associated with construction activities by requiring measures to prevent fire and providing procedures for responding to a fire. Therefore, impacts related to the potential for construction activities to introduce or exacerbate wildfire hazards would be **less than significant with mitigation incorporated**.

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4.10 HYDROLOGY AND WATER QUALITY

This section provides an analysis of the Project's potential impacts to hydrology and water quality. The analysis includes a description of existing conditions, the associated regulatory framework including applicable policies, the methods used to assess potential impacts, and an assessment of potential impacts based on the significance criteria. Changes in hydrodynamic parameters such as flow and storage, and water quality indicators such as changes to temperature, are evaluated in this section.

4.10.1 EXISTING CONDITIONS

SURFACE WATER

The hydrologic study area encompasses areas within and near the South Fork American River (or South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake. It includes the South Fork American River basin and segments of adjacent river basins which contribute flow to, or receive flow from, the South Fork American River. It also includes areas immediately downstream of Folsom Reservoir, specifically, the section of the Lower American River from Folsom, California to the Watt Avenue bridge in Sacramento, California. Folsom Reservoir provides water to the Lower American River and the Watt Avenue bridge is the location where water temperature targets have been established for Folsom Reservoir releases.

The South Fork American River is 90 miles long, flows west from its origins in the Eldorado National Forest in the Sierra Nevada, receives water from Silver Creek, a major tributary, and flows past the town of Coloma where it then turns southwest, receiving water from Weber Creek before entering Folsom Reservoir. The South Fork American River basin is approximately 840 square miles in size with elevations that range from approximately 9,900 feet at its headwaters to approximately 480 feet at Folsom Reservoir. From its headwaters, the South Fork descends through steep canyons characterized by pine forests and exposed bedrock. Channels are complex with substrates dominated by bedrock pools, boulders, and cobble. In the steep hill country, stream gradients are reduced but the channel is still complex and dominated by boulder and cobble substrates with frequent bedrock pools (Georgetown Divide Resource Conservation District 2003, Cosumnes American Bear Yuba [CABY] 2021).

Flow in the South Fork is regulated by numerous hydroelectric, water supply, and flood control projects. Although precipitation falls primarily as snow in the higher elevations with a spring runoff that extends into early summer, river dynamics no longer reflect an unrestricted natural flow regime. Several lakes in the upper watershed are managed for water supply and for recreation. In addition, there are ten hydroelectric plants located within the watershed – the Sacramento Municipal Utility District (SMUD) operates eight plants, and the El Dorado Irrigation District (District) and Hydroland Omega, LLC each operate one. SMUD also operates power facilities within the Middle Fork American River basin and transfers water to powerhouses located within the South Fork American River basin. Flow through power facilities located on the South Fork are regulated by the Federal Energy Regulatory Commission (FERC) under licenses for the District's El Dorado Hydroelectric Project (Project 184), SMUD's Upper American River Hydroelectric Project (Project 2101), and SMUD's Chili Bar Hydroelectric Project (Project 2155)[1]. In addition to power generation, surface water is used for municipal and agricultural water supplies.

[1] SMUD acquired the Chili Bar Hydroelectric Project in June 2021.

Figure 4.10-1 shows major surface water resources in the Project area along the South Fork American River and the Lower American River including Slab Creek Reservoir, Chili Bar Reservoir, Folsom Reservoir, and Lake Natoma. Figure 4.10-1 also shows the reservoirs and facilities operated by the District including Lake Aloha, Echo Lake, Caples Lake, Silver Lake, the El Dorado Diversion Dam, the El Dorado Canal, Hazel Creek Tunnel, Jenkinson Lake, and Forebay Reservoir. In addition, Figure 4.10-1 includes other reservoirs operated by SMUD: Camino Reservoir, Junction Reservoir, Union Valley Reservoir, and Ice House Reservoir. These reservoirs and facilities are described in subsections below.

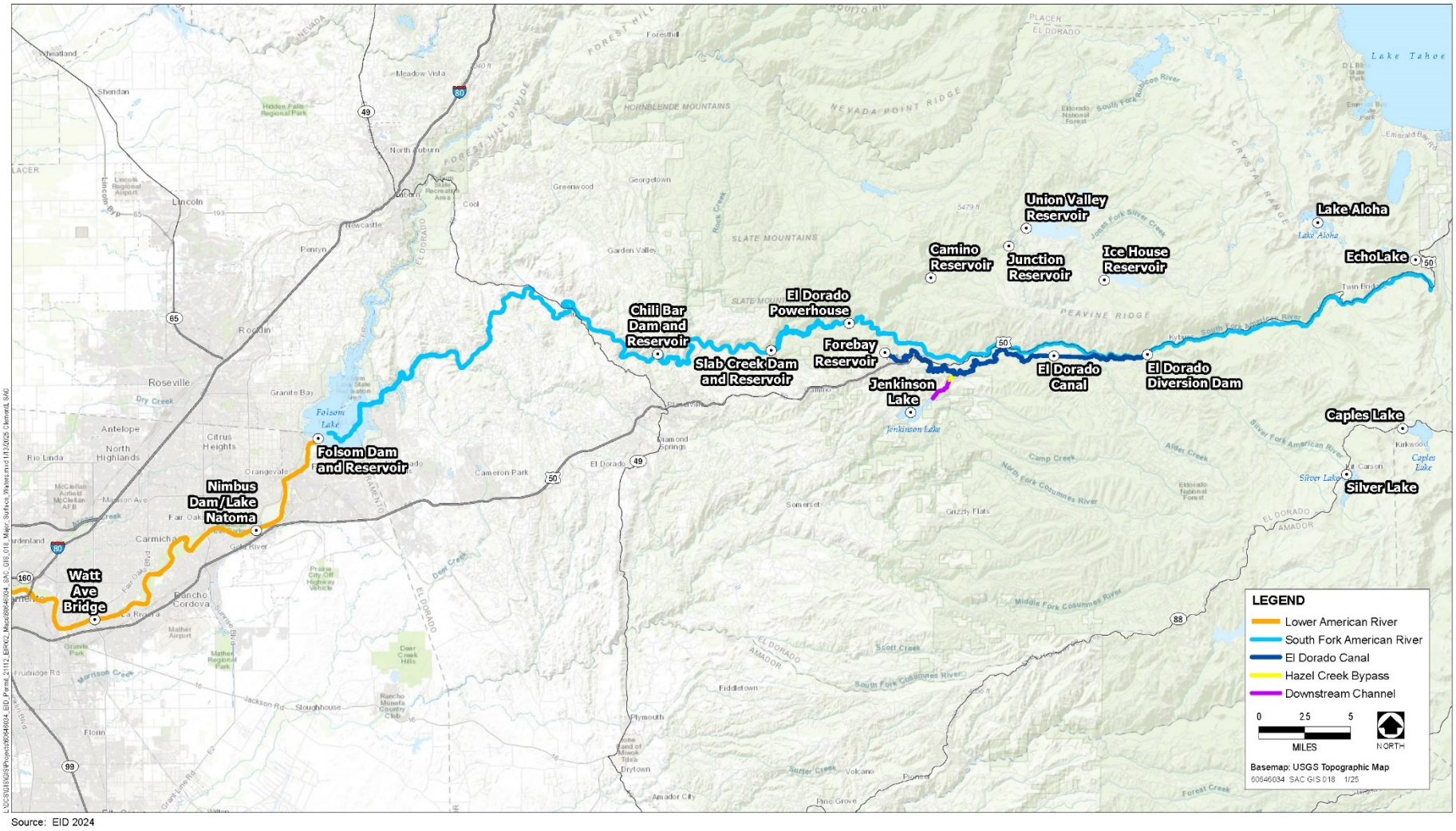
South Fork American River above El Dorado Diversion Dam

Tributaries to the South Fork American River above the El Dorado Diversion Dam include Sayles Canyon Creek, Pyramid Creek, Strawberry Creek, and the Silver Fork of the South Fork American River. Lakes and reservoirs in the upper tributaries include Silver Lake, Caples Lake, and Lake Aloha. In addition, water from Lower Echo Lake, which is located within the Upper Truckee River basin, is delivered to the South Fork American River via a conduit. These reservoirs are used to store water in the winter and spring for release to the South Fork and its tributaries for consumptive, hydropower, and fish and wildlife uses in the summer, fall, and early winter. The District's existing Water Right Permit 21112 (Permit 21112) allows a total of up to 32,931 acre-feet per year (AFY) to be diverted to storage in Silver Lake, Caples Lake, and Lake Aloha from November 1 to July 31 each year. Diversion to storage is limited to 21,581 AFY at Caples Lake, 6,000 AFY at Silver Lake, and 5,350 AFY at Lake Aloha. Power generation from the stored water is authorized under the District's Project 184 FERC license. The District's existing Permit 21112 allows for the consumptive use of water that has previously been stored and released for instream flows or for power generation under Project 184. This water can be re-diverted for consumptive use at Folsom Reservoir.

Monthly minimum flow releases are required at Echo Creek below Echo Dam, Pyramid Creek below Lake Aloha, Caples Creek below Caples Dam, and the Silver Fork American River below Silver Lake Dam in accordance with the District's FERC license for Project 184 (FERC 2006). Lake level targets are specified for Echo Lake, Caples Lake, Silver Lake and Lake Aloha to protect summer recreational uses under the District's FERC license for Project 184 (FERC 2006) and End-of-Month Lake Level Operational Requirements for Caples Lake, Silver Lake and Lake Aloha are also specified in the terms and conditions of Permit 21112 (State Water Resources Control Board [SWRCB] 2023).

South Fork American River between the El Dorado Diversion Dam and the El Dorado Powerhouse

Flow is diverted from the South Fork American River at the District's El Dorado Diversion Dam for hydroelectric generation under the District's pre-1914 and hydropower appropriative water rights, and for consumptive use under the District's pre-1914 water rights. In addition, pursuant to the District's FERC license for Project 184, a minimum flow release is maintained in the South Fork American River below the El Dorado Diversion Dam; minimum flows range from 15 cubic feet per second (cfs) to 240 cfs depending on month and water year type. These minimum flows were developed to support the integrity of aquatic resources in downstream areas, providing habitat with cool water temperatures for rainbow trout (FERC 2006).



Source: EID 2024

Figure 4.10-1. Major Surface Water Resources in the Hydrologic Study Area

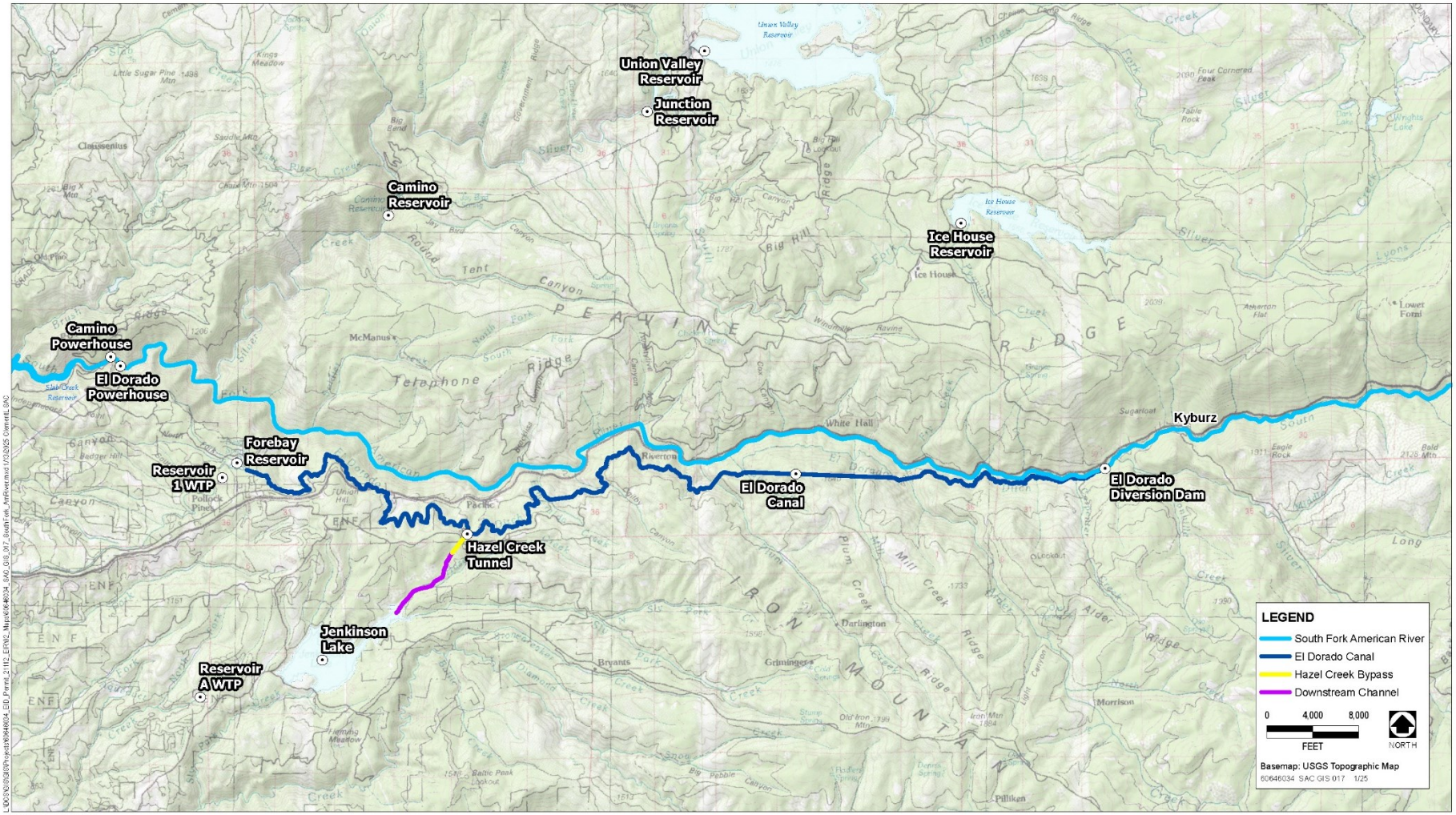
Flows of up to 145 cfs are currently diverted into the El Dorado Canal (shown in Figure 4.10-2). The El Dorado Canal also receives water from several small tributaries on the south side of the river (up to 10 to 15 cfs of flow from each). These tributaries include No Name Creek, Alder Creek, Mill Creek, Bull Creek, Ogilby Creek, and Esmeralda Creek. Contributions from these tributaries can supplement flow within the El Dorado Canal.

The El Dorado Canal provides water to the District's Forebay Reservoir which supplies water to the El Dorado Powerhouse or to the Reservoir 1 Water Treatment Plant (WTP) via pipeline or penstock. Water used to generate hydropower is returned to the South Fork below the El Dorado Powerhouse. The District also has infrastructure that diverts water from the El Dorado Canal into Hazel Creek Tunnel and conveys water from Hazel Creek Tunnel to Jenkinson Lake. Jenkinson Lake is a 41,000-acre-foot water supply reservoir owned and operated by the District. Jenkinson Lake provides water to Reservoir A WTP.

Other tributaries to the South Fork American River between the El Dorado Diversion Dam and the El Dorado Powerhouse include Soldier Creek and Silver Creek. SMUD operates the majority of its Upper American River Hydroelectric Project (Project 2101) within the Silver Creek watershed. Water stored in SMUD's Ice House Reservoir, Union Valley Reservoir, Junction Reservoir, and Camino Reservoir is used for power generation. Diversion for power generation also occurs within the Middle Fork's Rubicon River watershed, where water previously stored in SMUD's Rubicon Reservoir, Buck Island Reservoir, Loon Lake Reservoir, or Gerle Creek Reservoir is transferred to Union Valley Reservoir for additional power generation. Loon Lake Reservoir, Ice House Reservoir, and Union Valley Reservoir primarily operate as long-term storage reservoirs for winter/spring snowmelt runoff. Starting in mid-summer, the elevations of these storage reservoirs are gradually lowered as water is released to generate power. Junction Reservoir and Camino Reservoir primarily operate as re-regulating forebays and/or afterbays to various powerhouses (i.e., they are not operated to provide seasonal storage). Minimum flow releases are required at various locations within the Silver Creek watershed as per SMUD's FERC license. Below Camino Reservoir, minimum flows in Silver Creek range from 5 to 68 cfs depending on month and water year type (SWRCB 2013a).

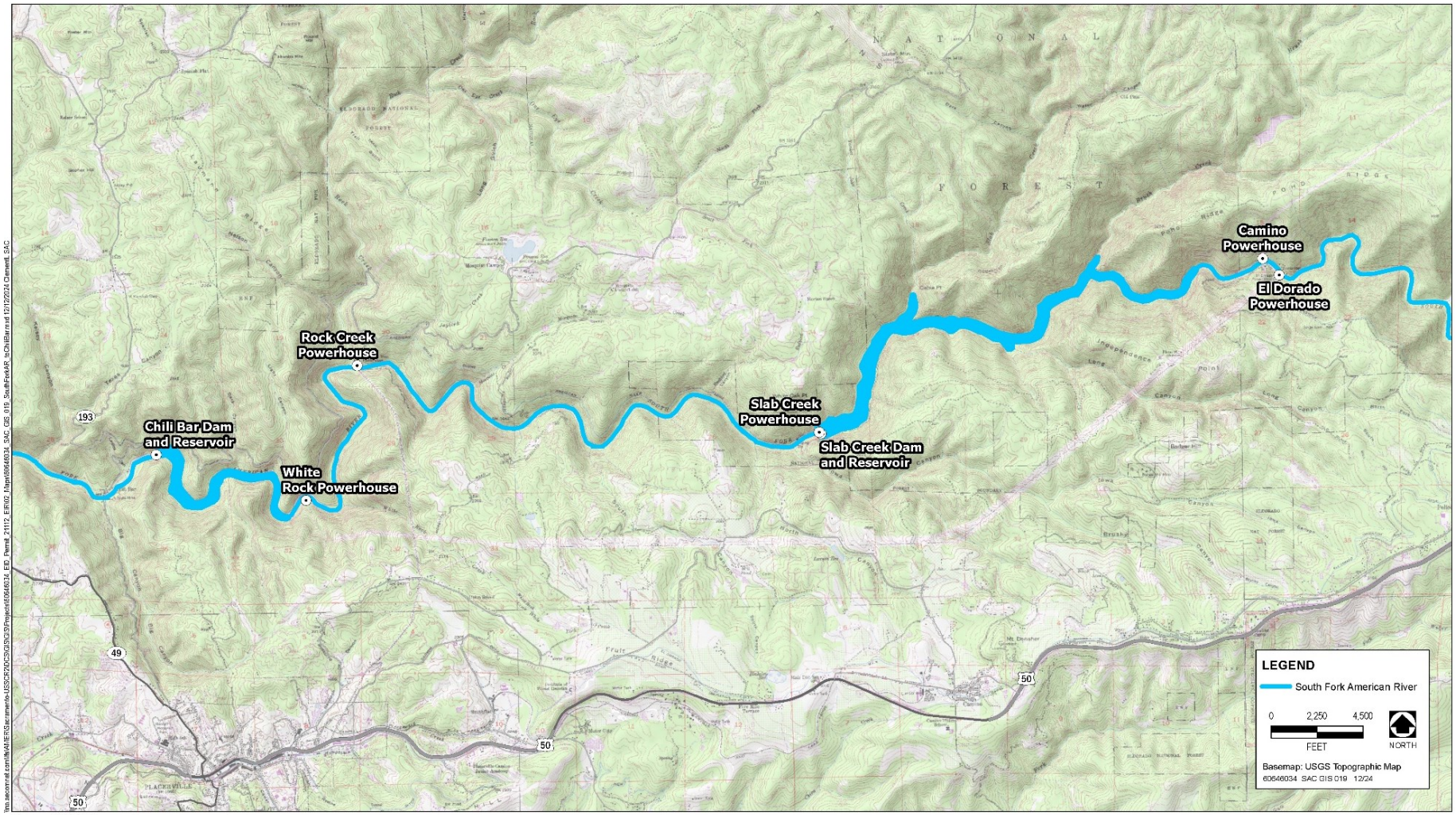
South Fork American River between El Dorado Powerhouse and Chili Bar

Two concrete dams span the South Fork American River between the El Dorado Powerhouse and Chili Bar, creating two separate impoundments: SMUD's Slab Creek Dam and Reservoir and Chili Bar Dam and Reservoir. Slab Creek Dam is a concrete arch dam with a central uncontrolled overflow spillway. Chili Bar Dam is a concrete gravity dam with a 170-foot-long spillway. Slab Creek Reservoir and Chili Bar Reservoir are used as re-regulating forebays and afterbays to various powerhouses. Powerhouses that directly or indirectly discharge water to this reach of the South Fork include the El Dorado Powerhouse (owned by the District), Camino Powerhouse (SMUD), Slab Creek Powerhouse (SMUD), Rock Creek Powerhouse (Hydroland Omega, LLC), White Rock Powerhouse (SMUD), and the Chili Bar Powerhouse (SMUD) (shown in Figure 4.10-3). Major tributaries to the South Fork within this reach include Brush Creek, Slab Creek, Iowa Canyon Creek, North Canyon Creek, South Canyon Creek, Mosquito Creek, Rock Creek, and White Rock Creek.



Source: EID 2024

Figure 4.10-2. South Fork American River between the El Dorado Diversion Dam and the El Dorado Powerhouse and El Dorado Canal



Source: EID 2024

Figure 4.10-3. South Fork American River between El Dorado Powerhouse and Chili Bar Dam

As previously described, water diverted from the South Fork at the District's El Dorado Diversion Dam and used for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. Water used for power generation in SMUD's Upper American River Hydroelectric Project is typically discharged to the South Fork at Camino Powerhouse, which is located approximately 0.25 mile downstream of the El Dorado Powerhouse. Maximum flow from the Camino Powerhouse is approximately ten times greater than the maximum flow from the El Dorado Powerhouse (U.S. Geological Survey [USGS] 2024). Flow from the El Dorado Powerhouse and the Camino Powerhouse contribute to the South Fork American River upstream of Slab Creek Reservoir. Slab Creek Reservoir acts a re-regulating afterbay for these flows.

Slab Creek Reservoir has a surface area of 280 acres when full, a pool elevation of about 1,850 feet, a usable storage capacity of 5,580-acre feet, and a normal maximum capacity of 16,600 acre-feet. Water levels fluctuate seasonally as well as daily in Slab Creek Reservoir due to power peaking. A typical change in water surface elevation under normal operations is approximately 6 feet on a daily basis and 30 feet on an annual basis (SWRCB 2013a, Table 1).

Pursuant to SMUD's FERC license for the Upper American River Hydroelectric Project (Project 2101), water levels are required to be maintained above 1,830 feet elevation during July through September between 10 am and 8 pm and water level fluctuations are limited to less than 7 feet per day (SWRCB 2013a). Minimum streamflow required below Slab Creek Dam ranges from 63 to 415 cfs based on month and water year type, with minimum streamflow changing weekly in some months. Recreational streamflows are also required in the South Fork below Slab Creek Dam. Recreational flows typically range from 850 to 950 cfs, or from 1,400 to 1,500 cfs, during specific times of the day during most weekends and holidays. Recreational flows are based on month, water year type, if flows are controllable at 1,500 cfs, and other factors (SWRCB 2013a).

In addition to being a re-regulating afterbay for Camino Powerhouse, Slab Creek Reservoir is also a re-regulating forebay for its downstream powerhouses: Slab Creek Powerhouse and White Rock Powerhouse. Slab Creek Powerhouse is located at Slab Creek Dam and generates power from run-of-river flows. White Rock Powerhouse is located upstream of Chili Bar Reservoir. Water diverted from the South Fork at Slab Creek Reservoir is returned to the river at White Rock Powerhouse approximately 7.5 miles downstream of the diversion. Rock Creek Powerhouse also discharges to the South Fork American River between Slab Creek Dam and Chili Bar Reservoir. Between Slab Creek Dam and Chili Bar Reservoir, the river channel is surrounded by bedrock and boulder outcroppings and steep valley slopes in a highly confined gorge (FERC 2008).

Chili Bar Reservoir has a surface area of 110 acres when full, a pool elevation of about 997.5 feet, and a usable storage capacity of 1,339 acre-feet (SWRCB 2013b). Chili Bar Reservoir has no seasonal or long-term storage capability and reservoir operations are largely controlled by releases from Slab Creek and White Rock Powerhouses except during winter storms and spring snowmelt flood events. Chili Bar Powerhouse is a daily peaking plant; operation of the powerhouse normally results in the flow changing from about 200 to 500 cfs to about 2,000 cfs during most days. In drier years, flows typically peak between 1,100 and 1,500 cfs (FERC 2008, SWRCB 2013b).

Pursuant to SMUD's FERC license for the Upper American River Hydroelectric Project (Project 2101), SMUD is required to maintain minimum streamflow in the South Fork below Chili Bar Dam. Minimum flows range from 150 to 500 cfs depending on month and water year type, provided that inflows are sufficient to maintain minimum instream levels. SMUD is also required to maintain recreational flows in the South Fork below Chili Bar Dam.

Minimum recreational flows range from 1,300 cfs to 1,700 cfs for 3 to 6 hours per day for certain days of the week based on season and water year type (SWRCB 2013a).

South Fork American River between Chili Bar Dam and Salmon Falls Bridge

The South Fork American River downstream of Chili Bar Dam (shown in Figure 4.10-4) is subject to daily flow fluctuations due to hydropower operations and streamflow management for recreational use. Flows are augmented by several tributaries within the 19-mile reach between Chili Bar Dam and Folsom Reservoir. Tributaries include Dutch Creek, Indian Creek, Granite Creek, Jacobs Creek, Greenwood Creek, Hastings Creek, Norton Ravine, and

Weber Creek. The upper and lower portions of the reach between Chili Bar Dam and Salmon Falls bridge are characterized by higher channel gradients that create flowing rapids and steeper canyon walls; while, the middle portion of this reach is wider, more sinuous, and has more gently sloping floodplains and channel gradients (FERC 2008).

Sly Park Dam and Jenkinson Lake

Sly Park Dam, on Sly Park Creek, forms Jenkinson Lake (shown in Figure 4.10-2). Jenkinson Lake has a storage capacity of 41,000 acre-feet with a surface area of 650 acres and it is the main water storage reservoir for the District. The District diverts up to 33,400 AFY of water from the Cosumnes River watershed and either directly uses that water or stores the water in Jenkinson Lake for later use under the District's permitted and licensed water rights. The District also holds a pre-1914 water right that allows diversion of up to 12.5 cfs from Camp Creek, typically in May through October. In addition, the District conveys water from the South Fork American River to Jenkinson Lake to meet water demands at the Reservoir A WTP, by diverting water at the El Dorado Diversion Dam under its pre-1914 water rights and conveying that water through the El Dorado Canal, through Hazel Creek Tunnel, and then through Jenkinson Lake. The Hazel Creek Tunnel, originating at the El Dorado Canal and extending 2,200 feet, has a design capacity of 180 cfs. Water diverted through Hazel Creek Tunnel discharges to a partially rip-rapped and lined drainage channel that extends to Hazel Creek and then to Jenkinson Lake. The existing channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake currently has an estimated capacity of approximately 80 cfs. The District is required to make minimum releases from Jenkinson Lake to Park Creek of 1 cfs, or the natural flow of Sly Park Creek, whichever is less, at all times. Minimum release requirements may increase up to 5 cfs from May through October if the estimated September 30 storage in Jenkinson Lake exceeds 23,800 acre-feet.

Figure 4.10-5 shows monthly storage at Jenkinson Lake for water years 1975 to 2022. Water released from storage is treated at the Reservoir A WTP and used to meet consumptive demands. Annual water use from Jenkinson Lake typically ranges between 18,000 and 24,000 acre-feet (El Dorado Irrigation District [EID] 2021). Although the reservoir is usually refilled each winter, water levels have been reduced when experiencing multiple dry years.

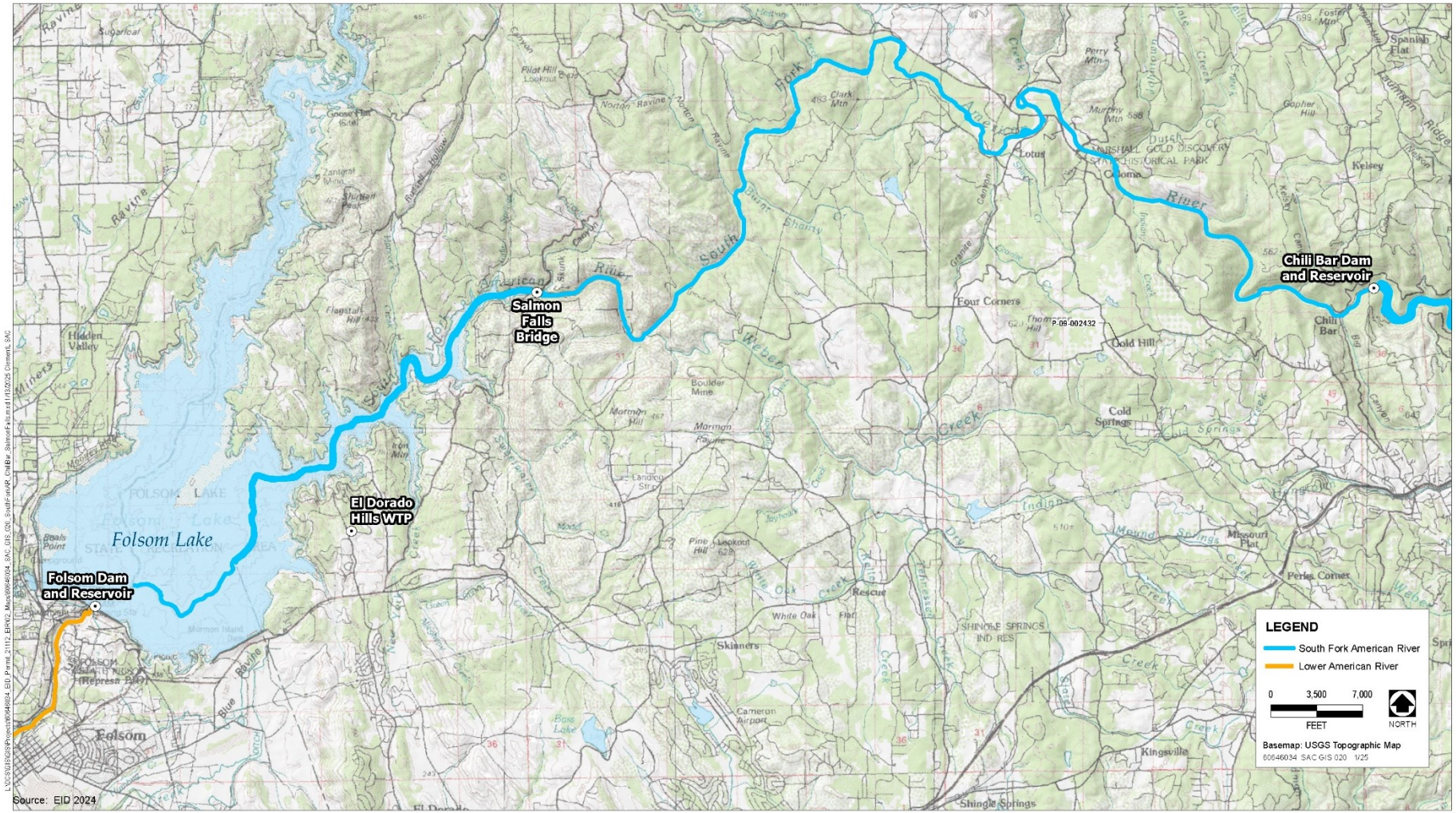
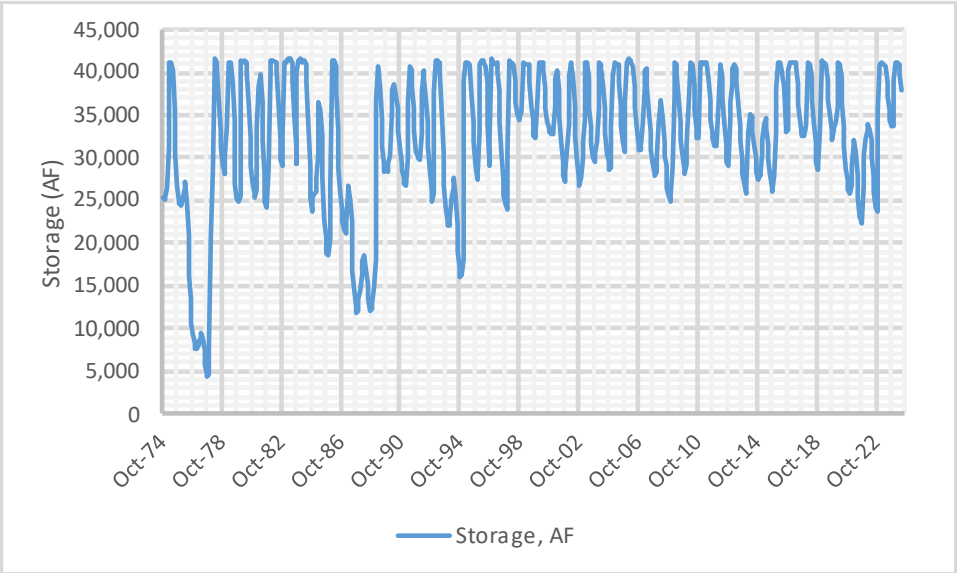


Figure 4.10-4. South Fork American River between Chili Bar Dam and Salmon Falls Bridge

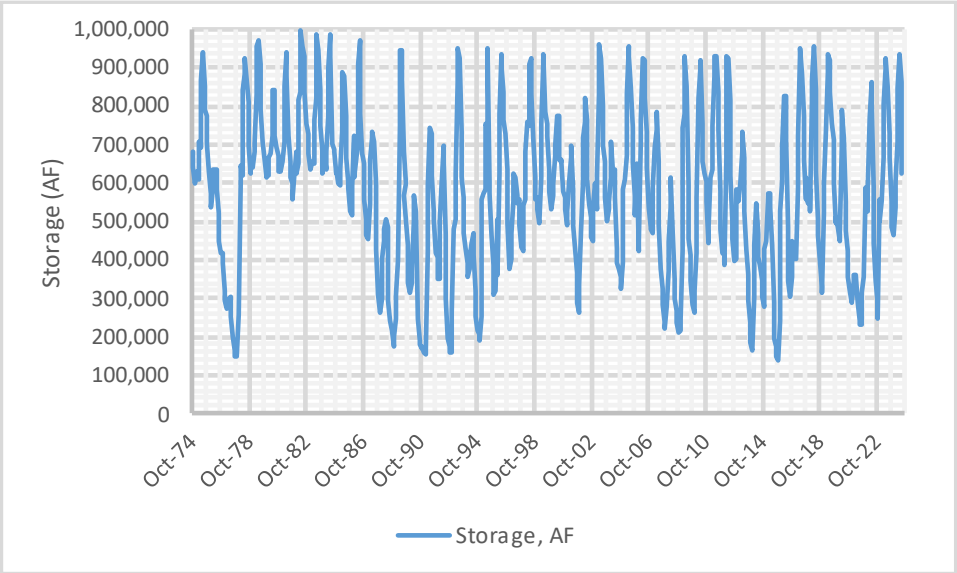


Source: DWR 2024a; CDEC Station JNK, Jenkinson Lake
Note: Results are shown by water year.

Figure 4.10-5. Storage at Jenkinson Lake

Folsom Reservoir

The North, Middle and South Forks of the American River flow into Folsom Reservoir. Folsom Reservoir is located about 23 miles northeast of the city of Sacramento (Folsom Reservoir is shown on Figure 4.10-4). The reservoir has a surface area of about 10,000 acres when full (with a 75-mile shoreline), a maximum water surface elevation of 480 feet, and a capacity of 976,000 acre-feet. Water levels normally vary from an elevation of 466 feet in early summer to a low of 426 feet in early winter (California State Parks 2023, Bureau of Reclamation [Reclamation] 2024). Figure 4.10-6 shows monthly storage at Folsom Reservoir for water years 1975 to 2023.



Source: DWR 2024b; CDEC Station FOL, Folsom Lake
Note: Results are shown by water year.

Figure 4.10-6. Storage at Folsom Reservoir

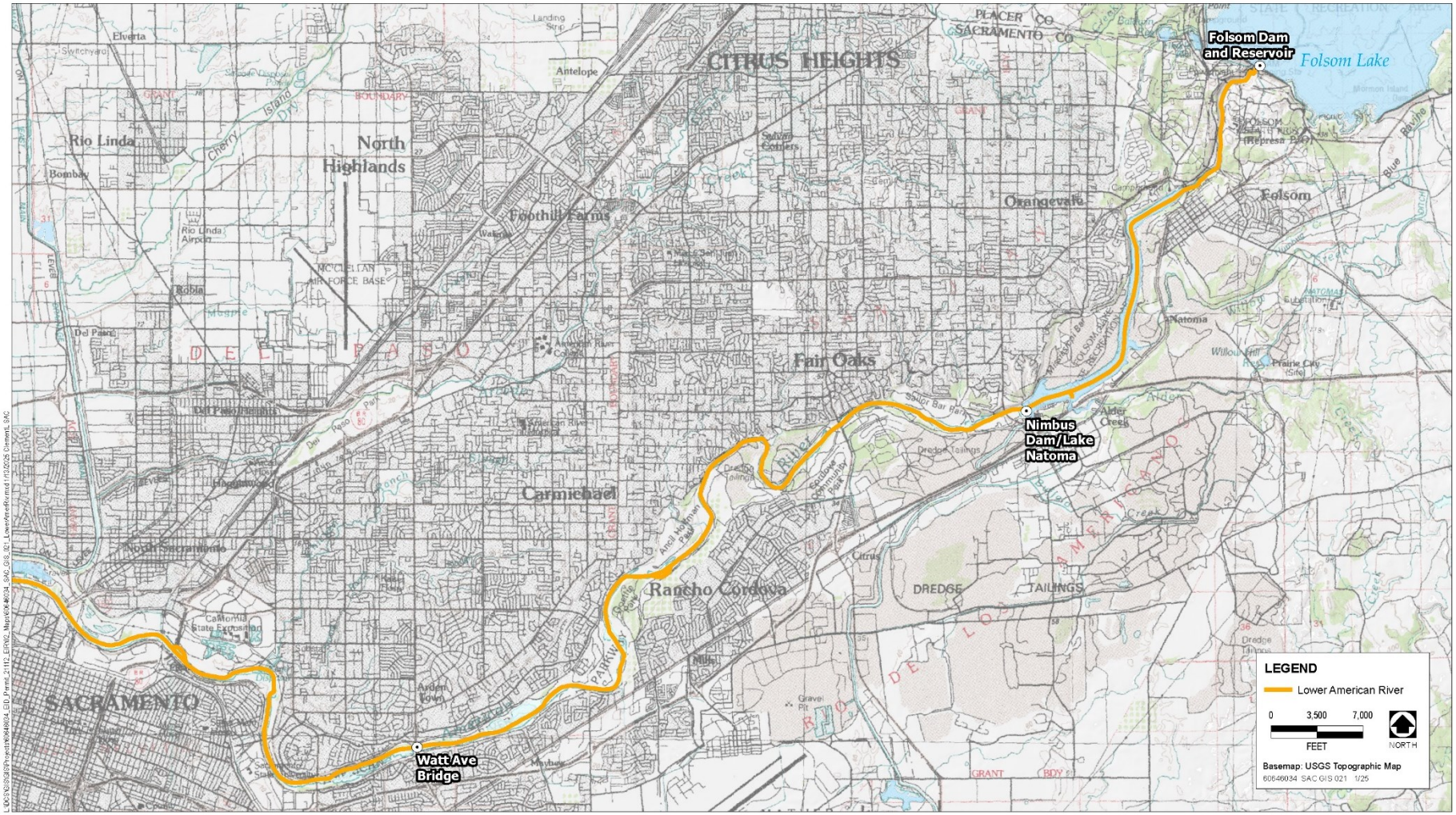
Originally authorized in 1944 as a 355,000 acre-feet flood control unit, Folsom Dam and Reservoir was reauthorized in 1949 as a 1,000,000 acre-feet multiple-purpose facility. The U.S. Army Corps of Engineers (USACE) constructed Folsom Dam and transferred it to the Department of Interior, Bureau of Reclamation (Reclamation) for coordinated operation of the Central Valley Project (CVP). Folsom Dam is operated for flood control, municipal, industrial, and agricultural water supplies, hydroelectric power generation, fish and wildlife protection, recreation, and Sacramento-San Joaquin Delta (Delta) water quality (Reclamation 2024, National Marine Fisheries Service [NMFS] 2019).

Folsom Reservoir is located at the western boundary and lowest elevation of the District's service area. The District currently diverts water from Folsom Reservoir under Permit 21112 as authorized under federal contract. Three different federal contracts allow the District to divert water from Folsom Reservoir to meet demands for the western portion of its service area; one of these contracts authorizes the use of the federal storage facility to divert Permit 21112 water. The total amount of water available under the three contracts is 29,110 AFY; however, the actual amount of water available in any given year can be affected by a variety of factors including federal water allocation, contract terms, hydrologic conditions, water rights conditions, and regulatory requirements. The amount of water that can be diverted at Folsom Reservoir under Permit 21112 is 17,000 AFY (including both direct diversion and re-diversion of stored water) at a maximum rate of diversion of 156 cfs. The District treats raw water diverted from Folsom Reservoir at the El Dorado Hills WTP and supplies potable water to the El Dorado Hills service zone.

American River from Folsom Dam to the Watt Avenue Bridge

Figure 4.10-7 shows the portion of the hydrologic study area between Folsom Dam and Watt Avenue bridge. Features in this reach include the Lower American River, Folsom Dam, Lake Natoma, Nimbus Dam, and Watt Avenue bridge.

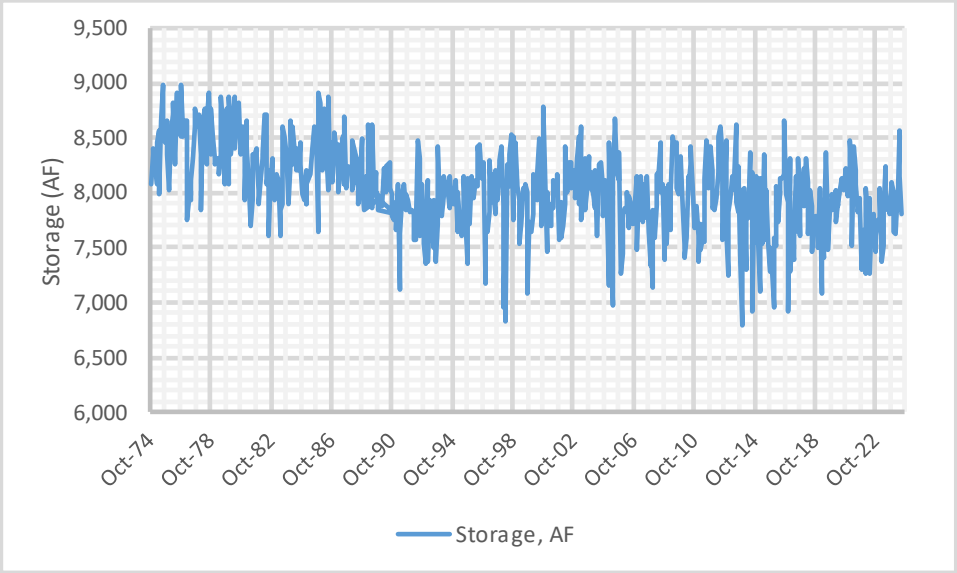
The American River Division of the CVP provides water for municipal and industrial use, irrigation, hydroelectric power, and recreation. Flood control is provided through dams, canals, and powerplants. American River Division facilities include Folsom Dam and Reservoir, its auxiliary spillway, Folsom Powerplant, Nimbus Dam, Lake Natoma, and Nimbus Powerplant. Folsom Powerplant is located at the foot of Folsom Dam on the north side of the river. It is operated as a peaking plant in combination with the downstream reservoir. Nimbus Dam, located 7 miles downstream of Folsom Dam, re-regulates releases made for power through Folsom Dam and serves as a diversion dam for the Folsom South Canal. Nimbus Dam forms Lake Natoma, which has a capacity of 8,760 acre-feet and a surface area of 540 acres (Reclamation 2024). Nimbus Powerplant, constructed and operated by Reclamation, is located on the right abutment of Nimbus Dam, on the north side of the river. Lake Natoma is a re-regulating reservoir (i.e., Lake Natoma is not operated for storage). Construction of Folsom and Nimbus Dams blocked access to natural spawning grounds of salmon and steelhead trout. To compensate in part for the loss of these spawning areas, Reclamation constructed the Nimbus Fish Hatchery on the left bank of the river, about 0.3 mile below Nimbus Dam (Reclamation 2024).



Source: EID 2024

Figure 4.10-7. Lower American River between Folsom Dam and Watt Avenue Bridge

Figure 4.10-8 shows monthly storage at Lake Natoma during water years 1975 to 2023.



Source: DWR 2024c; CDEC Station NAT, Lake Natoma (Nimbus Dam)
Note: Results are shown by water year.

Figure 4.10-8. Storage at Lake Natoma

The downstream extent of the hydrologic study area is the Lower American River at Watt Avenue bridge. Folsom Dam releases are managed, in part, to meet water temperature targets at Watt Avenue bridge (NMFS 2019). The Watt Avenue bridge is located 13.6 river miles downstream of Nimbus Dam.

GROUNDWATER

Groundwater resources exist to a limited degree in fractured rock formations within the region. The fractured bedrock formations of much of the western Sierra Nevada foothills and mountains are poorly suited to contain large quantities of groundwater; as such, groundwater is an inadequate and unreliable water supply for large-scale use. Although the use of groundwater as a source for public supply is limited in the South Fork American River basin, many rural homes, farms, and ranches have individual wells and rely on groundwater as their only source of water. Where rock fractures are present in bedrock, small amounts of water can be stored and made available to wells that intersect the fractures (CABY 2021).

SURFACE WATER AND GROUNDWATER QUALITY

South Fork American River. Surface water in the upper American River system is generally of high quality with source water coming from snowmelt, rainfall, and freshwater springs. Surface water often has: low turbidity except during high flow events; cold temperatures and high dissolved oxygen concentrations for most of the year; low levels of total dissolved solids, electrical conductivity, sodium, and chlorides; and low levels of nitrates, phosphates, pesticide residues, other agricultural and industrial chemicals, alkalinity, hardness, taste, odor, color, humic and fulvic acids, total trihalomethanes and other chlorinated organics, and fecal coliforms (California Department of Water Resources [DWR] 2014). Table 4.10-1 summarizes the water quality of the South Fork American River upstream and downstream of the El Dorado Diversion Dam. These data, collected as part of the

District's Project 184 monitoring efforts, are consistent with the above-mentioned trends (e.g., low turbidity, high dissolved oxygen, low conductivity, and, apart from possible outliers, low levels of nitrates).

Table 4.10-1. Water Quality in the South Fork American River at the El Dorado Diversion Dam

Parameter[1]	Count	Min[2]	Max	Median	Average
South Fork upstream of the El Dorado Diversion Dam[3]					
Turbidity (NTU)	31	0	17	0.5	1.4
TSS (mg/L)	31	0	590	0	21
Dissolved Oxygen (mg/L)	28	6.5	14	9.1	10
pH	29	6.3	9	7.3	7.4
Alkalinity (mg/L)	31	5.2	34	12	13
Hardness as $CaCO_3$ (mg/L)	31	4.9	19	10	10
Conductivity (µs/cm^3)	29	13	67	36	38
Aluminum (µg/L)	31	0	1,900	41	134
Copper (µg/L)	31	0	2.9	0.2	0.3
Nitrate/Nitrite (µg/L)	31	0	160	0	10
South Fork downstream of the El Dorado Diversion Dam[4]					
Turbidity (NTU)	31	0	13	0.6	1.1
TSS (mg/L)	31	0	100	0	7
Dissolved Oxygen (mg/L)	27	7.0	13	9.0	9
pH	29	6.5	9	7.5	7.4
Alkalinity (mg/L)	31	6.8	24	13	13
Hardness as $CaCO_3$ (mg/L)	31	5.1	20	11	11
Conductivity (µs/cm^3)	29	13	76	37	40
Aluminum (µg/L)	31	0	3,800	40	175
Copper (µg/L)	31	0	7.4	0.3	0.6
Nitrate/Nitrite (µg/L)	31	0	160	0	10

Source: EID 2015a, 2017a, 2019a, and 2022a

Notes:

1. Samples were collected between 2014 and 2021.
2. Concentrations that were not detected were assumed to equal zero.
3 Station WQ5. South Fork American River upstream of Kyburz Diversion Dam
4 Station WQ6. South Fork American River downstream of Kyburz Diversion Dam

Acronyms and abbreviations: µg/L = micrograms per liter; µs/cm^3 = micro-Siemens per cubic centimeter; $CaCO_3$ = calcium carbonate; Max = maximum; mg/L = milligrams per liter; Min = minimum; NTU = nephelometric turbidity units

The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature. Certain areas have been affected by historic gold mining (hydraulic and/or placer mining) which has caused heavy metal contamination. Areas that had historical timber harvest can also have streams with increased sedimentation. Poor livestock grazing practices, recreation activities, and runoff from roads can also affect surface waters. High intensity wildfire is a major concern for water quality. Water quality indicators most affected by high intensity wildfire include sediment, dissolved oxygen concentration, temperature, and turbidity (DWR 2014, CABY 2021). As part of an ongoing surface water quality assessment program, the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) and the State Water Resources Control Board (SWRCB) have evaluated rivers, creeks, and other waterbodies throughout the watershed and identified locations with water quality impairments. Water quality impairments include mercury at Slab Creek Reservoir and the South Fork American River below Slab Creek Reservoir; toxicity at North Canyon Creek and Coon Hollow Creek (which is tributary to South Canyon Creek); indicator bacteria at North Canyon Creek; and the pesticide breakdown product DDE (dichlorodiphenyldichloroethylene) at Coon Hollow Creek (SWRCB 2022).

In addition to the water quality parameters shown in Table 4.10-1, the District monitors stream temperature at various locations within the watershed including five locations on the South Fork American River from approximately 0.5 mile upstream of the El Dorado Diversion Dam to approximately 300 feet upstream of the El Dorado Powerhouse. Monthly water temperature was, on average, less than 20 degrees Celsius (°C) (68 degrees

Fahrenheit [°F]) in areas above and below the El Dorado Diversion Dam (shown on Table 4.10-2). During summer months, temperatures then transitioned to warmer water during the approximate 2,100-foot drop in elevation between the El Dorado Diversion Dam and the El Dorado Powerhouse.[2] This is reflective of a natural change as incrementally warmer water occurs with higher ambient air temperatures (EID 2024a).

Table 4.10-2. Monthly Water Temperature in the South Fork American River above El Dorado Diversion Dam to El Dorado Powerhouse (°C)

Monitoring Location	Apr	May	Jun	Jul	Aug	Sep	Oct
South Fork American River upstream of the Silver Fork[1]	5.5	7.8	12.9	17.7	17.4	13.8	9.0
South Fork American River upstream of the El Dorado Diversion Dam[2]	5.9	8.4	13.4	17.8	17.3	14.3	9.4
South Fork American River downstream of the El Dorado Diversion Dam[3]	5.9	8.6	13.5	17.8	17.5	14.4	9.4
South Fork American River near Bridal Veil Picnic Area[4]	7.9	11.0	17.2	20.3	20.3	16.3	10.6
South Fork American River upstream of El Dorado Powerhouse[5]	9.1	12.0	17.5	22.0	21.4	17.7	11.9

Source: EID 2015b, 2016, 2017b, 2019b, 2020, 2021a, 2022b, 2023, and 2024a
Note: Table includes measured data from 2014 to 2016 and from 2018 to 2023)
Acronym or abbreviation: °C = degrees Celsius
Footnote for the Monitoring Location:
[1] Station T8, South Fork American River upstream of the Silver Fork American River confluence
[2] Station T26, South Fork American River downstream of the Silver Fork American River confluence and upstream of the El Dorado Diversion Dam
[3] Station T9, South Fork American River downstream of the Kyburz Diversion Dam
[4] Station T25, South Fork American River near Bridal Veil Picnic Area
[5] Station T10, South Fork American River upstream of Akin Powerhouse

Groundwater in the upper American River system is found in fractured rock and is generally of good quality. The most common groundwater contaminant is arsenic and the primary source of arsenic in groundwater is minerals eroded from the volcanic and granitic rocks of the Sierra Nevada (DWR 2014). Groundwater also has higher total dissolved solids (salts) content than nearby surface waters.

Folsom Reservoir and the Lower American River. Folsom Reservoir, which provides cool water for the Lower American River, has a deep storage basin with strong thermal stratification. Lake Natoma has run-of-river flows (it is not used for storage) and weak thermal stratification; it becomes warmer during the summer due to the warmer weather. Cold water released from Folsom Dam warms as it passes through Lake Natoma during the summer and fall. Folsom Reservoir is listed as impaired for mercury and Lake Natoma is listed as impaired for mercury and indicator bacteria. Water quality impairments are also identified in the Lower American River between Nimbus Dam and the confluence with Sacramento River. These impairments include bifenthrin, indicator bacteria, mercury, PCBs (polychlorinated biphenyls), pyrethroids, water temperature, and toxicity (SWRCB 2022).

Temperature in the Lower American River. Folsom Dam has a series of temperature control devices. The three power generation penstocks are each fitted with an adjustable temperature control device that allows for four different configurations (discrete inflow elevations). Inflows to the penstocks pass through temperature control shutters – a series of large, solid metal panels that can be lowered or raised to determine the depth at which water is extracted from the reservoir and permitted to enter the dam's three power penstocks and turbines. In addition to the power generation penstock temperature control devices, a single variable elevation temperature control device has been installed on the Municipal Intake. Overall, the temperature control devices draw water from various elevations within the reservoirs, which controls the temperature of the water entering the Lower American River. Reclamation manages the Folsom/Nimbus Dam complex and the temperature control shutters at Folsom Dam to

[2] Water temperatures of less than 20°C (68°F) are described as being within the optimal temperature range for growth and survival of trout and other cold-water species including amphibians, while temperatures between 20°C (68°F) and 22°C (71.6°F) are considered suitable, but cold-water species would experience increased susceptibility to stressors (EID 2024a).

maintain a daily average water temperature of 65°F or lower (or another temperature as determined in consultation with resource agencies and stakeholders) at Watt Avenue bridge from May 15 through October 31, to provide suitable conditions for juvenile steelhead rearing in the Lower American River.[3] To achieve this objective, a temperature management plan is developed annually to implement strategies that vary annually based on hydrologic year type, storage conditions, cold-water reserves, and fishery objectives. Computational tools are used to predict the efficient use of the cold-water reserves, future downstream temperature performance, physical shutter operations of the temperature control device, and if bypasses of power generation would be needed (NMFS 2019, USACE 2024).

Water temperature in the Lower American River is a function of the timing, volume, and temperature of water being released from Folsom and Nimbus dams, river distance, and atmospheric heat exchange. Water temperature in the Lower American River is influenced by the storage volume and water temperature in Folsom Reservoir. The cold-water pool in Folsom Reservoir is limited, and this may result in elevated water temperatures in the Lower American River (NMFS 2019).

Table 4.10-3 shows measured water temperatures in the South Fork American River above Folsom Reservoir (located just upstream of Salmon Falls bridge), and in the Lower American River below Folsom Dam, below Lake Natoma, between Lake Natoma and Watt Avenue bridge, and below Watt Avenue bridge. Water temperature in the South Fork tends to be cooler in the winter and warmer in the summer than the water released from Folsom and Nimbus dams. Once released, water temperatures tend to increase particularly in the summer months as water moves down the Lower American River.

Table 4.10-3. Monthly Water Temperature in the South Fork American River and Lower American River (above Folsom Reservoir to Watt Avenue) (°C)

Monitoring Location	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
South Fork American River above Folsom Reservoir[1]	13.3	10.0	7.4	7.0	7.0	8.6	10.6	13.3	17.2	19.7	17.6	15.9
Lower American River below Folsom Dam[2]	16.2	13.5	11.1	9.2	8.8	9.6	11.1	12.5	14.1	15.8	16.5	17.0
Lower American River below Lake Natoma[3]	17.3	14.1	11.4	9.7	9.7	10.7	12.6	14.7	15.9	17.6	18.1	18.3
Lower American River between Lake Natoma and Watt Avenue[4]	17.5	14.0	11.1	9.5	9.4	10.5	12.6	15.3	16.7	18.4	18.9	19.0
Lower American River at Watt Avenue Bridge[5]	17.6	13.9	11.0	9.6	9.6	10.8	13.3	16.0	17.3	19.0	19.4	19.3

Source: USGS 2024

Note: Results are shown by water year. A water year is the period between October 1, for any given year through September 30, of the following year. Table includes measured data from October 2016 to May 2023.

Acronyms and abbreviations: °C = degrees Celsius; USGS = U.S. Geological Survey

Footnote for the Monitoring Location:

[1] USGS Station 11446030, South Fork American River near Pilot Hill CA

[2] USGS Station 11446220, American River below Folsom Dam near Folsom CA

[3] USGS Station 11446500, American River at Fair Oaks CA

[4] USGS Station 11446700, American River at William B Pond Park at Carmichael CA

[5] USGS Station 11446980, American River below Watt Avenue Bridge near Carmichael CA

FLOODPLAINS

Although flooding is not a widespread issue in the region, there are identified flood hazard areas. The Federal Emergency Management Agency (FEMA) has published Flood Insurance Rate Maps and has identified special

[3] In 1996, Reclamation established a working group to coordinate fishery and operational requirements for the Lower American River, known as the American River Group. The American River Group brings together stakeholders who have either a legislated or resources-specific interest in the operation of Folsom Dam and Reservoir and the Lower American River. Reclamation is the lead coordinator of the American River Group. The formal members include agencies with trust responsibilities for fisheries resources in the Lower American River: Reclamation, the U.S. Fish and Wildlife Service (USFWS), NMFS, California Department of Fish and Wildlife (CDFW), and Sacramento Water Forum (Reclamation 2022).

flood hazard areas (i.e., 100-year floodplain areas) within a portion of the South Fork American River (FEMA 2008). The limits of study on the South Fork American River extend from an area located downstream of Slab Creek Reservoir to Folsom Reservoir. Floodplains have also been designated on Weber Creek, and at the confluence of the South Fork with several smaller tributaries. Special flood hazard areas (100-year floodplains) have also been identified at Silver Lake. In general, water infrastructure is used to attenuate flood flows and Folsom Reservoir flood operations protect downstream areas.

WATER SUPPLIES

The District provides potable water, irrigation water, and recycled water to municipal and agricultural customers throughout a large portion of El Dorado County. The District's water supply is sourced from surface water; the District does not use groundwater supplies but does capture and treat wastewater from local communities to produce recycled water. The District's water supply system draws its water from Jenkinson Lake, the upper South Fork American River, and Folsom Reservoir (EID 2021b). The District delivers water to its customers throughout its service area under rights and entitlements from both the South Fork American River watershed and the Cosumnes River watershed and is conveyed through Forebay Reservoir or Jenkinson Lake (EID 2021b). The District can also supply water to the western portion of its service area under rights and entitlements from Folsom Reservoir.

The District's 2020 Urban Water Management Plan estimates water supply and demands in the District's service area in normal, single dry, and five consecutive dry years from 2020 through 2045. Based on this analysis, existing supplies are estimated at 55,328 AFY to 70,794 AFY, with planned supplies providing an additional 1,235 AFY to 7,500 AFY by 2045. Current demands range from 35,910 AFY to 40,930 AFY for the scenarios evaluated. Future demands are expected to increase and range from 43,320 AFY to 45,490 AFY by 2045. Based on this analysis, the District's water supplies are capable of meeting the water use in its service area in normal, single dry, and five consecutive dry years from 2020 through 2045 (EID 2021b). However, as discussed in Section 3.4, long-term water supply planning forecasts, including the District's 2024 Water and Recycled Water Master Plan (EID 2024b) and the El Dorado County Water Agency 2014 West Slope Update to the Water Resources Development & Management Plan (EID 2014), indicate that a portion of the Permit 21112 water supply will be necessary to serve District areas east of El Dorado Hills.

4.10.2 REGULATORY SETTING

This section focuses on laws related directly to surface water and water quality. A number of regulatory authorities at the federal, state, and local levels control the flow, quality, and supply of water in California, either directly or indirectly.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

This section presents the applicable Federal laws and regulations associated with hydrology and water quality.

Clean Water Act

The Clean Water Act (CWA, 33 United States Code Section 1251 et seq.) is the primary federal legislation governing water quality. The objective of the act is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." The CWA establishes the basic structure for regulating discharge of pollutants

into the waters of the United States and gives the U.S. Environmental Protection Agency (EPA) the authority to implement pollution control programs. In California, the EPA has delegated this authority to state agencies. Revelant sections of the CWA are described below.

- Section 303 requires states to adopt water quality standards for surface waters. The three major components of water quality standards are designated uses, water quality criteria, and antidegradation policy. Section 303(d) of the CWA requires states to develop a list of water-quality-impaired segments of waterways. Surface waters that are impaired by "pollutants" (e.g., sediment, temperature, metals, nutrients, and synthetic organic chemicals), but not those impaired by other types of "pollution" (e.g., altered flow, channel modification), are listed. Several waterbodies in the South Fork American River watershed downstream of the El Dorado Diversion Dam have been identified as impaired in accordance with provisions in CWA Section 303(d), as previously described under "water quality".

- Section 401 requires federal agencies to obtain certification from the state before issuing permits that would result in increased pollutant loads to a waterbody. The certification is issued if increased loads would not cause or contribute to exceedances of water quality standards.

- Section 402 creates the National Pollutant Discharge Elimination System (NPDES) permit program. This program covers point source pollution discharging into surface waterbodies. Statewide NPDES permit progams are described in more detail below under "State Plans, Policies, Regulations, and Laws."

- Section 404 establishes the permit system for the discharge of dredged or fill material into waters of the United States. The permit system is administered by the USACE. Waters of the United States include wetlands and lakes, rivers, streams, and their tributaries.

Antidegradation Policy

The Antidegradation Policy is designed to protect existing uses and water quality and national water resources, as authorized by Section 303(c) of the CWA. This policy protects water bodies where existing quality is higher than necessary for protection of beneficial uses. It states that high quality waters will be maintained unless a change in water quality is (1) consistent with maximum benefit to the people of the state, (2) will not unreasonably affect present and anticipated beneficial uses of the water, and (3) will not result in water quality less than that prescribed in policies.

Federal Power Act 16 U.S.C. §§ 797(e) and 808

The Federal Power Act (FPA) is the primary federal statute governing the wholesale transmission and sale of electric power, as well as the regulation of hydroelectric power (Congressional Research Service [CRS] 2020). FERC licenses and regulates the construction and operation of non-federal hydropower projects under the FPA. The District owns and operates the El Dorado Hydroelectric Project (Project No. 184) under a license with FERC. The District, as the Licensee of Project No. 184, is responsible to comply with the articles and conditions contained in the FERC license.

Safe Drinking Water Act

The Safe Drinking Water Act was established to protect the quality of drinking water in the United States. The Safe Drinking Water Act authorized EPA to set National health-based standards for drinking water, and requires

many actions to protect drinking water and its sources including rivers, lakes, reservoirs, springs, and groundwater wells. The Safe Drinking Water Act requires all owners or operators of public water systems to comply with primary (health-related) standards.

National Flood Insurance Program

FEMA is responsible for managing the National Flood Insurance Program, which makes federally backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. FEMA is also responsible for determining flood elevations and floodplain boundaries and distributing Flood Insurance Rate Maps. Flood Insurance Rate Maps identify the locations of special flood hazard areas including the 100-year and 500-year floodplain. Federal regulations governing development in a Zone A (100-year) floodplain are set forth in 44 Code of Federal Regulations Part 60, which enables FEMA to require municipalities that participate in the National Flood Insurance Program to adopt certain minimum floodplain management standards for construction and development within floodplains and designated floodways.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

This section presents the applicable State laws and regulations associated with hydrology and water quality.

California Water Code (Water Rights)

A water right is a legally protected right, granted by law, to take control of water and to put it to beneficial use. Under the California Water Code, the SWRCB is responsible for allocating surface water rights and permitting the diversion and use of water throughout the state. Through its Division of Water Rights, the SWRCB issues permits to store and to divert water for new appropriations and it authorizes changes to existing water rights. SWRCB can attach conditions to these permits to ensure that the water user prevents waste, conserves water, does not infringe on the rights of others, and puts the State's water resources to the most beneficial use.

An applicant, permittee, or licensee who wishes to change the point of diversion, place of use, or purpose of use from that specified in an existing permit or license must petition the SWRCB to amend the water right. When considering a petition for a water right amendment, SWRCB considers such factors as waste prevention, water conservation, infringement on the rights of others, and public trust values.

The District currently holds Water Right Permit 21112, issued in 2001 by the SWRCB. Permit 21112 allows the District to make direct diversions from the South Fork at Folsom Reservoir; to divert water to storage in Caples, Silver, and Aloha Lakes; and, to re-divert the water released from those upstream reservoirs once it reaches Folsom Reservoir for consumptive uses. The total quantity of water that may be diverted by the District under Permit 21112 at Folsom Reservoir annually (by a combination of direct diversion and re-diversion of stored water) is 17,000 AFY. The point of diversion at Folsom Reservoir draws direct diversions from the South Fork, along with water previously stored in upstream reservoirs (Caples, Silver, Aloha Lakes) that are operated pursuant to the District's Project 184 FERC license.

Permit 21112 authorizes direct diversion of up to 15,000 AFY from the South Fork at Folsom Reservoir to be collected from November 1 through July 31 with a maximum rate of diversion not to exceed 156 cfs. Permit 21112 allows a total of up to 32,931 AFY to be diverted to storage in Caples, Silver, and Aloha Lakes from November 1 to July 31 each year. This total authorized diversion to storage is limited to 21,581 AFY at Caples Lake, 6,000 AFY at Silver Lake, and 5,350 AFY at Lake Aloha. Permit 21112 also includes conditions for stream

and reservoir gaging, lake-level operational requirements to protect summer recreational uses at Caples, Silver, and Aloha Lakes, and annual reporting requirements.

Porter Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is California's statutory authority for protecting water quality. Pursuant to the act, the SWRCB and the Regional Water Quality Control Boards (RWQCBs) adopt and periodically update their Water Quality Control Plans (e.g., Basin Plans), which designate beneficial uses for specific surface water and groundwater resources, establish water quality objectives, and contain implementation programs and policies for impaired waters. The act also authorizes the SWRCB and the RWQCBs to issue and enforce waste discharge requirements and other approvals.

Water Quality Control Plan (Basin Plan)

The *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Central Valley RWQCB 2019) (Basin Plan) identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Sacramento and San Joaquin hydrologic regions. The Basin Plan describes a set of designated beneficial uses for each waterbody which help to define the resources, services, and qualities of the aquatic systems. Beneficial uses also serve as a basis for establishing water quality objectives and discharge prohibitions. The Basin Plan contains specific numeric water quality objectives such as those established for bacteria, dissolved oxygen, pH, pesticides, electrical conductivity, total dissolved solids, temperature, turbidity, and trace elements. Narrative water quality objectives are also established in the Basin Plan. And finally, the Basin Plan contains a set of implementation plans, which represent the Central Valley RWQCB's programs and specific plans of action for meeting water quality objectives and protecting beneficial uses. Table 4.10-4 lists the beneficial uses identified in the Basin Plan for the surface waters in the Project area.

Table 4.10-4. Beneficial Uses for Surface Waters

Waterbody	Beneficial Uses
South Fork American River, Source to Placerville	Municipal and domestic supply, power, contact recreation, canoeing and rafting, other noncontact recreation, potential warm freshwater habitat, cold freshwater habitat, cold water spawning habitat, and wildlife habitat
South Fork American River, Placerville to Folsom Lake	Municipal and domestic supply, irrigation, power, contact recreation, canoeing and rafting, other noncontact recreation, warm freshwater habitat, cold freshwater habitat, and wildlife habitat
Folsom Lake	Municipal and domestic supply, irrigation, potential service supply, power, contact recreation, noncontact recreation, warm freshwater habitat, cold freshwater habitat, warm water spawning habitat, and wildlife habitat
Folsom Dam to Sacramento River	Municipal and domestic supply, irrigation, power, contact recreation, canoeing and rafting, other noncontact recreation, warm freshwater habitat, cold freshwater habitat, warm water spawning habitat, cold water spawning habitat, and wildlife habitat

Source: Central Valley RWQCB 2019

Table 4.10-5 lists water quality objectives for these surface waters.

Table 4.10-5. Water Quality Objectives for Surface Waters

Parameter	Water Quality Objective
Bacteria	Fecal coliform concentration is not to exceed a geometric mean of 200/100 mL, and no more than 10 percent of the samples are to exceed 400/100 mL, for any 30-day period. At Folsom Lake, the fecal coliform concentration is not to exceed a geometric mean of 100/100 mL or any 30-day period.
Metals	At a minimum, water designated for use as domestic or municipal supply is not to contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in the following provisions of Title 22 of the California Code of Regulations. At a minimum, water designated for use as domestic or municipal supply is not to contain lead in excess of 0.015 mg/L. Folsom Lake also has specific maximum concentrations for arsenic, barium, copper, cyanide, iron manganese, silver and zinc.
Dissolved Oxygen	The monthly median of the mean daily dissolved oxygen concentration is not to fall below 85 percent of saturation in the main water mass and the 95-percentile concentration is not to fall below 75 percent saturation. In addition, dissolved oxygen concentration is not to be reduced below the following: • 5.0 mg/L minimum in waters designated WARM • 7.0 mg/L minimum in waters designated COLD • 7.0 mg/L minimum in waters designated SPWN
Oil and Grease	Waters are not to contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in visible film or coating on the surface of the water or on objects in the water, or that otherwise adversely affect beneficial uses.
pH	The pH is not to be depressed below 6.5 nor raised above 8.5.
Pesticides	No individual pesticide or combination of pesticides are to be present in concentrations that adversely affect beneficial uses. Waters designated for use as domestic or municipal supply (MUN) are not to contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15. Waters designated for use as domestic or municipal supply (MUN) are not to contain concentrations of thiobencarb in excess of 1.0 µg/L.
Total Dissolved Solids	Total dissolved solids are not to exceed 125 mg/L (90 percentile) in the South Fork of the American River from the source to Folsom Lake and not to exceed 125 mg/L (90 percentile) in Folsom Lake.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters is not to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Suspended Material and Settleable Material	Waters shall not contain substances or suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Temperature	The natural receiving water temperature intrastate waters shall not be altered unless it can be demonstrated that such alteration in temperature does not adversely affect beneficial uses. Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California including any revisions. At no time or place is the temperature of COLD or WARM intrastate waters to be increased more than 5ºF (2.8ºC) above natural receiving water temperature.
Toxicity	All waters are to be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors is not to be less than that for the same water body in areas unaffected by the waste discharge.
Turbidity	Waters are to be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed: 2 NTU where natural turbidity is less than 1 NTU; 1 NTU where natural turbidity is between 1 and 5 NTUs; 20 percent where natural turbidity is between 5 and 50 NTUs; 10 NTUs where natural turbidity is between 50 and 100 NTUs; or 10 percent where natural turbidity is greater than 100 NTUs. For Folsom Lake, except for periods of storm runoff, the turbidity is to be less than or equal to 10 NTUs.

Source: Central Valley RWQCB 2019

Key:

ºC = degree Celsius
ºF = degree Fahrenheit
µg/L = microgram per liter
µS/cm = microsiemen per centimeter
mL = milliliter
mg/L = milligrams per liter
NTU = nephelometric turbidity unit
RWQCB = Regional Water Quality Control Board

Statewide NPDES Permit Programs

Construction Activities. Construction activities that disturb one or more acres of land are subject to the permitting requirements of the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit; Order 2022-0057-DWQ, NPDES No. CAS000002; which supersedes Order 2009-0009-DWQ, as amended). The SWRCB established the Construction General Permit program to regulate stormwater discharges from construction sites. Construction activities that are subject to the Construction General Permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation.

The Construction General Permit implements a risk-based permitting approach, specifies minimum best management practice (BMP) requirements, and requires monitoring and reporting activities. Compliance with the permit requires preparation and implementation of a stormwater pollution prevention plan (SWPPP). A SWPPP describes the BMPs the discharger would use to manage stormwater runoff and reduce potential pollutants through the construction period. Typical BMPs include:

- Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater;
- Limiting fueling and other activities using hazardous materials to designated areas, providing drip pans under equipment, and daily checks for vehicle condition;
- Implementing practices to reduce erosion of exposed soil, including stockpile stabilization, watering for dust control, perimeter silt fences, and/or placement of fiber rolls;
- Implementing practices to maintain water quality including silt fences, stabilized construction entrances, and storm drain inlet protection;
- Implementing practices to capture and provide proper offsite disposal of concrete washwater, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system; and
- Developing spill prevention and emergency response plans to handle potential fuel or other spills.

Implementation of Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology to reduce or eliminate pollutants in stormwater runoff is required by the permit.

Municipal Systems. The *NPDES General Permit for Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* (Small MS4 Gernal Permit; Order 2013-0001-DWQ, NPDES No. CAS000004, as amended) authorizes municipal stormwater discharges in small municipality areas of less than 100,000 persons, including El Dorado County. The permit minimizes adverse effects to water quality from development during construction and during post-construction operations.

Construction phase storm water quality is managed through a construction site stormwater runoff control program, as per Provision E.10 of the Small MS4 Gernal Permit, which includes an enforceable construction site storm water runoff control ordinance that applies to projects that disturb less than one acre of soil. Projects that disturb one acre or more of soil are subject to the Construction General Permit in addition to the construction site

storm water runoff control ordinance. Individual projects are required to incorporate BMPs including erosion and sediment controls that reduce the potential for sediment or other water quality contaminants to be discharged directly or indirectly into a surface water body.

Post-construction requirements are described in Provision E.12 of the Small MS4 Gernal Permit. Individual projects are required to implement water quality control measures that control the volume, rate, and potential pollutant loading of stormwater runoff and reduce stormwater pollutants and/or erosive flows during the life of the project. Project compliance with the low impact design, water quality treatment, runoff retention, and peak runoff management requirements of the permit must be demonstrated.

Drinking Water Systems. The *NPDES Permit for Drinking Water System Discharges to Waters of the United States* (Order 2014-0194-DWQ, NPDES No. CAG140001) provides regulatory coverage for short-term or seasonal planned and unplanned discharges resulting from a water purveyor's transmission system (including pipes, canals, and open channels), distribution and storage system, water supply wells, and water treatment facilities. The permit also covers planned discharges to surface waters during transmission system installation and testing. Applicable water quality standards in this permit include narrative objectives for toxicity, which prohibit toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA), passed in 2014 and amended in 2015, creates a framework for sustainable, local groundwater management. The SGMA requires the formation of Groundwater Sustainability Agencies and the development of Groundwater Sustainability Plans for priority basins throughout California. As discussed under "Groundwater Resources," there are no defined groundwater basins within the region and therefore the procedures and regulations defined by SGMA do not apply.

Regional and Local Plans, Policies, Regulations, and Ordinances

The Project is proposed by the District, a special district that supplies water to customers throughout much of El Dorado County. Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from goals and policies outlined in the County's General Plan and Zoning Ordinance. However, the District seeks agreement with the County's goals and policies and considers the following goals and policies during Project implementation.

- **Goal 5.1, Provision of Public Services.** Provide and maintain a system of safe, adequate, and cost-effective public utilities and services; maintain an adequate level of service to existing development while allowing for additional growth in an efficient manner; and, ensure a safe and adequate water supply, wastewater disposal, and appropriate public services for rural areas.

- **Goal 5.2, Water Supply.** The development or acquisition of an adequate water supply consistent with the geographical distribution or location of future land uses and planned developments.
    - **Policy 5.2.1.13.** The County shall encourage water purveyors to design water supply and infrastructure projects in a manner that avoids or reduces significant environmental effects to the maximum extent feasible in light of the water supply objectives of a given project.
- **Goal 5.4, Storm Drainage.** Manage and control stormwater runoff to prevent flooding, protect soils from erosion, prevent contamination of surface waters, and minimize impacts to existing drainage infrastructure.
- **Goal 7.3, Water Quality and Quantity.** Conserve, enhance, and manage water resources and protect their quality from degradation.
    - **Objective 7.3.1, Water Resource Protection.** Preserve and protect the supply and quality of the County's water resources including the protection of critical watersheds, riparian zones, and aquifers.
    - **Objective 7.3.2, Water Quality.** Maintenance of and, where possible, improvement of the quality of underground and surface water.
        - **Policy 7.3.2.1.** Stream and lake embankments shall be protected from erosion, and streams and lakes shall be protected from excessive turbidity.
    - **Objective 7.3.4,** Drainage. Protection and utilization of natural drainage patterns.

In addition, the El Dorado County Ordinance Code, Sec. 8.79.150, indicates the following:

- **Reduction of pollutants in stormwater; best management practices.** The County may require development and/or redevelopment projects[4] to incorporate appropriate BMPs to control the volume, rate, and potential pollutant loading of stormwater runoff from such development/redevelopment. These required BMPs may be contained in any land use entitlement, conditions of approval, grading plans, improvement plans, or any construction or building-related permit to be issued relative to such development/redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required elsewhere in County Code and adopted stormwater management plans. The County may withhold final approvals or other authorizations if the owner or developer is in violation of the provisions of this chapter.

The El Dorado County Ordinance Code, Sec. 130.32.050 indicates the following:

- **Provisions for Flood Hazard Reduction.** Until a regulatory floodway is adopted, no new or modern construction, substantial improvement of any structure, or other development (including fill) shall be permitted within Zones A1-A9, A14 and A24, unless it is demonstrated that the cumulative effect of the

[4] Development means any activity that moves soils or substantially alters the pre-existing vegetated or man-made cover of any and all land. Development includes any activity that may be considered new development or redevelopment. This also includes, but is not limited to, grading, digging, cutting, scraping, stockpiling or excavating of soil, placement of fill materials, paving, pavement removal, exterior construction, substantial removal of vegetation where soils are disturbed including but not limited to removal by clearing or grubbing, or any activity which bares soil or rock or involves streambed alterations or the diversion or piping of any watercourse (Ordinance Code, Sec. 8.79.050).

proposed development, when combined with all other development, will not increase the base flood elevation more than one foot at any point within the County. Within an adopted regulatory floodway, the County shall prohibit encroachments, including fill, new or modern construction, substantial improvements to any structure, and other development, unless certification by a licensed civil engineer is provided demonstrating that the proposed encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.

4.10.3 IMPACT ANALYSIS

METHODOLOGY

This section describes the approach for the analysis of surface water and groundwater resources in the Project area, including water quality. The evaluation of the impacts is based on application of quantitative modeling results and qualitative assessments. The relevant technical reports prepared for the Project include the following appendices:

- Appendix B1 – Permit 21112 Change Petition Quantitative Assessment Modeling
- Appendix B2 – Permit 21112 Change Petition HEC-ResSim Modeling Technical Report
- Appendix B3 – Permit 21112 Change Petition CalSim 3 Modeling Technical Report
- Appendix C – Folsom Temperature Modeling in Support of Modification of Water Right Permit 21112

Baseline conditions and Project changes in hydrodynamic parameters such as flow and storage volume, as well as changes to temperature expected at Folsom Reservoir and the American River at Watt Avenue bridge due to these changed hydrodynamics, are presented below. As described in more detail below, both a current and future baseline is used as the basis for evaluating potential impacts to hydrology from Project operational scenarios. The significance and environmental implications of these changes are not discussed in this section, but instead are addressed in the impact statements below. Note that Figure 4.10-1 shows the Project area and vicinity including the South Fork American River, the El Dorado Diversion Dam, Jenkinson Lake, and Folsom Reservoir.

Baseline and Project Scenarios

The District is electing to use both a current and future baseline as the basis for evaluating potential impacts of the Project for water-dependent resource categories including biological, hydrology, and recreation. The use of a future baseline for these select resources is necessary to identify which impacts are associated with the Project as compared to which impacts are associated with future increases in water demands that would otherwise occur absent the Project.

The characteristics of each baseline include:

- **Current baseline (without the Project):** Current water demands are based on 5-year average (2017 – 2021) water use for all District customers (34,512 AF). Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for diversion at the El Dorado Diversion Dam for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP.

- **Future baseline (without the Project):** Forecasted future demands based on water use projections from the District's 2020 Urban Water Management Plan (UWMP; Table 4-11; EID 2021b) for the year 2045 for all

District sources (43,320 AF). This forecasted increase in water demands would occur with or without the proposed Project. Permit 21112 water cannot be diverted for consumptive use at El Dorado Diversion Dam. Only water available under the District's other water rights is available for diversion at the El Dorado Diversion Dam for consumptive use at Reservoir A WTP and/or at Reservoir 1 WTP.

Because the timing for implementing potential construction-related improvements to allow for the diversion of up to 156 cfs is unknown, two operational regimes for the diversion of Permit 21112 water at the El Dorado Diversion Dam are considered in this EIR: 1) existing infrastructure operations; and 2) post-construction operations:

- **Existing infrastructure operations:** This operational regime involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water at the El Dorado Diversion Dam to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- **Post-construction operations:** This operational regime involves operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam following construction of the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake that would allow for a maximum rate of diversion and re-diversion of up to 156 cfs.

The following constraints are also included with Project operations.

- Up to 15,000 AF of Permit 21112 water and up to 15,080 AF of pre-1914 rights water is available for diversion at the El Dorado Diversion Dam for consumptive use.

- Permit 21112 water may be delivered to Forebay Reservoir for delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

- The season of diversion for the proposed Project would be within the season of diversion currently specified in Permit 21112 (i.e., November 1 to July 31). The El Dorado Canal is typically offline for maintenance and does not convey water from October through mid-December. This maintenance outage is assumed to continue into the future and therefore the operational season of diversion at the El Dorado Diversion Dam with the proposed Project is anticipated to be from mid-December to July 31.

Due to the differing water demands between the current baseline and future baseline scenarios, the modeling output and likewise potential impacts associated with each may differ. Additionally, the proposed Project includes an existing infrastructure operational regime that describes the diversion of Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities. This results in four different Project scenarios:

- Project with existing infrastructure and current water demands compared to the current baseline
- Project with post-construction operations and current water demands compared to the current baseline
- Future Project with existing infrastructure and future water demands compared to the future baseline
- Future Project with post-construction operations and future water demands compared to future baseline

ResSim Hydrodynamic Modeling

The Hydrologic Engineering Center Reservoir System Simulation (HEC-ResSim; or ResSim) software, developed by the USACE's Institute for Water Resources, was used to model operations of the South Fork American River system with and without the proposed Project. ResSim simulates system operations utilizing user-defined inputs and rules to simulate various elements of system operations including but not limited to: physical processes (e.g., surface water inflow or accretion, evaporation, diversions), operational constraints (e.g., reservoir size, seasonal storage limits, water demands), and regulatory constraints (e.g., minimum flow requirements, lake level targets, water right permit conditions, FERC license conditions). A change to these particular inputs can change how the model operates various system components. The assumptions and operational rules included in the ResSim model for the proposed Project are described in detail in Appendix B2 to this EIR. For the analysis in this EIR, the ResSim model was used to forecast when Project diversions would occur by evaluating system conditions observed over a 46-year study period (water years 1975 to 2021).

CalSim 3 Hydrodynamic Modeling

California Simulation Model version 3 (CalSim 3; or CalSim) is a water resources planning model, jointly developed by the California Department of Water Resources (DWR) and the Mid-Pacific Region of the U.S. Bureau of Reclamation (Reclamation), to simulate operations of the State Water Project (SWP) and the CVP and much of the water resources infrastructure in the Central Valley and the Sacramento-San Joaquin Delta (Delta) region. The primary purpose of CalSim is to evaluate CVP and SWP operations at current or future levels of development, with and without various assumed future facilities, various regulatory requirements, and with different facility management options. Geographically, the model covers the portion of California's Central Valley that drains to the Delta, and the SWP exports to the San Francisco Bay area, the Central Coast, and Southern California. CalSim simulates system operations during a multi-year period using a monthly time step. The model assumes that facilities, land use, water supply contracts, and regulatory requirements are constant over the modeling period, representing a fixed level of development (e.g., 2020, 2040). The historical streamflow record, adjusted for the influence of land-use changes and upstream flow regulations, is used to represent the possible range of water supply conditions for the Central Valley. For this EIR, the hydrologic modeling period analyzed in CalSim was water years 1975 to 2015.

Inflows to Folsom Reservoir are required for the CalSim 3 computational analysis. Output data from the ResSim model for the South Fork American River were used to calculate inflows to Folsom Reservoir (Zanjero 2024a). Output from the CalSim model includes monthly storage at Folsom Reservoir and monthly flow in the Lower American River.

CE-QUAL-W2 Temperature Modeling

CE-QUAL-W2 is a two-dimensional hydrodynamic and water quality model. The CE-QUAL-W2 temperature model of Folsom Reservoir, also referred to as the Folsom Reservoir water temperature model, was originally commissioned by Placer County Water Agency and has been used by the Sacramento Water Forum. It simulates

Folsom Dam's low-level outlets and the existing temperature control device. The Folsom Reservoir water temperature model was developed to test the ability of alternative hydrology and reservoir operations scenarios to meet water temperature targets in the Lower American River at Watt Avenue bridge. The primary water temperature management objective for the Lower American River is to meet the best possible temperature schedule each year for Central Valley steelhead (summer rearing) and fall-run Chinook salmon spawning (fall months), given Folsom Reservoir inflows, available reservoir volume, and reservoir outflows. The CE-QUAL-W2 model input data for Folsom Reservoir inflow and outflow were derived from the CalSim 3 modeling.

Water temperature targets are based on Automated Temperature Selection Procedure (ATSP) schedules. The CE-QUAL-W2 temperature model automatically determines the best ATSP outflow temperature schedule possible for each water year based on the active use of the cold-water pool in Folsom Reservoir. The temperature model iteratively solves for the Lower American River temperature schedule by modifying the position of individual penstock shutters and the proportion of water going through each penstock. In addition, a single variable elevation temperature control device has been installed on the Municipal Intake and is included in the model. The model iteratively sets the elevation of the municipal intake to a user-supplied water temperature and operates the low-level outlets within a range of dates and maximum daily volumes. Low-level outlet operations allow access to cold water below the power penstock intake elevations. Output from the model provides an ATSP schedule that can be met each year given specified reservoir inflows, flow releases, and meteorological data. The ATSP schedules are a series of monthly water temperatures at Watt Avenue bridge from May through November which vary from each other by 1°F during at least one of these months. As such, a change in ATSP schedule corresponds to a modeled 1°F change (or more) in water temperature at Watt Avenue bridge during at least one month from May through November.

To evaluate potential impacts of the Project, model output was aggregated by month, and the change in monthly temperature between baseline and Project conditions was evaluated by month and water year type. Changes in monthly water temperature in the Lower American River at Watt Avenue were also compared to temperature targets and, when modeled changes in monthly temperature were greater than 0.2°C (0.4°F), these changes were further evaluated based on the average conditions for the month and water year type, the month and water year type when baseline conditions were expected to be the warmest, and the month and water year type when project effects were expected to be greatest (see the analysis under Impact 4.10-2). Changes in temperatures that are less than or equal to 0.2°C (0.4°F) are often at or below the accuracy of calibrated temperature measurement equipment (USGS 2023).

THRESHOLDS OF SIGNIFICANCE

The criteria used for determining the significance of a potential impact on hydrology and water quality are based on the State, California Environmental Quality Act (CEQA) Guidelines, listed below, and professional standards and practices.

Impacts on hydrology and water quality are considered significant if implementation of the project would:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

b) Degrade receiving water temperatures in a manner that adversely affects beneficial uses.

c) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

d) 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 offsite;

   ii Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

   iii Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

   iv Impede or redirect flood flows.

e) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

f) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.10-1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Summary of Impact

The sub-sections that follow include detailed analyses of potential impacts to water quality amongst the various Project operational scenarios and construction activities by relevant river segment and/or water body. Extensive details are provided within this resource chapter, rather than in an appendix, due in part because other resource chapters rely upon and cross-reference this chapter (see, e.g., Biological Resources). To facilitate public review, the following summary of impact is provided prior to the more detailed analysis below:

1. The Project's potential operational impacts to hydrology and water quality resulting from changes in flow or changes in storage would be less than significant.

2. The Project's potential impacts to water quality during construction would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality and impacts would be less than significant with mitigation incorporated.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam utilizing existing infrastructure (i.e., prior to construction of any improvements necessary to divert up to 156 cfs) with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP.

Tables in this subsection show Res-Sim and CalSim model output. Monthly flow is shown by water year type for baseline and Project conditions. The "absolute difference" is the change in monthly flow between baseline and Project conditions averaged by month and water year type. The "relative difference" is the percent change

between baseline and Project conditions for the results averaged by month and water year type. The "maximum reduction" and the "maximum increase" are the results from the month with the maximum change between baseline and Project conditions for each month and water year type.

Tables in this subsection also show change in storage by month and water year type. The change in storage represents conditions that were predicted to occur at the end of the month. The "absolute difference" is the change in end of month storage between baseline and Project conditions averaged by month and water year type. The "relative difference" is the percent change between baseline and Project conditions for the results averaged by month and water year type. The "maximum reduction" and the "maximum increase" are the results from the month with the maximum change between baseline and Project conditions for each month and water year type.

Project

Project operations with existing infrastructure and current water demands are described in this section. The analysis of operational impacts below are provided by river segment.

Kyburz to El Dorado Powerhouse

South Fork above El Dorado Diversion Dam. The Project is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam on a monthly basis (Table 4.10-6).

Table 4.10-6. South Fork American River above the El Dorado Diversion Dam, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Project, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Baseline, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Project, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Below Normal	Baseline, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Project, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Dry	Baseline, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Project, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Critically Dry	Baseline, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Project, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Flow in the South Fork below the El Dorado Diversion Dam would remain unchanged as compared to baseline conditions when the Project is operated with existing infrastructure (Table 4.10-7). The District would continue to divert water at the El Dorado Diversion Dam under the Project at the same rate and timing as it does under baseline conditions. However, under the Project, water that would otherwise be diverted for non-consumptive hydropower generation would instead be diverted for consumptive purposes. As such, a change in South Fork American River flow is observed further downstream, resulting from reduced return flow below the El Dorado Powerhouse, as described in the following section.

Table 4.10-7. South Fork American River below the El Dorado Diversion Dam, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	114	132	204	235	398	530	853	1,993	2,038	640	90	54	607
	Project, CFS	114	132	204	235	398	530	853	1,993	2,038	640	90	54	607
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Baseline, CFS	78	87	65	432	217	244	545	1,493	926	262	65	50	372
	Project, CFS	78	87	65	432	217	244	545	1,493	926	262	65	50	372
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Below Normal	Baseline, CFS	90	212	159	169	255	504	824	1,166	569	130	65	50	349
	Project, CFS	90	212	159	169	255	504	824	1,166	569	130	65	50	349
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Dry	Baseline, CFS	69	100	139	381	103	232	539	914	393	86	18	15	249
	Project, CFS	69	100	139	381	103	232	539	914	393	86	18	15	249
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Critically Dry	Baseline, CFS	64	62	71	36	54	101	288	377	116	40	18	15	104
	Project, CFS	64	62	71	36	54	101	288	377	116	40	18	15	104
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Permit 21112 water that is diverted at El Dorado Diversion Dam would be delivered in two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP; and/or 2) to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to the Reservoir A WTP. The water stored in Jenkinson Lake would be delivered to Reservoir A WTP as needed throughout the year to help meet water demands, with the highest demand occurring in late summer and fall months.

Because there would be a change from non-consumptive hydropower generation to consumptive use with Project operations, additional water would be either be diverted from Forebay Reservoir to Reservoir 1 WTP or be routed through Hazel Creek Tunnel to Jenkinson Lake and less water would be delivered to the El Dorado Powerhouse for power production. Table 4.10-8 provides estimated flow releases at the El Dorado Powerhouse for baseline and Project conditions. The change between baseline and Project conditions represents the change in return flows provided to the South Fork during Project operations. This change in powerhouse releases also affects power production, which is discussed in more detail in Section 4.6.

Forebay Reservoir is the re-regulating forebay for these power production flows; as such, it routinely fluctuates in storage and elevation. Changes in end of month storage at Forebay Reservoir would occur during some years, with reductions in storage occurring primarily in January and February and increased storage occurring primarily in June through August (see Appendix B2). The expected range in elevation and storage with Project operations would remain within the current levels seen under existing conditions.

Table 4.10-8. El Dorado Powerhouse Releases, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	1	0	82	126	135	142	140	138	131	105	84	116	100
	Project, CFS	1	0	81	118	135	142	140	138	131	105	84	116	99
	Absolute Difference, CFS	0	0	-1	-8	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.0	0.0	-1.2	-6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.7
	Maximum Reduction, CFS	0	0	-14	-40	0	0	0	0	0	0	0	0	-5
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	Baseline, CFS	1	0	94	127	129	131	141	137	127	50	38	89	89
	Project, CFS	1	0	94	122	129	131	143	137	127	50	38	89	88
	Absolute Difference, CFS	0	0	0	-5	0	0	1	0	0	0	0	0	0
	Relative Difference (%)	2.1	0.0	0.0	-3.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	-0.3
	Maximum Reduction, CFS	0	0	0	-14	0	0	0	0	0	0	0	0	-1
	Maximum Increase, CFS	0	0	0	0	0	0	3	0	0	0	0	0	0
Below Normal	Baseline, CFS	1	0	81	104	122	136	136	128	111	21	12	74	77
	Project, CFS	1	0	81	88	120	140	141	133	115	22	12	78	78
	Absolute Difference, CFS	0	0	0	-16	-2	4	5	5	5	2	0	4	1
	Relative Difference (%)	0.0	0.0	-0.3	-15.0	-1.6	2.7	3.7	3.8	4.2	7.9	2.9	5.4	0.7
	Maximum Reduction, CFS	0	0	-2	-52	-30	-2	0	0	0	0	0	0	0
	Maximum Increase, CFS	0	0	0	0	7	15	20	27	39	14	2	32	5
Dry	Baseline, CFS	1	0	76	75	89	112	130	123	103	55	62	101	77
	Project, CFS	1	0	76	68	61	105	121	128	116	66	69	101	76
	Absolute Difference, CFS	0	0	0	-7	-29	-7	-8	5	13	11	7	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-9.2	-32.2	-6.7	-6.4	3.9	12.9	19.7	10.5	0.0	-1.7
	Maximum Reduction, CFS	0	0	0	-32	-60	-44	-60	0	0	0	0	0	0
	Maximum Increase, CFS	0	0	0	0	0	14	6	24	39	39	28	0	1
Critically Dry	Baseline, CFS	1	0	63	46	80	105	115	105	61	27	28	71	59
	Project, CFS	1	0	63	28	23	58	90	117	78	45	46	75	52
	Absolute Difference, CFS	0	0	0	-17	-57	-47	-26	12	17	19	18	4	-7
	Relative Difference (%)	0.0	0.0	-0.4	-38.2	-71.5	-44.6	-22.3	11.2	27.7	69.5	62.5	5.0	-11.2
	Maximum Reduction, CFS	0	0	-4	-67	-73	-60	-60	-53	-13	0	0	0	-1
	Maximum Increase, CFS	0	0	0	0	-17	0	20	27	39	44	50	35	-2

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse is expected to be reduced by about 2 cfs on an average annual basis when the Project is operated with existing infrastructure with current water demands. The difference in river flows below the El Dorado Powerhouse between baseline and Project conditions is related to the change in water use from non-consumptive power generation to consumptive use which occurs with Project operations. Changes to South Fork American River flows below the El Dorado Powerhouse is the most upstream location within the river where changes to flows would occur with Project implementation when operated using existing infrastructure to meet current water demands.

In general, diversions of Permit 21112 water at the El Dorado Diversion Dam would occur primarily in the winter and spring months when unimpaired flows in the South Fork are high. The actual pattern of diversion of Permit 21112 water under the Project would vary depending on a variety of system conditions (e.g., infrastructure conveyance capacity, hydrologic availability, regulatory requirements such as water right conditions and FERC license conditions, demands at Reservoir 1 WTP and Reservoir A WTP, and available storage and forecasted carry-over storage in Jenkinson Lake). Because these variables change from year to year and/or month to month, the Project's Permit 21112 diversions will also vary subject to these variables.

Flow in the South Fork below the El Dorado Powerhouse would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in

below normal, dry, and critically dry water year types. In general, monthly streamflow below the powerhouse would be reduced in January of wet and above normal years, January and February in below normal years, and January through April in dry and critically dry years when compared to baseline conditions (Table 4.10-9). However, by transferring water to storage in Jenkinson Lake in winter and early spring for later consumptive use, diversions in late spring and early summer in below normal, dry, and critically dry years that would otherwise have been allocated for direct consumptive use under baseline conditions, instead would be used to generate hydropower and would be returned to the river, thus resulting in increases in flows in the South Fork relative to baseline conditions.

Table 4.10-9. South Fork America River below El Dorado Powerhouse, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	189	229	620	899	1,315	1,443	1,752	3,442	3,529	1,214	260	228	1,260
	Project, CFS	190	229	619	891	1,315	1,443	1,752	3,442	3,529	1,214	260	228	1,259
	Absolute Difference, CFS	0	0	-1	-8	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.1	0.0	-0.2	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-14	-40	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	2	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Baseline, CFS	145	160	266	1,493	874	740	1,083	2,582	1,594	447	152	179	810
	Project, CFS	145	160	266	1,488	874	740	1,084	2,582	1,594	447	152	179	809
	Absolute Difference, CFS	0	0	0	-5	0	0	1	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	-0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-14	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	3	0	0	0	0	0	
Below Normal	Baseline, CFS	141	475	563	541	1,047	1,265	1,455	1,839	949	231	116	161	732
	Project, CFS	141	475	563	526	1,045	1,268	1,460	1,844	954	233	116	165	732
	Absolute Difference, CFS	0	0	0	-16	-2	3	5	5	5	2	0	4	1
	Relative Difference (%)	0.0	0.0	0.0	-2.9	-0.2	0.3	0.3	0.3	0.5	0.7	0.3	2.5	0.1
	Maximum Reduction, CFS	0	0	-2	-52	-30	-2	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	7	15	20	28	39	14	2	32	
Dry	Baseline, CFS	121	174	433	1,450	416	578	1,017	1,446	706	207	116	146	568
	Project, CFS	121	174	433	1,443	387	571	1,009	1,451	720	218	123	146	566
	Absolute Difference, CFS	0	0	0	-7	-29	-7	-8	5	13	11	7	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.5	-6.9	-1.3	-0.8	0.3	1.9	5.2	5.6	0.0	-0.2
	Maximum Reduction, CFS	0	0	0	-32	-60	-45	-60	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	14	6	24	39	39	28	0	
Critically Dry	Baseline, CFS	123	109	212	138	237	337	621	713	279	109	73	108	255
	Project, CFS	123	109	212	120	179	290	595	725	296	128	90	111	248
	Absolute Difference, CFS	0	0	0	-17	-57	-47	-26	12	17	19	18	4	-7
	Relative Difference (%)	0.0	0.0	-0.1	-12.6	-24.2	-13.9	-4.1	1.7	6.1	17.0	24.1	3.3	-2.6
	Maximum Reduction, CFS	0	0	-4	-67	-73	-60	-60	-53	-13	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-17	0	20	27	39	44	50	35	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

As shown in Table 4.10-9, the maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 73 cfs, expected to occur during February of a critically dry year (during a single month in the 47-year modeling period), and the average reduction in monthly flows during February of critically dry years is 57 cfs (a 24 percent decrease). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 50 cfs, expected to occur during August of a critically dry year and the average increase in monthly flows during August of critically dry years is 18 cfs (a 24 percent increase). Reductions in flow of 60 cfs or more would occur in February or April during a dry year or January through April of critically dry years. Increases in river flow of 40 cfs or more would occur in July and August of critically dry years. Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches and these changes would represent an increasingly smaller fraction of the overall flow as tributaries and return flows from downstream operators join the river.

As described above, operation of the Project is expected to both increase and decrease flows in the South Fork American River below the El Dorado Powerhouse. For example, flow would be reduced by 24 percent in February of critically dry years in the South Fork below the El Dorado Powerhouse, with the average flow being

reduced from 237 cfs to 179 cfs during Project operations and flow would then be increased by 24 percent in August of the same critically dry years, increasing the average flow from 73 cfs to 90 cfs. Overall, the range in flows expected with Project operations would remain within the current levels seen under existing conditions and minimum flow would increase (e.g., the minimum monthly flow for baseline conditions during the 47-year modeling period was 35 cfs expected to occur during August 1997, a critically dry year; flows during this month increased to 45 cfs with Project operations; see Appendix B2). Although the Project would result in reduced flow in the South Fork American River below the El Dorado Diversion Dam at times (e.g., a 24 percent average reduction in February in critically dry years), this is offset, or partially offset, by the increased flows seen during critical summer months. In addition, the Project would be operated such that minimum flow releases would be maintained in the South Fork American River below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license.

As discussed in Section 4.10.1, surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to the quantity of return flows would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals in the South Fork are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Additionally, the District would continue to meet FERC license required minimum streamflows below the El Dorado Diversion Dam, which are designed to protect instream beneficial uses. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the South Fork below the El Dorado Diversion Dam due to changes in flow. Impacts to hydrology and water quality resulting from Project-related changes in flow in the South Fork American River below the El Dorado Diversion Dam and the El Dorado Powerhouse would be **less than significant**.

El Dorado Canal to Sly Park Dam (Hazel Creek and Jenkinson Lake)

Sly Park Dam, on Sly Park Creek, forms Jenkinson Lake. Jenkinson Lake is a water supply reservoir that currently stores water from the Cosumnes River watershed under the District's permitted and licensed water rights. In addition, the District conveys water from the South Fork through Jenkinson Lake to meet water demands at Reservoir A WTP, by diverting water at El Dorado Diversion Dam under its pre-1914 water rights and conveying that water from the El Dorado Canal through Hazel Creek Tunnel and Hazel Creek and then to Jenkinson Lake. With Project operations, water that would otherwise have been diverted at El Dorado Diversion Dam and used to generate hydropower at the El Dorado Powerhouse under other District water rights, would instead be diverted under Permit 21112 and stored in Jenkinson Lake and used to meet consumptive water demands.

Hazel Creek Tunnel and Hazel Creek. Project operations would use existing facilities within their existing operational capacities. Although the frequency or duration of use for conveying water through Hazel Creek Tunnel and Hazel Creek may vary with Project operations, the maximum flow through Hazel Creek Tunnel and

Hazel Creek would not change between baseline and Project conditions. As such, potential effects due to erosion (or sedimentation) within the channel that conveys water from the Hazel Creek Tunnel outlet to Hazel Creek and Hazel Creek proper will be similar to existing conditions.

Jenkinson Lake. Figure 4.10-9 shows modeled end of month storage and end of month elevation at Jenkinson Lake for Project and baseline conditions when existing infrastructure is used to meet current water demands. Increased storage at Jenkinson Lake provides increased water supply reliability, particularly in the spring and summer of dry and critically dry years.



(a) End of Month Storage (acre feet) (b) End of Month Elevation (feet)

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Figure 4.10-9. Jenkinson Lake Storage and Elevation with Existing Infrastructure and Current Water Demands

Project operations would not change maximum flows in Hazel Creek and would increase water surface elevations and water supply reliability at Jenkinson Lake. Because there would be no change in the maximum flows within the channel that conveys water from the Hazel Tunnel outlet to Hazel Creek or Hazel Creek proper, and because the changes in water surface elevations at Jenkinson Lake would be within the range of normal operations, the Project would not result in the violation of water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater resources. Therefore, the effects to hydrology and water quality in Hazel Creek resulting from the Project would be **less than significant** and changes in storage at Jenkinson Lake during Project operations would be **beneficial**.

Slab Creek to Chili Bar

Minimum flows and recreational flows are required in the South Fork American River below Slab Creek Dam and Chili Bar Dam, consistent with requirements in SMUD's FERC license. The Project's hydrologic modeling prioritizes compliance with all such FERC license minimum instream requirements and assumes that SMUD would release additional water from storage to meet these minimum flow requirements during times when Project operations would reduce flows in the South Fork American River. Therefore, the modeling shows only minor changes occur in the flow differences between Project and baseline conditions between El Dorado Powerhouse and Chili Bar; see Table 4.10-9 (above) and Table 4.10-10 (below). Changes in flow would continue to have a seasonal pattern. For example, flow would be reduced by 8.1 percent in February of critically dry years in the South Fork at Chili Bar, with the average flow being reduced from 693 cfs to 637 cfs during Project operations,

and flow would then be increased by 3.5 percent in September of the same critically dry years, increasing the average flow from 545 cfs to 564 cfs.

Table 4.10-10. South Fork American River at Chili Bar, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	795	675	1,487	2,336	3,044	3,179	3,477	4,975	4,942	2,214	1,124	1,132	2,448
	Project, CFS	797	675	1,486	2,328	3,044	3,179	3,477	4,975	4,942	2,214	1,124	1,132	2,448
	Absolute Difference, CFS	2	0	-1	-8	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.2	0.0	-0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	-14	-40	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	25	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Baseline, CFS	858	698	895	2,784	2,422	1,946	2,085	3,908	2,433	1,239	884	930	1,757
	Project, CFS	858	698	895	2,779	2,422	1,946	2,086	3,908	2,433	1,239	884	930	1,757
	Absolute Difference, CFS	0	0	0	-5	0	0	1	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	-0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-14	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	3	0	0	0	0	0	
Below Normal	Baseline, CFS	673	1,054	1,306	1,362	2,181	2,543	2,419	2,754	1,495	806	769	906	1,522
	Project, CFS	675	1,054	1,306	1,347	2,179	2,546	2,424	2,759	1,499	807	769	910	1,523
	Absolute Difference, CFS	2	0	0	-15	-2	3	5	5	4	2	0	4	1
	Relative Difference (%)	0.3	0.0	0.0	-1.1	-0.1	0.1	0.2	0.2	0.3	0.2	0.0	0.5	0.0
	Maximum Reduction, CFS	0	0	-2	-51	-26	-2	0	0	0	0	0	0	
	Maximum Increase, CFS	16	0	0	0	7	15	20	27	36	17	1	34	
Dry	Baseline, CFS	671	674	1,228	2,449	1,148	1,364	1,852	1,993	1,136	681	829	899	1,244
	Project, CFS	671	674	1,228	2,442	1,120	1,357	1,844	1,998	1,147	693	835	899	1,242
	Absolute Difference, CFS	0	0	0	-7	-28	-7	-8	5	11	13	6	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.3	-2.5	-0.5	-0.4	0.2	1.0	1.9	0.8	0.0	-0.1
	Maximum Reduction, CFS	0	0	0	-32	-60	-45	-60	0	0	0	-2	0	
	Maximum Increase, CFS	0	0	0	0	0	14	6	24	34	43	28	0	
Critically Dry	Baseline, CFS	738	485	651	540	693	798	1,052	1,008	625	533	546	545	685
	Project, CFS	738	485	651	522	637	751	1,026	1,019	635	542	561	564	678
	Absolute Difference, CFS	0	0	0	-18	-56	-47	-26	11	10	9	15	19	-7
	Relative Difference (%)	0.0	0.0	0.0	-3.2	-8.1	-5.9	-2.5	1.1	1.6	1.8	2.8	3.5	-1.0
	Maximum Reduction, CFS	0	0	0	-67	-73	-60	-60	-53	-13	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-17	-1	20	29	30	48	46	59	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Slab Creek Reservoir and Chili Bar Reservoir are used as re-regulating forebays and afterbays to various powerhouses. Powerhouses that discharge water to this reach of the South Fork include Camino Powerhouse, Slab Creek Powerhouse, Rock Creek Powerhouse, White Rock Powerhouse, and the Chili Bar Powerhouse. Camino Powerhouse, located about ¼ mile downstream of El Dorado Powerhouse, contributes flow from the Upper American River Hydroelectric Project.

SMUD operates the majority of its Upper American River Hydroelectric Project (Project 2101) within the Silver Creek watershed. Water stored in Ice House Reservoir, Union Valley Reservoir, Junction Reservoir, and Camino Reservoir is used for power generation. Diversion for power generation also occurs within the Middle Fork's Rubicon River watershed, where water previously stored in Rubicon Reservoir, Buck Island Reservoir, Loon Lake Reservoir, or Gerle Creek Reservoir is transferred to Union Valley Reservoir for storage and additional power generation. Union Valley Reservoir receives these power production flows from the abovementioned reservoirs. Junction Reservoir and Camino Reservoir are located downstream of Union Valley Reservoir. These reservoirs are operated as re-regulating reservoirs for power production. With Project operations, changes in end of month storage at Union Valley Reservoir would occur primarily in below normal, dry, and critically dry years with reduced storage occurring in December through May and increased storage occurring in June through September of critically dry years (see Appendix B2). These changes are small compared to amount of water stored within the reservoir (a less than 0.5 percent decrease and a less than 2 percent increase in end of month storage). Changes in releases from Camino Powerhouse are shown in Table 4.10-11. Changes in releases occur primarily in critically dry years, where, on average, releases are reduced in June through August and increased in September.

Table 4.10-11. Camino Powerhouse Releases, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	567	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Project, CFS	569	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Absolute Difference, CFS	2	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	23	0	0	0	0	0	0	0	0	0	0	0	2
Above Normal	Baseline, CFS	683	488	545	988	990	936	801	1,160	723	745	695	741	791
	Project, CFS	683	488	545	988	990	936	801	1,160	723	745	695	741	791
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	Baseline, CFS	499	490	546	666	686	877	774	812	458	538	622	732	642
	Project, CFS	501	490	546	666	686	877	773	812	458	538	622	732	642
	Absolute Difference, CFS	2	0	0	0	1	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	-3	0	0	-3	0	-1	0	0
	Maximum Increase, CFS	16	0	0	1	5	0	0	0	0	2	0	1	2
Dry	Baseline, CFS	512	435	575	650	571	613	669	432	362	443	684	741	557
	Project, CFS	512	435	575	650	571	613	669	432	360	445	683	741	557
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	-2	2	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.4	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	-8	0	-2	0	0
	Maximum Increase, CFS	0	0	0	0	1	1	0	0	0	8	0	0	0
Critically Dry	Baseline, CFS	581	333	364	330	336	359	372	239	315	406	462	427	377
	Project, CFS	581	333	364	330	336	359	372	239	308	397	460	442	377
	Absolute Difference, CFS	0	0	0	0	1	0	0	0	-7	-9	-2	15	0
	Relative Difference (%)	0.0	0.0	0.1	-0.1	0.2	0.0	0.0	-0.1	-2.4	-2.2	-0.5	3.6	-0.1
	Maximum Reduction, CFS	0	0	0	-3	0	-4	0	-1	-22	-36	-25	-22	-2
	Maximum Increase, CFS	0	0	3	0	5	4	1	0	0	6	30	53	0

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Slab Creek Reservoir and Chili Bar Reservoir operate as re-regulating afterbays and forebays for power production. Between these two reservoirs is White Rock Powerhouse. White Rock Powerhouse generates power from South Fork American River flows. Water is diverted at Slab Creek Dam and returned to the river upstream of Chili Bar Reservoir. Project changes in return flows at White Rock Powerhouse typically have a similar seasonal pattern to Project effects in the upstream river reach, with reduction in flows occurring in winter and early spring and increases in flow occurring in late spring and summer in some water year types (Table 4.10-12).

Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to inflows at Slab Creek Reservoir that result from Project operations and changes to SMUD releases predicted by the Project's hydrologic modeling are small compared to the baseline flows in this reach and within the normal range of operations for this facility and therefore would not result in a substantial change in the concentrations of chemical constituents within the water (such as metals and mercury). Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between the El Dorado Powerhouse and Chili Bar due to changes in flow. The Project modeling assumes that SMUD would continue to comply with minimum flows and recreational flows in the South Fork American River below Slab Creek Dam and Chili Bar Dam, although some additional water from storage may need to be released by SMUD to meet these requirements. Impacts to hydrology and water quality resulting from

changes in flow in the South Fork American River between the El Dorado Powerhouse and Chili Bar would be **less than significant**.

Table 4.10-12. White Rock Powerhouse Releases, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	668	522	936	1,526	1,769	1,931	2,110	2,795	2,866	1,679	1,011	1,033	1,571
	Project, CFS	669	522	935	1,518	1,769	1,931	2,110	2,795	2,866	1,679	1,010	1,033	1,570
	Absolute Difference, CFS	2	0	-1	-7	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.2	0.0	-0.1	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	-13	-33	-1	-1	-1	-1	-1	-1	-1	0	-3
	Maximum Increase, CFS	25	0	0	0	0	0	0	0	0	10	0	0	0
Above Normal	Baseline, CFS	763	587	722	1,569	1,440	1,440	1,574	2,469	1,847	1,098	796	845	1,262
	Project, CFS	763	587	722	1,566	1,440	1,439	1,574	2,468	1,846	1,098	796	845	1,262
	Absolute Difference, CFS	0	0	0	-3	0	0	0	-1	-1	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-10	-1	0	-1	-1	-1	-1	0	0	-1
	Maximum Increase, CFS	0	0	0	0	0	0	2	0	-1	0	0	0	0
Below Normal	Baseline, CFS	578	728	779	1,024	1,117	1,612	1,762	1,981	1,197	691	682	821	1,081
	Project, CFS	579	728	781	1,009	1,106	1,614	1,765	1,984	1,200	693	682	825	1,081
	Absolute Difference, CFS	2	0	1	-15	-11	2	3	3	3	2	0	4	0
	Relative Difference (%)	0.3	0.0	0.1	-1.5	-1.0	0.1	0.2	0.2	0.3	0.3	0.0	0.5	0.0
	Maximum Reduction, CFS	0	0	-2	-52	-82	-4	-1	-1	-1	-1	0	0	-6
	Maximum Increase, CFS	16	0	12	0	6	11	17	21	33	17	1	34	5
Dry	Baseline, CFS	565	549	773	960	832	1,001	1,417	1,622	947	569	743	820	900
	Project, CFS	565	549	773	953	805	994	1,408	1,625	957	582	749	820	898
	Absolute Difference, CFS	0	0	0	-7	-27	-7	-9	4	10	13	6	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.7	-3.3	-0.7	-0.6	0.2	1.1	2.2	0.8	0.0	-0.2
	Maximum Reduction, CFS	0	0	0	-31	-60	-42	-59	-1	-1	0	-2	0	-3
	Maximum Increase, CFS	0	0	0	1	0	14	6	20	33	42	28	0	0
Critically Dry	Baseline, CFS	642	381	491	413	503	614	864	847	513	439	472	474	554
	Project, CFS	642	381	491	395	450	567	838	858	522	448	487	494	548
	Absolute Difference, CFS	0	0	0	-17	-53	-47	-26	11	9	9	15	19	-7
	Relative Difference (%)	0.0	0.0	0.0	-4.2	-10.5	-7.6	-3.0	1.3	1.8	2.1	3.3	4.1	-1.2
	Maximum Reduction, CFS	0	0	0	-67	-73	-60	-60	-53	-14	0	0	0	-16
	Maximum Increase, CFS	0	0	0	0	-17	0	19	27	29	48	45	59	-2

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Chili Bar to Folsom Reservoir

South Fork between Chili Bar and Salmon Falls Bridge. Salmon Falls bridge is located near the upstream extent of the southern arm of Folsom Reservoir. River flows at this location represents South Fork inflows to Folsom Reservoir. Tributary flows contribute to the river between Chili Bar and Salmon Falls bridge. Project changes in flow seen at Chili Bar propagate down the river and at an increasingly smaller fraction of the flow (Table 4.10-13). The maximum reduction in monthly flow in the South Fork American River at Salmon Fall bridge between Project and baseline conditions is projected to be 73 cfs, expected to occur during February of a critically dry year (a single month during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 56 cfs (a 7 percent decrease). The maximum increase in monthly flow between Project and baseline conditions is projected to be 59 cfs, expected to occur during September of a critically dry year and the average increase in monthly flows during September of critically dry years is 19 cfs (a 3.5 percent increase).

Table 4.10-13. South Fork American River at Salmon Falls, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	831	750	1,732	2,847	3,780	3,842	4,035	5,266	5,089	2,301	1,180	1,178	2,736
	Project, CFS	833	750	1,732	2,840	3,780	3,842	4,035	5,266	5,089	2,301	1,180	1,178	2,735
	Absolute Difference, CFS	2	0	-1	-8	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.2	0.0	-0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	-14	-40	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	25	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Baseline, CFS	890	752	980	3,116	3,093	2,241	2,299	4,076	2,508	1,285	921	960	1,927
	Project, CFS	890	752	980	3,111	3,093	2,241	2,300	4,076	2,508	1,285	921	960	1,926
	Absolute Difference, CFS	0	0	0	-5	0	0	1	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-14	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	3	0	0	0	0	0	
Below Normal	Baseline, CFS	704	1,158	1,534	1,528	2,706	2,958	2,580	2,857	1,542	835	791	928	1,677
	Project, CFS	706	1,158	1,533	1,513	2,704	2,961	2,585	2,862	1,546	837	791	932	1,677
	Absolute Difference, CFS	2	0	0	-15	-2	3	5	5	4	2	0	4	1
	Relative Difference (%)	0.3	0.0	0.0	-1.0	-0.1	0.1	0.2	0.2	0.3	0.2	0.0	0.5	0.0
	Maximum Reduction, CFS	0	0	-2	-51	-26	-2	0	0	0	0	0	0	
	Maximum Increase, CFS	16	0	0	0	7	15	20	27	36	17	1	34	
Dry	Baseline, CFS	708	747	1,506	2,867	1,317	1,518	2,032	2,082	1,183	708	849	917	1,369
	Project, CFS	708	747	1,506	2,860	1,288	1,511	2,023	2,086	1,194	720	855	917	1,368
	Absolute Difference, CFS	0	0	0	-7	-28	-7	-8	5	11	13	6	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.2	-2.2	-0.5	-0.4	0.2	1.0	1.8	0.7	0.0	-0.1
	Maximum Reduction, CFS	0	0	0	-32	-60	-45	-60	0	0	0	-2	0	
	Maximum Increase, CFS	0	0	0	0	0	14	6	24	34	43	28	0	
Critically Dry	Baseline, CFS	770	527	714	609	825	896	1,117	1,050	651	547	556	555	735
	Project, CFS	770	527	714	592	769	849	1,091	1,061	661	556	571	574	728
	Absolute Difference, CFS	0	0	0	-18	-56	-47	-26	11	10	9	15	19	-7
	Relative Difference (%)	0.0	0.0	0.0	-2.9	-6.8	-5.2	-2.3	1.1	1.5	1.7	2.8	3.5	-0.9
	Maximum Reduction, CFS	0	0	0	-67	-73	-60	-60	-53	-13	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-17	-1	20	29	30	48	46	59	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Folsom Reservoir. The North, Middle and South Forks of the American River empty into Folsom Reservoir. Reclamation operates Folsom Reservoir for flood protection, water supply use, power generation, recreation, and environmental purposes including water temperature management in the Lower American River. Folsom Dam and Reservoir are located at the western boundary and lowest elevation of the District's service area. The District diverts water from Folsom Reservoir under Permit 21112 and other water rights and entitlements as authorized under federal contract. The District treats raw water from Folsom Reservoir at the El Dorado Hills WTP and supplies potable water to the El Dorado Hills service zone when demands are high.

Table 4.10-14 shows end of month storage at Folsom Reservoir modeled for Project and baseline conditions assuming Project operations with existing infrastructure and current water demands. On average, under Project operations storage is expected to be reduced at Folsom Reservoir in fall and winter of below normal years, in winter and early spring of dry years, and in winter, spring, and summer of critically dry years. The magnitude of these reductions is small compared to the total amount of storage in Folsom Reservoir (averaging less than 2 percent by water year type). In addition, storage is expected to be increased in late spring and fall of dry years.

Table 4.10-14. Folsom Reservoir End of Month Storage, Existing Infrastructure (Baseline vs Project) – in 1,000 acre-feet

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	Baseline, 1,000 AF	500	434	462	550	556	738	887	967	967	920	792	752
	Project, 1,000 AF	500	434	463	549	556	738	887	967	967	920	792	752
	Absolute Difference, 1,000 AF	0	1	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-3	-3	-4	-2	-1	-1	-2	0	0	0	0	0
	Maximum Increase, 1,000 AF	6	7	6	0	0	0	0	0	0	0	0	0
Above Normal	Baseline, 1,000 AF	566	498	521	567	567	726	900	967	928	820	726	676
	Project, 1,000 AF	566	498	521	567	567	726	900	967	928	820	726	676
	Absolute Difference, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, 1,000 AF	0	0	0	0	0	0	0	0	0	0	1	0
Below Normal	Baseline, 1,000 AF	484	431	470	512	529	756	857	961	867	638	563	519
	Project, 1,000 AF	483	429	468	510	527	756	857	961	868	638	563	519
	Absolute Difference, 1,000 AF	-2	-2	-2	-2	-2	0	0	0	0	0	0	0
	Relative Difference (%)	-0.3	-0.4	-0.3	-0.4	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-10	-10	-10	-12	-14	0	0	0	0	0	0	0
	Maximum Increase, 1,000 AF	0	0	0	0	0	0	0	1	3	1	0	1
Dry	Baseline, 1,000 AF	525	465	474	471	481	617	725	783	673	498	421	378
	Project, 1,000 AF	525	465	474	470	480	615	723	780	674	500	423	380
	Absolute Difference, 1,000 AF	0	0	0	-1	-2	-2	-3	-2	1	2	2	2
	Relative Difference (%)	0.0	0.0	0.0	-0.1	-0.4	-0.4	-0.4	-0.3	0.2	0.3	0.4	0.5
	Maximum Reduction, 1,000 AF	0	0	0	-2	-6	-7	-7	-5	-3	-1	0	0
	Maximum Increase, 1,000 AF	1	0	0	0	0	0	1	0	8	9	9	9
Critically Dry	Baseline, 1,000 AF	472	403	415	403	423	465	503	504	481	371	321	292
	Project, 1,000 AF	473	403	415	403	419	458	497	499	477	369	319	291
	Absolute Difference, 1,000 AF	1	0	0	-1	-3	-6	-6	-5	-4	-2	-2	-1
	Relative Difference (%)	0.1	0.0	0.1	-0.2	-0.8	-1.4	-1.2	-1.1	-0.9	-0.5	-0.6	-0.3
	Maximum Reduction, 1,000 AF	-2	-2	-1	-4	-9	-12	-13	-13	-13	-11	-11	-11
	Maximum Increase, 1,000 AF	9	2	2	1	0	-1	4	3	1	3	4	6

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

The maximum reduction in end of month storage in Folsom Reservoir between Project and baseline conditions is projected to be up to 13,000 acre-feet during April through June of critically dry years and the average reduction ranges from 4,000 to 6,000 acre-feet during this same time period.

These model results were generated using CalSim 3. CalSim is a planning model that analyzes CVP and SWP water management actions on a monthly time step. It has complex rules, such as those used to route water for water supply contracts and regulatory requirements, which call upon different water supply reservoirs in the Central Valley. Geographically, the CalSim model covers all water supply reservoirs that supply flow upstream of the Delta and SWP exports to the San Francisco Bay area, the Central Coast, and Southern California. Overall, under Project operations the system modeled by CalSim at large is not experiencing net negative effects beyond those which can be inferred at Folsom Reservoir due to changes in South Fork American River inflows. Because Folsom Reservoir storage levels and water surface elevations can have large fluctuations in response to system-wide operational decisions, changes in end of month storage at Folsom Reservoir may not be in direct response to Project changes in Folsom Reservoir inflows and may not be of the same magnitude as Project effects. In some cases, a larger reduction in end of month storage could represent multiple months of reduced inflows into Folsom Reservoir under Project operations. In other cases, a larger reduction in end of month storage could be a result of Reclamation's operational decisions that are triggered within the context of a much larger geographical and water management framework.

Although inflows to Folsom Reservoir would be reduced, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between Chili Bar and Folsom Reservoir or at Folsom Reservoir. Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water

often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to flows in the South Fork American River below Chili Bar that result from Project operations would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between Chili Bar and Folsom and at Folsom Reservoir would be **less than significant**.

Folsom Dam to Lower American River at Watt Avenue Bridge

Releases from Folsom Dam flow to Lake Natoma. Nimbus Dam, which forms Lake Natoma, is located 7 miles downstream of Folsom Dam. Lake Natoma is a re-regulating reservoir for Folsom Powerplant and releases from Nimbus Dam flow to the Lower American River. Watt Avenue bridge, the downstream extent of the hydrologic study area on the Lower American River, is located 13.6 river miles downstream of Nimbus Dam.

Lower American River at Nimbus Dam. Flow in the Lower American River at Nimbus Dam is expected to be reduced by about 2 cfs on an average annual basis, which is consistent with Project changes in average annual inflows to Folsom Reservoir. As shown in Table 4.10-15, the maximum reduction in monthly flow in Lower American River at Nimbus Dam between Project and baseline conditions is projected to be 229 cfs, expected to occur during March of a below normal year (a single month during the 47-year modeling period) and the average reduction in monthly flows during March of below normal years is 38 cfs (a 0.9 percent decrease). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 117 cfs, expected to occur during November of a critically dry year and the average increase in monthly flows during November of critically dry years is 10 cfs (a less than 0.5 percent increase). Larger-scale changes, such as the modeled maximum reduction in monthly flow of 229 cfs, are likely a result of the operational decisions by Reclamation included in the CalSim 3 model to manage a much larger geographical area over a time scale of months to years.[5] Changes in flow of this magnitude represent a reasonable flow scenario for the Lower American River downstream of Folsom within the context of CVP and SWP operations.

[5] These model results were generated using CalSim 3. CalSim is a planning model that analyzes CVP and SWP water management actions on a monthly time step. It has complex rules which call upon different water supply reservoirs within the Central Valley. Geographically, the model covers all water supply reservoirs that supply flow upstream of the Delta, and SWP exports to the San Francisco Bay area, the Central Coast, and Southern California. CVP and SWP operations rely on an integrated system of reservoirs and export facilities for system operations and the CalSim model is programed to optimize those operations given the constraints of the system, *i.e.*, geographic constraints, hydrologic constraints, physical capacity, flood control requirements, environmental constraints (water quality, outflow), contractual and water rights requirements, economic constraints, and demand patterns. For example, Delta inflows can increase to meet export demands through additional releases from Shasta Lake, Lake Oroville, or Folsom Reservoir. If, for example, short-term releases are made from Shasta Lake instead of Folsom Reservoir during Project operations to rebalance reservoir storage, flow in the Lower American River would be reduced compared to baseline conditions and the magnitude of that change could be related to CVP and SWP system-wide operations, such as maximizing contractual water supply deliveries, and not necessarily be in direct response to change in South Fork American River inflows.

Table 4.10-15. Lower American River at Nimbus Dam, Existing Infrastructure (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	1,593	2,835	4,074	5,558	7,651	6,926	6,320	9,243	8,395	3,897	3,884	2,356	5,228
	Project, CFS	1,593	2,834	4,074	5,557	7,651	6,925	6,320	9,240	8,394	3,896	3,884	2,356	5,227
	Absolute Difference, CFS	0	-1	0	-1	-1	-1	-1	-3	-1	-1	0	0	-1
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	-11	-1	-106	-1	-1	-1	-31	-1	-3	-1	-1	
	Maximum Increase, CFS	0	0	3	80	0	0	0	-1	-1	0	2	0	
Above Normal	Baseline, CFS	1,500	2,472	2,187	6,536	5,943	2,557	2,003	6,176	4,816	3,285	2,845	1,926	3,521
	Project, CFS	1,500	2,472	2,186	6,534	5,942	2,557	2,003	6,175	4,815	3,284	2,846	1,926	3,520
	Absolute Difference, CFS	0	0	-1	-3	0	0	0	-1	-1	-1	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	-1	-8	-1	-1	-1	-1	-2	-2	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	-1	0	0	1	1	
Below Normal	Baseline, CFS	1,423	3,063	3,289	2,862	7,426	4,187	3,202	3,764	4,605	4,722	2,479	1,961	3,582
	Project, CFS	1,423	3,063	3,289	2,859	7,425	4,149	3,204	3,767	4,605	4,730	2,481	1,965	3,580
	Absolute Difference, CFS	0	0	0	-3	0	-38	2	3	0	8	1	3	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.1	0.0	-0.9	0.1	0.1	0.0	0.2	0.1	0.2	-0.1
	Maximum Reduction, CFS	-1	0	0	-17	-1	-229	-2	-1	-1	-1	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	17	22	0	57	10	24	
Dry	Baseline, CFS	1,242	2,590	3,657	6,976	2,954	1,463	1,562	2,211	4,068	3,815	2,188	1,765	2,874
	Project, CFS	1,241	2,590	3,657	6,976	2,942	1,463	1,559	2,208	4,031	3,821	2,190	1,765	2,870
	Absolute Difference, CFS	-1	0	0	0	-12	0	-4	-3	-37	5	2	-1	-4
	Relative Difference (%)	0	0	0	0	0	0	0	0	-1	0	0	0	0
	Maximum Reduction, CFS	-5	0	0	-1	-57	0	-17	-10	-191	-1	0	-3	
	Maximum Increase, CFS	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	27.0	8.0	0.0	
Critically Dry	Baseline, CFS	1,312	2,227	1,924	1,172	1,574	1,414	1,168	1,217	1,531	2,429	1,518	1,264	1,563
	Project, CFS	1,312	2,237	1,927	1,171	1,564	1,414	1,142	1,217	1,518	2,415	1,519	1,266	1,559
	Absolute Difference, CFS	0	10	3	-1	-11	0	-26	0	-13	-15	1	2	-4
	Relative Difference (%)	0	0	0	0	-1	0	-2	0	-1	-1	0	0	0
	Maximum Reduction, CFS	-16	-1	0	-18	-69	0	-183	-16	-85	-142	-34	0	
	Maximum Increase, CFS	13.0	117.0	14.0	0.0	0.0	0.0	0.0	27.0	25.0	24.0	56.0	26.0	

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

As discussed in Section 4.10.1, water quality impairments identified in the Lower American River include mercury and indicator bacteria at Lake Natoma and bifenthrin, indicator bacteria, mercury, PCBs, pyrethroids, water temperature, and toxicity between Nimbus Dam and the confluence with Sacramento River (SWRCB 2022). Although flow in the Lower American River can be reduced during Project operations (e.g., up to 229 cfs per month), changes in flow at this magnitude are not expected to change the chemical constituents within the water. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to water temperature in the Lower American River is expected to be minor as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the Lower American River between Folsom Dam and Watt Avenue bridge would be **less than significant**.

Future Project

Project operations with existing infrastructure and future water demands are described in this section.

Kyburz to El Dorado Powerhouse

South Fork above El Dorado Diversion Dam. The Project is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam on a monthly basis (Table 4.10-16).

Table 4.10-16. South Fork American River above the El Dorado Diversion Dam, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Future Project, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Future Baseline, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Future Project, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Below Normal	Future Baseline, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Future Project, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Dry	Future Baseline, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Future Project, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Critically Dry	Future Baseline, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Future Project, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Flow in the South Fork below the El Dorado Diversion Dam is expected to remain unchanged as compared to future baseline conditions when the Project is operated with existing infrastructure (Table 4.10-17). The District would continue to divert water at the El Dorado Diversion Dam under the Project at the same rate and timing as it does under future baseline conditions. However, under the Project, water that would otherwise be diverted for non-consumptive hydropower generation would instead be diverted for consumptive purposes. As such, a change in South Fork American River flow is observed further downstream, resulting from reduced return flow below the El Dorado Powerhouse, as described in the following section.

Table 4.10-17. South Fork American River below the El Dorado Diversion Dam, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	114	132	204	235	398	530	853	1,993	2,038	640	90	54	607
	Future Project, CFS	114	132	204	235	398	530	853	1,993	2,038	640	90	54	607
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Future Baseline, CFS	78	87	65	432	217	244	545	1,493	926	262	65	50	372
	Future Project, CFS	78	87	65	432	217	244	545	1,493	926	262	65	50	372
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Below Normal	Future Baseline, CFS	90	212	159	169	255	504	824	1,166	569	130	65	50	349
	Future Project, CFS	90	212	159	169	255	504	824	1,166	569	130	65	50	349
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Dry	Future Baseline, CFS	69	100	139	381	103	232	539	914	393	86	18	15	249
	Future Project, CFS	69	100	139	381	103	232	539	914	393	86	18	15	249
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Critically Dry	Future Baseline, CFS	64	62	71	36	54	101	288	377	116	40	18	15	104
	Future Project, CFS	64	62	71	36	54	101	288	377	116	40	18	15	104
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Permit 21112 water that is diverted at El Dorado Diversion Dam would be delivered in two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP; and/or 2) to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to the Reservoir A WTP. The water stored in Jenkinson Lake would be delivered to Reservoir A WTP as needed throughout the year to help meet water demands.

Because there would be a change from non-consumptive hydropower generation to consumptive use with Project operations, additional water would be either be diverted from Forebay Reservoir to Reservoir 1 WTP or be routed through Hazel Creek Tunnel to Jenkinson Lake and less water would be delivered to the El Dorado Powerhouse for power production. Table 4.10-18 shows estimated flow releases from the El Dorado Powerhouse for baseline and Project conditions and the change between baseline and Project conditions represents the change in return flows provided to the South Fork during Project operations. A change in powerhouse releases also affects power production (discussed in more detail in Section 4.6).

Table 4.10-18. El Dorado Powerhouse Releases, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	1	0	81	125	135	141	139	133	127	102	80	113	98
	Future Project, CFS	1	0	79	108	135	141	139	135	127	102	80	113	97
	Absolute Difference, CFS	0	0	-3	-17	0	0	0	1	0	0	0	0	-1
	Relative Difference (%)	-0.5	0.0	-3.1	-13.4	0.0	0.0	0.1	1.0	0.0	0.0	0.0	0.0	-1.5
	Maximum Reduction, CFS	0	0	-18	-69	-1	0	0	0	0	0	0	0	-7
	Maximum Increase, CFS	0	0	0	0	0	0	2	19	0	0	0	0	0
Above Normal	Future Baseline, CFS	1	0	94	124	127	123	133	130	123	48	34	86	85
	Future Project, CFS	1	0	92	90	129	128	134	134	123	48	34	86	83
	Absolute Difference, CFS	0	0	-2	-35	2	6	1	4	0	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-1.8	-27.9	1.8	4.5	1.1	2.7	0.0	0.0	0.0	0.0	-2.3
	Maximum Reduction, CFS	0	0	-5	-60	0	0	0	0	0	0	0	0	-2
	Maximum Increase, CFS	0	0	0	-18	8	17	4	11	0	0	0	0	-2
Below Normal	Future Baseline, CFS	1	0	81	103	119	126	125	115	90	20	9	74	72
	Future Project, CFS	1	0	79	76	97	125	135	128	110	20	9	72	71
	Absolute Difference, CFS	0	0	-2	-28	-22	-1	10	13	20	0	0	-1	-1
	Relative Difference (%)	0.0	0.0	-2.2	-26.8	-18.7	-0.4	7.8	11.5	21.8	-0.5	0.0	-1.8	-1.3
	Maximum Reduction, CFS	0	0	-16	-52	-60	-40	0	0	0	-2	0	-6	-6
	Maximum Increase, CFS	0	0	0	0	8	26	26	34	50	1	0	0	7
Dry	Future Baseline, CFS	1	0	75	74	89	106	114	103	83	58	65	98	72
	Future Project, CFS	1	0	71	53	43	70	111	114	105	61	64	98	66
	Absolute Difference, CFS	0	0	-4	-20	-46	-35	-3	11	21	4	0	0	-6
	Relative Difference (%)	0.0	0.0	-5.5	-27.7	-51.7	-33.5	-2.6	10.5	25.6	6.3	-0.7	0.0	-8.5
	Maximum Reduction, CFS	0	0	-17	-56	-73	-54	-55	-43	0	-1	-1	0	-13
	Maximum Increase, CFS	0	0	0	0	0	0	26	34	46	12	1	0	0
Critically Dry	Future Baseline, CFS	1	0	63	45	80	99	109	94	44	32	39	71	56
	Future Project, CFS	1	0	58	22	23	50	73	91	55	31	28	67	42
	Absolute Difference, CFS	0	0	-5	-23	-57	-50	-36	-3	11	-1	-11	-5	-15
	Relative Difference (%)	0.0	0.0	-7.4	-51.6	-71.7	-50.1	-32.7	-2.8	24.6	-3.2	-27.2	-6.3	-26.4
	Maximum Reduction, CFS	0	0	-18	-67	-73	-55	-55	-45	-10	-39	-34	-47	-22
	Maximum Increase, CFS	0	0	0	0	-19	-6	21	30	45	25	0	0	-4

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Forebay Reservoir is the re-regulating forebay for these flows. As such, it routinely fluctuates in storage and elevation. Changes in end of month storage at Forebay Reservoir would occur during some years, with reductions in storage occurring primarily in December through February and in July and August, and increased storage occurring in June (see Appendix B2). The expected range in storage and elevation with Project operations would remain within the current levels seen under existing conditions.

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse is expected to be reduced by about 6 cfs on an average annual basis when the Project is operated with existing infrastructure with future water demands. The difference in river flow below the El Dorado Powerhouse between baseline and Project conditions is related to the change in water use from non-consumptive power generation to consumptive use that occurs with Project operation. With future water demands, additional water is allocated for consumptive use, more water is transferred to Jenkinson Lake in the winter, and less water is returned to the river in spring and early summer. Changes to South Fork American River flows below the El Dorado Powerhouse is the most upstream location within the river where changes to flows would occur with Project implementation when operated using existing infrastructure to meet future water demands.

Under Project operations, flow in the river is typically reduced below the El Dorado Powerhouse in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through May and August through September in critically dry years. In some years, Project operations would also result in increased return flows; this would primarily occur in February through May in above normal years, April through June in below normal years, May through July in dry years, and June of critically dry years (Table 4.10-19).

Table 4.10-19. South Fork America River below El Dorado Powerhouse, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	190	229	620	898	1,315	1,442	1,750	3,438	3,525	1,211	256	225	1,258
	Future Project, CFS	189	229	618	881	1,315	1,442	1,750	3,439	3,525	1,211	256	225	1,257
	Absolute Difference, CFS	0	0	-3	-17	0	0	0	1	0	0	0	0	-2
	Relative Difference (%)	-0.1	0.0	-0.4	-1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-3	0	-18	-69	-1	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	19	0	0	0	0	
Above Normal	Future Baseline, CFS	145	160	265	1,491	871	732	1,074	2,575	1,591	445	148	175	806
	Future Project, CFS	145	160	264	1,455	874	737	1,076	2,579	1,591	445	148	175	804
	Absolute Difference, CFS	0	0	-2	-35	2	6	1	4	0	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.6	-2.4	0.3	0.8	0.1	0.1	0.0	0.0	0.0	0.0	-0.2
	Maximum Reduction, CFS	0	0	-5	-60	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	-18	7	17	4	11	0	0	0	0	
Below Normal	Future Baseline, CFS	141	475	563	540	1,044	1,255	1,445	1,826	929	231	113	161	727
	Future Project, CFS	141	475	561	513	1,022	1,254	1,455	1,839	949	231	113	159	726
	Absolute Difference, CFS	0	0	-2	-28	-22	-1	10	13	20	0	0	-1	-1
	Relative Difference (%)	0.0	0.0	-0.3	-5.1	-2.1	-0.1	0.7	0.7	2.1	0.0	0.0	-0.8	-0.1
	Maximum Reduction, CFS	0	0	-16	-52	-60	-43	0	0	0	-2	0	-6	
	Maximum Increase, CFS	0	0	0	0	7	26	25	34	48	1	0	0	
Dry	Future Baseline, CFS	121	174	433	1,449	416	572	1,002	1,426	687	210	118	143	562
	Future Project, CFS	121	174	429	1,428	369	536	999	1,437	708	214	118	143	556
	Absolute Difference, CFS	0	0	-4	-20	-46	-35	-3	11	21	4	0	0	-6
	Relative Difference (%)	0.0	0.0	-1.0	-1.4	-11.1	-6.2	-0.3	0.8	3.1	1.7	-0.4	0.0	-1.1
	Maximum Reduction, CFS	0	0	-17	-56	-73	-54	-55	-43	0	-1	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	25	34	45	12	1	0	
Critically Dry	Future Baseline, CFS	123	109	212	138	237	331	614	701	262	115	83	108	253
	Future Project, CFS	123	109	207	114	179	281	579	699	273	114	73	103	238
	Absolute Difference, CFS	0	0	-5	-23	-57	-50	-36	-3	11	-1	-10	-5	-15
	Relative Difference (%)	0.0	0.0	-2.2	-17.0	-24.2	-15.0	-5.8	-0.4	4.2	-0.9	-12.6	-4.2	-5.9
	Maximum Reduction, CFS	0	0	-18	-67	-73	-55	-55	-45	-10	-39	-34	-47	
	Maximum Increase, CFS	0	0	0	0	-17	-6	20	30	43	25	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

As shown in Table 4.10-19, the maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 73 cfs, expected to occur during February of a critically dry year (a single month during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 57 cfs (a 24 percent reduction). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 48 cfs, expected to occur during June of a below normal year and the average increase in monthly flows during June of below normal years is 20 cfs (a 2.1 percent increase). Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches and these changes would represent an increasingly smaller fraction of the overall flow as tributaries and return flows from downstream operators join the river.

As described above, operation of the Project is expected to both increase and decrease flows in the South Fork American River below the El Dorado Powerhouse. For example, flow would be reduced by 24 percent in February of critically dry years in the South Fork below the El Dorado Powerhouse, with the average flow being reduced from 237 cfs to 179 cfs during Project operations and flow would then be increased by 4.2 percent in June of the same critically dry years, increasing the average flow from 262 cfs to 273 cfs. Overall, the range in flows expected with Project operations would remain the same as the current levels seen under existing conditions; see Appendix B2). Although the Project would result in reduced flow in the South Fork American River below the El Dorado Diversion Dam and the El Dorado Powerhouse at times (e.g. 24 percent average reduction in February in critically dry years), this is partially offset by the increased flows seen during critical summer months. In addition, the Project would be operated such that minimum instream flows would be maintained in the South Fork American River below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license.

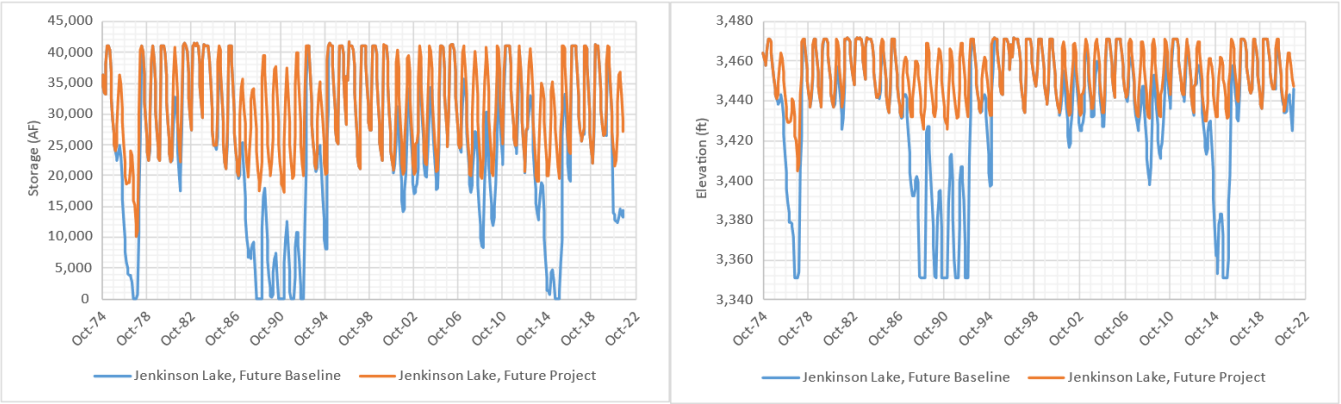
Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to the quantity of return flows would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals in the South Fork are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Additionally, the District would continue to meet FERC license required minimum streamflows below the El Dorado Diversion Dam, which are designed to protect instream beneficial uses. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the South Fork below the El Dorado Diversion Dam due to changes in flow. Impacts to hydrology and water quality resulting from flow in the South Fork American River below the El Dorado Diversion Dam and the El Dorado Powerhouse would be **less than significant**.

El Dorado Canal to Sly Park Dam (Hazel Creek and Jenkinson Lake)

Hazel Creek Tunnel and Hazel Creek. Project operations would use existing facilities to meet future water demands. Although the frequency or duration of use for conveying water through Hazel Creek Tunnel and Hazel Creek may vary with Project operations, the maximum flow through Hazel Creek Tunnel and Hazel Creek would not change between baseline and Project conditions. As such, potential effects due to erosion (or sedimentation) within the channel that conveys water from the Hazel Creek Tunnel outlet to Hazel Creek and Hazel Creek proper will be similar to existing conditions.

Jenkinson Lake. Figure 4.10-10 shows modeled end of month storage at Jenkinson Lake for future baseline and future Project conditions when the Project is operated with existing infrastructure to meet future water demands. Modeling results show that Jenkinson Lake may be emptied in future baseline conditions in several critically dry years and in years which follow those critically dry years in the attempt to meet the modeled future water demands. Operation of the Project is expected to prevent Jenkinson Lake from emptying when meeting future water demands.

Project operations would not change maximum flows in Hazel Creek and would increase water surface elevations and water supply reliability at Jenkinson Lake. Because there would be no change in the maximum flows within the channel that conveys water from the Hazel Tunnel outlet to Hazel Creek or Hazel Creek proper, and because the changes in water surface elevations at Jenkinson Lake would be within the range of normal operations, the Project would not result in the violation of water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater resources. Therefore, the effects to hydrology and water quality in Hazel Creek resulting from the Project would be **less than significant** and changes in storage at Jenkinson Lake during Project operations would be **beneficial**.



(a) End of Month Storage (acre feet) (b) End of Month Elevation (feet)

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Figure 4.10-10. Jenkinson Lake Storage and Elevation with Existing Infrastructure and Future Water Demands

Slab Creek to Chili Bar

Minimum flows and recreational flows are required in the South Fork American River below Slab Creek Dam and Chili Bar Dam, consistent with requirements in SMUD's FERC license. The Project's hydrologic modeling prioritizes compliance with all such FERC license minimum instream requirements and assumes that SMUD would release additional water from storage to meet these minimum flow requirements during times when Project operations would reduce flows in the South Fork American River. Therefore, the modeling shows only minor changes occur in the flow differences between Project and baseline conditions between El Dorado Powerhouse and Chili Bar (Table 4.10-20). Changes in flow would continue to have a seasonal pattern. For example, flow would be reduced by 8.1 percent in February of critically dry years in the South Fork at Chili Bar, with the average flow being reduced from 693 cfs to 637 cfs during Project operations, and flow would then be increased by 1.4 percent in June of the same critically dry years, increasing the average flow from 612 cfs to 621 cfs.

Slab Creek Reservoir and Chili Bar Reservoir are used as re-regulating forebays and afterbays to various powerhouses. Powerhouses that discharge water to this reach of the South Fork include Camino Powerhouse, Slab Creek Powerhouse, Rock Creek Powerhouse, White Rock Powerhouse, and the Chili Bar Powerhouse.

Camino Powerhouse, located about ¼ mile downstream of El Dorado Powerhouse, contributes flow from the Upper American River Hydroelectric Project. Union Valley Reservoir receives power production flows from higher elevation reservoirs in the Silver Creek and Rubicon River watersheds and releases water to Junction Reservoir, and indirectly to Camino Reservoir. With Project operations, changes in end of month storage at Union Valley Reservoir would occur primarily in below normal, dry, and critically dry years with reduced storage occurring in December through May and in August and September, and increased storage occurring in June and July of critically dry years (see Appendix B2). These changes are small compared to amount of water stored in the reservoir (less than a 2 percent decrease and less than a 1 percent increase in end of month storage). Releases from Camino Powerhouse are shown in in Table 4.10-21. With Project operations, changes in flow below the Camino Powerhouse occur primarily in critically dry years, where, on average, flow is reduced in June and July and increased in August and September of critically dry years.

Table 4.10-20. South Fork American River at Chili Bar, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	796	675	1,487	2,335	3,044	3,178	3,475	4,971	4,938	2,211	1,120	1,128	2,446
	Future Project, CFS	794	675	1,484	2,318	3,044	3,178	3,475	4,972	4,938	2,211	1,120	1,128	2,445
	Absolute Difference, CFS	-2	0	-2	-17	0	0	0	1	0	0	0	0	-2
	Relative Difference (%)	-0.2	0.0	-0.2	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-28	0	-18	-69	-1	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	19	0	0	0	0	
Above Normal	Future Baseline, CFS	858	698	895	2,782	2,420	1,938	2,076	3,901	2,429	1,237	881	926	1,753
	Future Project, CFS	858	698	893	2,747	2,422	1,943	2,077	3,905	2,429	1,237	881	926	1,751
	Absolute Difference, CFS	0	0	-2	-35	2	6	1	4	0	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.2	-1.3	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-5	-60	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	-18	7	17	4	11	0	0	0	0	
Below Normal	Future Baseline, CFS	675	1,054	1,306	1,361	2,178	2,533	2,409	2,741	1,475	804	767	905	1,517
	Future Project, CFS	673	1,054	1,304	1,334	2,156	2,531	2,419	2,754	1,494	804	767	903	1,516
	Absolute Difference, CFS	-2	0	-2	-27	-22	-1	10	13	19	1	0	-1	-1
	Relative Difference (%)	-0.3	0.0	-0.1	-2.0	-1.0	-0.1	0.4	0.5	1.3	0.1	0.0	-0.1	-0.1
	Maximum Reduction, CFS	-18	0	-16	-51	-61	-48	0	0	0	-1	0	-6	
	Maximum Increase, CFS	0	0	0	0	7	26	25	35	48	4	0	0	
Dry	Future Baseline, CFS	671	674	1,228	2,448	1,148	1,358	1,837	1,973	1,118	684	829	895	1,239
	Future Project, CFS	671	674	1,225	2,426	1,103	1,323	1,833	1,984	1,137	689	829	895	1,233
	Absolute Difference, CFS	0	0	-3	-21	-45	-35	-4	11	18	5	0	0	-6
	Relative Difference (%)	0.0	0.0	-0.3	-0.9	-3.9	-2.6	-0.2	0.6	1.7	0.7	0.0	0.0	-0.5
	Maximum Reduction, CFS	0	0	-17	-56	-70	-54	-54	-43	0	0	-11	0	
	Maximum Increase, CFS	0	0	0	0	0	0	25	37	38	9	13	0	
Critically Dry	Future Baseline, CFS	738	485	651	540	693	793	1,045	996	612	535	554	546	682
	Future Project, CFS	738	485	647	516	637	743	1,010	993	621	534	547	542	668
	Absolute Difference, CFS	0	0	-4	-23	-56	-50	-35	-3	8	-1	-7	-3	-15
	Relative Difference (%)	0.0	0.0	-0.6	-4.3	-8.1	-6.3	-3.3	-0.3	1.4	-0.2	-1.2	-0.6	-2.1
	Maximum Reduction, CFS	0	0	-18	-67	-73	-56	-55	-46	-10	-39	-30	-23	
	Maximum Increase, CFS	0	0	0	0	-17	-6	20	30	42	12	1	24	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Table 4.10-21. Camino Powerhouse Releases, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	568	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Future Project, CFS	566	383	654	1,035	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Absolute Difference, CFS	-2	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	-25	0	0	0	0	0	0	0	0	0	0	0	-2
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	Future Baseline, CFS	683	488	545	988	990	936	801	1,160	723	745	696	740	791
	Future Project, CFS	683	488	545	989	990	936	801	1,160	723	745	696	740	791
	Absolute Difference, CFS	0	0	0	1	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0	0	0	2	0	0	0	0	0	0	0	0	0
Below Normal	Future Baseline, CFS	500	490	546	666	686	877	774	812	459	537	623	731	642
	Future Project, CFS	498	490	546	666	687	877	773	812	458	538	623	731	642
	Absolute Difference, CFS	-2	0	0	0	1	0	0	0	-1	1	0	0	0
	Relative Difference (%)	-0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-0.2	0.1	0.0	0.0	0.0
	Maximum Reduction, CFS	-18	0	0	0	0	-4	0	0	-4	-1	0	0	-1
	Maximum Increase, CFS	0	0	0	1	7	1	0	0	0	4	0	0	0
Dry	Future Baseline, CFS	512	435	575	650	571	613	669	432	364	444	681	740	557
	Future Project, CFS	512	435	576	649	572	614	669	432	361	445	681	740	557
	Absolute Difference, CFS	0	0	1	-1	1	1	0	0	-3	1	0	0	0
	Relative Difference (%)	0.0	0.0	0.2	-0.1	0.2	0.2	0.0	0.0	-0.8	0.2	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-5	0	0	0	0	-11	-6	-11	0	0
	Maximum Increase, CFS	0	0	5	0	5	6	0	0	0	10	11	0	0
Critically Dry	Future Baseline, CFS	581	333	364	330	336	359	372	239	320	402	459	428	377
	Future Project, CFS	581	333	364	330	336	359	372	239	318	402	462	429	377
	Absolute Difference, CFS	0	0	0	0	1	0	0	0	-2	-1	4	1	0
	Relative Difference (%)	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	-0.7	-0.2	0.8	0.3	0.1
	Maximum Reduction, CFS	0	0	0	-6	-1	-4	0	0	-14	-13	-4	-22	0
	Maximum Increase, CFS	0	0	6	4	5	4	1	0	0	9	18	28	2

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

White Rock Powerhouse generates power from South Fork American River flows. Project changes in return flows have a seasonal pattern where flow can be reduced in December through April in dry years, and December through May and July through September in critically dry years. In addition, return flows can increase in May through July in dry years and June of critically dry years (Table 4.10-22).

Table 4.10-22. White Rock Powerhouse Releases, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	668	522	936	1,525	1,769	1,931	2,110	2,794	2,865	1,676	1,007	1,029	1,569
	Future Project, CFS	667	522	933	1,507	1,769	1,931	2,109	2,794	2,865	1,676	1,007	1,029	1,567
	Absolute Difference, CFS	-2	0	-2	-18	0	0	0	0	0	-1	0	0	-2
	Relative Difference (%)	-0.3	0.0	-0.3	-1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-28	0	-16	-92	-1	-1	-1	-1	-1	-1	-1	0	-12
	Maximum Increase, CFS	0	0	0	0	0	0	0	8	0	0	0	0	0
Above Normal	Future Baseline, CFS	763	587	722	1,567	1,438	1,432	1,566	2,465	1,844	1,096	792	841	1,259
	Future Project, CFS	763	587	721	1,538	1,440	1,438	1,567	2,467	1,843	1,095	792	841	1,258
	Absolute Difference, CFS	0	0	-1	-29	2	6	1	2	-1	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.1	-1.9	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-2	-55	0	0	-1	-1	-1	-1	0	0	-2
	Maximum Increase, CFS	0	0	0	-10	6	18	5	6	-1	0	0	0	-1
Below Normal	Future Baseline, CFS	579	728	779	1,024	1,105	1,603	1,755	1,972	1,179	689	680	820	1,076
	Future Project, CFS	577	728	779	999	1,084	1,603	1,761	1,981	1,196	690	680	819	1,075
	Absolute Difference, CFS	-2	0	0	-24	-21	0	6	8	17	1	0	-1	-1
	Relative Difference (%)	-0.4	0.0	-0.1	-2.4	-1.9	0.0	0.4	0.4	1.5	0.1	0.0	-0.2	-0.1
	Maximum Reduction, CFS	-18	0	-16	-52	-56	-31	-1	-1	-1	-1	0	-6	-6
	Maximum Increase, CFS	0	0	12	0	6	22	24	32	44	4	0	0	7
Dry	Future Baseline, CFS	565	549	773	959	832	996	1,405	1,604	929	573	742	816	895
	Future Project, CFS	565	549	769	938	788	961	1,398	1,613	947	578	742	816	889
	Absolute Difference, CFS	0	0	-3	-21	-44	-35	-6	9	18	5	0	0	-7
	Relative Difference (%)	0.0	0.0	-0.4	-2.2	-5.3	-3.5	-0.5	0.5	1.9	0.8	0.0	0.0	-0.7
	Maximum Reduction, CFS	0	0	-17	-56	-69	-54	-54	-41	-1	0	-11	0	-13
	Maximum Increase, CFS	0	0	0	1	0	0	18	29	38	9	13	0	0
Critically Dry	Future Baseline, CFS	642	381	491	412	503	609	857	836	500	441	479	475	552
	Future Project, CFS	642	381	487	389	450	559	822	833	508	440	473	472	538
	Absolute Difference, CFS	0	0	-4	-23	-53	-50	-35	-3	8	-1	-7	-3	-14
	Relative Difference (%)	0.0	0.0	-0.9	-5.6	-10.6	-8.2	-4.1	-0.4	1.6	-0.3	-1.4	-0.7	-2.6
	Maximum Reduction, CFS	0	0	-18	-67	-73	-55	-54	-46	-11	-39	-30	-22	-21
	Maximum Increase, CFS	0	0	0	0	-17	-6	18	28	41	12	1	24	-3

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to inflows at Slab Creek Reservoir that result from Project operations and changes to SMUD releases predicted by the Project's hydrologic modeling are small compared to the baseline flows in this reach and would not results in a substantial change in the concentrations of chemical constituents within the water (such as metals and mercury). Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between the El Dorado Powerhouse and Chili Bar due to changes in flow. The Project modeling assumes that SMUD would continue to comply with minimum flows and recreational flows in the South Fork American River below Slab Creek Dam and Chili Bar Dam, although some additional water from storage may need to be released by SMUD to meet these requirements. Impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between the El Dorado Powerhouse and Chili Bar would be **less than significant**.

Chili Bar to Folsom Reservoir

South Fork between Chili Bar and Salmon Falls Bridge. Tributary flows contribute to the river between Chili Bar and Salmon Falls. Project changes in flow seen at Chili Bar propagate down the river and at an increasingly smaller fraction of the flow (Table 4.10-23). The maximum reduction in monthly flow in the South Fork American River at Salmon Fall bridge between Project and baseline conditions is projected to be 73 cfs, expected

to occur during February of a critically dry year (a single month during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 56 cfs (a 7 percent decrease). The maximum increase in monthly flow between Project and baseline conditions is projected to be 48 cfs, expected to occur during June of a below normal year and the average increase in monthly flows during June of below normal years is 19 cfs (a 1.2 percent increase).

Table 4.10-23. South Fork American River at Salmon Falls, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	832	750	1,732	2,847	3,780	3,842	4,033	5,262	5,085	2,297	1,176	1,174	2,734
	Future Project, CFS	830	750	1,730	2,830	3,780	3,842	4,033	5,263	5,085	2,297	1,176	1,174	2,732
	Absolute Difference, CFS	-2	0	-2	-17	0	0	0	1	0	0	0	0	-2
	Relative Difference (%)	-0.2	0.0	-0.1	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-28	0	-18	-69	-1	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	19	0	0	0	0	
Above Normal	Future Baseline, CFS	890	752	979	3,113	3,090	2,232	2,290	4,069	2,504	1,282	918	956	1,923
	Future Project, CFS	890	752	978	3,079	3,093	2,238	2,291	4,073	2,504	1,282	918	956	1,921
	Absolute Difference, CFS	0	0	-2	-35	2	6	1	4	0	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.2	-1.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-5	-60	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	-18	7	17	4	11	0	0	0	0	
Below Normal	Future Baseline, CFS	706	1,158	1,533	1,527	2,703	2,948	2,570	2,844	1,523	833	789	927	1,672
	Future Project, CFS	704	1,158	1,532	1,500	2,681	2,946	2,580	2,857	1,542	834	789	925	1,671
	Absolute Difference, CFS	-2	0	-2	-27	-22	-1	10	13	19	1	0	-1	-1
	Relative Difference (%)	-0.3	0.0	-0.1	-1.8	-0.8	0.0	0.4	0.5	1.2	0.1	0.0	-0.1	-0.1
	Maximum Reduction, CFS	-18	0	-16	-51	-61	-48	0	0	0	-1	0	-6	
	Maximum Increase, CFS	0	0	0	0	7	26	25	35	48	4	0	0	
Dry	Future Baseline, CFS	708	747	1,506	2,866	1,317	1,512	2,017	2,061	1,165	711	849	913	1,364
	Future Project, CFS	708	747	1,502	2,844	1,272	1,478	2,013	2,072	1,183	716	849	913	1,358
	Absolute Difference, CFS	0	0	-3	-21	-45	-35	-4	11	18	5	0	0	-6
	Relative Difference (%)	0.0	0.0	-0.2	-0.7	-3.4	-2.3	-0.2	0.5	1.6	0.7	0.0	0.0	-0.5
	Maximum Reduction, CFS	0	0	-17	-56	-70	-54	-54	-43	0	0	-11	0	
	Maximum Increase, CFS	0	0	0	0	0	0	25	37	38	9	13	0	
Critically Dry	Future Baseline, CFS	770	527	714	609	825	890	1,110	1,039	638	549	564	556	733
	Future Project, CFS	770	527	710	586	769	840	1,075	1,036	646	547	557	552	718
	Absolute Difference, CFS	0	0	-4	-23	-56	-50	-35	-3	8	-1	-7	-3	-15
	Relative Difference (%)	0.0	0.0	-0.6	-3.8	-6.8	-5.6	-3.1	-0.3	1.3	-0.2	-1.2	-0.6	-2.0
	Maximum Reduction, CFS	0	0	-18	-67	-73	-56	-55	-46	-10	-39	-30	-23	
	Maximum Increase, CFS	0	0	0	0	-17	-6	20	30	42	12	1	24	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Folsom Reservoir. Table 4.10-24 shows modeled end of month storage at Folsom Reservoir for Project and baseline conditions with future water demands. On average, storage is expected to be reduced at Folsom Reservoir in fall of wet years, in fall and winter of below normal years, and throughout the year in dry and critically dry years with Project operations.

Table 4.10-24. Folsom Reservoir End of Month Storage, Existing Infrastructure (Future Baseline vs Future Project) – in 1,000 acre-feet

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	Future Baseline, 1,000 AF	499	433	462	549	556	738	887	967	967	920	792	752
	Future Project, 1,000 AF	498	432	461	549	556	738	886	967	967	920	792	752
	Absolute Difference, 1,000 AF	-1	-1	-1	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-7	-7	-8	-4	-4	-5	-4	0	0	0	0	0
	Maximum Increase, 1,000 AF	1	1	1	0	0	0	0	0	0	0	0	0
Above Normal	Future Baseline, 1,000 AF	566	498	521	567	567	725	900	967	928	820	726	675
	Future Project, 1,000 AF	566	498	521	567	567	726	900	967	928	820	726	675
	Absolute Difference, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, 1,000 AF	0	1	0	0	0	1	0	0	0	0	0	0
Below Normal	Future Baseline, 1,000 AF	484	430	469	512	529	756	857	960	866	638	562	519
	Future Project, 1,000 AF	481	427	466	508	525	756	857	961	867	638	562	519
	Absolute Difference, 1,000 AF	-3	-3	-3	-4	-4	0	0	0	1	0	0	0
	Relative Difference (%)	-0.6	-0.7	-0.7	-0.7	-0.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-17	-17	-17	-19	-22	0	-1	0	0	-1	0	0
	Maximum Increase, 1,000 AF	0	0	0	0	0	1	1	2	3	1	1	0
Dry	Future Baseline, 1,000 AF	524	464	474	471	481	616	724	780	671	497	420	377
	Future Project, 1,000 AF	523	463	473	469	477	610	718	775	668	496	419	376
	Absolute Difference, 1,000 AF	-1	-1	-1	-2	-4	-6	-6	-5	-3	-1	-1	-1
	Relative Difference (%)	-0.2	-0.2	-0.3	-0.4	-0.7	-0.9	-0.8	-0.6	-0.4	-0.3	-0.2	-0.2
	Maximum Reduction, 1,000 AF	-3	-3	-3	-6	-9	-13	-14	-13	-8	-4	-4	-4
	Maximum Increase, 1,000 AF	0	0	0	0	0	0	1	2	1	2	1	1
Critically Dry	Future Baseline, 1,000 AF	472	403	415	404	423	464	502	503	480	370	320	290
	Future Project, 1,000 AF	471	402	414	401	418	457	494	495	473	367	317	288
	Absolute Difference, 1,000 AF	-1	-1	-1	-2	-5	-8	-8	-8	-6	-3	-3	-3
	Relative Difference (%)	-0.2	-0.2	-0.2	-0.6	-1.1	-1.6	-1.7	-1.7	-1.3	-0.9	-0.9	-0.9
	Maximum Reduction, 1,000 AF	-6	-5	-5	-7	-11	-13	-14	-14	-15	-15	-15	-15
	Maximum Increase, 1,000 AF	0	0	0	0	0	-3	-1	-1	0	0	0	0

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

The maximum reduction in end of month storage in Folsom Reservoir between Project and baseline conditions is projected to be up to 15,000 acre-feet during June through September of critically dry years and the average reduction ranges from 3,000 to 6,000 acre-feet during this same time period.

These model results were generated using CalSim 3. CalSim is a planning model that analyzes CVP and SWP water management actions on a monthly time step. It has complex rules, such as those used to route water for water supply contracts and regulatory requirements, which call upon different water supply reservoirs in the Central Valley. Geographically, the CalSim model covers all water supply reservoirs that supply flow upstream of the Delta and SWP exports to the San Francisco Bay area, the Central Coast, and Southern California. Overall, under Project operations the system modeled by CalSim at large is not experiencing net negative effects beyond those which can be inferred at Folsom Reservoir due to changes in South Fork American River inflows. Because Folsom Reservoir storage levels and water surface elevations can have large fluctuations in response to system-wide operational decisions, changes in end of month storage at Folsom Reservoir may not be in direct response to Project changes in Folsom Reservoir inflows and may not be of the same magnitude as Project effects. In some cases, a larger reduction in end of month storage could represent multiple months of reduced inflows into Folsom Reservoir under Project operations. In other cases, a larger reduction in end of month storage could be a result of Reclamation's operational decisions that are triggered within the context of a much larger geographical and water management framework.

Although inflows to Folsom Reservoir would be reduced, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between Chili Bar and Folsom Reservoir or at Folsom Reservoir. Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen

concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to flows in the South Fork American River below Chili Bar that result from Project operations would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between Chili Bar and Folsom and at Folsom Reservoir would be **less than significant**.

Folsom Dam to Lower American River at Watt Avenue Bridge

Lower American River at Nimbus Dam. Flow in the Lower American River at Nimbus Dam is expected to be reduced by about 6 cfs on an average annual basis, which is consistent with Project changes in average annual inflows to Folsom Reservoir. As shown in Table 4.10-25, the maximum reduction in monthly flow in Lower American River at Nimbus Dam between Project and baseline conditions is projected to be 396 cfs, expected to occur during March of a below normal year (a single month during the 47-year modeling period) and the average reduction in monthly flows during March of below normal years is 78 cfs (a 1.9 percent decrease). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 64 cfs, expected to occur during June of a dry year and the average change in monthly flow during June of dry years is a reduction of 9 cfs (a less than 0.2 percent decrease).

Larger-scale changes, such as the modeled maximum reduction in monthly flow of 396 cfs, are likely a result of the operational decisions by Reclamation included in the CalSim 3 model to manage a much larger geographical area over a time scale of months to years. CVP and SWP operations rely on an integrated system of reservoirs and export facilities for system operations and the CalSim model is programed to optimize those operations given the constraints of the system, *i.e.*, geographic constraints, hydrologic constraints, physical capacity, flood control requirements, environmental constraints (water quality, outflow), contractual and water rights requirements, economic constraints, and demand patterns. For example, Delta inflows can increase to meet export demands through additional releases from Shasta Lake, Lake Oroville, or Folsom Reservoir. If, for example, short-term releases are made from Shasta Lake instead of Folsom Reservoir during Project operations to rebalance reservoir storage, flow in the Lower American River would be reduced compared to baseline conditions and the magnitude of that change could be related to CVP and SWP system-wide operations, such as maximizing contractual water supply deliveries, and not necessarily be in direct response to change in South Fork American River inflows. This becomes evident when modeled changes are estimated to be more than 120 cfs when using existing infrastructure. The maximum rate of diversion for the Project under this scenario is 120 cfs, so a modeled change in flow at Nimbus Dam of 396 cfs is clearly evidence of operational decisions included in the model, rather than a direct result of Project diversions. However, changes in flow of this magnitude represent a reasonable flow scenario for the Lower American River downstream of Folsom within the context of CVP and SWP operations.

Table 4.10-25. Lower American River at Nimbus Dam, Existing Infrastructure (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	1,593	2,833	4,074	5,546	7,651	6,926	6,319	9,236	8,391	3,893	3,881	2,352	5,225
	Future Project, CFS	1,593	2,832	4,074	5,520	7,651	6,926	6,319	9,233	8,391	3,893	3,881	2,352	5,222
	Absolute Difference, CFS	0	-1	0	-27	0	0	0	-4	0	0	0	0	-3
	Relative Difference (%)	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-1	-7	-2	-197	-1	-1	0	-47	0	0	-4	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	4	0	0	
Above Normal	Future Baseline, CFS	1,500	2,472	2,185	6,530	5,940	2,557	1,986	6,170	4,812	3,284	2,842	1,924	3,517
	Future Project, CFS	1,500	2,472	2,184	6,495	5,943	2,557	1,993	6,173	4,812	3,284	2,841	1,925	3,515
	Absolute Difference, CFS	0	0	-1	-35	2	0	7	4	0	0	-1	1	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.5	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-2	-61	0	0	0	0	0	0	-2	0	
	Maximum Increase, CFS	0	0	0	-18	7	0	21	11	0	0	0	2	
Below Normal	Future Baseline, CFS	1,423	3,063	3,289	2,855	7,423	4,179	3,192	3,750	4,598	4,713	2,480	1,958	3,577
	Future Project, CFS	1,423	3,063	3,289	2,838	7,411	4,101	3,204	3,759	4,604	4,727	2,480	1,958	3,571
	Absolute Difference, CFS	0	0	0	-17	-12	-78	12	9	6	14	0	0	-6
	Relative Difference (%)	0.0	0.0	0.0	-0.6	-0.2	-1.9	0.4	0.2	0.1	0.3	0.0	0.0	-0.2
	Maximum Reduction, CFS	0	0	0	-56	-63	-396	0	-1	0	0	-2	-4	
	Maximum Increase, CFS	0	0	0	0	3	0	34	28	33	50	3	5	
Dry	Future Baseline, CFS	1,242	2,588	3,657	6,976	2,954	1,463	1,562	2,204	4,038	3,811	2,180	1,765	2,870
	Future Project, CFS	1,241	2,588	3,657	6,967	2,940	1,463	1,558	2,198	4,029	3,792	2,176	1,765	2,865
	Absolute Difference, CFS	-1	0	0	-9	-14	0	-4	-6	-9	-19	-4	-1	-6
	Relative Difference (%)	-0.1	0.0	0.0	-0.1	-0.5	0.0	-0.3	-0.3	-0.2	-0.5	-0.2	0.0	-0.2
	Maximum Reduction, CFS	-5	0	0	-44	-68	0	-20	-23	-56	-48	-36	-3	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	64	1	9	0	
Critically Dry	Future Baseline, CFS	1,311	2,224	1,924	1,172	1,574	1,414	1,167	1,213	1,519	2,426	1,530	1,235	1,559
	Future Project, CFS	1,309	2,219	1,921	1,171	1,562	1,414	1,147	1,205	1,499	2,396	1,507	1,233	1,549
	Absolute Difference, CFS	-2	-5	-3	-1	-12	0	-20	-8	-20	-30	-23	-2	-11
	Relative Difference (%)	-0.1	-0.2	-0.1	-0.1	-0.8	0.0	-1.7	-0.7	-1.3	-1.2	-1.5	-0.1	-0.7
	Maximum Reduction, CFS	-20	-65	-16	-18	-89	0	-145	-44	-99	-184	-181	-21	
	Maximum Increase, CFS	0	1	0	0	0	0	0	13	51	9	26	0	

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

As discussed in Section 4.10.1, water quality impairments identified in the Lower American River include mercury and indicator bacteria at Lake Natoma and bifenthrin, indicator bacteria, mercury, PCBs, pyrethroids, water temperature, and toxicity between Nimbus Dam and the confluence with Sacramento River (SWRCB 2022). Although flow in the Lower American River can be reduced during Project operations (e.g., up to 396 cfs per month), changes in flow at this magnitude are not expected to change the chemical constituents within the water. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to water temperature in the Lower American River are expected to be minor as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the Lower American River between Folsom Dam and Watt Avenue bridge would be **less than significant**.

Construction Impacts

The proposed Project includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, as well as the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for diversion and conveyance of up to 156 cfs.

Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these

Project construction activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only.

Anticipated construction activities may include vegetation and tree removal and road improvements and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Construction activities have the potential to degrade surface water quality by introducing sediment to surface waters, potentially increasing turbidity, and adversely affecting both surface and groundwater quality by introducing pollutants to receiving waters. Vegetation removal, grading, excavation, trenching, and backfilling could result in disturbed soils being temporarily exposed to the erosive forces of wind, rain, and stormwater runoff, causing the release of construction-generated sediment to downstream waterbodies. Stormwater runoff could be contaminated with chemicals typically used during construction (e.g., fuels, oils, and solvents) through the daily use, transportation, and storage of these materials if they are not properly controlled. In addition, construction activities such as grading, excavation, and trenching have the potential to change existing drainage patterns, which could affect erosion and sedimentation in new areas if unconsolidated sediments are exposed to new flow paths, or if the total amount of flow is greater than historical norms. In addition to potential erosion and sedimentation that could occur with construction, channel stabilization measures (e.g., rip-rap) would need to be sized properly for the flows that are anticipated during post-construction. Without implementation of appropriate post-construction erosion control measures, additional scour of bed and banks could occur within the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake. Therefore, Project impacts to water quality from construction activities are **potentially significant**. See mitigation measures 4.10-1 through 4.10-4 below that address this potential impact.

Operational Impacts (Post-Construction)

This operational regime involves operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam following construction of the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. The effect of this change would be increased conveyance through Hazel Tunnel and into Hazel Creek to a greater extent than pre-construction operations, as well as reduced flows in the South Fork American River below El Dorado Diversion Dam.

Tables in this subsection show Res-Sim and CalSim model output. Monthly flow is shown by water year type for baseline and Project conditions. The “absolute difference” is the change in monthly flow between baseline and Project conditions averaged by month and water year type. The “relative difference” is the percent change

between baseline and Project conditions for the results averaged by month and water year type. The "maximum reduction" and the "maximum increase" are the results from the month with the maximum change between baseline and Project conditions for each month and water year type.

Tables in this subsection also show change in storage by month and water year type. The change in storage represents conditions that were predicted to occur at the end of the month. The "absolute difference" is the change in end of month storage between baseline and Project conditions averaged by month and water year type. The "relative difference" is the percent change between baseline and Project conditions for the results averaged by month and water year type. The "maximum reduction" and the "maximum increase" are the results from the month with the maximum change between baseline and Project conditions for each month and water year type.

Project

Post-construction operations with current water demands are described in this section.

Kyburz to El Dorado Powerhouse

South Fork above El Dorado Diversion Dam. The Project is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam on a monthly basis (Table 4.10-26). Although the authorized capacity in the El Dorado Canal would be restored post-construction (which would increase maximum diversions from 145 cfs to 156 cfs), District operations upstream of El Dorado Diversion Dam, including operational releases from the upper watershed, would remain unchanged.

Table 4.10-26. South Fork American River above the El Dorado Diversion Dam, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Project, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Baseline, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Project, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Below Normal	Baseline, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Project, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Dry	Baseline, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Project, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Critically Dry	Baseline, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Project, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. Diversions at the El Dorado Diversion Dam would increase post-construction in all years and water year types. Monthly diversion rates would increase by up to 11 cfs, which is the difference between the current maximum rate of diversion at the El Dorado Diversion Dam with existing infrastructure (i.e., 145 cfs) and the maximum rate of diversion authorized under Permit 21112 (i.e., 156 cfs) that could be achieved after construction improvements. Flow in the South Fork below the El Dorado Diversion Dam is expected to be reduced by about 4 cfs on an average annual basis post-construction, while Project operations are used to meet current water demands. The majority of the changes would occur in January through June, although some reductions would occur in December and continue through July and August. In critically dry years, reductions in streamflow would occur primarily in February through June (Table 4.10-27).

Table 4.10-27. South Fork American River below the El Dorado Diversion Dam, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	114	132	204	235	398	530	853	1,993	2,038	640	90	54	607
	Project, CFS	114	132	201	228	390	520	842	1,982	2,027	632	88	53	601
	Absolute Difference, CFS	0	0	-3	-7	-8	-9	-10	-11	-11	-8	-2	0	-6
	Relative Difference (%)	0.0	0.0	-1.5	-2.9	-1.9	-1.8	-1.2	-0.6	-0.5	-1.3	-2.2	-0.8	-1.0
	Maximum Reduction, CFS	0	0	-7	-11	-11	-11	-11	-11	-11	-11	-8	-2	
	Maximum Increase, CFS	0	0	0	0	0	-2	-3	-11	-11	-5	0	0	
Above Normal	Baseline, CFS	78	87	65	432	217	244	545	1,493	926	262	65	50	372
	Project, CFS	78	87	63	424	212	235	534	1,482	916	259	65	50	367
	Absolute Difference, CFS	0	0	-2	-7	-5	-9	-11	-11	-10	-3	0	0	-5
	Relative Difference (%)	0.0	0.0	-3.0	-1.7	-2.4	-3.5	-2.0	-0.7	-1.1	-1.1	0.0	0.0	-1.3
	Maximum Reduction, CFS	0	0	-5	-11	-11	-11	-11	-11	-11	-9	0	0	
	Maximum Increase, CFS	0	0	0	-3	-1	-6	-10	-11	-10	0	0	0	
Below Normal	Baseline, CFS	90	212	159	169	255	504	824	1,166	569	130	65	50	349
	Project, CFS	90	212	157	163	249	495	813	1,155	560	129	65	50	345
	Absolute Difference, CFS	0	0	-2	-6	-6	-9	-11	-11	-9	-1	0	0	-5
	Relative Difference (%)	0.0	0.0	-1.5	-3.5	-2.4	-1.9	-1.3	-0.9	-1.6	-0.5	0.0	0.0	-1.3
	Maximum Reduction, CFS	0	0	-7	-11	-11	-11	-11	-11	-11	-4	0	0	
	Maximum Increase, CFS	0	0	0	0	0	-6	-10	-11	-4	0	0	0	
Dry	Baseline, CFS	69	100	139	381	103	232	539	914	393	86	18	15	249
	Project, CFS	69	100	137	379	100	226	528	903	384	86	18	15	245
	Absolute Difference, CFS	0	0	-2	-2	-3	-6	-10	-11	-9	0	0	0	-4
	Relative Difference (%)	0.0	0.0	-1.5	-0.5	-2.7	-2.5	-1.9	-1.2	-2.3	-0.4	0.0	-0.2	-1.4
	Maximum Reduction, CFS	0	0	-7	-11	-11	-11	-11	-11	-11	-1	0	0	
	Maximum Increase, CFS	0	0	0	0	0	-3	-8	-11	-7	0	0	0	
Critically Dry	Baseline, CFS	64	62	71	36	54	101	288	377	116	40	18	15	104
	Project, CFS	64	62	70	35	51	95	279	367	112	40	18	15	101
	Absolute Difference, CFS	0	0	-1	-1	-3	-6	-9	-10	-4	0	0	0	-3
	Relative Difference (%)	0.0	0.0	-1.4	-1.6	-4.8	-6.2	-3.2	-2.7	-3.3	0.0	-0.4	0.0	-2.7
	Maximum Reduction, CFS	0	0	-7	-6	-8	-11	-11	-11	-9	0	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	-4	-6	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Permit 21112 water that is diverted at El Dorado Diversion Dam would be delivered in two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP; and/or 2) to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to the Reservoir A WTP. The water stored in Jenkinson Lake would be delivered to Reservoir A WTP as needed throughout the year to help meet water demands.

Because there would be a change from non-consumptive hydropower generation to consumptive use with Project operations, additional water would be either be diverted from Forebay Reservoir to Reservoir 1 WTP or be routed through Hazel Creek Tunnel to Jenkinson Lake and less water would be delivered to the El Dorado Powerhouse for power production. Table 4.10-28 shows estimated flow releases from the El Dorado Powerhouse for baseline and Project conditions and the change between baseline and Project conditions represents the change in return flows provided to the South Fork during Project operations. A change in powerhouse releases also affects power production (discussed in more detail in Section 4.6). Forebay Reservoir is the re-regulating forebay for these flows. As such, it routinely fluctuates in storage and elevation. Changes in end of month storage at Forebay

Reservoir would occur during some years, with reductions in storage occurring primarily in January through April and increased storage occurring in June through August (see Appendix B2). The expected range in storage and elevation with Project operations would remain within the current levels seen under existing conditions.

Table 4.10-28. El Dorado Powerhouse Releases, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	1	0	82	126	135	142	140	138	131	105	84	116	100
	Project, CFS	1	0	82	119	138	145	144	143	139	112	86	117	102
	Absolute Difference, CFS	0	0	1	-7	3	3	4	6	8	7	2	0	2
	Relative Difference (%)	0.0	0.0	0.9	-5.2	1.9	2.3	2.7	4.1	6.2	6.5	2.0	0.3	2.2
	Maximum Reduction, CFS	0	0	-13	-65	0	1	0	0	5	4	0	0	-4
	Maximum Increase, CFS	0	0	6	9	9	8	8	10	10	10	7	2	6
Above Normal	Baseline, CFS	1	0	94	127	129	131	141	137	127	50	38	89	89
	Project, CFS	1	0	96	128	131	137	149	143	136	53	38	89	92
	Absolute Difference, CFS	0	0	1	1	2	5	7	7	9	3	0	0	3
	Relative Difference (%)	2.1	0.0	1.6	0.7	1.9	4.1	5.1	4.9	6.8	5.1	0.0	0.0	3.3
	Maximum Reduction, CFS	0	0	0	-1	0	5	6	4	8	0	0	0	27
	Maximum Increase, CFS	0	0	4	2	5	6	8	10	10	7	0	0	46
Below Normal	Baseline, CFS	1	0	81	104	122	136	136	128	111	21	12	74	77
	Project, CFS	1	0	83	90	123	145	149	143	123	23	12	78	81
	Absolute Difference, CFS	0	0	1	-14	2	9	14	15	12	2	0	4	4
	Relative Difference (%)	0.2	0.0	1.6	-13.5	1.3	6.4	10.0	11.6	11.1	10.2	2.9	5.4	4.8
	Maximum Reduction, CFS	0	0	-1	-69	-25	2	7	9	3	0	0	0	13
	Maximum Increase, CFS	0	0	7	10	15	23	29	37	45	14	2	31	91
Dry	Baseline, CFS	1	0	76	75	89	112	130	123	103	55	62	101	77
	Project, CFS	1	0	77	69	60	104	130	143	124	66	69	101	79
	Absolute Difference, CFS	0	0	1	-6	-29	-8	1	19	21	11	7	0	1
	Relative Difference (%)	0.0	0.0	1.5	-8.3	-32.6	-7.0	0.5	15.7	20.5	20.1	10.5	0.0	1.8
	Maximum Reduction, CFS	0	0	0	-31	-59	-73	-45	9	6	0	0	0	-13
	Maximum Increase, CFS	0	0	3	2	3	19	15	37	46	39	28	0	45
Critically Dry	Baseline, CFS	1	0	63	46	80	105	115	105	61	27	28	71	59
	Project, CFS	1	0	64	28	4	45	125	131	85	46	46	75	54
	Absolute Difference, CFS	0	0	1	-18	-76	-60	9	26	23	19	18	4	-5
	Relative Difference (%)	0.0	0.0	1.0	-39.1	-95.1	-57.4	8.0	24.5	38.0	72.6	62.8	5.0	-7.7
	Maximum Reduction, CFS	0	0	-3	-70	-108	-116	-90	-39	5	0	0	0	-135
	Maximum Increase, CFS	0	0	6	6	-16	30	29	37	44	45	51	34	33

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse is expected to be reduced by about 3 cfs on an average annual basis with post-construction operations with current water demands. The difference in river flow below the El Dorado Powerhouse between baseline and Project conditions is related to the change in water use from non-consumptive power generation to consumptive use that occurs with Project operation. Flow below the El Dorado Powerhouse varies seasonally, with river flow reduced in winter and increased in primarily in late spring and summer of dry and critically dry years with Project operations. Below-normal years also have a seasonal pattern and the reduced flows are shifted to early winter (Table 4.10-29). By transferring water to storage in Jenkinson Lake in winter for later consumptive use, diversions in late spring and early summer in below normal, dry, and critically dry years that would otherwise have been allocated for direct consumptive use under baseline conditions, instead are used to generate hydropower and are returned to the river, thus resulting in increases in flows in the South Fork relative to baseline conditions.

Table 4.10-29. South Fork America River below El Dorado Powerhouse, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	189	229	620	899	1,315	1,443	1,752	3,442	3,529	1,214	260	228	1,260
	Project, CFS	190	229	619	889	1,314	1,442	1,751	3,441	3,528	1,213	260	228	1,259
	Absolute Difference, CFS	0	0	-1	-10	-1	-1	-1	-1	-1	-1	0	0	-1
	Relative Difference (%)	0.1	0.0	-0.2	-1.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1
	Maximum Reduction, CFS	0	0	-14	-67	-1	-1	-1	-1	-1	-1	-1	0	
	Maximum Increase, CFS	2	0	0	0	0	0	0	-1	-1	-1	0	0	
Above Normal	Baseline, CFS	145	160	266	1,493	874	740	1,083	2,582	1,594	447	152	179	810
	Project, CFS	145	160	266	1,490	873	740	1,083	2,581	1,593	447	152	179	809
	Absolute Difference, CFS	0	0	0	-4	-1	-1	0	-1	-1	0	0	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.2	-0.1	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	0	-10	-1	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	-1	-1	0	0	0	
Below Normal	Baseline, CFS	141	475	563	541	1,047	1,265	1,455	1,839	949	231	116	161	732
	Project, CFS	141	475	563	523	1,044	1,268	1,459	1,843	953	233	116	165	732
	Absolute Difference, CFS	0	0	0	-18	-2	3	4	4	4	1	0	4	0
	Relative Difference (%)	0.0	0.0	-0.1	-3.4	-0.2	0.2	0.3	0.2	0.4	0.6	0.3	2.5	0.0
	Maximum Reduction, CFS	0	0	-2	-71	-30	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	0	6	14	19	27	37	14	2	32	
Dry	Baseline, CFS	121	174	433	1,450	416	578	1,017	1,446	706	207	116	146	568
	Project, CFS	121	174	433	1,443	385	566	1,009	1,455	719	218	123	146	566
	Absolute Difference, CFS	0	0	0	-7	-30	-12	-8	9	12	11	7	0	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.5	-7.3	-2.1	-0.8	0.6	1.8	5.2	5.6	0.0	-0.3
	Maximum Reduction, CFS	0	0	0	-31	-65	-75	-54	-1	-1	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-1	15	6	26	38	38	28	0	
Critically Dry	Baseline, CFS	123	109	212	138	237	337	621	713	279	109	73	108	255
	Project, CFS	123	109	212	120	158	271	621	729	299	129	90	111	248
	Absolute Difference, CFS	0	0	0	-18	-78	-66	0	16	20	19	18	4	-7
	Relative Difference (%)	0.0	0.0	-0.1	-13.3	-33.1	-19.6	0.0	2.2	7.0	17.7	24.1	3.3	-2.9
	Maximum Reduction, CFS	0	0	-4	-70	-128	-122	-98	-45	-1	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-17	20	19	26	38	45	50	35	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

As shown in Table 4.10-29, the maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 128 cfs, expected to occur during February of a critically dry year (a single month during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 78 cfs (a 33 percent reduction). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 50 cfs, expected to occur during August of a critically dry year and the average increase in monthly flows during August of critically dry years is 18 cfs (a 24 percent increase). Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches and these changes would represent an increasingly smaller fraction of the overall flow as tributaries and return flows from downstream operators join the river.

As described above, operation of the Project is expected to both increase and decrease flows in the South Fork American River below the El Dorado Powerhouse. For example, flow would be reduced by 33 percent in February of critically dry years in the South Fork below the El Dorado Powerhouse, with the average flow being reduced from 237 cfs to 158 cfs during Project operations and flow would then be increased by 24 percent in August of the same critically dry years, increasing the average flow from 73 cfs to 90 cfs. Overall, the range in flows expected with Project operations would remain within the current levels seen under existing conditions and minimum flow would increase (e.g., the minimum monthly flow for baseline conditions during the 47-year modeling period was 35 cfs expected to occur during August 1997, a critically dry year; flows during this month increased to 45 cfs with Project operations; see Appendix B2). Although the Project would result in reduced flow in the South Fork American River below the El Dorado Diversion Dam at times (e.g., a 33 percent average reduction in February in critically dry years), this is offset, or partially offset, by the increased flows seen during critical summer months. In addition, the Project would be operated such that minimum instream flows would be maintained in the South Fork American River below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license.

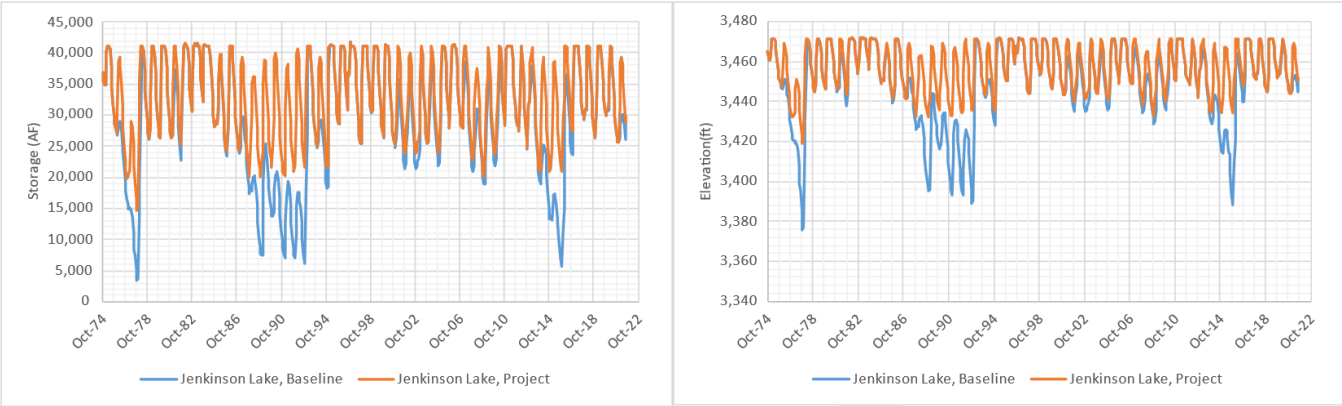
Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to the quantity of return flows would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals in the South Fork are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Additionally, the District would continue to meet FERC license required minimum streamflows below the El Dorado Diversion Dam, which are designed to protect instream beneficial uses. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the South Fork below the El Dorado Diversion Dam due to changes in flow. Impacts to hydrology and water quality resulting from flow in the South Fork American River below the El Dorado Diversion Dam and the El Dorado Powerhouse would be **less than significant**.

El Dorado Canal to Sly Park Dam (Hazel Creek and Jenkinson Lake)

The improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Post-construction operations would include an increased rate of diversion at El Dorado Diversion Dam and increased flow in the El Dorado Canal, Hazel Creek Tunnel, and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake as compared to existing conditions.

Hazel Creek Tunnel and Hazel Creek. Although post-construction operations would increase the maximum flow through Hazel Creek Tunnel and Hazel Creek, this change in flow would occur after stabilization measures are installed at various locations along the channel. The stabilization measures implemented within the creek channel between Hazel Creek Tunnel to Jenkinson Lake would be sized for the maximum flow rates and velocities anticipated post-construction. As such, potential erosion due to the increased flow from post-construction operations would be minimal.

Jenkinson Lake. Figure 4.10-11 shows modeled end of month storage and end of month elevation at Jenkinson Lake for baseline and Project conditions when the Project is operated post-construction to meet current water demands. Increased storage at Jenkinson Lake provides increased water supply reliability, particularly in spring and summer of dry and critically dry years.



(a) End of Month Storage (acre feet) (b) End of Month Elevation (feet)

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Figure 4.10-11. Jenkinson Lake Storage and Elevation Post-Construction Infrastructure with Current Water Demands

Project operations would increase maximum flows in Hazel Creek post-construction, increase water surface elevations and water supply reliability at Jenkinson Lake during operations. Because the channel that conveys water from the Hazel Tunnel outlet to Hazel Creek and Hazel Creek proper would have stabilization measures sized for post-construction flow rates and velocities, and because the changes in water surface elevations at Jenkinson Lake would be within the range of normal operations, the Project would not result in the violation of water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater resources. Therefore, the effects to hydrology and water quality in Hazel Creek resulting from the Project would be **less than significant** and changes in storage at Jenkinson Lake during Project operations would be **beneficial**.

Slab Creek to Chili Bar

Minimum flows and recreational flows are required in the South Fork American River below Slab Creek Dam and Chili Bar Dam, consistent with requirements in SMUD's FERC license. The Project's hydrologic modeling prioritizes compliance with all such FERC license minimum instream requirements and assumes that SMUD would release additional water from storage to meet these minimum flow requirements during times when Project operations would reduce flows in the South Fork American River. Therefore, the modeling shows only minor changes occur in the flow differences between Project and baseline conditions between El Dorado Powerhouse and Chili Bar (Table 4.10-30). Changes in flow would continue to have a seasonal pattern. For example, flow would be reduced by 11.1 percent in February of critically dry years in the South Fork at Chili Bar, with the average flow being reduced from 693 cfs to 617 cfs during Project operations, and flow would then be increased by 3.6 percent in September of the same critically dry years, increasing the average flow from 545 cfs to 564 cfs.

Table 4.10-30. South Fork American River at Chili Bar, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	795	675	1,487	2,336	3,044	3,179	3,477	4,975	4,942	2,214	1,124	1,132	2,448
	Project, CFS	797	675	1,486	2,325	3,044	3,178	3,476	4,974	4,941	2,213	1,123	1,132	2,447
	Absolute Difference, CFS	2	0	-1	-10	-1	-1	-1	-1	-1	-1	0	0	-1
	Relative Difference (%)	0.2	0.0	-0.1	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-14	-67	-1	-1	-1	-1	-1	-1	-1	0	
	Maximum Increase, CFS	25	0	0	0	0	0	0	-1	-1	-1	0	0	
Above Normal	Baseline, CFS	858	698	895	2,784	2,422	1,946	2,085	3,908	2,433	1,239	884	930	1,757
	Project, CFS	858	698	895	2,781	2,422	1,946	2,085	3,907	2,432	1,239	884	930	1,756
	Absolute Difference, CFS	0	0	0	-4	-1	-1	0	-1	-1	0	0	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-10	-1	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	-1	-1	0	0	0	
Below Normal	Baseline, CFS	673	1,054	1,306	1,362	2,181	2,543	2,419	2,754	1,495	806	769	906	1,522
	Project, CFS	675	1,054	1,306	1,344	2,179	2,545	2,423	2,758	1,498	807	769	910	1,522
	Absolute Difference, CFS	2	0	0	-18	-2	2	4	4	3	2	0	4	0
	Relative Difference (%)	0.3	0.0	0.0	-1.3	-0.1	0.1	0.2	0.1	0.2	0.2	0.0	0.5	0.0
	Maximum Reduction, CFS	0	0	-2	-69	-25	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	18	0	0	0	6	14	19	26	35	17	1	34	
Dry	Baseline, CFS	671	674	1,228	2,449	1,148	1,364	1,852	1,993	1,136	681	829	899	1,244
	Project, CFS	671	674	1,228	2,442	1,118	1,352	1,844	2,002	1,146	693	835	899	1,242
	Absolute Difference, CFS	0	0	0	-7	-30	-12	-8	8	10	13	6	0	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.3	-2.6	-0.9	-0.4	0.4	0.9	1.9	0.7	0.0	-0.1
	Maximum Reduction, CFS	0	0	0	-31	-65	-75	-54	-1	-1	0	-2	0	
	Maximum Increase, CFS	0	0	0	0	-1	14	6	26	33	42	28	0	
Critically Dry	Baseline, CFS	738	485	651	540	693	798	1,052	1,008	625	533	546	545	685
	Project, CFS	738	485	651	521	617	733	1,050	1,023	637	543	561	564	677
	Absolute Difference, CFS	0	0	0	-19	-77	-66	-1	15	12	10	15	20	-8
	Relative Difference (%)	0.0	0.0	0.0	-3.4	-11.1	-8.2	-0.1	1.5	2.0	1.9	2.8	3.6	-1.1
	Maximum Reduction, CFS	0	0	0	-70	-126	-122	-96	-47	-1	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-17	20	19	29	29	48	46	59	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Slab Creek Reservoir and Chili Bar Reservoir are used as re-regulating forebays and afterbays to various powerhouses. Powerhouses that discharge water to this reach of the South Fork include Camino Powerhouse, Slab Creek Powerhouse, Rock Creek Powerhouse, White Rock Powerhouse, and the Chili Bar Powerhouse.

Camino Powerhouse, located about ¼ mile downstream of El Dorado Powerhouse, contributes flow from the Upper American River Hydroelectric Project. Union Valley Reservoir receives power production flows from higher elevation reservoirs in the Silver Creek and Rubicon River watersheds and releases water to Junction Reservoir and indirectly to Camino Reservoir. With Project operations, changes in end of month storage at Union Valley Reservoir would occur primarily in below normal, dry, and critically dry years with reduced storage occurring in December through May and increased storage occurring in June through September of critically dry years (see Appendix B2). These changes are small compared to amount of water stored in the reservoir (less than a 0.5 percent decrease and less than a 2 percent increase in end of month storage). Releases from Camino Powerhouse are shown in Table 4.10-31. Changes in flow occur primarily in critically dry years, where flow can be reduced in June through September or increased in July through September.

Table 4.10-31. Camino Powerhouse Releases, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	567	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Project, CFS	569	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Absolute Difference, CFS	2	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	23	0	0	0	0	0	0	0	0	0	0	0	2
Above Normal	Baseline, CFS	683	488	545	988	990	936	801	1,160	723	745	695	741	791
	Project, CFS	683	488	545	988	990	936	801	1,160	723	745	695	741	791
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	Baseline, CFS	499	490	546	666	686	877	774	812	458	538	622	732	642
	Project, CFS	501	490	546	666	686	877	773	812	458	538	622	732	642
	Absolute Difference, CFS	2	0	0	0	1	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	-3	0	0	-3	0	-1	0	0
	Maximum Increase, CFS	18	0	0	1	5	0	0	0	0	2	0	1	2
Dry	Baseline, CFS	511	435	575	650	571	613	669	432	362	443	684	741	557
	Project, CFS	511	435	575	650	571	613	669	432	360	445	683	741	557
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	-2	2	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-0.5	0.5	-0.1	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	-8	0	-2	0	0
	Maximum Increase, CFS	0	0	0	0	2	1	0	0	0	8	0	0	0
Critically Dry	Baseline, CFS	581	333	364	330	336	359	372	239	315	406	462	427	377
	Project, CFS	581	333	364	330	336	359	372	239	308	397	459	443	377
	Absolute Difference, CFS	0	0	0	0	1	0	0	0	-8	-9	-2	16	0
	Relative Difference (%)	0.0	0.0	0.1	-0.1	0.2	0.0	0.0	-0.1	-2.4	-2.2	-0.5	3.6	-0.1
	Maximum Reduction, CFS	0	0	0	-3	0	-4	0	-1	-21	-36	-25	-22	-2
	Maximum Increase, CFS	0	0	3	0	5	6	0	0	0	6	30	55	0

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

White Rock Powerhouse generates power from South Fork American River flows. Project changes in return flows at this location have a similar seasonal pattern as Project effects in the upstream reach, with reduction in flows occurring in winter and early spring and increases in flow in late spring and summer in some water year types (Table 4.10-32).

Table 4.10-32. White Rock Powerhouse Releases, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	668	522	936	1,526	1,769	1,931	2,110	2,795	2,866	1,679	1,011	1,033	1,571
	Project, CFS	669	522	935	1,516	1,769	1,931	2,110	2,795	2,866	1,679	1,010	1,033	1,570
	Absolute Difference, CFS	2	0	-1	-9	0	0	0	0	0	0	0	0	-1
	Relative Difference (%)	0.2	0.0	-0.1	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-13	-62	-1	-1	-1	-1	-1	-1	-1	0	-4
	Maximum Increase, CFS	25	0	0	0	0	0	0	0	0	10	0	0	0
Above Normal	Baseline, CFS	763	587	722	1,569	1,440	1,440	1,574	2,469	1,847	1,098	796	845	1,262
	Project, CFS	763	587	722	1,565	1,440	1,439	1,574	2,468	1,846	1,098	796	845	1,262
	Absolute Difference, CFS	0	0	0	-3	0	0	0	-1	-1	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-10	-1	0	-1	-1	-1	-1	0	0	-1
	Maximum Increase, CFS	0	0	0	0	0	0	2	0	-1	0	0	0	0
Below Normal	Baseline, CFS	578	728	779	1,024	1,117	1,612	1,762	1,981	1,197	691	682	821	1,081
	Project, CFS	580	728	781	1,006	1,106	1,614	1,765	1,984	1,200	693	682	825	1,080
	Absolute Difference, CFS	2	0	1	-18	-11	2	3	3	3	2	0	4	-1
	Relative Difference (%)	0.3	0.0	0.1	-1.7	-1.0	0.1	0.2	0.2	0.3	0.3	0.0	0.5	-0.1
	Maximum Reduction, CFS	0	0	-2	-69	-82	-4	-1	-1	-1	-1	0	0	-6
	Maximum Increase, CFS	18	0	12	0	6	11	17	21	33	17	1	34	5
Dry	Baseline, CFS	565	549	773	960	832	1,001	1,417	1,622	947	569	743	820	900
	Project, CFS	565	549	773	953	803	990	1,409	1,629	957	582	749	820	898
	Absolute Difference, CFS	0	0	0	-7	-28	-11	-8	8	10	13	6	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.7	-3.4	-1.1	-0.5	0.5	1.1	2.2	0.8	0.0	-0.2
	Maximum Reduction, CFS	0	0	0	-31	-63	-66	-54	-1	-1	0	-2	0	-3
	Maximum Increase, CFS	0	0	0	1	0	15	6	25	33	42	28	0	0
Critically Dry	Baseline, CFS	642	381	491	413	503	614	864	847	513	439	472	474	554
	Project, CFS	642	381	491	394	431	548	863	862	525	449	487	494	547
	Absolute Difference, CFS	0	0	0	-19	-72	-65	-1	15	12	10	15	20	-7
	Relative Difference (%)	0.0	0.0	0.0	-4.5	-14.3	-10.7	-0.1	1.7	2.4	2.3	3.2	4.1	-1.3
	Maximum Reduction, CFS	0	0	0	-70	-119	-122	-96	-46	-1	0	0	0	-16
	Maximum Increase, CFS	0	0	0	0	-17	20	19	28	29	48	45	59	-2

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to inflows at Slab Creek Reservoir that result from Project operations and changes to SMUD releases predicted by the Project's hydrologic modeling are small compared to the baseline flows in this reach and would not results in a substantial change in the concentrations of chemical constituents within the water (such as metals and mercury). Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between the El Dorado Powerhouse and Chili Bar due to changes in flow. The Project modeling assumes that SMUD would continue to comply with minimum flows and recreational flows in the South Fork American River below Slab Creek Dam and Chili Bar Dam, although some additional water from storage may need to be released by SMUD to meet these requirements. Impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between the El Dorado Powerhouse and Chili Bar would be **less than significant**.

Chili Bar to Folsom Reservoir

South Fork between Chili Bar and Salmon Falls Bridge. Tributary flows contribute to the river between Chili Bar and Salmon Falls. Project changes in flow seen at Chili Bar propagate down the river and at an increasingly smaller fraction of the flow (Table 4.10-33). The maximum reduction in monthly flow in the South Fork American River at Salmon Fall bridge between Project and baseline conditions is projected to be 126 cfs, expected to occur during February of a critically dry year (a single month during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 77 cfs (a 9.3 percent decrease). The maximum increase in monthly flow between Project and baseline conditions is projected to be 59 cfs, expected to occur during September of a critically dry year and the average increase in monthly flows during September of critically dry years is 20 cfs (a 3.5 percent increase).

Table 4.10-33. South Fork American River at Salmon Falls, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	831	750	1,732	2,847	3,780	3,842	4,035	5,266	5,089	2,301	1,180	1,178	2,736
	Project, CFS	833	750	1,731	2,837	3,779	3,841	4,034	5,265	5,088	2,300	1,180	1,178	2,735
	Absolute Difference, CFS	2	0	-1	-10	-1	-1	-1	-1	-1	-1	0	0	-1
	Relative Difference (%)	0.2	0.0	-0.1	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	-14	-67	-1	-1	-1	-1	-1	-1	-1	0	
	Maximum Increase, CFS	25	0	0	0	0	0	0	-1	-1	-1	0	0	
Above Normal	Baseline, CFS	890	752	980	3,116	3,093	2,241	2,299	4,076	2,508	1,285	921	960	1,927
	Project, CFS	890	752	980	3,112	3,092	2,240	2,299	4,075	2,506	1,284	921	960	1,926
	Absolute Difference, CFS	0	0	0	-3	-1	-1	0	-1	-1	0	0	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-10	-1	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	-1	-1	0	0	0	
Below Normal	Baseline, CFS	704	1,158	1,534	1,528	2,706	2,958	2,580	2,857	1,542	835	791	928	1,677
	Project, CFS	706	1,158	1,533	1,510	2,704	2,960	2,584	2,861	1,545	836	791	932	1,677
	Absolute Difference, CFS	2	0	0	-18	-2	2	4	4	3	2	0	4	0
	Relative Difference (%)	0.3	0.0	0.0	-1.2	-0.1	0.1	0.2	0.1	0.2	0.2	0.0	0.5	0.0
	Maximum Reduction, CFS	0	0	-2	-69	-25	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	18	0	0	0	6	14	19	26	35	17	1	34	
Dry	Baseline, CFS	708	747	1,506	2,867	1,317	1,518	2,032	2,082	1,183	708	849	917	1,369
	Project, CFS	708	747	1,506	2,860	1,287	1,506	2,024	2,090	1,193	720	855	917	1,368
	Absolute Difference, CFS	0	0	0	-7	-30	-12	-8	8	10	13	6	0	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.2	-2.3	-0.8	-0.4	0.4	0.9	1.8	0.7	0.0	-0.1
	Maximum Reduction, CFS	0	0	0	-31	-65	-75	-54	-1	-1	0	-2	0	
	Maximum Increase, CFS	0	0	0	0	-1	15	6	26	33	42	28	0	
Critically Dry	Baseline, CFS	770	527	714	609	825	896	1,117	1,050	651	547	556	555	735
	Project, CFS	770	527	714	591	749	830	1,115	1,065	663	557	571	574	727
	Absolute Difference, CFS	0	0	0	-19	-77	-66	-1	15	12	10	15	20	-8
	Relative Difference (%)	0.0	0.0	0.0	-3.0	-9.3	-7.3	-0.1	1.4	1.9	1.8	2.7	3.5	-1.0
	Maximum Reduction, CFS	0	0	0	-70	-126	-122	-96	-46	-1	0	0	0	
	Maximum Increase, CFS	0	0	0	0	-17	20	19	29	29	48	46	59	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Folsom Reservoir. Table 4.10-34 shows modeled end of month storage at Folsom Reservoir for Project and baseline conditions assuming current water demands and post-construction operations. On average, under Project operations Folsom Reservoir storage is expected to be reduced at Folsom Reservoir in fall and winter of below normal years, in winter and early spring of dry years, and in winter, spring, and summer of critically dry years. Conversely, storage is expected to be increased in late spring and fall of dry years. The magnitude of these reductions in storage is small compared to the total amount of storage in Folsom Reservoir (averaging less than 2 percent).

The maximum reduction in end of month storage in Folsom Reservoir between Project and baseline conditions is projected to be up to 15,000 acre-feet during March through June of critically dry years and the average reduction ranges from 5,000 to 8,000 acre-feet during this same time period.

Table 4.10-34. Folsom Reservoir End of Month Storage, Post-Construction (Baseline vs Project) – in 1,000 acre-feet

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	Baseline, 1,000 AF	500	434	462	550	556	738	887	967	967	920	792	752
	Project, 1,000 AF	500	434	463	549	556	738	887	967	967	920	792	752
	Absolute Difference, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-4	-4	-5	-1	-1	-1	-2	0	0	0	0	0
	Maximum Increase, 1,000 AF	6	7	6	0	0	0	0	0	0	0	0	0
Above Normal	Baseline, 1,000 AF	566	498	521	567	567	726	900	967	928	820	726	676
	Project, 1,000 AF	566	498	521	567	567	726	900	967	928	820	726	676
	Absolute Difference, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, 1,000 AF	0	0	0	0	0	0	0	0	0	0	1	0
Below Normal	Baseline, 1,000 AF	484	431	470	512	529	756	857	961	867	638	563	519
	Project, 1,000 AF	483	429	468	510	526	756	857	961	868	638	563	519
	Absolute Difference, 1,000 AF	-2	-2	-2	-2	-3	0	0	0	0	0	0	0
	Relative Difference (%)	-0.4	-0.4	-0.3	-0.4	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	Maximum Reduction, 1,000 AF	-11	-11	-10	-12	-15	0	0	0	0	0	0	0
	Maximum Increase, 1,000 AF	0	0	0	0	0	0	0	1	3	1	0	1
Dry	Baseline, 1,000 AF	525	465	474	471	481	617	725	783	673	498	421	378
	Project, 1,000 AF	525	465	474	470	480	614	723	780	674	500	423	380
	Absolute Difference, 1,000 AF	0	0	0	-1	-2	-3	-3	-2	1	2	2	2
	Relative Difference (%)	0.0	0.0	0.0	-0.1	-0.4	-0.4	-0.4	-0.3	0.1	0.3	0.4	0.5
	Maximum Reduction, 1,000 AF	0	0	0	-2	-6	-7	-8	-6	-3	0	0	0
	Maximum Increase, 1,000 AF	1	0	0	0	0	0	1	0	7	8	8	9
Critically Dry	Baseline, 1,000 AF	472	403	415	403	423	465	503	504	481	371	321	292
	Project, 1,000 AF	473	403	415	403	419	456	496	498	476	369	319	291
	Absolute Difference, 1,000 AF	1	0	0	-1	-4	-8	-7	-6	-5	-2	-2	-1
	Relative Difference (%)	0.1	0.0	0.1	-0.2	-1.0	-1.8	-1.3	-1.2	-0.9	-0.6	-0.6	-0.3
	Maximum Reduction, 1,000 AF	-2	-2	-1	-4	-11	-14	-14	-14	-14	-12	-11	-12
	Maximum Increase, 1,000 AF	8	2	2	1	0	1	4	3	1	3	4	6

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

These model results were generated using CalSim 3. CalSim is a planning model that analyzes CVP and SWP water management actions on a monthly time step. It has complex rules, such as those used to route water for water supply contracts and regulatory requirements, which call upon different water supply reservoirs in the Central Valley. Geographically, the CalSim model covers all water supply reservoirs that supply flow upstream of the Delta and SWP exports to the San Francisco Bay area, the Central Coast, and Southern California. Overall, under Project operations the system modeled by CalSim at large is not experiencing net negative effects beyond those which can be inferred at Folsom Reservoir due to changes in South Fork American River inflows. Because Folsom Reservoir storage levels and water surface elevations can have large fluctuations in response to system-wide operational decisions, changes in end of month storage at Folsom Reservoir may not be in direct response to Project changes in Folsom Reservoir inflows and may not be of the same magnitude as Project effects. In some cases, a larger reduction in end of month storage could represent multiple months of reduced inflows into Folsom Reservoir under Project operations. In other cases, a larger reduction in end of month storage could be a result of Reclamation's operational decisions that are triggered within the context of a much larger geographical and water management framework.

Although inflows to Folsom Reservoir would be reduced, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between Chili Bar and Folsom Reservoir or at Folsom Reservoir. Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014,

CABY 2021). Changes to flows in the South Fork American River below Chili Bar that result from Project operations would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between Chili Bar and Folsom and at Folsom Reservoir would be **less than significant**.

Folsom Dam to Lower American River at Watt Avenue Bridge

Lower American River at Nimbus Dam. Flow in the Lower American River at Nimbus Dam is expected to be reduced by about 3 cfs on an average annual basis, which is consistent with Project changes in average annual inflows to Folsom Reservoir. As shown in Table 4.10-35, the maximum reduction in monthly flow in Lower American River at Nimbus Dam between Project and baseline conditions is projected to be 232 cfs, expected to occur during March of a below normal year (a single month during the 47-year modeling period) and the average reduction in monthly flows during March of below normal years is 41 cfs (a 1 percent decrease). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 107 cfs, expected to occur during November of a critically dry year and the average increase in monthly flows during November of critically dry years is 9 cfs (a less than 0.5 percent increase).

Larger-scale changes, such as the modeled maximum reduction in monthly flow of 232 cfs, are likely a result of the operational decisions by Reclamation included in the CalSim 3 model to manage a much larger geographical area over a time scale of months to years. CVP and SWP operations rely on an integrated system of reservoirs and export facilities for system operations and the CalSim model is programed to optimize those operations given the constraints of the system, *i.e.*, geographic constraints, hydrologic constraints, physical capacity, flood control requirements, environmental constraints (water quality, outflow), contractual and water rights requirements, economic constraints, and demand patterns. For example, Delta inflows can increase to meet export demands through additional releases from Shasta Lake, Lake Oroville, or Folsom Reservoir. If, for example, short-term releases are made from Shasta Lake instead of Folsom Reservoir during Project operations to rebalance reservoir storage, flow in the Lower American River would be reduced compared to baseline conditions and the magnitude of that change could be related to CVP and SWP system-wide operations, such as maximizing contractual water supply deliveries, and not necessarily be in direct response to change in South Fork American River inflows. This becomes evident when modeled changes in flow are estimated to be more than 156 cfs post-construction. The maximum rate of diversion for the Project under this scenario is 156 cfs, so a modeled change in flows at Nimbus Dam of 232 cfs is clearly evidence of operational decisions included in the model, rather than a direct result of Project diversions. However, changes in flow of this magnitude represent a reasonable flow scenario for the Lower American River downstream of Folsom within the context of CVP and SWP operations.

Table 4.10-35. Lower American River at Nimbus Dam, Post-Construction (Baseline vs Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline, CFS	1,593	2,835	4,074	5,558	7,651	6,926	6,320	9,243	8,395	3,897	3,884	2,356	5,228
	Project, CFS	1,593	2,833	4,074	5,553	7,651	6,925	6,320	9,240	8,394	3,895	3,884	2,356	5,227
	Absolute Difference, CFS	0	-1	0	-5	-1	-1	-1	-3	-1	-1	0	0	-1
	Relative Difference (%)	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	-17	-1	-148	-1	-1	-1	-30	-1	-4	-1	-1	
	Maximum Increase, CFS	0	0	2	84	0	0	0	-1	-1	0	3	0	
Above Normal	Baseline, CFS	1,500	2,472	2,187	6,536	5,943	2,557	2,003	6,176	4,816	3,285	2,845	1,926	3,521
	Project, CFS	1,500	2,472	2,186	6,534	5,942	2,557	2,003	6,175	4,815	3,284	2,846	1,926	3,520
	Absolute Difference, CFS	0	0	-1	-3	0	0	0	-1	-1	-1	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	-1	-8	-1	-1	-1	-1	-2	-2	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	2	-1	0	0	1	1	
Below Normal	Baseline, CFS	1,423	3,063	3,289	2,862	7,426	4,187	3,202	3,764	4,605	4,722	2,479	1,961	3,582
	Project, CFS	1,423	3,063	3,289	2,858	7,425	4,146	3,204	3,768	4,605	4,730	2,481	1,965	3,580
	Absolute Difference, CFS	0	0	0	-3	0	-41	2	4	0	8	1	4	-2
	Relative Difference (%)	0.0	0.0	0.0	-0.1	0.0	-1.0	0.1	0.1	0.0	0.2	0.1	0.2	-0.1
	Maximum Reduction, CFS	-1	0	0	-20	-1	-232	-2	-1	-1	-1	-1	-1	
	Maximum Increase, CFS	0	0	0	0	0	0	14	22	0	57	9	26	
Dry	Baseline, CFS	1,242	2,590	3,657	6,976	2,954	1,463	1,562	2,211	4,068	3,815	2,188	1,765	2,874
	Project, CFS	1,241	2,590	3,657	6,976	2,940	1,463	1,559	2,211	4,032	3,819	2,190	1,764	2,870
	Absolute Difference, CFS	-1	0	0	0	-13	0	-3	0	-37	4	2	-1	-4
	Relative Difference (%)	0	0	0	0	0	0	0	0	-1	0	0	0	0
	Maximum Reduction, CFS	-5	0	0	-1	-66	0	-15	-2	-190	-1	0	-4	
	Maximum Increase, CFS	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	14.0	20.0	9.0	0.0	
Critically Dry	Baseline, CFS	1,312	2,227	1,924	1,172	1,574	1,414	1,168	1,217	1,531	2,429	1,518	1,264	1,563
	Project, CFS	1,312	2,236	1,928	1,170	1,558	1,414	1,140	1,218	1,520	2,413	1,520	1,266	1,558
	Absolute Difference, CFS	0	9	3	-2	-16	0	-28	1	-11	-17	1	2	-5
	Relative Difference (%)	0	0	0	0	-1	0	-2	0	-1	-1	0	0	0
	Maximum Reduction, CFS	-10	-2	0	-22	-120	0	-195	-16	-81	-162	-34	0	
	Maximum Increase, CFS	12.0	107.0	21.0	0.0	0.0	0.0	0.0	28.0	27.0	26.0	67.0	25.0	

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

As discussed in Section 4.10.1, water quality impairments identified in the Lower American River include mercury and indicator bacteria at Lake Natoma and bifenthrin, indicator bacteria, mercury, PCBs, pyrethroids, water temperature, and toxicity between Nimbus Dam and the confluence with Sacramento River (SWRCB 2022). Although flow in the Lower American River can be reduced during Project operations (e.g., up to 232 cfs per month), changes in flow at this magnitude are not expected to change the chemical constituents within the water. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to water temperature in the Lower American River are expected to be minor as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the Lower American River between Folsom Dam and Watt Avenue bridge would be **less than significant**.

Future Project

Post-construction operations with future water demands are described in this section.

Kyburz to El Dorado Powerhouse

South Fork above El Dorado Diversion Dam. The Project is expected to cause no change in system operations upstream of the El Dorado Diversion Dam. Accordingly, there would be no change in streamflow upstream of the El Dorado Diversion Dam on a monthly basis with Project operations (Table 4.10-36). Although the authorized capacity in the El Dorado Canal would be restored post-construction (which would increase maximum diversions from 145 cfs to 156 cfs), the District's upstream operations, including operational releases from the upper watershed, would remain unchanged.

Table 4.10-36. South Fork American River above the El Dorado Diversion Dam, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Future Project, CFS	119	130	298	342	534	671	1,018	2,161	2,156	727	189	184	711
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Above Normal	Future Baseline, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Future Project, CFS	79	87	161	559	340	376	710	1,649	1,039	315	121	153	466
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Below Normal	Future Baseline, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Future Project, CFS	91	215	241	271	377	653	971	1,321	669	160	97	142	434
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Dry	Future Baseline, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Future Project, CFS	70	101	227	441	189	363	696	1,052	507	167	104	129	337
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
Critically Dry	Future Baseline, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Future Project, CFS	65	64	132	83	136	231	437	513	212	105	81	103	180
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork between El Dorado Diversion Dam and El Dorado Powerhouse. During Project operations, South Fork flow below the El Dorado Diversion Dam is expected to be reduced post-construction by about 4 cfs on an average annual basis when meeting future demands (Table 4.10-37). Monthly diversion rates would increase in all years and water year types, with the monthly maximum diversion rate increasing by up to 11 cfs, which is the difference between the current rate of diversion at the El Dorado Diversion Dam with existing infrastructure (i.e., 145 cfs) and the maximum rate of diversion authorized under Permit 21112 (i.e., 156 cfs) that could be achieved after construction improvements. This increase in diversion causes a corresponding reduction in streamflow below the El Dorado Diversion Dam. The majority of the changes in river flow would occur in January through June, although some reductions would occur in December and continue through July and August. In critically dry years, reductions in streamflow would occur primarily in February through June.

Table 4.10-37. South Fork American River below the El Dorado Diversion Dam, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	114	132	204	235	398	530	853	1,993	2,038	640	90	54	607
	Future Project, CFS	114	132	201	228	390	520	842	1,982	2,027	632	88	53	601
	Absolute Difference, CFS	0	0	-3	-7	-8	-9	-10	-11	-11	-8	-2	0	-6
	Relative Difference (%)	0.0	0.0	-1.5	-2.9	-1.9	-1.8	-1.2	-0.6	-0.5	-1.3	-2.2	-0.8	-1.0
	Maximum Reduction, CFS	0	0	-7	-11	-11	-11	-11	-11	-11	-11	-8	-2	
	Maximum Increase, CFS	0	0	0	0	0	-2	-3	-11	-11	-5	0	0	
Above Normal	Future Baseline, CFS	78	87	65	432	217	244	545	1,493	926	262	65	50	372
	Future Project, CFS	78	87	63	424	212	235	534	1,482	916	259	65	50	367
	Absolute Difference, CFS	0	0	-2	-7	-5	-9	-11	-11	-10	-3	0	0	-5
	Relative Difference (%)	0.0	0.0	-3.0	-1.7	-2.4	-3.5	-2.0	-0.7	-1.1	-1.1	0.0	0.0	-1.3
	Maximum Reduction, CFS	0	0	-5	-11	-11	-11	-11	-11	-11	-9	0	0	
	Maximum Increase, CFS	0	0	0	-3	-1	-6	-10	-11	-10	0	0	0	
Below Normal	Future Baseline, CFS	90	212	159	169	255	504	824	1,166	569	130	65	50	349
	Future Project, CFS	90	212	157	163	249	495	813	1,155	560	129	65	50	345
	Absolute Difference, CFS	0	0	-2	-6	-6	-9	-11	-11	-9	-1	0	0	-5
	Relative Difference (%)	0.0	0.0	-1.5	-3.5	-2.4	-1.9	-1.3	-0.9	-1.6	-0.5	0.0	0.0	-1.3
	Maximum Reduction, CFS	0	0	-7	-11	-11	-11	-11	-11	-11	-4	0	0	
	Maximum Increase, CFS	0	0	0	0	0	-6	-10	-11	-4	0	0	0	
Dry	Future Baseline, CFS	69	100	139	381	103	232	539	914	393	86	18	15	249
	Future Project, CFS	69	100	137	379	100	226	528	903	384	86	18	15	245
	Absolute Difference, CFS	0	0	-2	-2	-3	-6	-10	-11	-9	0	0	0	-4
	Relative Difference (%)	0.0	0.0	-1.5	-0.5	-2.7	-2.5	-1.9	-1.2	-2.3	-0.4	0.0	-0.2	-1.4
	Maximum Reduction, CFS	0	0	-7	-11	-11	-11	-11	-11	-11	-1	0	0	
	Maximum Increase, CFS	0	0	0	0	0	-3	-8	-11	-7	0	0	0	
Critically Dry	Future Baseline, CFS	64	62	71	36	54	101	288	377	116	40	18	15	104
	Future Project, CFS	64	62	70	35	51	95	279	367	112	40	18	15	101
	Absolute Difference, CFS	0	0	-1	-1	-3	-6	-9	-10	-4	0	0	0	-3
	Relative Difference (%)	0.0	0.0	-1.4	-1.6	-4.8	-6.2	-3.2	-2.7	-3.3	0.0	-0.4	0.0	-2.7
	Maximum Reduction, CFS	0	0	-7	-6	-8	-11	-11	-11	-9	0	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	-4	-6	0	0	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Permit 21112 water that is diverted at El Dorado Diversion Dam would be delivered in two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP; and/or 2) to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to the Reservoir A WTP. The water stored in Jenkinson Lake would be delivered to Reservoir A WTP as needed throughout the year to help meet water demands.

Because there would be a change from non-consumptive hydropower generation to consumptive use with Project operations, additional water would be either be diverted from Forebay Reservoir to Reservoir 1 WTP or be routed through Hazel Creek Tunnel to Jenkinson Lake and less water would be delivered to the El Dorado Powerhouse for power production. Table 4.10-38 shows estimated flow releases from the El Dorado Powerhouse for baseline and Project conditions and the change between baseline and Project conditions represents the change in return flows provided to the South Fork during Project operations. A change in powerhouse releases also affects power production (discussed in more detail in Section 4.6). Forebay Reservoir is the re-regulating forebay for these flows. As such, it routinely fluctuates in storage and elevation. Changes in end of month storage at Forebay Reservoir would occur during some years, with reductions in storage occurring primarily in December through April and in July and August, and increased storage occurring in June (see Appendix B2). The expected range in storage and elevation with Project operations would remain within the current levels seen under existing conditions.

Table 4.10-38. El Dorado Powerhouse Releases, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	1	0	81	125	135	141	139	133	127	102	80	113	98
	Future Project, CFS	1	0	81	109	138	145	143	140	135	108	82	113	100
	Absolute Difference, CFS	0	0	-1	-16	3	3	4	7	8	7	2	0	1
	Relative Difference (%)	-0.5	0.0	-1.0	-13.1	1.9	2.4	2.8	5.2	6.5	6.7	2.1	0.3	1.4
	Maximum Reduction, CFS	0	0	-16	-77	0	1	0	0	5	4	0	0	-5
	Maximum Increase, CFS	0	0	6	9	9	8	9	29	10	10	7	2	6
Above Normal	Future Baseline, CFS	1	0	94	124	127	123	133	130	123	48	34	86	85
	Future Project, CFS	1	0	94	89	131	134	140	140	132	50	34	86	86
	Absolute Difference, CFS	0	0	0	-35	5	12	8	10	9	3	0	0	1
	Relative Difference (%)	0.0	0.0	-0.1	-28.1	3.8	9.6	5.7	7.8	7.1	5.3	0.0	0.0	1.0
	Maximum Reduction, CFS	0	0	-1	-53	0	5	6	6	8	0	0	0	0
	Maximum Increase, CFS	0	0	0	-22	10	24	9	15	10	7	0	0	1
Below Normal	Future Baseline, CFS	1	0	81	103	119	126	125	115	90	20	9	74	72
	Future Project, CFS	1	0	81	74	100	128	145	140	119	21	9	73	74
	Absolute Difference, CFS	0	0	0	-29	-19	2	20	24	28	1	0	-1	2
	Relative Difference (%)	0.2	0.0	-0.2	-28.2	-15.8	1.9	15.8	21.2	31.5	3.0	0.0	-1.3	3.1
	Maximum Reduction, CFS	0	0	-15	-69	-66	-56	7	9	3	0	0	-6	-3
	Maximum Increase, CFS	0	0	7	10	17	34	35	44	57	3	0	0	11
Dry	Future Baseline, CFS	1	0	75	74	89	106	114	103	83	58	65	98	72
	Future Project, CFS	1	0	72	53	26	73	120	133	118	62	64	98	68
	Absolute Difference, CFS	0	0	-3	-20	-63	-33	5	29	35	4	0	0	-4
	Relative Difference (%)	0.0	0.0	-4.0	-27.5	-70.6	-31.1	4.5	28.3	42.1	7.1	-0.4	0.0	-5.3
	Maximum Reduction, CFS	0	0	-17	-60	-111	-84	-97	10	9	-1	-1	0	-10
	Maximum Increase, CFS	0	0	3	2	4	17	34	44	52	13	1	0	4
Critically Dry	Future Baseline, CFS	1	0	63	45	80	99	109	94	44	32	39	71	56
	Future Project, CFS	1	0	59	21	0	29	103	109	61	35	36	68	44
	Absolute Difference, CFS	0	0	-4	-24	-80	-70	-5	15	17	2	-2	-3	-13
	Relative Difference (%)	0.0	0.0	-6.0	-53.4	-99.9	-70.4	-4.9	15.9	38.2	7.4	-6.0	-4.7	-22.8
	Maximum Reduction, CFS	0	0	-16	-76	-137	-111	-87	-36	0	-22	-22	-47	-19
	Maximum Increase, CFS	0	0	6	6	-17	-6	35	44	50	25	1	0	-3

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

South Fork below El Dorado Powerhouse. Flow in the South Fork below the El Dorado Powerhouse is expected to be reduced by about 7 cfs on an average annual basis with post-construction operations with future water demands. The difference in river flow below the El Dorado Powerhouse between baseline and Project conditions is related to the change in water use from non-consumptive power generation to consumptive use that occurs with Project operation. With future water demands, additional water is allocated for consumptive use, more water is transferred to Jenkinson Lake in the winter, and less water is returned to the river in spring and early summer.

Under Project operations, flow is typically reduced below the El Dorado Powerhouse in December and January of wet and above normal years, December through March in below normal years, December through April in dry years, and December through April and August through September in critically dry years. In some years, Project operations would also result in increased return flows; this would primarily occur in February through May in above normal years, April through June in below normal years, and May through July in dry years and critically dry years (Table 4.10-39).

Table 4.10-39. South Fork America River below El Dorado Powerhouse, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	190	229	620	898	1,315	1,442	1,750	3,438	3,525	1,211	256	225	1,258
	Future Project, CFS	190	229	618	878	1,314	1,442	1,750	3,438	3,524	1,210	256	224	1,256
	Absolute Difference, CFS	0	0	-3	-20	-1	-1	-1	0	-1	-1	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.4	-2.2	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.2
	Maximum Reduction, CFS	0	0	-17	-79	-1	-1	-1	-1	-1	-1	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	1	18	-1	-1	0	0	
Above Normal	Future Baseline, CFS	145	160	265	1,491	871	732	1,074	2,575	1,591	445	148	175	806
	Future Project, CFS	145	160	264	1,450	873	737	1,075	2,578	1,589	444	148	175	803
	Absolute Difference, CFS	0	0	-2	-40	2	6	0	3	-1	0	0	0	-3
	Relative Difference (%)	0.0	0.0	-0.6	-2.7	0.2	0.8	0.0	0.1	-0.1	-0.1	0.0	0.0	-0.3
	Maximum Reduction, CFS	0	0	-5	-61	-1	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	-24	6	19	3	10	-1	0	0	0	
Below Normal	Future Baseline, CFS	141	475	563	540	1,044	1,255	1,445	1,826	929	231	113	161	727
	Future Project, CFS	141	475	561	507	1,021	1,251	1,455	1,840	949	231	113	160	725
	Absolute Difference, CFS	0	0	-2	-33	-23	-4	10	14	20	0	0	-1	-2
	Relative Difference (%)	0.0	0.0	-0.3	-6.2	-2.2	-0.3	0.7	0.7	2.1	0.0	0.0	-0.6	-0.2
	Maximum Reduction, CFS	0	0	-16	-71	-67	-62	-1	-1	-1	-1	0	-6	
	Maximum Increase, CFS	0	0	0	-1	6	25	24	34	47	1	0	0	
Dry	Future Baseline, CFS	121	174	433	1,449	416	572	1,002	1,426	687	210	118	143	562
	Future Project, CFS	121	174	428	1,428	351	534	998	1,445	713	214	118	143	556
	Absolute Difference, CFS	0	0	-4	-21	-64	-37	-3	18	26	4	0	0	-7
	Relative Difference (%)	0.0	0.0	-1.0	-1.4	-15.5	-6.5	-0.3	1.3	3.8	1.8	-0.2	0.0	-1.2
	Maximum Reduction, CFS	0	0	-17	-60	-113	-89	-104	-1	-1	-1	-1	0	
	Maximum Increase, CFS	0	0	0	0	-1	14	25	33	44	13	1	0	
Critically Dry	Future Baseline, CFS	123	109	212	138	237	331	614	701	262	115	83	108	253
	Future Project, CFS	123	109	207	113	155	255	600	706	275	118	81	104	237
	Absolute Difference, CFS	0	0	-5	-25	-82	-76	-14	5	13	2	-2	-3	-16
	Relative Difference (%)	0.0	0.0	-2.2	-18.0	-34.7	-22.9	-2.4	0.7	5.0	2.1	-2.9	-3.1	-6.2
	Maximum Reduction, CFS	0	0	-18	-76	-145	-117	-92	-42	0	-22	-22	-47	
	Maximum Increase, CFS	0	0	0	0	-17	-6	24	33	43	25	0	0	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

As shown in Table 4.10-39, the maximum reduction in monthly flow in the South Fork American River below the El Dorado Powerhouse between Project and baseline conditions is projected to be 145 cfs, expected to occur during February of a critically dry year (a single month during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 82 cfs (a 35 percent reduction). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 47 cfs, expected to occur during June of a below normal year and the average increase in monthly flows during June of below normal years is 20 cfs (a 2.1 percent increase). Changes to flow below the El Dorado Powerhouse would propagate to downstream river reaches and these changes represent an increasingly smaller fraction of the overall flow as tributaries and return flows from downstream operators join the river.

As described above, operation of the Project is expected to both increase and decrease flows in the South Fork American River below the El Dorado Powerhouse. For example, flow would be reduced by 35 percent in February of critically dry years in the South Fork below the El Dorado Powerhouse, with the average flow being reduced from 237 cfs to 155 cfs during Project operations and flow would then be increased by 5 percent in June of the same critically dry years, increasing the average flow from 262 cfs to 275 cfs. Overall, the range in flows expected with Project operations would remain within the current levels seen under existing conditions; see Appendix B2). Although the Project would result in reduced flow in the South Fork American River below the El Dorado Diversion Dam and the El Dorado Powerhouse at times (e.g. 35 percent average reduction in February in critically dry years), this is partially offset by the increased flows seen during critical summer months. In addition, the Project would be operated such that minimum flow releases would be maintained in the South Fork American River below the El Dorado Diversion Dam, consistent with requirements in the District's FERC license.

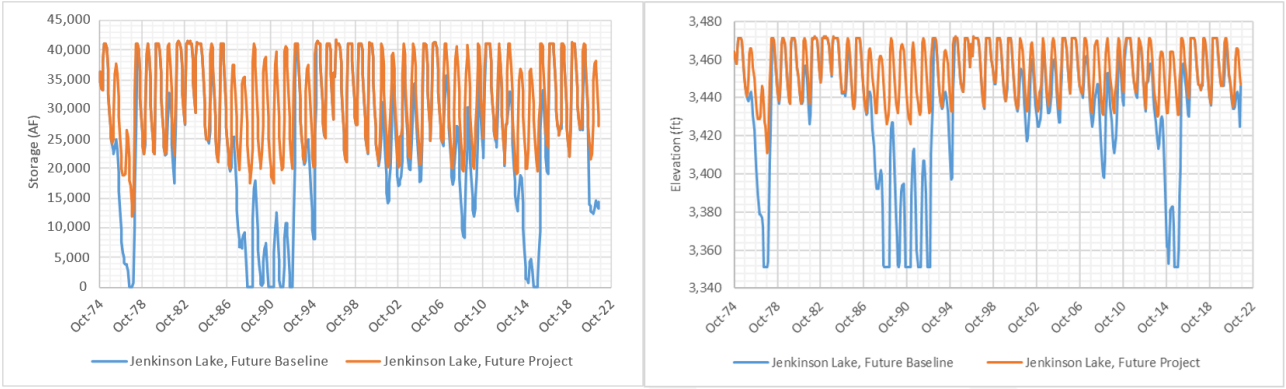
Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events,

cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to the quantity of return flows would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals in the South Fork are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Additionally, the District would continue to meet FERC license required minimum streamflows below the El Dorado Diversion Dam, which are designed to protect instream beneficial uses. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the South Fork below the El Dorado Diversion Dam due to changes in flow. Impacts to hydrology and water quality resulting from flow in the South Fork American River below the El Dorado Diversion Dam and the El Dorado Powerhouse would be **less than significant**.

El Dorado Canal to Sly Park Dam (Hazel Creek and Jenkinson Lake)

Hazel Creek Tunnel and Hazel Creek. Although post-construction operations would increase the maximum flow through Hazel Creek Tunnel and Hazel Creek, this change in flow would occur after stabilization measures are installed between the outlet of the Hazel Creek Tunnel and Jenkinson Lake at various locations along the channel. The stabilization measures implemented within the creek channel between Hazel Creek Tunnel to Jenkinson Lake would be sized for the maximum flow rates and velocities anticipated post-construction. As such, potential erosion due to increase flow from post-construction operations would be minimal.

Jenkinson Lake. Figure 4.10-12 shows modeled end of month storage at Jenkinson Lake for future baseline and future Project conditions when the Project is operated post-construction to meet future water demands. Modeling results show that Jenkinson Lake may be emptied in future baseline conditions in several critically dry years and in years which follow those critically dry years in the attempt to meet the modeled future water demands. Project operations allow for increased water supply reliability at Jenkinson Lake in critically dry years and in years which follow those critically dry years. Operation of the Project is expected to prevent Jenkinson Lake from emptying when meeting future water demands.



(a) End of Month Storage (acre feet) (b) End of Month Elevation (feet)

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Figure 4.10-12. Jenkinson Lake Storage and Elevation Post-Construction Infrastructure with Future Water Demands

Project operations would increase maximum flows in Hazel Creek post-construction, increase water surface elevations and water supply reliability at Jenkinson Lake during operations. Because the channel that conveys water from the Hazel Tunnel outlet to Hazel Creek and Hazel Creek proper would have stabilization measures sized for post-construction flow rates and velocities, and because the changes in water surface elevations at Jenkinson Lake would be within the range of normal operations, the Project would not result in the violation of water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater resources. Therefore, the effects to hydrology and water quality in Hazel Creek resulting from the Project would be **less than significant** and changes in storage at Jenkinson Lake during Project operations would be **beneficial**.

Slab Creek to Chili Bar

Minimum flows and recreational flows are required in the South Fork American River below Slab Creek Dam and Chili Bar Dam, consistent with requirements in the SMUD's FERC license. The Project's hydrologic modeling prioritizes compliance with all such FERC license minimum instream requirements and assumes that SMUD would release additional water from storage to meet these minimum flow requirements during times when Project operations would reduce flows in the South Fork American River. Therefore, the modeling shows only minor changes occur in the flow differences between Project and baseline conditions between El Dorado Powerhouse and Chili Bar (Table 4.10-40). Changes in flow would continue to have a seasonal pattern. For example, flow would be reduced by 11.6 percent in February of critically dry years in the South Fork at Chili Bar, with the average flow being reduced from 693 cfs to 613 cfs during Project operations, and flow would then be increased by 1.5 percent in June of the same critically dry years, increasing the average flow from 612 cfs to 622 cfs.

Table 4.10-40. South Fork American River at Chili Bar, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	796	675	1,487	2,335	3,044	3,178	3,475	4,971	4,938	2,211	1,120	1,128	2,446
	Future Project, CFS	795	675	1,484	2,315	3,044	3,178	3,474	4,971	4,937	2,210	1,120	1,128	2,444
	Absolute Difference, CFS	-2	0	-3	-20	-1	-1	-1	0	-1	-1	0	0	-2
	Relative Difference (%)	-0.2	0.0	-0.2	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-24	0	-17	-79	-1	-1	-1	-1	-1	-1	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	1	18	-1	-1	0	0	
Above Normal	Future Baseline, CFS	858	698	895	2,782	2,420	1,938	2,076	3,901	2,429	1,237	881	926	1,753
	Future Project, CFS	858	698	893	2,742	2,422	1,943	2,076	3,904	2,428	1,236	881	926	1,751
	Absolute Difference, CFS	0	0	-2	-39	2	6	0	3	-1	0	0	0	-3
	Relative Difference (%)	0.0	0.0	-0.2	-1.4	0.1	0.3	0.0	0.1	0.0	0.0	0.0	0.0	-0.2
	Maximum Reduction, CFS	0	0	-5	-61	-1	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	-24	6	19	3	10	-1	0	0	0	
Below Normal	Future Baseline, CFS	675	1,054	1,306	1,361	2,178	2,533	2,409	2,741	1,475	804	767	905	1,517
	Future Project, CFS	674	1,054	1,304	1,328	2,156	2,528	2,419	2,754	1,494	805	767	904	1,516
	Absolute Difference, CFS	-1	0	-2	-33	-22	-4	10	14	19	1	0	-1	-2
	Relative Difference (%)	-0.2	0.0	-0.1	-2.4	-1.0	-0.2	0.4	0.5	1.3	0.1	0.0	-0.1	-0.1
	Maximum Reduction, CFS	-9	0	-16	-69	-60	-67	-1	-1	-1	-2	0	-6	
	Maximum Increase, CFS	0	0	0	-1	6	25	24	34	47	4	0	0	
Dry	Future Baseline, CFS	671	674	1,228	2,448	1,148	1,358	1,837	1,973	1,118	684	829	895	1,239
	Future Project, CFS	671	674	1,225	2,426	1,086	1,321	1,833	1,992	1,141	689	828	895	1,232
	Absolute Difference, CFS	0	0	-3	-22	-62	-37	-4	19	23	5	-1	0	-7
	Relative Difference (%)	0.0	0.0	-0.3	-0.9	-5.4	-2.7	-0.2	1.0	2.0	0.8	-0.1	0.0	-0.6
	Maximum Reduction, CFS	0	0	-17	-60	-101	-89	-104	-1	-1	0	-17	0	
	Maximum Increase, CFS	0	0	0	0	-1	13	25	35	38	10	13	0	
Critically Dry	Future Baseline, CFS	738	485	651	540	693	793	1,045	996	612	535	554	546	682
	Future Project, CFS	738	485	647	515	613	717	1,030	1,001	622	535	551	550	667
	Absolute Difference, CFS	0	0	-4	-25	-81	-76	-15	5	9	1	-3	4	-15
	Relative Difference (%)	0.0	0.0	-0.7	-4.6	-11.6	-9.6	-1.5	0.5	1.5	0.1	-0.5	0.7	-2.3
	Maximum Reduction, CFS	0	0	-18	-76	-145	-116	-90	-44	-2	-22	-22	-20	
	Maximum Increase, CFS	0	0	0	0	-17	-6	24	33	41	12	10	25	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Slab Creek Reservoir and Chili Bar Reservoir are used as re-regulating forebays and afterbays to various powerhouses. Powerhouses that discharge water to this reach of the South Fork include Camino Powerhouse, Slab Creek Powerhouse, Rock Creek Powerhouse, White Rock Powerhouse, and the Chili Bar Powerhouse.

Camino Powerhouse, located about ¼ mile downstream of El Dorado Powerhouse, contributes flow from the Upper American River Hydroelectric Project. Union Valley Reservoir receives power production flows from higher elevation reservoirs in the Silver Creek and Rubicon River watersheds and releases water to Junction Reservoir, and indirectly to Camino Reservoir. With Project operations, changes in end of month storage at Union Valley Reservoir would occur primarily in below normal, dry, and critically dry years with reduced storage occurring in December through May and in September, and increased storage occurring in June through August of critically dry years (see Appendix B2). These changes are small compared to amount of water stored in the reservoir (less than a 1 percent change in end of month storage). Releases from Camino Powerhouse are shown in Table 4.10-41. Changes in flow occur primarily in dry or critically dry years, where flow can be reduced in June through September or increased in July through September.

Table 4.10-41. Camino Powerhouse Releases, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	568	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Future Project, CFS	568	383	654	1,034	1,149	1,196	1,207	1,238	1,239	900	802	876	937
	Absolute Difference, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	3	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	Future Baseline, CFS	683	488	545	988	990	936	801	1,160	723	745	696	740	791
	Future Project, CFS	683	488	545	989	990	936	801	1,160	723	745	696	740	791
	Absolute Difference, CFS	0	0	0	1	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum Increase, CFS	0	0	0	3	0	0	0	0	0	0	0	0	0
Below Normal	Future Baseline, CFS	500	490	546	666	686	877	774	812	459	537	623	731	642
	Future Project, CFS	499	490	546	666	687	877	773	812	458	538	623	731	642
	Absolute Difference, CFS	-1	0	0	0	1	0	0	0	-1	1	0	0	0
	Relative Difference (%)	-0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-0.2	0.1	0.0	0.0	0.0
	Maximum Reduction, CFS	-9	0	0	0	0	-4	0	0	-4	-2	0	0	0
	Maximum Increase, CFS	0	0	0	1	7	1	0	0	0	4	0	0	0
Dry	Future Baseline, CFS	511	435	575	650	571	613	669	432	364	444	681	740	557
	Future Project, CFS	511	435	576	649	573	614	669	432	360	446	680	740	557
	Absolute Difference, CFS	0	0	1	-1	2	1	0	0	-3	2	-1	0	0
	Relative Difference (%)	0.0	0.0	0.2	-0.1	0.3	0.2	0.0	0.0	-1.0	0.4	-0.1	0.0	0.0
	Maximum Reduction, CFS	0	0	0	-5	0	0	0	0	-11	-6	-17	0	0
	Maximum Increase, CFS	0	0	5	0	9	9	0	0	0	11	11	0	0
Critically Dry	Future Baseline, CFS	581	333	364	330	336	359	372	239	320	402	459	428	377
	Future Project, CFS	581	333	364	330	336	359	372	239	316	400	458	433	377
	Absolute Difference, CFS	0	0	0	0	1	0	0	0	-3	-2	0	5	0
	Relative Difference (%)	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	-1.1	-0.5	-0.1	1.3	0.0
	Maximum Reduction, CFS	0	0	0	-6	-1	-4	0	0	-14	-13	-8	-2	0
	Maximum Increase, CFS	0	0	6	4	6	6	1	0	0	9	10	25	1

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

White Rock Powerhouse generates power from South Fork American River flows. Project changes in return flows have a seasonal pattern where flow can be reduced in December to April, and in August, of dry and critically dry years. Return flows can increase in May to July, and in September, of dry years and critically dry years (Table 4.10-42).

Table 4.10-42. White Rock Powerhouse Releases, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	668	522	936	1,525	1,769	1,931	2,110	2,794	2,865	1,676	1,007	1,029	1,569
	Future Project, CFS	667	522	933	1,507	1,769	1,931	2,109	2,794	2,865	1,676	1,007	1,029	1,567
	Absolute Difference, CFS	-1	0	-2	-18	0	0	0	0	0	-1	0	0	-2
	Relative Difference (%)	-0.2	0.0	-0.3	-1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-21	0	-16	-67	-1	-1	-1	-1	-1	-1	-1	0	-9
	Maximum Increase, CFS	0	0	0	0	0	0	0	8	0	0	0	0	0
Above Normal	Future Baseline, CFS	763	587	722	1,567	1,438	1,432	1,566	2,465	1,844	1,096	792	841	1,259
	Future Project, CFS	763	587	721	1,534	1,440	1,438	1,567	2,467	1,843	1,095	792	841	1,257
	Absolute Difference, CFS	0	0	-1	-33	2	6	1	2	-1	0	0	0	-2
	Relative Difference (%)	0.0	0.0	-0.1	-2.1	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	-0.2
	Maximum Reduction, CFS	0	0	-2	-62	0	0	-1	-1	-1	-1	0	0	-3
	Maximum Increase, CFS	0	0	0	-11	6	19	5	6	-1	0	0	0	-1
Below Normal	Future Baseline, CFS	579	728	779	1,024	1,105	1,603	1,755	1,972	1,179	689	680	820	1,076
	Future Project, CFS	578	728	779	996	1,083	1,602	1,762	1,982	1,197	690	680	819	1,075
	Absolute Difference, CFS	-1	0	0	-28	-22	-2	8	9	18	1	0	-1	-2
	Relative Difference (%)	-0.2	0.0	-0.1	-2.7	-2.0	-0.1	0.4	0.5	1.5	0.1	0.0	-0.1	-0.1
	Maximum Reduction, CFS	-9	0	-16	-69	-60	-45	-1	-1	-1	-2	0	-6	-6
	Maximum Increase, CFS	0	0	12	0	6	22	24	32	44	4	0	0	6
Dry	Future Baseline, CFS	565	549	773	959	832	996	1,405	1,604	929	573	742	816	895
	Future Project, CFS	565	549	769	937	771	960	1,399	1,620	952	578	741	816	888
	Absolute Difference, CFS	0	0	-3	-21	-60	-36	-6	16	23	5	-1	0	-7
	Relative Difference (%)	0.0	0.0	-0.4	-2.2	-7.3	-3.6	-0.4	1.0	2.5	0.9	-0.2	0.0	-0.8
	Maximum Reduction, CFS	0	0	-17	-60	-101	-89	-104	0	-1	0	-17	0	-13
	Maximum Increase, CFS	0	0	0	1	0	7	23	29	38	10	13	0	0
Critically Dry	Future Baseline, CFS	642	381	491	412	503	609	857	836	500	441	479	475	552
	Future Project, CFS	642	381	487	388	427	533	842	840	509	441	477	479	537
	Absolute Difference, CFS	0	0	-4	-25	-76	-75	-16	4	9	0	-3	4	-15
	Relative Difference (%)	0.0	0.0	-0.9	-6.0	-15.0	-12.4	-1.8	0.5	1.9	0.1	-0.6	0.8	-2.7
	Maximum Reduction, CFS	0	0	-18	-76	-145	-116	-90	-44	-2	-22	-22	-24	-22
	Maximum Increase, CFS	0	0	0	0	-17	-6	24	33	41	12	10	25	-6

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to inflows at Slab Creek Reservoir that result from Project operations and changes to SMUD releases predicted by the Project's hydrologic modeling are small compared to the baseline flows in this reach and would not result in a substantial change in the concentrations of chemical constituents within the water (such as metals and mercury). Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between the El Dorado Powerhouse and Chili Bar due to changes in flow. The Project modeling assumes that SMUD would continue to comply with minimum flows and recreational flows in the South Fork American River below Slab Creek Dam and Chili Bar Dam, although some additional water from storage may need to be released by SMUD to meet these requirements. Impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between the El Dorado Powerhouse and Chili Bar would be **less than significant**.

Chili Bar to Folsom Reservoir

South Fork between Chili Bar and Salmon Falls Bridge. Tributary flows contribute to the river between Chili Bar and Salmon Falls bridge. Changes in flow between Project and baseline conditions seen at Chili Bar propagate down the river and at an increasingly smaller fraction of the flow (Table 4.10-43). The maximum reduction in monthly flow in the South Fork American River at Salmon Fall bridge between Project and baseline conditions is projected to be 145 cfs, expected to occur during February of a critically dry year (a single month

during the 47-year modeling period) and the average reduction in monthly flows during February of critically dry years is 81 cfs (a 9.8 percent decrease). The maximum increase in monthly flow between Project and baseline conditions is projected to be 47 cfs, expected to occur during June of a below normal year and the average increase in monthly flows during June of below normal years is 19 cfs (a 1.2 percent increase).

Folsom Reservoir. Table 4.10-44 shows modeled end of month storage at Folsom Reservoir for Project and baseline conditions with future water demands. On average, under Project operations storage is expected to be reduced at Folsom Reservoir in fall of wet years, in fall and winter of below normal years, and throughout the year in dry and critically dry years.

Table 4.10-43. South Fork American River at Salmon Falls, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	832	750	1,732	2,847	3,780	3,842	4,033	5,262	5,085	2,297	1,176	1,174	2,734
	Future Project, CFS	830	750	1,730	2,827	3,779	3,841	4,032	5,262	5,084	2,296	1,176	1,174	2,732
	Absolute Difference, CFS	-2	0	-3	-20	-1	-1	-1	0	-1	-1	0	0	-2
	Relative Difference (%)	-0.2	0.0	-0.1	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-24	0	-17	-79	-1	-1	-1	-1	-1	-1	-1	0	
	Maximum Increase, CFS	0	0	0	0	0	0	1	18	-1	-1	0	0	
Above Normal	Future Baseline, CFS	890	752	979	3,113	3,090	2,232	2,290	4,069	2,504	1,282	918	956	1,923
	Future Project, CFS	890	752	978	3,074	3,092	2,238	2,290	4,072	2,502	1,282	918	956	1,920
	Absolute Difference, CFS	0	0	-2	-39	2	6	0	3	-1	0	0	0	-3
	Relative Difference (%)	0.0	0.0	-0.2	-1.3	0.1	0.3	0.0	0.1	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-5	-61	-1	-1	-1	-1	-1	-1	0	0	
	Maximum Increase, CFS	0	0	0	-24	6	19	3	10	-1	0	0	0	
Below Normal	Future Baseline, CFS	706	1,158	1,533	1,527	2,703	2,948	2,570	2,844	1,523	833	789	927	1,672
	Future Project, CFS	705	1,158	1,531	1,494	2,681	2,944	2,580	2,858	1,542	834	789	926	1,670
	Absolute Difference, CFS	-1	0	-2	-33	-22	-4	10	14	19	1	0	-1	-2
	Relative Difference (%)	-0.2	0.0	-0.1	-2.2	-0.8	-0.1	0.4	0.5	1.2	0.1	0.0	-0.1	-0.1
	Maximum Reduction, CFS	-9	0	-16	-69	-60	-67	-1	-1	-1	-2	0	-6	
	Maximum Increase, CFS	0	0	0	-1	6	25	24	34	47	4	0	0	
Dry	Future Baseline, CFS	708	747	1,506	2,866	1,317	1,512	2,017	2,061	1,165	711	849	913	1,364
	Future Project, CFS	708	747	1,502	2,844	1,255	1,475	2,013	2,080	1,188	716	848	913	1,357
	Absolute Difference, CFS	0	0	-3	-22	-62	-37	-4	19	23	5	-1	0	-7
	Relative Difference (%)	0.0	0.0	-0.2	-0.8	-4.7	-2.4	-0.2	0.9	2.0	0.8	-0.1	0.0	-0.5
	Maximum Reduction, CFS	0	0	-17	-60	-101	-89	-104	-1	-1	0	-17	0	
	Maximum Increase, CFS	0	0	0	0	-1	13	25	36	38	10	13	0	
Critically Dry	Future Baseline, CFS	770	527	714	609	825	890	1,110	1,039	638	549	564	556	733
	Future Project, CFS	770	527	710	584	745	815	1,095	1,044	647	549	561	560	717
	Absolute Difference, CFS	0	0	-4	-25	-81	-76	-15	5	9	1	-3	4	-15
	Relative Difference (%)	0.0	0.0	-0.6	-4.1	-9.8	-8.5	-1.4	0.4	1.5	0.1	-0.5	0.7	-2.1
	Maximum Reduction, CFS	0	0	-18	-76	-145	-116	-90	-44	-2	-22	-22	-20	
	Maximum Increase, CFS	0	0	0	0	-17	-6	24	33	41	12	10	25	

Source: Appendix B2 (Zanjero 2024b, ResSim model output)

Table 4.10-44. Folsom Reservoir End of Month Storage, Post-Construction (Future Baseline vs Future Project) – in 1,000 acre-feet

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	Future Baseline, 1,000 AF	499	433	462	549	556	738	887	967	967	920	792	752
	Future Project, 1,000 AF	498	432	461	549	556	738	886	967	967	920	792	752
	Absolute Difference, 1,000 AF	-1	-1	-1	0	0	0	0	0	0	0	0	0
	Relative Difference (%)	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-8	-8	-9	-5	-4	-4	-4	0	0	0	0	0
	Maximum Increase, 1,000 AF	2	1	1	0	0	0	0	0	0	0	0	0
Above Normal	Future Baseline, 1,000 AF	566	498	521	567	567	725	900	967	928	820	726	675
	Future Project, 1,000 AF	566	498	521	567	567	726	900	967	928	819	726	675
	Absolute Difference, 1,000 AF	0	0	0	0	0	1	0	0	0	0	0	0
	Relative Difference (%)	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-1	0	0	0	0	0	0	0	0	-1	0	0
	Maximum Increase, 1,000 AF	0	0	0	0	0	2	0	0	0	0	0	0
Below Normal	Future Baseline, 1,000 AF	484	430	469	512	529	756	857	960	866	638	562	519
	Future Project, 1,000 AF	481	427	466	508	524	756	857	961	868	638	562	519
	Absolute Difference, 1,000 AF	-3	-3	-3	-4	-5	0	0	0	1	0	0	0
	Relative Difference (%)	-0.6	-0.7	-0.7	-0.8	-0.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Maximum Reduction, 1,000 AF	-17	-17	-17	-19	-23	0	-1	0	0	-1	0	-1
	Maximum Increase, 1,000 AF	0	0	0	0	0	1	1	2	4	1	1	0
Dry	Future Baseline, 1,000 AF	524	464	474	471	481	616	724	780	671	497	420	377
	Future Project, 1,000 AF	523	464	473	468	477	610	718	775	668	495	419	376
	Absolute Difference, 1,000 AF	-1	-1	-1	-2	-4	-6	-6	-5	-3	-2	-1	-1
	Relative Difference (%)	-0.2	-0.2	-0.2	-0.5	-0.8	-1.0	-0.9	-0.6	-0.4	-0.3	-0.3	-0.2
	Maximum Reduction, 1,000 AF	-3	-3	-3	-6	-9	-15	-14	-12	-8	-5	-5	-4
	Maximum Increase, 1,000 AF	0	0	0	0	0	1	2	4	1	2	1	1
Critically Dry	Future Baseline, 1,000 AF	472	403	415	404	423	464	502	503	480	370	320	290
	Future Project, 1,000 AF	471	402	414	401	417	454	492	494	473	366	317	287
	Absolute Difference, 1,000 AF	-1	-1	-1	-2	-6	-10	-10	-9	-7	-4	-3	-3
	Relative Difference (%)	-0.2	-0.2	-0.2	-0.6	-1.3	-2.2	-1.9	-1.8	-1.5	-1.0	-1.0	-1.0
	Maximum Reduction, 1,000 AF	-6	-5	-5	-7	-13	-15	-16	-16	-16	-16	-16	-16
	Maximum Increase, 1,000 AF	0	0	0	0	0	-3	-1	-1	0	0	1	0

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

The maximum reduction in end of month storage in Folsom Reservoir between Project and baseline conditions is projected to be up to 23,000 acre-feet during February of a below normal year and the average reduction was 5,000 acre-feet during all Februarys of below normal years.

These model results were generated using CalSim 3. CalSim is a planning model that analyzes CVP and SWP water management actions on a monthly time step. It has complex rules, such as those used to route water for water supply contracts and regulatory requirements, which call upon different water supply reservoirs in the Central Valley. Geographically, the CalSim model covers all water supply reservoirs that supply flow upstream of the Delta and SWP exports to the San Francisco Bay area, the Central Coast, and Southern California. Overall, under Project operations the system modeled by CalSim at large is not experiencing net negative effects beyond those which can be inferred at Folsom Reservoir due to changes in South Fork American River inflows. Because Folsom Reservoir storage levels and water surface elevations can have large fluctuations in response to system-wide operational decisions, changes in end of month storage at Folsom Reservoir may not be in direct response to Project changes in Folsom Reservoir inflows and may not be of the same magnitude as Project effects. In some cases, a larger reduction in end of month storage could represent multiple months of reduced inflows into Folsom Reservoir under Project operations. In other cases, a larger reduction in end of month storage could be a result of Reclamation's operational decisions that are triggered within the context of a much larger geographical and water management framework.

Although inflows to Folsom Reservoir would be reduced, Project operations would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in the river between Chili Bar and Folsom Reservoir or at Folsom Reservoir. Surface water and groundwater within the South Fork American River basin is generally high in quality with source water from rainfall and snowmelt. Surface water

often has low turbidity except during high flow events, cold temperatures and high dissolved oxygen concentrations for most of the year, and low levels of other water quality indicators such as nitrates, agricultural and industrial chemicals, and chlorinated organics. The most significant surface water quality concerns in the region include metals from mining (e.g., mercury), erosion and sedimentation, and temperature (DWR 2014, CABY 2021). Changes to flows in the South Fork American River below Chili Bar that result from Project operations would not change the chemical constituents within the water, and therefore the concentration of agricultural and industrial chemicals, chlorinated organics, and metals are expected to remain the same. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to the temperature of the South Fork are expected to be minimal as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the South Fork American River between Chili Bar and Folsom and at Folsom Reservoir would be **less than significant**.

Folsom Dam to Lower American River at Watt Avenue Bridge

Lower American River at Nimbus Dam. Flow in the Lower American River at Nimbus Dam is expected to be reduced by about 7 cfs on an average annual basis, which is consistent with Project changes in average annual inflows to Folsom Reservoir. As shown in Table 4.10-45, the maximum reduction in monthly flow in Lower American River at Nimbus Dam between Project and baseline conditions is projected to be 431 cfs, expected to occur during March of a below normal year (a single month during the 47-year modeling period) and the average reduction in monthly flows during March of below normal years is 85 cfs (a 2 percent decrease). Additionally, the maximum increase in monthly flow between Project and baseline conditions is projected to be 83 cfs, expected to occur during June of a dry year and the average change in monthly flows during June of dry years is a decrease of 3 cfs (a 0.1 percent decrease).

Larger-scale changes, such as the modeled maximum reduction in monthly flow of 431 cfs, are likely a result of the operational decisions by Reclamation included in the CalSim 3 model to manage a much larger geographical area over a time scale of months to years. CVP and SWP operations rely on an integrated system of reservoirs and export facilities for system operations and the CalSim model is programed to optimize those operations given the constraints of the system, *i.e.*, geographic constraints, hydrologic constraints, physical capacity, flood control requirements, environmental constraints (water quality, outflow), contractual and water rights requirements, economic constraints, and demand patterns. For example, Delta inflows can increase to meet export demands through additional releases from Shasta Lake, Lake Oroville, or Folsom Reservoir. If, for example, short-term releases are made from Shasta Lake instead of Folsom Reservoir during Project operations to rebalance reservoir storage, flow in the Lower American River would be reduced compared to baseline conditions and the magnitude of that change could be related to CVP and SWP system-wide operations, such as maximizing contractual water supply deliveries, and not necessarily be in direct response to change in South Fork American River inflows. This becomes evident when modeled changes to Lower American River flows are estimated to be more than 156 cfs post-construction. The maximum rate of diversion for the Project under this scenario is 156 cfs, so a modeled change in flows at Nimbus Dam of 431 cfs is clearly evidence of operational decisions included in the model, rather than a direct result of Project diversions. However, changes in flow of this magnitude represent a reasonable flow scenario for the Lower American River downstream of Folsom within the context of CVP and SWP operations.

Table 4.10-45. Lower American River at Nimbus Dam, Post-Construction (Future Baseline vs Future Project) – monthly flow in cfs

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Future Baseline, CFS	1,593	2,833	4,074	5,546	7,651	6,926	6,319	9,236	8,391	3,893	3,881	2,352	5,225
	Future Project, CFS	1,593	2,832	4,074	5,516	7,650	6,925	6,318	9,232	8,390	3,893	3,880	2,352	5,221
	Absolute Difference, CFS	0	-1	0	-30	-1	-1	-1	-5	-1	0	-1	0	-3
	Relative Difference (%)	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	-1	-10	-2	-227	-2	-2	-1	-49	-1	-1	-3	-1	
	Maximum Increase, CFS	0	0	0	0	0	1	0	0	0	3	0	0	
Above Normal	Future Baseline, CFS	1,500	2,472	2,185	6,530	5,940	2,557	1,986	6,170	4,812	3,284	2,842	1,924	3,517
	Future Project, CFS	1,500	2,472	2,184	6,491	5,941	2,557	1,992	6,172	4,811	3,284	2,842	1,925	3,514
	Absolute Difference, CFS	0	0	-1	-39	1	-1	7	2	-1	0	0	1	-3
	Relative Difference (%)	0.0	0.0	0.0	-0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	-0.1
	Maximum Reduction, CFS	0	0	-3	-63	-3	-1	-1	-1	-2	-1	0	0	
	Maximum Increase, CFS	0	0	0	-22	7	0	22	9	0	1	0	2	
Below Normal	Future Baseline, CFS	1,423	3,063	3,289	2,855	7,423	4,179	3,192	3,750	4,598	4,713	2,480	1,958	3,577
	Future Project, CFS	1,423	3,063	3,289	2,834	7,411	4,095	3,205	3,759	4,603	4,728	2,480	1,960	3,571
	Absolute Difference, CFS	0	0	0	-21	-12	-85	13	10	5	16	0	2	-6
	Relative Difference (%)	0.0	0.0	0.0	-0.7	-0.2	-2.0	0.4	0.3	0.1	0.3	0.0	0.1	-0.2
	Maximum Reduction, CFS	-1	0	0	-65	-64	-431	-1	-2	-1	0	-2	-4	
	Maximum Increase, CFS	0	0	0	0	2	0	34	28	33	62	2	19	
Dry	Future Baseline, CFS	1,242	2,588	3,657	6,976	2,954	1,463	1,562	2,204	4,038	3,811	2,180	1,765	2,870
	Future Project, CFS	1,242	2,588	3,657	6,967	2,933	1,463	1,554	2,200	4,035	3,792	2,177	1,764	2,864
	Absolute Difference, CFS	0	0	0	-9	-20	0	-8	-4	-3	-19	-4	-1	-6
	Relative Difference (%)	0.0	0.0	0.0	-0.1	-0.7	0.0	-0.5	-0.2	-0.1	-0.5	-0.2	0	0
	Maximum Reduction, CFS	0	0	-1	-43	-101	-1	-38	-10	-51	-50	-34	-6	
	Maximum Increase, CFS	0	0	0	0	0	0	0	0	83	1	11	0.0	
Critically Dry	Future Baseline, CFS	1,311	2,224	1,924	1,172	1,574	1,414	1,167	1,213	1,519	2,426	1,530	1,235	1,559
	Future Project, CFS	1,313	2,219	1,921	1,170	1,553	1,414	1,145	1,206	1,497	2,393	1,507	1,234	1,548
	Absolute Difference, CFS	1	-5	-3	-2	-21	0	-22	-7	-22	-33	-23	-1	-11
	Relative Difference (%)	0.1	-0.2	-0.1	-0.1	-1.3	0.0	-1.9	-0.6	-1.4	-1.4	-1.5	0	-1
	Maximum Reduction, CFS	0	-70	-16	-22	-139	0	-163	-44	-121	-206	-195	-9	
	Maximum Increase, CFS	8	5	0	0	0	0	0	15	59	4	41	0.0	

Source: Appendix B3 (Zanjero 2024c, CalSim model output)

As discussed in Section 4.10.1, water quality impairments identified in the Lower American River include mercury and indicator bacteria at Lake Natoma and bifenthrin, indicator bacteria, mercury, PCBs, pyrethroids, water temperature, and toxicity between Nimbus Dam and the confluence with Sacramento River (SWRCB 2022). Although flow in the Lower American River can be reduced during Project operations (e.g., up to 431 cfs per month), changes in flow at this magnitude are not expected to change the chemical constituents within the water. Erosion and sedimentation are not expected to increase, as flows are expected to remain within current levels seen under existing conditions. Changes to water temperature in the Lower American River are expected to be minor as discussed in more detail under Impact 4.10-2. Therefore, impacts to hydrology and water quality resulting from changes in flow in the Lower American River between Folsom Dam and Watt Avenue bridge would be **less than significant**.

Mitigation Measures

Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction

Mitigation Measure 4.10-2: Implement Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials

Mitigation Measure 4.10-3: Implement Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan

Mitigation Measure 4.10-4: Prepare and Implement a Dewatering and/or Stream Bypass Plan

The District and/or Contractor shall prepare and implement a Dewatering Plan or Stream Bypass Plan during construction where this type of construction activity is required, to ensure that water quality impacts will be less than significant. The Dewatering Plan will specify the following : (1) the methods used for dewatering, (2) the location of the dewatering, (3) the estimated amount of water, (4) the discharge locations, (5) the BMPs and avoidance and minimization measures to be implemented during dewatering, and (6) any erosion protection measures needed at the point of discharge. Examples of BMPs, avoidance and minimization measures, and/or erosion protections measures that may be included, and are known to be effective, include, but are not limited to:

- Pumps and generators maintained and operated in a manner that minimizes impacts to water quality and aquatic species;
- Water discharged in a nonerosive manner; and
- If high levels of groundwater in a work area are encountered and pumped out of the work site, the water shall be directed into specifically constructed infiltration basins, into holding ponds, or onto areas with vegetation to remove sediment prior to the water re-entering a creek, if necessary to protect water quality.

If dewatering of the stream channel is needed, the length of the dewatered stream channel and the duration that the creek is dewatered will be kept at a minimum, disturbance to the channel will be minimized, and downstream flows will be maintained at a level adequate to prevent stranding of fish during dewatering activities.

The Stream Bypass Plan will specify the following: (1) the diversion approach, (2) the discharge points, (3) the BMPs and avoidance and minimization measures to be implemented during diversions, and (4) any erosion protection measures needed at the point of discharge. Examples of BMPs, avoidance and minimization measures, and/or erosion protections measures that may be included, and are known to be effective, include, but are not limited to:

- Diverting the entire streamflow around the work area through use of a barrier, except where it has been determined by a qualified biologist that the least environmentally disruptive approach is to work in a flowing stream. Ambient stream flows shall be maintained below the diversion, waters discharged below the work site shall not be diminished or degraded by the diversion itself, and to prevent increases in temperature and decreases in dissolved oxygen, if bypass pipes are used, they shall be properly sized (i.e., larger diameter pipes to better pass the flows).
- Use of appropriate equipment for the job that minimizes disturbance to the stream bottom. Appropriately tired vehicles, either tracked or wheeled, shall be used depending on the situation.
- Protecting the top of the bank by leaving vegetation in place to the maximum extent possible, thereby minimizing localized erosion that can occur after removal of in-channel vegetation.
- To the extent that stream bed design changes are not part of the work, the stream bed will be returned to as close to pre-project conditions as appropriate. Materials placed within the channel to dewater the stream shall be removed and normal flows shall be restored to the stream as soon as is feasible and safe after work is complete.

If a stream bypass is required, the length of water conveyance will be kept at a minimum. Mitigation Measure 4.10-5: Design for Channel Stabilization Measures from the Hazel Creek Tunnel to Jenkinson Lake

The District shall have a registered engineer design the stabilization measures that will be implemented at the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Stabilization measures located within this channel will be sized based on maximum flow rates and velocities anticipated post-construction.

Significance After Mitigation

Implementation of Mitigation Measure 4.7-1, Stormwater Management during Construction, would reduce potential water quality impacts from construction related to runoff and erosion. Erosion and sedimentation, as well as potential contamination of stormwater and non-stormwater discharges, would be managed in active construction areas as per approved BMPs in the water pollution control plan or SWPPP. In addition, implementation of Mitigation Measure 4.9-1a, Comply with all Regulations on the Transport and Use of Hazardous Materials, and Mitigation Measure 4.9-1b, Prepare and Implement a Hazardous Materials Release Prevention Plan, will reduce potential impacts associated with the transport, handling, use, and disposal of hazardous materials during construction. Mitigation Measure 4.10-4 requires the District and/or the Contractor to prepare and implement a Dewatering Plan or Stream Bypass Plan during construction where such an activity is applicable. The plans would detail the BMPs and avoidance and minimization measures to be used to minimize erosion and disturbance to the channel during construction to ensure that impacts will not be significant. Mitigation Measure 4.10-5 requires that the stabilization measures implemented within the creek channel between Hazel Creek Tunnel to Jenkinson Lake be designed by a licensed engineer and appropriately sized for the maximum flow rates and velocities anticipated post-construction. By implementing these mitigation measures, potential contamination and sediment transport by stormwater runoff from active construction areas and the potential for post-construction erosion and sedimentation will be minimized and substantially avoided. Therefore, impacts to water quality during construction and post-construction operations would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality and impacts would be **less than significant with mitigation incorporated**.

Impact 4.10-2. Degrades receiving water temperatures in a manner that adversely affects beneficial uses?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam using existing infrastructure with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP.

Tables in this subsection show CE-QUAL-W2 model output for water temperature. Water temperature is shown by month and water year type for baseline and Project conditions. The “absolute difference” is the change in temperature between baseline and Project conditions when averaged by month and water year type. The “maximum temperature increase” and the “maximum temperature decrease” are the results from the month with the maximum change between baseline and Project conditions for each month and water year type.

Project

Project operations with existing infrastructure and current water demands are described in this section.

South Fork American River

Although change in water temperature in the South Fork American River during Project operations is not modeled directly, there are several observations that can be made based on existing data (e.g., Table 4.10-2). Monthly water temperature at monitoring stations located within the South Fork American River from 0.5 mile above the El Dorado Diversion Dam to the El Dorado Powerhouse ranged from 17.3°C (63.1°F) to 22.0°C (71.6°F) depending on location during the warmer months of July and August. The warmest temperatures occurred at the monitoring stations located farther downstream, most likely due to higher ambient air temperatures occurring at lower elevations. Effects from direct diversions appear to be minimal; the difference between monthly water temperatures upstream and downstream of the El Dorado Diversion Dam was less than 0.2°C (0.4°F). [6]

Changes in riverine flow rates can also affect water temperature. Project operations that change river flow in areas immediately downstream of storage reservoirs are more likely to affect water temperatures than similar changes in flow that occur tens of miles downstream, particularly when water is released from a cold-water pool and water temperatures are not at equilibrium when released. Once water is released, river distance and environmental heat flux influences stream temperature as water moves downstream (Daniels and Danner 2020). Once river temperatures approach the equilibrium temperature, additional changes to water temperatures are more likely to be a result of changing air temperatures, solar radiation, steam shading, or wind sheltering (which change the equilibrium condition) and/or new inputs such as groundwater, than reductions in streamflow (Bogan et al. 2003).

Although changes to water temperature could occur in the South Fork American River, Project operations are expected to have only minor effects on temperature in the area between the El Dorado Diversion Dam and Folsom Reservoir as direct effects from diversions have been shown to be minimal and because equilibrium water temperatures for the river would be highly influenced by ambient air temperatures, shading, and inflows from seeps or springs, all of which would be unaffected by Project operations.

Folsom Reservoir Releases

Table 4.10-46 shows the average monthly water temperature of Folsom Dam releases in the Lower American River below Folsom Dam that were modeled for Project and baseline conditions assuming current water demands and the use of existing infrastructure. Change in monthly water temperatures due to Project operations would range from -0.8°C to 0.7°C (-1.4°F to 1.3°F), with the maximum increase in temperature expected to occur in September of a critically dry water year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are predicted to decrease by more than 0.2°C (0.4°F) during five non-consecutive months, four of which would occur during critically dry water years. In addition, temperatures are expected to increase by more than 0.2°C (0.4°F) during seven months, all of which would occur during critically dry water years.

[6] Changes in temperatures that are less than 0.2°C (0.4°F) are often at or below the accuracy of calibrated temperature measurement equipment (USGS 2023).

Table 4.10-46. Monthly Water Temperature in the Lower American River below Folsom Dam, Existing Infrastructure (Baseline vs Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	16.1	13.9	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Project (°C)	16.0	13.9	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
	Maximum Temperature Decrease (°C)	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	15.4	14.1	11.2	8.7	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Project (°C)	15.4	14.1	11.2	8.7	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	15.7	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	15.0	14.7	12.3
	Project (°C)	15.7	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	14.9	14.7	12.3
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**-0.8**	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Dry	Baseline (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.6	14.5	15.9	16.5	16.2	12.8
	Project (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.6	14.5	15.9	16.5	16.1	12.8
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0	-0.2	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
Critically Dry	Baseline (°C)	16.1	14.1	11.1	8.6	8.6	9.9	11.7	13.3	15.0	16.7	16.7	17.1	13.3
	Project (°C)	16.1	14.2	11.1	8.6	8.6	9.9	11.7	13.4	15.1	16.7	16.7	17.2	13.3
	Maximum Temperature Increase (°C)	0.1	0.2	0.0	0.0	0.0	0.1	0.2	0.1	0.4	0.1	0.3	**0.7**	
	Maximum Temperature Decrease (°C)	-0.4	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.1	-0.1	-0.3	-0.1	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-5)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

Folsom Reservoir is operated to meet a variety of objectives including flood control, municipal, industrial, and agricultural water supply, hydroelectric power generation, fish and wildlife protection, recreation, and Delta water quality (Reclamation 2024). In addition, Folsom Dam releases provide cold water for the Lower American River system and managing water temperatures for downstream aquatic resources is a management goal for the releases. Although Project operations change both the volume and timing of inflows to Folsom Reservoir from the South Fork American River (discussed in Impact 4.10-1), subsequent effects on the temperature of Folsom Dam releases are expected to be minor (less than 1°C on average per month, as shown in Table 4.10-46), with some months having cooler releases and some months having warmer releases than baseline conditions.

Releases from Folsom Dam are re-regulated approximately 7 miles downstream by Nimbus Dam. Temperature sensitive aquatic resources such as special-status salmonids are found in the Lower American River between Nimbus Dam and the Watt Avenue bridge (this discussed in more detail in Section 4.4, Biological Resources). Consequently, water temperature targets for the Lower American River have been established to support Central Valley steelhead incubation and rearing during the late spring and summer, and for fall-run Chinook salmon spawning and incubation starting in late October and early November (Reclamation 2019). Water temperatures expected in the Lower American River below Nimbus Dam are discussed in the subsection below.

Lower American River at Watt Avenue

Table 4.10-47 shows the average monthly water temperature in the Lower American River at Watt Avenue bridge modeled for Project and baseline conditions assuming current water demands and the use of existing infrastructure. Change in monthly temperature ranges from -0.5°C to 0.5°C (-0.9°F to 0.9°F), with a maximum increase in temperature expected to occur in September of a critically dry water year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, temperatures were predicted to decrease by more than 0.2°C (0.4°F) during three non-consecutive months, two of which would occur during critically dry water years. In addition, temperatures are expected to increase by more than 0.2°C (0.4°F) during four different months, all of which would occur during critically dry water years and three of which occur during the same summer. Changes in magnitude greater than 0.2°C (0.4°F) are discussed herein as this is the lower limit of accuracy for temperature measurements (USGS 2023).

As per the October 2019 biological opinion for the long-term operation of the CVP and SWP, Reclamation actively manages water temperature in the Lower American River, targeting a daily water temperature of 65°F (18.3°C) or lower at Watt Avenue bridge from May 15 through October 31 of each year to support juvenile steelhead rearing. These operational targets are managed on a monthly basis. When the target temperature cannot be met because of the limited availability of cold water in Folsom Reservoir, then target water temperatures for Watt Avenue are increased incrementally to as high as 68°F (20°C). Reclamation also manages water temperatures in November and December, targeting a daily water temperature of 56°F (13.3°C) or lower from November 1 through December 31 each year if the cold-water pool allows, to support fall-run Chinook salmon spawning and embryo incubation (NMFS 2019, Reclamation 2019, and Reclamation 2023).

As per the December 2024 biological opinion, these water temperature management strategies have been updated. Monthly water temperature targets at the Watt Avenue bridge now range from 63°F to 72°F (17.2°C to 22.2°C) depending on the temperature schedule. If temperature targets are exceeded for 3 consecutive days or by more than 3°F (1.7°C) in a single day, Reclamation informs NMFS and the American River Group, outlining steps to realign water temperature with its Temperature Management Plan (NMFS 2024).

Table 4.10-47. Monthly Water Temperature in the Lower American River at Watt Avenue, Existing Infrastructure (Baseline vs Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	17.3	14.0	11.1	8.5	8.9	10.6	11.6	12.6	14.6	17.0	18.0	17.8	13.5
	Project (°C)	17.3	14.0	11.1	8.5	8.9	10.6	11.6	12.6	14.6	17.0	18.0	17.8	13.5
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
	Maximum Temperature Decrease (°C)	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Project (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	17.3	14.0	10.6	8.7	9.0	11.2	13.2	14.3	15.8	18.3	18.6	18.2	14.1
	Project (°C)	17.3	14.0	10.6	8.7	9.1	11.2	13.2	14.3	15.8	18.3	18.5	18.2	14.1
	Maximum Temperature Increase (°C)	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**-0.5**	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Dry	Baseline (°C)	16.8	14.0	10.7	8.5	9.5	12.2	14.4	15.5	17.1	18.8	19.7	19.4	14.7
	Project (°C)	16.8	14.0	10.7	8.5	9.6	12.2	14.4	15.5	17.1	18.8	19.7	19.4	14.7
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Critically Dry	Baseline (°C)	17.4	14.1	10.9	9.1	10.0	12.6	15.2	17.5	18.9	20.0	20.8	20.3	15.6
	Project (°C)	17.4	14.2	10.9	9.1	10.0	12.6	15.2	17.5	19.0	20.1	20.7	20.3	15.6
	Maximum Temperature Increase (°C)	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.1	**0.5**	
	Maximum Temperature Decrease (°C)	-0.3	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-12)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

As discussed in Section 4.4, Biological Resources, baseline conditions in the Lower American River include temperatures that are stressful to salmonids (e.g., during egg incubation, smolt emigration, and juvenile rearing). As seen by the modeled baseline conditions described in Table 4.10-47, a target water temperature of 65°F (18.3°C) at Watt Avenue bridge is rarely met in the summer of dry and critically dry years. In addition, water temperatures in November are often greater than the 56°F (13.3°C) target due to the limited availability of Folsom Reservoir's cold-water pool. As such, water temperature targets for the Lower American River at Watt Avenue bridge are frequently increased above 65°F (18.3°C) during May to October for at least one month during baseline conditions; this is expected to occur approximately every other year (Appendix C, Table 3-2). Baseline conditions can be warm in the summer and early fall with water temperatures found to exceed 68°F (20°C) in August and September in one of the five dry years and eight of the twelve critically dry water years modeled (Appendix C, Table 3-23).

Table 4.10-48 describes exceedance of temperature targets for baseline and Project conditions when evaluated on a month-by-month basis for the 40-year temperature modeling period. Based on the water temperature modeling conducted for the Project, monthly water temperature at Watt Avenue in May through October is expected to be greater than the 65°F (18.3°C) approximately 36 percent of the time and greater than 68°F (20°C) approximately 11 percent of the time under baseline conditions (Table 4.10-48). Project operations that decrease the volume or affect the timing of cold-water inflows to Folsom Reservoir have the potential to increase the temperature of Folsom Dam releases and increase target temperatures for the Lower American River at Watt Avenue. Although temperature modeling indicates that there can be some increases in water temperature under Project conditions

during months when water temperatures exceeded 68°F (20°C), temperatures are more likely to decrease or cause no change compared to baseline conditions when evaluated on a month-by-month basis.

Table 4.10-48. Percent Exceedance of Temperature Targets in the Lower American River at Watt Avenue, Existing Infrastructure (Baseline and Project)

Scenario	Target Value	May	Jun	Jul	Aug	Sep	Oct	May-Oct
Baseline	> 65°F (18.3°C)	5%	20%	48%	65%	53%	25%	36%
Project (Existing Infrastructure)	> 65°F (18.3°C)	8%	18%	48%	63%	55%	25%	36%
Baseline	> 68°F (20°C)	0%	5%	18%	23%	23%	0%	11%
Project (Existing Infrastructure)	> 68°F (20°C)	0%	5%	18%	25%	23%	0%	12%

Source: Derived from data in Appendix C (Tables 3-23 and 3-24)
% = percent; > = greater than
°C = degrees Celsius; °F = degrees Fahrenheit

Table 4.10-49 describes modeled baseline conditions and changes in water temperature in the Lower American River at Watt Avenue during average conditions, when baseline conditions are warmest, and when modeled changes are the greatest. Water temperatures are expected to increase by more than 0.2°C (0.36°F) during months occurring in June, July, or September in critically dry years and when baseline temperatures are greater than 20°C (68°F).

Section 4.4, Biological Resources, discusses potential effects to special-status salmonids (steelhead and fall run Chinook salmon) due to changes in water temperatures during Project operations. Each of the life stages present in the Lower American River (adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts) were evaluated by month and year type against applicable temperature tolerances. Potential effects to special-status salmonids were considered moderate when increased temperature stress occurred well outside of thermal optimums for a given life stage and when increased temperature stress occurred during multiple months or during peak activity for that life stage. In some cases, individual fish were expected to be adversely affected for one or more months; however, such effects were found to occur infrequently (typically in only one of the 40 years that were modeled) and would not have a significant effect on population abundance. Overall, changes in water temperature of the magnitude described in Table 4.10-49 (i.e., increased temperatures of up to 0.5°C) during Project operations would not have a substantial adverse effect on sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat.

The Basin Plan includes numeric and narrative water quality objectives for water temperature. In waterbodies with cold or warm freshwater habitat, water temperatures are not to be increased more than 5ºF (2.8ºC) above natural receiving water temperatures, nor altered in a manner that adversely affects beneficial uses. As discussed above, Project effects on water temperature are expected to be minor and changes in riverine temperatures are not expected to increase above this numeric water quality objective. In addition, effects from Project operations on temperature sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat are expected to be less than significant (refer to Section 4.4, Biological Resources). As such, the Project would not degrade receiving water temperatures in a manner that adversely affects beneficial uses and Project impacts associated with operations with existing infrastructure and current water demands to overall temperature conditions in the Lower American River temperature would be **less than significant**. No mitigation is required.

Table 4.10-49. Baseline Water Temperature and Change in Water Temperature in the Lower American River at Watt Avenue, Existing Infrastructure (Baseline and Project) (°C)

Scenario	October	November	December	January	February	March	April	May	June	July	August	September
Wet												
average condition	17.3 +0	14.0 +0	11.1 +0	8.5 +0	8.9 +0	10.6 +0	11.6 +0	12.6 +0	14.6 +0	17.0 +0	18.0 +0	17.8 +0
warmest baseline	19.4 +0	14.6 -0.1	12.5 +0	9.5 +0	9.8 +0	12.1 +0	13.4 +0	14.1 +0	16.3 +0	17.8 +0	18.3 +0	18.3 +0
greatest change	19.4 +0	13.2 +0	10.6 +0	8.1 +0	8.8 +0	11.3 +0	13.4 +0	13.7 +0	15.4 +0	17.4 +0	18.2 +0	17.1 +0.1
Above Normal												
average condition	16.8 +0	14 0+0	11.3 +0	9.0 +0	9.0 +0	11.9 +0	12.8 +0	13.6 +0	15.8 +0	17.8 +0	18.3 +0	18.2 +0
warmest baseline	17.3 +0	14.2 +0	12.0 +0	9.2 +0	9.7 +0	12.5 +0	12.8 +0	13.8 +0	16.3 +0	18.2 +0.1	18.4 +0	18.4 +0
greatest change	16.6 +0	14.2 +0	10.7 +0	9.2 +0	9.7 +0	12.5 +0	12.8 +0	13.7 +0	16.3 +0	18.2 +0.1	18.4 +0	18.2 +0
Below Normal												
average condition	17.3 +0	14.0 +0	10.6 +0	8.7 +0	9.0 +0	11.2 +0	13.2 +0	14.3 +0	15.8 +0	18.3 +0	18.6 -0.1	18.2 +0
warmest baseline	19.0 +0.2	14.5 +0	11.4 +0	9.2 +0	10 +0	11.9 +0	14.0 +0	15.1 +0	16.3 +0	18.7 +0	19.0 +0	18.9 +0
greatest change	19.0 +0.2	14.5 +0	10.7 +0	8.3 +0	8.2 +0	10.6 +0.1	14.0 +0	14.7 +0	16.2 +0	17.8 +0	18.2 +0.1	18.4 +0
Dry												
average condition	16.8 +0	14.0 +0	10.7 +0	8.5 +0	9.5 +0	12.2 +0	14.4 +0	15.5 +0	17.1 +0	18.8 +0	19.7 +0	19.4 +0
warmest baseline	18.7 +0.1	14.3 +0	11.4 +0	8.8 +0	10.5 +0	13.4 +0	15.6 +0	17.4 +0	18.7 +0	20.1 +0	21.1 +0	20.9 +0
greatest change	18.7 +0.1	14.3 +0	10.6 +0	8.4 +0	9.4 +0	13.4 +0	14.8 +0	15.4 +0	17.7 +0.2	18.3 +0	19.9 +0	18.3 +0
Critically Dry												
average condition	17.4 +0	14.1 +0	10.9 +0	9.1 +0	10.0 +0	12.6 +0	15.2 +0	17.5 +0	18.9 +0.1	20.0 +0	20.8 +0	20.3 +0
warmest baseline	19.3 +0.1	15.2 +0.1	11.9 +0	9.9 +0	10.9 +0	13.3 +0.1	16.4 +0	19.1 +0.1	20.9 **+0.3**	21.9 +0	23.4 +0	21.7 +0
greatest change	19.3 +0.1	14 0+0.2	11.0 +0	9.2 +0	10.5 +0	13.3 +0.1	15.1 +0.1	18.2 +0.1	20.9 **+0.3**	21.4 **+0.3**	20 +0.1	20.6 **+0.5**

Source: Derived from data in Appendix C (Tables 3-23 and 3-24)
Note: Modeled temperature increase >0.2°C indicated in red.
°C = degrees Celsius

Future Project

Project operations with existing infrastructure and future water demands are described in this section.

South Fork American River

Project operations could affect water temperature in the South Fork American River; changes in temperature could occur at and below areas with changes in diversions or return flows on the river. Effects from direct diversions appear to be minimal. The difference between monthly water temperatures upstream and downstream of the El Dorado Diversion Dam was less than 0.2°C (0.36°F) based on existing monitoring data (Table 4.10-2). Although reductions in the volume of riverine flows can be associated with warmer water temperature, these effects are more likely to occur in river reaches immediately downstream of storage reservoirs than in reaches located tens of miles downstream (Daniels and Danner 2020). Once river temperatures approach equilibrium, changes to water temperatures are more likely to be a result of changing air temperatures, the amount solar radiation, steam shading, or wind sheltering (which change the equilibrium condition), and/or new inputs such as groundwater, than reductions in streamflow (Bogan et al. 2003).

Although changes to water temperature could occur, Project operations are expected to have only minor effects on temperature in the South Fork American River between the El Dorado Diversion Dam and Folsom Reservoir as direct effects from diversions have been shown to be minimal, this reach of the South Fork American River is at a distance from reservoirs with managed cold water pools, and because equilibrium water temperatures for the river would be highly influenced by ambient air temperatures, shading, and inflows from seeps or springs, all of which would be unaffected by Project operations.

Folsom Reservoir Releases

Table 4.10-50 shows the average monthly water temperature of Folsom Dam releases in the Lower American River below Folsom Dam modeled for Project and baseline conditions assuming future water demands and the use of existing infrastructure. Change in monthly water temperature would range from -0.3°C to 0.8°C (-0.6°F to 1.4°F), with the maximum increase in temperature expected to occur in October of a critically dry year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are predicted to decrease by 0.2°C (0.4°F) or more during two non-consecutive months, one of which would occur during a critically dry water year. In addition, temperatures are expected to increase by 0.2°C (0.4°F) or more during eight of the months, five of which would occur during critically dry water years. Apart from a single month in the 40-year modeling period, changes to monthly water temperatures from Project operations are expected to be minor (less than or equal to 0.8°C), with some months being cooler and some months being warmer than baseline conditions.

Managing water temperatures for downstream aquatic resources is one of several management goals for Folsom Reservoir. Although Project operations change both the volume and timing of inflows to Folsom Reservoir from the South Fork American River (discussed in more detail in Impact 4.10-1), subsequent effects on the temperature of Folsom Dam releases are expected to be minor (less than or equal to 0.8°C, as shown in Table 4.10-50); some months were expected to have cooler releases and some months were expected to have warmer releases than baseline conditions.

Table 4.10-50. Monthly Water Temperature in the Lower American River below Folsom Dam, Existing Infrastructure (Future Baseline vs Future Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	16.0	13.9	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Project (°C)	16.0	13.9	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Maximum Temperature Increase (°C)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
	Maximum Temperature Decrease (°C)	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	15.4	14.1	11.2	8.7	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Project (°C)	15.4	14.1	11.2	8.7	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Maximum Temperature Increase (°C)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	15.7	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	15.1	14.7	12.3
	Project (°C)	15.8	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	15.0	14.7	12.3
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dry	Baseline (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.6	14.5	15.9	16.5	16.2	12.8
	Project (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.7	14.5	16.0	16.7	16.2	12.8
	Maximum Temperature Increase (°C)	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	**0.8**	0.4	
	Maximum Temperature Decrease (°C)	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0
Critically Dry	Baseline (°C)	16.1	14.1	11.1	8.6	8.6	9.9	11.7	13.3	15.1	16.7	16.8	17.2	13.3
	Project (°C)	16.2	14.1	11.1	8.6	8.6	9.9	11.7	13.4	15.2	16.7	16.7	17.2	13.3
	Maximum Temperature Increase (°C)	1.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.2	
	Maximum Temperature Decrease (°C)	-0.1	-0.2	-0.1	0.0	0.0	-0.1	-0.2	-0.1	0.0	**-0.3**	-0.1	-0.1	
	Absolute Difference (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-33)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

Reservoir releases provide cold water for the Lower American River system. Water released from Folsom Dam flows through Lake Natoma before being discharged from Nimbus Dam. Temperature sensitive aquatic resources are in the Lower American River between Nimbus Dam and the Watt Avenue bridge (discussed in more detail in Section 4.4, Biological Resources). Water temperatures expected in this reach are discussed in the subsection below.

Lower American River at Watt Avenue

Table 4.10-51 shows average monthly water temperature in the Lower American River at Watt Avenue bridge modeled for Project and baseline conditions assuming future water demands and the use of existing infrastructure. Changes in monthly water temperature would range from -0.3°C to 0.8°C (-0.5°F to 1.4°F), with the maximum increase in temperature expected to occur in October of a critically dry year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are expected to decrease by 0.2°C (0.4°F) or more during two non-consecutive months, one of which would occur during a critically dry water year. In addition, temperatures are expected to increase by 0.2°C (0.4°F) or more during five of the months, four of which would occur during critically dry water years. Changes in water temperature of 0.2°C (0.4°F) or less are at the lower limit of accuracy for temperature measurements (USGS 2023).

Table 4.10-51. Monthly Water Temperature in the Lower American River at Watt Avenue, Existing Infrastructure (Future Baseline vs Future Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	17.3	14.0	11.1	8.5	8.9	10.6	11.6	12.6	14.6	17.0	18.0	17.8	13.5
	Project (°C)	17.2	14.0	11.1	8.5	8.9	10.6	11.7	12.6	14.6	17.0	18.0	17.8	13.5
	Maximum Temperature Increase (°C)	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	**-0.3**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Project (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	17.3	14.0	10.6	8.7	9.0	11.2	13.2	14.3	15.8	18.3	18.6	18.2	14.1
	Project (°C)	17.3	14.0	10.6	8.7	9.1	11.2	13.2	14.3	15.8	18.3	18.6	18.2	14.1
	Maximum Temperature Increase (°C)	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	
	Absolute Difference (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dry	Baseline (°C)	16.8	14.0	10.7	8.5	9.5	12.2	14.4	15.5	17.1	18.8	19.7	19.4	14.8
	Project (°C)	16.8	14.0	10.7	8.5	9.6	12.2	14.4	15.6	17.1	18.9	19.8	19.4	14.8
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.5	0.0	
	Maximum Temperature Decrease (°C)	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Critically Dry	Baseline (°C)	17.4	14.1	10.9	9.1	10.0	12.6	15.1	17.5	18.9	20.1	20.7	20.3	15.6
	Project (°C)	17.5	14.1	10.9	9.1	10.0	12.6	15.2	17.5	19.0	20.1	20.7	20.4	15.6
	Maximum Temperature Increase (°C)	**0.8**	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.2	0.1	0.0	
	Maximum Temperature Decrease (°C)	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.2	-0.1	0.0	
	Absolute Difference (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-40)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

As per the October 2019 biological opinion for the long-term operation of the CVP and SWP, Reclamation actively manages water temperature in the Lower American River, targeting a daily water temperature of 65°F (18.3°C) or lower at Watt Avenue bridge from May 15 through October 31 of each year to support juvenile steelhead rearing. When the target temperature cannot be met because of the limited availability of cold water in Folsom Reservoir, then the target water temperatures for Watt Avenue are increased incrementally to as high as 68°F (20°C). Reclamation also targets a daily water temperature of 56°F (13.3°C) or lower from November 1 through December 31 each year, if the cold-water pool allows, to support fall-run Chinook salmon spawning and embryo incubation (NMFS 2019, Reclamation 2019, and Reclamation 2023).

As per the December 2024 biological opinion, these water temperature management strategies have been updated. Monthly water temperature targets at the Watt Avenue bridge now range from 63°F to 72°F (17.2°C to 22.2°C) depending on the temperature schedule. If temperature targets are exceeded for 3 consecutive days or by more than 3°F (1.7°C) in a single day, Reclamation informs NMFS and the American River Group, outlining steps to realign water temperature with its Temperature Management Plan (NMFS 2024).

As discussed in Section 4.4, Biological Resources, baseline conditions in the Lower American River include temperatures that are stressful to salmonids (e.g., during egg incubation, smolt emigration, and juvenile rearing). As seen by the modeled baseline conditions described in Table 4.10-51, a target water temperature of 65°F (18.3°C) at Watt Avenue bridge is rarely met in the summer of dry and critically dry years. Baseline conditions can be warm in the summer and early fall with water temperatures found to exceed 68°F (20°C) in one of the five dry years and eight of the twelve critically dry years modeled (see Appendix C, Table 3-51). In addition, water

temperatures in November are often greater than the 56°F (13.3°C) target due to the limited availability of Folsom Reservoir's cold-water pool. Target water temperatures at Watt Avenue bridge are frequently increased above 65°F (18.3°C) during May to October for at least one month in baseline conditions. This is expected to occur approximately every other year (see Appendix C, Table 3-30). Based on the water quality modeling conducted for the Project, monthly water temperature at Watt Avenue in May through October is expected to be greater than the 65°F (18.3°C) approximately 36 percent of the time, and greater than 68°F (20°C) approximately 11 percent of the time, under baseline conditions (see Table 4.10-52).

Table 4.10-52. Percent Exceedance of Temperature Targets in the Lower American River at Watt Avenue, Existing Infrastructure (Future Baseline and Future Project)

Scenario	Target Value	May	Jun	Jul	Aug	Sep	Oct	May-Oct
Future Baseline	> 65°F (18.3°C)	5%	20%	48%	65%	55%	25%	36%
Future Project (Existing Infrastructure)	> 65°F (18.3°C)	8%	23%	48%	63%	55%	28%	37%
Future Baseline	> 68°F (20°C)	0%	5%	18%	23%	23%	0%	11%
Future Project (Existing Infrastructure)	> 68°F (20°C)	0%	5%	18%	28%	23%	0%	12%

Source: Appendix C (Tables 3-51 and 3-52)
% = percent, > = greater than, °C = degrees Celsius, °F = degrees Fahrenheit

Table 4.10-52 describes exceedance of temperature targets for baseline and Project conditions when evaluated on a month-by-month basis for the 40-year temperature modeling period. Project operations that decrease the volume or affect the timing of cold-water inflows to Folsom Reservoir have the potential to increase the temperature of Folsom Dam releases and increase target temperatures in the Lower American River at Watt Avenue; these effects have been found to be minor (i.e., less than 1°C) and often negligible (less than 0.2°C; at or below the lower limit of accuracy for temperature measurements). Although the temperature modeling indicates that there can be some increases in water temperature under Project conditions during months when water temperatures exceeded 68°F (20°C), temperatures are about equally likely to decrease or cause no change compared to baseline conditions when evaluated on a month-by-month basis.

Table 4.10-53 describes modeled baseline conditions and changes in water temperature in the Lower American River at Watt Avenue during average conditions, when baseline conditions are warmest, and when modeled changes are the greatest. Water temperatures are expected to increase by 0.2°C (0.36°F) during months occurring in June, July, or October of a critically dry year, and in August of a dry year, with one increase that occurred when baseline temperatures are expected to be greater than 20°C (68°F).

Table 4.10-53. Baseline Water Temperature and Change in Water Temperature in the Lower American River at Watt Avenue, Existing Infrastructure (Future Baseline and Future Project) (°C)

Scenario	October	November	December	January	February	March	April	May	June	July	August	September
Wet												
average condition	17.3 +0	14.0 +0	11.1 +0	8.5 +0	8.9 +0	10.6 +0	11.6 +0	12.6 +0	14.6 +0	17 +0	18.0 +0	17.8 +0
warmest baseline	19.4 +0.1	14.6 +0.2	12.5 +0	9.5 +0	9.8 +0	12.1 +0	13.4 +0	14.1 +0	16.3 +0	17.8 +0	18.4 -0.1	18.3 +0
greatest change	19.4 +0.1	14.6 +0.2	10.1 +0	8.7 +0	9.7 +0	11.8 +0	13.4 +0	13.7 +0	15.9 +0	17.8 +0	18.2 +0	18.2 +0
Above Normal												
average condition	16.8 +0	14.0 +0	11.3 +0	9.0 +0	9.0 +0	11.9 +0	12.8 +0	13.6 +0	15.8 +0	17.8 +0	18.3 +0	18.2 +0
warmest baseline	17.3 +0	14.2 +0	12.0 +0	9.2 +0	9.7 +0	12.5 +0	12.8 +0	13.8 +0	16.3 +0	18.2 +0.1	18.4 +0	18.4 +0
greatest change	16.6 +0	14.2 +0	10.7 +0	9.2 +0	9.7 +0	12.5 +0	12.8 +0	13.8 +0	16.3 +0	18.2 +0.1	18.4 +0	18.2 +0
Below Normal												
average condition	17.3 +0.1	14.0 +0	10.6 +0	8.7 +0	9.0 +0	11.2 +0	13.2 +0	14.3 +0	15.8 +0	18.3 +0	18.6 +0	18.2 +0
warmest baseline	19.0 +0.2	14.5 +0	11.4 +0	9.2 +0	10.0 +0	11.9 +0	14.0 +0	15.1 +0	16.3 +0	18.7 +0	18.9 +0	18.9 +0
greatest change	19.0 +0.2	14.5 +0	10.3 +0	9.0 +0	8.2 +0	10.6 +0.1	14.0 +0	14.7 +0	16.3 +0	17.8 +0.1	18.9 +0	18.4 +0
Dry												
average condition	16.8 +0	14.0 +0	10.7 +0	8.5 +0	9.5 +0	12.2 +0	14.4 +0	15.5 +0	17.1 +0	18.8 +0	19.7 +0.1	19.4 +0
warmest baseline	18.7 +0.1	14.3 +0	11.4 +0	8.8 +0	10.5 +0	13.5 +0	15.6 +0	17.4 +0.1	18.7 +0.2	20.2 +0.1	21.1 +0	20.9 +0
greatest change	18.7 +0.1	14.3 +0	11.0 +0	8.8 +0	9.4 +0	12.1 +0	14.8 +0	17.4 +0.1	18.7 +0.2	18.5 +0.1	19.9 **+0.5**	19.3 +0
Critically Dry												
average condition	17.4 +0.1	14.1 +0	10.9 +0	9.1 +0	10.0 +0	12.6 +0	15.1 +0	17.5 +0.1	18.9 +0.1	20.1 +0	20.7 +0	20.3 +0
warmest baseline	19.3 +0	15.2 +0	11.9 +0	9.9 +0	10.9 +0	13.3 +0.1	16.4 +0	19.1 +0.1	21.1 +0.1	21.9 +0	23.4 +0	21.7 +0
greatest change	18.1 **+0.8**	13.5 +0	11.9 +0	8.5 +0	10.9 +0	13.3 +0.1	15.1 +0.2	16.7 +0.2	20.8 **+0.3**	18.7 +0.2	20 +0.1	19.8 +0

Source: Derived from data in Appendix C (Tables 3-51 and 3-52)
Note: Modeled temperature increase >0.2°C indicated in red.
°C = degrees Celsius

Section 4.4, Biological Resources, discusses potential effects to special-status salmonids (steelhead and fall run Chinook salmon) due to changes in water temperatures during Project operations. Each of the life stages present in the Lower American River (adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts) were evaluated by month and year type against applicable temperature tolerances. Potential effects to special-status salmonids were considered moderate when increased temperature stress occurred well outside of thermal optimums for a given life stage and when increased temperature stress occurred during multiple months or during peak activity for that life stage. In some cases, individual fish were expected to be adversely affected; however, such effects were found to occur infrequently (typically in only one of the 40 years that were modeled) and would not have a significant effect on population abundance. Overall, changes in water temperature of the magnitude described in Table 4.10-53 (i.e., increased temperatures of up to 0.8°C) during Project operations would not have a substantial adverse effect on sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat.

The Basin Plan includes numeric and narrative water quality objectives for water temperature. In waterbodies with cold or warm freshwater habitat, water temperatures are not to be increased more than 5ºF (2.8ºC) above natural receiving water temperatures, nor altered in a manner that adversely affects beneficial uses. As discussed above, Project effects on water temperature are expected to be minor and changes in riverine temperatures are not expected to increase above this numeric water quality objective. In addition, effects from Project operations on temperature sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat are expected to be less than significant (refer to Section 4.4, Biological Resources). As such, the Project would not degrade receiving water temperatures in a manner that adversely affects beneficial uses and Project impacts associated with operations with existing infrastructure and future water demands to overall temperature conditions in the Lower American River would be **less than significant**. No mitigation is required.

Construction Impacts

The proposed Project includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, as well as the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for diversion and conveyance of up to 156 cfs.

Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project construction activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only.

Anticipated construction activities may include vegetation and tree removal and road improvements and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of

retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Construction activities could affect the temperature of water diversions and temporary conveyances. However, existing water temperature data shows only minimal effects from diversions (as discussed in the "South Fork American River" subsection) and the Project is not expected to change drainage patterns or remove substantial amounts of riparian vegetation in a manner that would have a measurable effect on water temperature. As such, Project would not degrade receiving water temperatures in a manner that adversely affects beneficial uses and impacts to water temperature from construction activities are **less than significant**.

Operational Impacts (Post-Construction)

This operational regime involves operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam following construction of the improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. The effect of this change would be increased conveyance through Hazel Tunnel and into Hazel Creek to a greater extent than pre-construction operations, as well as reduced flows in the South Fork American River below El Dorado Diversion Dam.

Tables in this subsection show CE-QUAL-W2 model output for water temperature. Water temperature is shown by month and water year type for baseline and Project conditions. The "absolute difference" is the change in temperature between baseline and Project conditions when averaged by month and water year type. The "maximum reduction" and the "maximum increase" are the results from the month with the maximum change between baseline and Project conditions for each month and water year type.

Project

Post-construction operations with current water demands are described in this section.

South Fork American River

Project operations could affect water temperature in the South Fork American River; changes in temperature could occur at and below areas with changes in diversions or return flows on the river. Effects from direct diversions appear to be minimal; the difference between monthly water temperatures upstream and downstream of the El Dorado Diversion Dam was less than 0.2°C (0.36°F) based on existing monitoring data (Table 4.10-2). Although reductions in the volume of riverine flows can be associated with warmer water temperature, these effects are more likely to occur in river reaches immediately downstream of storage reservoirs than in reaches located tens of miles downstream (Daniels and Danner 2020). Once river temperatures approach equilibrium, changes to water temperatures are more likely to be a result of changing air temperatures, the amount solar

radiation, steam shading, or wind sheltering (which change the equilibrium condition), and/or new inputs such as groundwater, than reductions in streamflow (Bogan et al. 2003).

Although changes to water temperature could occur, Project operations are expected to have only minor effects on temperature in the South Fork American River between the El Dorado Diversion Dam and Folsom Reservoir as direct effects from diversions have been shown to be minimal, this reach of the South Fork American River is at a distance from reservoirs with managed cold water pools, and because equilibrium water temperatures for the river would be highly influenced by ambient air temperatures, shading, and inflows from seeps or springs, all of which would be unaffected by Project operations.

Folsom Reservoir Releases

Table 4.10-54 shows the average monthly water temperature of Folsom Dam releases in the Lower American River below Folsom Dam for Project and baseline conditions that is expected to occur post-construction assuming a current level of water demand. Change in monthly water temperature would range from -0.8°C to 0.8°C (-1.5°F to 1.4°F), with the maximum increase in temperature expected to occur in September of a critically dry year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are predicted to decrease by 0.2°C (0.4°F) or more during eight non-consecutive months, five of which would occur during critically dry water years. In addition, temperatures are expected to increase by 0.2°C (0.4°F) or more during nine of the months, all of which would occur during critically dry water years. Changes to monthly water temperatures from Project operations are expected to be minor (less than 1°C), with some months being cooler and some months being warmer than baseline conditions.

Managing water temperatures for downstream aquatic resources is one of several management goals for Folsom Reservoir. Although Project operations change both the volume and timing of inflows to Folsom Reservoir from the South Fork American River (discussed in more detail in Impact 4.10-1), subsequent effects on the temperature of Folsom Dam releases are expected to be minor (changes were less than 1°C on average per month, as shown in Table 4.10-54); some months were expected to have cooler releases and some months were expected to have warmer releases than baseline conditions.

Table 4.10-54. Monthly Water Temperature in the Lower American River below Folsom Dam, Post-Construction (Baseline vs Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	16.1	13.9	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Project (°C)	16.0	13.8	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Maximum Temperature Increase (°C)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	
	Maximum Temperature Decrease (°C)	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	15.4	14.1	11.2	8.7	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Project (°C)	15.4	14.1	11.2	8.6	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	
	Absolute Difference (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	15.7	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	15.0	14.7	12.3
	Project (°C)	15.7	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	14.9	14.7	12.3
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	**-0.8**	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Dry	Baseline (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.6	14.5	15.9	16.5	16.2	12.8
	Project (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.6	14.5	15.9	16.5	16.1	12.8
	Maximum Temperature Increase (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Critically Dry	Baseline (°C)	16.1	14.1	11.1	8.6	8.6	9.9	11.7	13.3	15.0	16.7	16.7	17.1	13.3
	Project (°C)	16.1	14.1	11.1	8.6	8.6	9.9	11.7	13.4	15.1	16.7	16.7	17.2	13.3
	Maximum Temperature Increase (°C)	0.2	0.2	0.0	0.0	0.0	0.1	0.2	0.1	0.4	0.3	0.4	**0.8**	
	Maximum Temperature Decrease (°C)	-0.4	0.0	0.0	0.0	0.0	-0.1	-0.5	-0.1	-0.1	-0.4	0.0	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-6)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

Reservoir releases provide cold water for the Lower American River system. Water released from Folsom Dam flows through Lake Natoma before being discharged from Nimbus Dam. Temperature sensitive aquatic resources are in the Lower American River between Nimbus Dam and the Watt Avenue bridge (discussed in more detail in Section 4.4, Biological Resources). Water temperatures expected in this reach are discussed in the subsection below.

Lower American River at Watt Avenue

Table 4.10-55 shows the average monthly water temperature in the Lower American River at Watt Avenue bridge for Project and baseline conditions that is expected to occur post-construction assuming a current level of water demand. Change in monthly water temperature would range from -0.5°C to 0.5°C (-0.9°F to 0.8°F), with the maximum increase in temperature expected to occur in September of a critically dry year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are predicted to decrease by 0.2°C (0.4°F) or more during six non-consecutive months, four of which would occur during critically dry water years. In addition, temperatures are expected to increase by 0.2°C (0.4°F) or more during five of the months, four of which would occur during critically dry water years. Changes in water temperature of 0.2°C (0.4°F) or less are at the lower limit of accuracy for temperature measurements (USGS 2023).

Table 4.10-55. Monthly Water Temperature in the Lower American River at Watt Avenue, Post-Construction (Baseline vs Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	17.3	14.0	11.1	8.5	8.9	10.6	11.6	12.6	14.6	17.0	18.0	17.8	13.5
	Project (°C)	17.2	13.9	11.1	8.5	8.9	10.6	11.6	12.6	14.6	17.0	18.0	17.8	13.5
	Maximum Temperature Increase (°C)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	
	Maximum Temperature Decrease (°C)	-0.2	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Project (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	17.3	14.0	10.6	8.7	9.0	11.2	13.2	14.3	15.8	18.3	18.6	18.2	14.1
	Project (°C)	17.3	14.0	10.6	8.7	9.1	11.2	13.2	14.3	15.8	18.3	18.5	18.2	14.1
	Maximum Temperature Increase (°C)	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	**-0.5**	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Dry	Baseline (°C)	16.8	14.0	10.7	8.5	9.5	12.2	14.4	15.5	17.1	18.8	19.7	19.4	14.7
	Project (°C)	16.8	14.0	10.7	8.5	9.6	12.2	14.4	15.5	17.1	18.8	19.7	19.4	14.7
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Critically Dry	Baseline (°C)	17.4	14.1	10.9	9.1	10.0	12.6	15.2	17.5	18.9	20.0	20.8	20.3	15.6
	Project (°C)	17.4	14.2	10.9	9.1	10.0	12.6	15.1	17.5	19.0	20.1	20.7	20.3	15.6
	Maximum Temperature Increase (°C)	0.2	0.2	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.2	0.1	**0.5**	
	Maximum Temperature Decrease (°C)	-0.3	0.0	0.0	0.0	0.0	-0.1	-0.4	-0.1	-0.1	-0.2	-0.2	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-13)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

As per the October 2019 biological opinion for the long-term operation of the CVP and SWP, Reclamation actively manages water temperature in the Lower American River, targeting a daily water temperature of 65°F (18.3°C) or lower at Watt Avenue bridge from May 15 through October 31 of each year to support juvenile steelhead rearing. When the target temperature cannot be met because of the limited availability of cold water in Folsom Reservoir, then the target water temperatures for Watt Avenue are increased incrementally to as high as 68°F (20°C). Reclamation also targets a daily water temperature of 56°F (13.3°C) or lower from November 1 through December 31 each year, if the cold-water pool allows, to support fall-run Chinook salmon spawning and embryo incubation (NMFS 2019, Reclamation 2019, and Reclamation 2023).

As per the December 2024 biological opinion, these water temperature management strategies have been updated. Monthly water temperature targets at the Watt Avenue bridge now range from 63°F to 72°F (17.2°C to 22.2°C) depending on the temperature schedule. If temperature targets are exceeded for 3 consecutive days or by more than 3°F (1.7°C) in a single day, Reclamation informs NMFS and the American River Group, outlining steps to realign water temperature with its Temperature Management Plan (NMFS 2024).

As seen by the modeled baseline conditions described in Table 4.10-55, a target water temperature of 65°F (18.3°C) at Watt Avenue bridge is rarely met in the summer of dry and critically dry years. Baseline conditions can be warm in the summer and early fall with water temperatures found to exceed 68°F (20°C) in one of the five dry years and eight of the twelve critically dry years modeled (see Appendix C, Table 3-23). In addition, water temperatures in November are often greater than the 56°F (13.3°C) target due to the limited availability of Folsom

Reservoir's cold-water pool. Target water temperatures at Watt Avenue bridge are frequently increased above 65°F (18.3°C) during May to October for at least one month in baseline conditions. This is expected to occur approximately every other year (see Appendix C, Table 3-2). Based on the water quality modeling conducted for the Project, monthly water temperature at Watt Avenue in May through October is expected to be greater than the 65°F (18.3°C) approximately 36 percent of the time, and greater than 68°F (20°C) approximately 11 percent of the time, under baseline conditions (see Table 4.10-56).

Table 4.10-56. Percent Exceedance of Temperature Targets in the Lower American River at Watt Avenue, Post-Construction (Baseline and Project)

Scenario	Target Value	May	Jun	Jul	Aug	Sep	Oct	May-Oct
Baseline	> 65°F (18.3°C)	5%	20%	48%	65%	53%	25%	36%
Project (Post-Construction)	> 65°F (18.3°C)	8%	20%	48%	63%	53%	25%	36%
Baseline	> 68°F (20°C)	0%	5%	18%	23%	23%	0%	11%
Project (Post-Construction)	> 68°F (20°C)	0%	5%	18%	25%	23%	0%	12%

Source: Appendix C (Tables 3-23 and 3-25)
% = percent, > = greater than, °C = degrees Celsius, °F = degrees Fahrenheit

Table 4.10-56 describes exceedance of temperature targets for baseline and Project conditions when evaluated on a month-by-month basis for the 40-year temperature modeling period. Project operations that decrease the volume or affect the timing of cold-water inflows to Folsom Reservoir have the potential to increase the temperature of Folsom Dam releases and increase target temperatures in the Lower American River at Watt Avenue; these effects have been found to be minor (i.e., less than 1°C) and often negligible (less than 0.2°C; at or below the lower limit of accuracy for temperature measurements). Although the temperature modeling indicates that there can be some increases in water temperature under Project conditions during months when water temperatures exceeded 68°F (20°C), temperatures are more likely to decrease or cause no change compared to baseline conditions when evaluated on a month-by-month basis.

Table 4.10-57 describes modeled baseline conditions and changes in water temperature in the Lower American River at Watt Avenue during average conditions, when baseline conditions are warmest, and when modeled changes are the greatest. Water temperatures are expected to increase by 0.2°C (0.36°F) during months occurring in June, July, and September of critically dry years often when baseline temperatures are greater than 20°C (68°F).

Table 4.10-57. Baseline Water Temperature and Change in Water Temperature in the Lower American River at Watt Avenue, Post-Construction (Baseline and Project) (°C)

Scenario	October	November	December	January	February	March	April	May	June	July	August	September
Wet												
average condition	17.3 +0	14.0 +0	11.1 +0	8.5 +0	8.9 +0	10.6 +0	11.6 +0	12.6 +0	14.6 +0	17.0 +0	18.0 +0	17.8 +0
warmest baseline	19.4 +0	14.6 +0	12.5 +0	9.5 +0	9.8 +0	12.1 +0	13.4 +0	14.1 +0	16.3 +0	17.8 +0	18.3 +0.1	18.3 +0
greatest change	19.3 +0	13.2 +0	10.6 +0.1	8.1 +0	8.8 +0	12.1 +0	13.4 +0	13.7 +0	16.3 +0	17.8 +0	18.3 +0.1	18.3 +0
Above Normal												
average condition	16.8 +0	14.0 +0	11.3 +0	9.0 +0	9.0 +0	11.9 +0	12.8 +0	13.6 +0	15.8 +0	17.8 +0	18.3 +0	18.2 +0
warmest baseline	17.3 +0	14.2 +0	12.0 +0	9.2 +0	9.7 +0	12.5 +0	12.8 +0	13.8 +0	16.3 +0	18.2 +0	18.4 +0	18.4 -0.1
greatest change	16.6 +0.1	13.9 +0	12.0 +0	9.2 +0	9.7 +0	11.5 +0	12.8 +0	13.7 +0	16.3 +0	18.2 +0	18.3 +0	18.2 +0
Below Normal												
average condition	17.3 +0	14.0 +0	10.6 +0	8.7 +0	9.0 +0	11.2 +0	13.2 +0	14.3 +0	15.8 +0	18.3 +0	18.6 -0.1	18.2 +0
warmest baseline	19.0 +0.2	14.5 +0	11.4 +0	9.2 +0	10.0 +0	11.9 +0	14.0 +0	15.1 +0	16.3 +0	18.7 +0	19.0 +0	18.9 +0
greatest change	19.0 +0.2	14.0 +0	11.4 +0	8.3 +0	8.2 +0	10.6 +0.1	14.0 +0	14.7 +0	16.2 +0	17.9 +0	18.9 +0	18.4 +0
Dry												
average condition	16.8 +0	14.0 +0	10.7 +0	8.5 +0	9.5 +0	12.2 +0	14.4 +0	15.5 +0	17.1 +0	18.8 +0	19.7 +0	19.4 +0
warmest baseline	18.7 +0.1	14.3 +0	11.4 +0	8.8 +0	10.5 +0	13.4 +0	15.6 +0	17.4 +0	18.7 +0	20.1 +0	21.1 +0	20.9 +0
greatest change	18.7 +0.1	14.3 +0	10.6 +0	8.4 +0	9.4 +0	13.4 +0	14.8 +0	15.4 +0.1	17.7 +0.2	18.3 +0	19.4 +0	19.3 +0
Critically Dry												
average condition	17.4 +0	14.1 +0	10.9 +0	9.1 +0	10.0 +0	12.6 +0	15.2 +0	17.5 +0.1	18.9 +0.1	20.0 +0	20.8 +0	20.3 +0
warmest baseline	19.3 +0.2	15.2 +0.1	11.9 +0	9.9 +0	10.9 +0	13.3 +0.1	16.4 +0	19.1 +0.1	20.9 **+0.3**	21.9 +0	23.4 +0	21.7 +0
greatest change	19.3 +0.2	14.0 +0.2	11.0 +0	9.2 +0	10.5 +0	13.3 +0.1	15.1 +0.2	18.2 +0.1	20.9 **+0.3**	18.7 **+0.2**	20.0 +0.1	20.6 **+0.5**

Source: Derived from data in Appendix C (Tables 3-23 and 3-25)
Note: Modeled temperature increase >0.2°C indicated in red (increases evaluated before rounding to the one-tenths).
°C = degrees Celsius

Section 4.4, Biological Resources, discusses potential effects to special-status salmonids (steelhead and fall run Chinook salmon) due to changes in water temperatures during Project operations. Each of the life stages present in the Lower American River (adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts) were evaluated by month and year type against applicable temperature tolerances. Potential effects to special-status salmonids were considered moderate when increased temperature stress occurred well outside of thermal optimums for a given life stage and when increased temperature stress occurred during multiple months or during peak activity for that life stage. In some cases, individual fish were expected to be adversely affected; however, such effects were found to occur infrequently (typically in only one of the 40 years that were modeled) and would not have a significant effect on population abundance. Overall, changes in water temperature of the magnitude described in Table 4.10-57 (i.e., increased temperatures of up to 0.5°C) during Project operations would not have a substantial adverse effect on sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat.

The Basin Plan includes numeric and narrative water quality objectives for water temperature. In waterbodies with cold or warm freshwater habitat, water temperatures are not to be increased more than 5ºF (2.8ºC) above natural receiving water temperatures, nor altered in a manner that adversely affects beneficial uses. As discussed above, Project effects on water temperature are expected to be minor and changes in riverine temperatures are not expected to increase above this numeric water quality objective. In addition, effects from Project operations on temperature sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat are expected to be less than significant (refer to Section 4.4, Biological Resources). As such, the Project would not degrade receiving water temperatures in a manner that adversely affects beneficial uses and Project impacts associated with post-construction operations and current water demands to overall temperature conditions in the Lower American River temperature would be **less than significant**. No mitigation is required.

Future Project

Post-construction operations with future water demands are described in this section.

South Fork American River

Project operations could affect water temperature in the South Fork American River; changes in temperature could occur at and below areas with changes to diversions or return flows on the river. Effects from direct diversions appear to be minimal; the difference between monthly water temperatures upstream and downstream of the El Dorado Diversion Dam was less than 0.2°C (0.36°F) based on existing monitoring data (Table 4.10-2). Although reductions in the volume of riverine flows can be associated with warmer water temperature, these effects are more likely to occur in river reaches immediately downstream of storage reservoirs than in reaches located tens of miles downstream (Daniels and Danner 2020). Once river temperatures approach equilibrium, changes to water temperatures are more likely to be a result of changing air temperatures, the amount solar radiation, steam shading, or wind sheltering (which change the equilibrium condition), and/or new inputs such as groundwater, than reductions in streamflow (Bogan et al. 2003).

Although changes to water temperature could occur, Project operations are expected to have only minor effects on temperature in the South Fork American River between the El Dorado Diversion Dam and Folsom Reservoir as direct effects from diversions have been shown to be minimal, this reach of the South Fork American River is at a distance from reservoirs with managed cold water pools, and because equilibrium water temperatures for the river

would be highly influenced by ambient air temperatures, shading, and inflows from seeps or springs, all of which would be unaffected by Project operations.

Folsom Reservoir Releases

Table 4.10-58 shows the average monthly water temperature of Folsom Dam releases in the Lower American River below Folsom Dam for Project and baseline conditions that is expected to occur post-construction assuming future water demands. Change in monthly water temperature would range from -0.5°C to 0.3°C (-1.0°F to 0.6°F), with the maximum increase in temperature expected to occur in June of a critically dry water year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are predicted to decrease by 0.2°C (0.4°F) or more during six non-consecutive months, four of which would occur during critically dry water years. In addition, temperatures are expected to increase by 0.2°C (0.4°F) or more during seven of the months, all of which would occur during critically dry water years. Changes to monthly water temperatures from Project operations are expected to be minor (less than 1°C), with some months being cooler and some months being warmer than baseline conditions.

Table 4.10-58. Monthly Water Temperature in the Lower American River below Folsom Dam, Post-Construction (Future Baseline vs Future Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	16.0	13.9	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Project (°C)	16.0	13.8	10.6	8.1	8.4	9.5	10.5	11.8	12.9	14.0	15.1	14.6	12.1
	Maximum Temperature Increase (°C)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
	Maximum Temperature Decrease (°C)	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	15.4	14.1	11.2	8.7	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Project (°C)	15.4	14.1	11.2	8.6	8.3	9.8	11.0	11.8	13.0	14.5	14.8	14.3	12.2
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	15.7	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	15.1	14.7	12.3
	Project (°C)	15.8	14.0	10.7	8.2	8.2	9.6	11.0	11.9	13.4	15.6	15.0	14.7	12.3
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dry	Baseline (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.6	14.5	15.9	16.5	16.2	12.8
	Project (°C)	15.1	14.0	10.9	8.1	8.3	9.8	11.5	12.7	14.5	16.0	16.5	16.2	12.8
	Maximum Temperature Increase (°C)	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.2	
	Maximum Temperature Decrease (°C)	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Critically Dry	Baseline (°C)	16.1	14.1	11.1	8.6	8.6	9.9	11.7	13.3	15.1	16.7	16.8	17.2	13.3
	Project (°C)	16.1	14.1	11.1	8.6	8.6	9.9	11.7	13.4	15.2	16.7	16.7	17.2	13.3
	Maximum Temperature Increase (°C)	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.2	**0.3**	0.3	0.2	0.2	
	Maximum Temperature Decrease (°C)	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.5	-0.1	-0.1	**-0.5**	-0.1	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-34)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

Managing water temperatures for downstream aquatic resources is one of several management goals for Folsom Reservoir. Although Project operations change both the volume and timing of inflows to Folsom Reservoir from the South Fork American River (discussed in more detail in Impact 4.10-1), subsequent effects on the temperature of Folsom Dam releases are expected to be minor (changes were less than 1°C on average per month, as shown in

Table 4.10-58); some months were expected to have cooler releases and some months were expected to have warmer releases than baseline conditions.

Reservoir releases provide cold water for the Lower American River system. Water released from Folsom Dam flows through Lake Natoma before being discharged from Nimbus Dam. Temperature sensitive aquatic resources are in the Lower American River between Nimbus Dam and the Watt Avenue bridge (discussed in more detail in Section 4.4, Biological Resources). Water temperatures expected in this reach are discussed in the subsection below.

Lower American River at Watt Avenue

Table 4.10-59 shows the average monthly water temperature in the Lower American River at Watt Avenue bridge for Project and baseline conditions that is expected to occur post-construction assuming a future level of water demand. Change in monthly water temperature would range from -0.3°C to 0.3°C (-0.6°F to 0.5°F), with the maximum increase in temperature expected to occur in June of a critically dry water year. Water temperatures were modeled for a 40-year period (a total of 480 months). During this modeling period, water temperatures are predicted to decrease by 0.2°C (0.4°F) or more during four non-consecutive months, two of which would occur during critically dry water years. In addition, temperatures are expected to increase by 0.2°C (0.4°F) or more during seven of the months, five of which would occur during critically dry water years. Changes in water temperature of 0.2°C (0.4°F) or less are at the lower limit of accuracy for temperature measurements (USGS 2023).

Table 4.10-59. Monthly Water Temperature in the Lower American River at Watt Avenue, Post-Construction (Future Baseline vs Future Project) (°C)

Water Year Type	Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
Wet	Baseline (°C)	17.3	14.0	11.1	8.5	8.9	10.6	11.6	12.6	14.6	17.0	18.0	17.8	13.5
	Project (°C)	17.2	14.0	11.1	8.5	8.9	10.6	11.7	12.6	14.6	17.0	18.0	17.8	13.5
	Maximum Temperature Increase (°C)	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
	Maximum Temperature Decrease (°C)	-0.3	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal	Baseline (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Project (°C)	16.8	14.0	11.3	9.0	9.0	11.9	12.8	13.6	15.8	17.8	18.3	18.2	14.1
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Below Normal	Baseline (°C)	17.3	14.0	10.6	8.7	9.0	11.2	13.2	14.3	15.8	18.3	18.6	18.2	14.1
	Project (°C)	17.3	14.0	10.6	8.7	9.1	11.2	13.2	14.3	15.8	18.3	18.6	18.2	14.1
	Maximum Temperature Increase (°C)	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	
	Absolute Difference (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dry	Baseline (°C)	16.8	14.0	10.7	8.5	9.5	12.2	14.4	15.5	17.1	18.8	19.7	19.4	14.8
	Project (°C)	16.8	14.0	10.7	8.5	9.6	12.2	14.4	15.5	17.1	18.9	19.7	19.4	14.8
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	
	Maximum Temperature Decrease (°C)	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Critically Dry	Baseline (°C)	17.4	14.1	10.9	9.1	10.0	12.6	15.1	17.5	18.9	20.1	20.7	20.3	15.6
	Project (°C)	17.4	14.1	10.9	9.1	10.0	12.6	15.2	17.6	19.0	20.1	20.7	20.4	15.6
	Maximum Temperature Increase (°C)	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	**0.3**	0.2	0.1	0.1	
	Maximum Temperature Decrease (°C)	-0.1	0.0	0.0	0.0	0.0	-0.1	**-0.3**	-0.1	0.0	-0.2	-0.1	0.0	
	Absolute Difference (°C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Source: Appendix C (Kleinschmidt 2024, Table 3-41)
Note: Range in temperature changes shown in red.
°C = degrees Celsius, WY = water year

As per the October 2019 biological opinion for the long-term operation of the CVP and SWP, Reclamation actively manages water temperature in the Lower American River, targeting a daily water temperature of 65°F (18.3°C) or lower at Watt Avenue bridge from May 15 through October 31 of each year to support juvenile steelhead rearing. When the target temperature cannot be met because of the limited availability of cold water in Folsom Reservoir, then the target water temperatures for Watt Avenue are increased incrementally to as high as 68°F (20°C). Reclamation also targets a daily water temperature of 56°F (13.3°C) or lower from November 1 through December 31 each year, if the cold-water pool allows, to support fall-run Chinook salmon spawning and embryo incubation (NMFS 2019, Reclamation 2019, and Reclamation 2023).

As per the December 2024 biological opinion, these water temperature management strategies have been updated. Monthly water temperature targets at the Watt Avenue bridge now range from 63°F to 72°F (17.2°C to 22.2°C) depending on the temperature schedule. If temperature targets are exceeded for 3 consecutive days or by more than 3°F (1.7°C) in a single day, Reclamation informs NMFS and the American River Group, outlining steps to realign water temperature with its Temperature Management Plan (NMFS 2024).

As seen by the modeled baseline conditions described in Table 4.10-59, a target water temperature of 65°F (18.3°C) at Watt Avenue bridge is rarely met in the summer of dry and critically dry years. Baseline conditions can be warm in the summer and early fall with water temperatures found to exceed 68°F (20°C) in one of the five dry years and eight of the twelve critically dry years modeled (see Appendix C, Table 3-51). In addition, water temperatures in November are often greater than the 56°F (13.3°C) target due to the limited availability of Folsom Reservoir's cold-water pool. Target water temperatures at Watt Avenue bridge are frequently increased above 65°F (18.3°C) during May to October for at least one month in baseline conditions. This is expected to occur approximately every other year (see Appendix C, Table 3-30). Based on the water quality modeling conducted for the Project, monthly water temperature at Watt Avenue in May through October is expected to be greater than 65°F (18.3°C) approximately 36 percent of the time, and greater than 68°F (20°C) approximately 11 percent of the time, under baseline conditions (see Table 4.10-60).

Table 4.10-60. Percent Exceedance of Temperature Targets in the Lower American River at Watt Avenue, Post-Construction (Future Baseline and Future Project)

Scenario	Target Value	May	Jun	Jul	Aug	Sep	Oct	May-Oct
Future Baseline	> 65°F (18.3°C)	5%	20%	48%	65%	55%	25%	36%
Future Project (Post-Construction)	> 65°F (18.3°C)	10%	23%	48%	63%	53%	25%	37%
Future Baseline	> 68°F (20°C)	0%	5%	18%	23%	23%	0%	11%
Future Project (Post-Construction)	> 68°F (20°C)	0%	5%	18%	25%	23%	0%	12%

Source: Appendix C (Tables 3-51 and 3-53)
% = percent, > = greater than, °C = degrees Celsius, °F = degrees Fahrenheit

Table 4.10-60 describes exceedance of temperature targets for baseline and Project conditions when evaluated on a month-by-month basis for the 40-year temperature modeling period. Project operations that decrease the volume or affect the timing of cold-water inflows to Folsom Reservoir have the potential to increase the temperature of Folsom Dam releases and increase target temperatures in the Lower American River at Watt Avenue; these effects have been found to be minor (i.e., less than 1°C) and often negligible (less than 0.2°C; at or below the lower limit of accuracy for temperature measurements). Although the temperature modeling indicates that there can be some increases in water temperature under Project conditions during months when baseline temperatures exceeded 68°F (20°C), temperatures are more likely to decrease or cause no change compared to baseline conditions when evaluated on a month-by-month basis.

Table 4.10-61 describes modeled baseline conditions and changes in water temperature in the Lower American River at Watt Avenue during average conditions, when baseline conditions are warmest, and when modeled changes are the greatest. Water temperatures are expected to increase by 0.2°C (0.36°F) during months occurring in May and June of critically dry years, and in June of dry year and November of a wet year and none of these changes are expected to occur when baseline temperatures are greater than 20°C (68°F).

Section 4.4, Biological Resources, discusses potential effects to special-status salmonids (steelhead and fall run Chinook salmon) due to changes in water temperatures during Project operations. Each of the life stages present in the Lower American River (adult migrating, adult holding, spawner, egg/alevin, juveniles, and smolts) were evaluated by month and year type against applicable temperature tolerances. Potential effects to special-status salmonids were considered moderate when increased temperature stress occurred well outside of thermal optimums for a given life stage and when increased temperature stress occurred during multiple months or during peak activity for that life stage. In some cases, individual fish were expected to be adversely affected; however, such effects were found to occur infrequently (typically in only one of the 40 years that were modeled) and would not have a significant effect on population abundance. Overall, changes in water temperature of the magnitude described in Table 4.10-61 (i.e., increased temperatures of up to 0.3°C) during Project operations would not have a substantial adverse effect on sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat.

The Basin Plan includes numeric and narrative water quality objectives for water temperature. In waterbodies with cold or warm freshwater habitat, water temperatures are not to be increased more than 5ºF (2.8ºC) above natural receiving water temperatures, nor altered in a manner that adversely affects beneficial uses. As discussed above, Project effects on water temperature are expected to be minor and changes in riverine temperatures are not expected to increase above this numeric water quality objective. In addition, effects from Project operations on temperature sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat are expected to be less than significant (refer to Section 4.4, Biological Resources). As such, the Project would not degrade receiving water temperatures in a manner that adversely affects beneficial uses and Project impacts associated with post-construction operations and future water demands to overall temperature conditions in the Lower American River temperature would be **less than significant**.

Mitigation Measures

No mitigation is required.

Table 4.10-61. Baseline Water Temperature and Change in Water Temperature in the Lower American River at Watt Avenue, Post-Construction (Future Baseline and Future Project) (°C)

Scenario	October	November	December	January	February	March	April	May	June	July	August	September
Wet												
average condition	17.3 +0	14.0 +0	11.1 +0	8.5 +0	8.9 +0	10.6 +0	11.6 +0	12.6 +0	14.6 +0	17.0 +0	18.0 +0	17.8 +0
warmest baseline	19.4 +0.1	14.6 **+0.2**	12.5 +0	9.5 +0	9.8 +0	12.1 +0	13.4 +0	14.1 +0	16.3 +0	17.8 +0	18.4 +0.1	18.3 +0
greatest change	19.4 +0.1	14.6 **+0.2**	10.6 +0.1	8.7 +0	9.7 +0	11.8 +0	13.4 +0	13.7 +0	16.3 +0	17.8 +0	18.4 +0.1	17.1 +0.1
Above Normal												
average condition	16.8 +0	14.0 +0	11.3 +0	9.0 +0	9.0 +0	11.9 +0	12.8 +0	13.6 +0	15.8 +0	17.8 +0	18.3 +0	18.2 +0
warmest baseline	17.3 +0	14.2 +0	12.0 +0	9.2 +0	9.7 +0	12.5 +0	12.8 +0	13.8 +0	16.3 +0	18.2 +0	18.4 +0	18.4 -0.1
greatest change	16.6 +0.1	13.9 +0	12.0 +0	9.2 +0	9.7 +0	11.7 +0	12.8 +0	13.8 +0	16.3 +0	18.2 +0	18.3 +0	18.2 +0
Below Normal												
average condition	17.3 +0.1	14.0 +0	10.6 +0	8.7 +0	9.0 +0	11.2 +0	13.2 +0	14.3 +0	15.8 +0	18.3 +0	18.6 +0	18.2 +0
warmest baseline	19.0 +0.2	14.5 +0	11.4 +0	9.2 +0	10.0 +0	11.9 +0	14.0 +0	15.1 +0	16.3 +0	18.7 +0	18.9 +0	18.9 +0
greatest change	19.0 +0.2	13.0 +0	10.3 +0	8.2 +0	8.2 +0.1	10.6 +0.1	14.0 +0	14.7 +0	16.3 +0	17.8 +0.1	18.9 +0	18.4 +0
Dry												
average condition	16.8 +0	14.0 +0	10.7 +0	8.5 +0	9.5 +0	12.2 +0	14.4 +0	15.5 +0	17.1 +0	18.8 +0.1	19.7 +0	19.4 +0
warmest baseline	18.7 +0.1	14.3 +0	11.4 +0	8.8 +0	10.5 +0	13.5 +0	15.6 +0	17.4 +0.1	18.7 +0.2	20.2 +0.1	21.1 +0	20.9 +0
greatest change	18.7 +0.1	13.8 +0	11.0 +0	8.8 +0	9.4 +0	12.1 +0	14.8 +0.1	17.4 +0.1	18.7 +0.2	18.5 +0.1	21.1 +0	19.8 +0
Critically Dry												
average condition	17.4 +0	14.1 +0	10.9 +0	9.1 +0	10 +0	12.6 +0	15.1 +0	17.5 +0.1	18.9 +0.1	20.1 +0	20.7 +0	20.3 +0
warmest baseline	19.3 +0.1	15.2 +0	11.9 +0	9.9 +0	10.9 +0	13.3 +0.1	16.4 +0	19.1 +0.1	21.1 +0.1	21.9 +0	23.4 +0	21.7 +0
greatest change	19.3 +0.1	13.5 +0	11.9 +0	8.5 +0	10.5 +0	13.3 +0.1	15.1 +0.2	18.2 **+0.2**	17.9 **+0.3**	18.7 +0.2	20.0 +0.1	19.8 +0.1

Source: Derived from data in Appendix C (Tables 3-51 and 3-53)
Note: Modeled temperature increase >0.2°C indicated in red (increases evaluated before rounding to the one-tenths).
°C = degrees Celsius

Impact 4.10-3. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam utilizing existing infrastructure (i.e., prior to construction of any improvements necessary to divert up to 156 cfs) with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Project operations would not use groundwater supplies; Permit 21112 water would be sourced entirely from surface waters. Project operations would not substantially interfere with groundwater recharge. Under Project operations, water that would otherwise be diverted from the South Fork for non-consumptive hydropower generation would instead be diverted for consumptive purposes and there would be reduced return flow below the El Dorado Powerhouse; however, the fractured bedrock of much of the western Sierra Nevada foothills and mountains are poorly suited to contain large quantities of groundwater and groundwater recharge would be largely unaffected during Project operations. As such, the Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge in a manner that would impede sustainable groundwater management of the basin. The Project would have **no impact** to groundwater supplies, groundwater recharge, and sustainable groundwater management of the basin at this magnitude.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only.

These infrastructure improvements would only slightly increase the amount of impervious surfaces within the region. The infrastructure improvements would be located at discrete sites that would be disconnected from each other and from contiguous impervious areas aside from the canal, and cause only local changes to stormwater flow paths prior to discharging to pervious areas. During construction at channels or at channel crossings, dewatering activities may be needed for construction purposes. These activities are not anticipated to deplete groundwater supplies because dewatering would be temporary and flows would be bypassed and returned into the creek below the construction zone. In addition, as discussed in Section 4.10.1, only small amounts of water can be stored in the fractured bedrock that characterizes the region. For these reasons, groundwater recharge is expected to remain largely unaffected during construction. As such, the Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge in a manner that would impede

sustainable groundwater management of the basin. The Project would have **no impact** to groundwater supplies, groundwater recharge, and sustainable groundwater management of the basin at this magnitude.

Operational Impacts (Post-Construction)

The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. The effect of this change would be increased conveyance through Hazel Tunnel and into Hazel Creek to a greater extent than pre-construction operations, as well as reduced river flows below El Dorado Diversion Dam. Post-construction operations would not use groundwater supplies; Permit 21112 water would be sourced entirely from surface waters. Nor would post-construction operations substantially interfere with groundwater recharge for the same reasons as stated above. As such, the Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge in a manner that would impede sustainable groundwater management of the basin. The Project would have **no impact** to groundwater supplies, groundwater recharge, and sustainable groundwater management of the basin during post-construction operations at this magnitude.

Mitigation Measures

No mitigation is required.

Impact 4.10-4. 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 a substantial erosion or siltation on- or off-site;

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

iv) Impede or redirect flood flows?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam utilizing existing infrastructure (i.e., prior to construction of any improvements necessary to divert up to 156 cfs) with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP.

During Project operations, additional water would be conveyed through Hazel Creek Tunnel to Hazel Creek and from Hazel Creek to Jenkinson Lake; these flows would not exceed the capacity of existing infrastructure or contribute to flooding on or off-site. The channels located from the outfall of the Hazel Creek Tunnel to Hazel Creek and from Hazel Creek to Jenkinson Lake would be subject to conveyance of an increased flow volume with Project operations. Erosion can increase when flow velocities within earthen channels also increase. Although the frequency and duration of the use of these channels would increase, the maximum flow rates through these channels would not change between baseline and Project conditions because the flow rates are limited by the

existing operational capacity of the infrastructure. During Project operations, the bed and banks of these channels would continue to be subject to flows within the range of historic norms; flow velocities, and therefore erosion, is not expected to increase. Operations with existing infrastructure would not substantially alter the existing drainage patterns in a manner that would result in substantial erosion or siltation, flooding, exceedance of stormwater drainage capacity, or impedance or redirection of flood flows. Therefore, impacts would be **less than significant**.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only.

Construction activities would alter existing drainage patterns within active construction areas. Grading, excavation, and trenching would change topography, which can affect erosion and sedimentation in new areas if unconsolidated sediments are exposed to new flow paths. Without the appropriate construction-site BMPs, water from upgradient areas can enter active construction areas, erode disturbed soils, and adversely affect downgradient areas through siltation.

Dewatering activities and/or construction of a stream bypass may be needed during construction. Rip-rap or other materials would be placed in the channels between Hazel Creek Tunnel and Jenkinson Lake where water velocities are expected to increase and otherwise cause excess erosion of the channel bed or bank. Improvement/stabilization areas would need to be isolated from the creek during construction and may require dewatering. A stream bypass may also be needed at channel crossings where new culverts or bridges are constructed. Erosion could occur at the point of discharge from the dewatering and where water is returned to the creek after being conveyed through a construction bypass.

New culverts and bridges located within the 100-year floodplain have the potential to impede flood flow conveyance by restricting the channel opening. When conveyance is limited, water surface elevations can increase upstream of the bridge or culvert and flood new areas. For the reasons described above, Project construction activities could result in erosion or siltation, flooding, or impedance or redirection of flood flows. Therefore, impacts during construction would be **potentially significant**.

Operational Impacts (Post-Construction)

The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. The effect of this change

would be increased conveyance through Hazel Tunnel and into Hazel Creek to a greater extent than pre-construction operations, as well as reduced river flows below El Dorado Diversion Dam. As detailed above, the channels between Hazel Creek Tunnel and Jenkinson Lake would be improved where they are currently inadequate to convey these flows – rip-rap or other materials would be used to stabilize the channels. In addition, the improvements themselves would be designed to accommodate post-construction flows. As such, substantial erosion or siltation is not expected to occur on- or off-site. Impacts would be **less than significant.**

Mitigation Measures

Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction

Mitigation Measure 4.10-4: Prepare and Implement a Dewatering and/or Stream Bypass Plan

Mitigation Measure 4.10-5: Design for Channel Stabilization Measures from the Hazel Creek Tunnel to Jenkinson Lake

Significance After Mitigation

As discussed under Impact 4.10-1, Mitigation Measure 4.7-1 requires the District and/or Contractor to develop and implement a water pollution control plan or SWPPP during construction. Stormwater BMPs would be used to reduce the amount of drainage from offsite areas from being introduced to active construction areas with disturbed soils and work areas would have perimeter controls downstream of disturbed soils to prevent sediment-laden waters from leaving active construction areas. With implementation of required construction site BMPs, major flow paths and drainage outlets are expected to remain unchanged. Mitigation Measure 4.10-4 requires the District and/or the Contractor to prepare and implement a Dewatering Plan or Stream Bypass Plan during construction where such an activity is applicable. The plan would detail the BMPs and avoidance and minimization measures to be used to minimize erosion and disturbance to the channel during construction. Mitigation Measure 4.10-5 requires the District to have a registered engineer design the stabilization measures that would be implemented within the creek channel between Hazel Creek Tunnel and Jenkinson Lake such that it is appropriately sized for the maximum flow rates and velocities anticipated post-construction. For these reasons, the overall potential for the Project to substantially alter the existing drainage pattern of the site or area in a manner that would result in erosion or siltation, flooding, exceedance of stormwater drainage capacity, or impedance or redirection of flood flows would be **less than significant with mitigation incorporated.**

Impact 4.10-5. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam utilizing existing infrastructure (i.e., prior to construction of any improvements necessary to divert up to 156 cfs) with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Existing facilities include the El Dorado Diversion dam, the El Dorado Canal (both canal and tunnel facilities), Hazel Creek Tunnel, Jenkinson Lake, Forebay Reservoir, inlet structures, headgate structures, siphons, etc., as well as other facilities on the South Fork American River and

Folsom Reservoir. These are existing facilities and Project operations would not cause, or increase, a risk for a release of pollutants due to inundation compared to baseline conditions. Therefore, **no impact** would occur.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only.

Infrastructure improvements would occur at the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and at the channels that convey water from the outfall of the Hazel Creek Tunnel to Hazel Creek and from Hazel Creek to Jenkinson Lake. As discussed in Section 4.10.1, although flooding is not a widespread issue in the region, there are mapped floodplains on the South Fork American River from an area located downstream of Slab Creek Reservoir to Folsom Reservoir. However, construction activities would not occur within these mapped flood hazard areas or within an inundation zone. Construction areas are inland, not subject to tsunamis, and are not near a large body of water that would be subject to a seiche.

Regardless, construction activities are expected at or near the channel located between the outfall of the Hazel Creek Tunnel and Hazel Creek and between Hazel Creek and Jenkinson Lake. Depending on the activity occurring within a specific area, construction in creek channels and/or floodplains could expose surface waters to pollutants. Without the appropriate construction-site BMPs and avoidance and minimization actions, surface waters could be contaminated with chemicals due to the presence of construction equipment and materials if those materials become inundated. For the reasons described above, Project construction activities can pose a substantial risk for release of pollutants due to inundation. As such, impacts during construction are **potentially significant**.

Operational Impacts (Post-Construction)

The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. The effect of this change would be increased conveyance through Hazel Tunnel and into Hazel Creek to a greater extent than pre-construction operations, as well as reduced river flows below El Dorado Diversion Dam. These are all existing facilities and Project operations would not cause, or increase, a risk for a release of pollutants due to inundation compared to baseline conditions. Therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction

Mitigation Measure 4.10-2: Implement Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials

Mitigation Measure 4.10-3: Implement Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan

Significance After Mitigation

The Districts and the Contractor are required to comply with all regulations on the transport and use of hazardous materials (Mitigation Measure 4.9-1a), they are required to prepare and implement a hazardous materials release prevention plan (Mitigation Measure 4.9-1b), and they must develop and implement a water pollution control plan or SWPPP during construction (Mitigation Measure 4.7-1). Implementing these measures would reduce the risk and/or substantially avoid a release of polluted runoff from leaving the construction site. Impacts would be **less than significant with mitigation incorporated**.

Impact 4.10-6. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of facilities to divert Permit 21112 water at the El Dorado Diversion Dam utilizing existing infrastructure (i.e., prior to construction of any improvements necessary to divert up to 156 cfs) with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. As discussed above in Section 4.10.1, the Basin Plan is the primary water quality control plan for the region for both surface water and groundwater resources. In addition, there is no designated groundwater basin or sustainable groundwater management plan for the region. The Basin Plan contains water quality objectives necessary for the protection of beneficial uses and to prevent nuisance. Operations with existing infrastructure would not increase pollutant loads or substantially increase erosion or siltation. As discussed in Impact 4.10-3, the channels located from the outfall of the Hazel Creek Tunnel to Hazel Creek and from Hazel Creek to Jenkinson Lake would be subject to conveyance of an increased flow volume with Project operations. However, the maximum flow rate through these channels would not change between baseline and Project conditions and therefore flow velocities and erosion is not expected to increase within these channels.

In addition, the Basin Plan includes numeric and narrative water quality objectives for temperature. In waterbodies with cold or warm freshwater habitat, temperatures are not to be increased more than 5ºF (2.8ºC) above natural receiving water temperature, nor are natural receiving water temperatures to be altered in a manner that adversely affects beneficial uses. As discussed above in Impact 4.10-2, water temperatures are not expected to be increased more than 5ºF (2.8ºC) above natural receiving water temperatures, nor altered in a manner that adversely affects sensitive aquatic resources and associated beneficial uses including freshwater habitat and spawning habitat.

The Project is not anticipated to conflict with or obstruct implementation of water quality control plans or sustainable groundwater management plans. Impacts would be **less than significant**.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. The exact location and extent of these Project activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only.

As discussed under Impact 4.10-1, construction activities have the potential to degrade surface water quality by introducing sediment to surface waters, potentially increasing turbidity, and adversely affecting both surface and groundwater quality by introducing pollutants to receiving waters. Without the appropriate construction-site BMPs, grading, excavation, and trenching can affect erosion and sedimentation in new areas if unconsolidated sediments are exposed to new flow paths and stormwater runoff could be contaminated with chemicals typically used during construction. For the reasons described above, Project construction activities could conflict with or obstruct implementation of water quality control plans. As such, impacts during construction are **potentially significant**.

Operational Impacts (Post-Construction)

The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. The effect of this change would be increased conveyance through Hazel Tunnel and into Hazel Creek to a greater extent than pre-construction operations, as well as reduced river flows below El Dorado Diversion Dam. As detailed above, the channels between Hazel Creek Tunnel and Jenkinson Lake would be improved where they are currently inadequate to convey these flows – rip-rap or other materials would be used to stabilize the channels. The improvements themselves would be designed to accommodate post-construction flows. Similar to Project operations with existing infrastructure, post-construction operations are not anticipated to conflict with or obstruct implementation of water quality control plans or sustainable groundwater management plans. Impacts would be **less than significant**.

Mitigation Measures

Mitigation Measure 4.10-1: Implement Mitigation Measure 4.7-1: Stormwater Management during Construction

Mitigation Measure 4.10-2: Implement Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials

Mitigation Measure 4.10-3: Implement Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan

Mitigation Measure 4.10-4: Prepare and Implement a Dewatering and/or Stream Bypass Plan

Mitigation Measure 4.10-5: Design for Channel Stabilization Measures from the Hazel Creek Tunnel to Jenkinson Lake

Significance After Mitigation

As identified in Impact 4.10-1, the District and the Contractor are required to comply with all regulations on the transport and use of hazardous materials (Mitigation Measure 4.9-1a), they are required to prepare and implement a hazardous materials release prevention plan (Mitigation Measure 4.9-1b), and they must develop and implement an water pollution control plan or SWPPP during construction (Mitigation Measure 4.7-1). In addition, Mitigation Measure 4.10-4 requires the District and/or the Contractor to prepare and implement a Dewatering Plan or Stream Bypass Plan during construction where such an activity is applicable. The plan would detail the BMPs and avoidance and minimization measures to be used to minimize erosion and disturbance to the channel during construction and Mitigation Measure 4.10-5 requires that stabilization measures implemented within the creek channel between Hazel Creek Tunnel to Jenkinson Lake be appropriately sized for the maximum flow rates and velocities anticipated post-construction. Implementing these measures would prevent polluted runoff from leaving the Project site, ensure that water and disturbed soils are properly managed throughout the duration of construction activities, and provide for erosion control post-construction. Therefore, the overall potential for the Project to conflict with or obstruct implementation of water quality control plans or sustainable groundwater management plans would be **less than significant with mitigation incorporated**.

4.11 LAND USE AND PLANNING

This section provides an analysis of potential impacts on land use and planning associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.11.1 EXISTING CONDITIONS

The Project Area encompasses areas within and near the South Fork American River from Kyburz, California to Folsom Reservoir (Exhibit 3.4, Existing Water Supply Infrastructure) as well as the El Dorado Canal, Hazel Creek Tunnel, and the channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake (Exhibit 3.6, Project Construction Alignment). The Project is located within El Dorado County. Portions of the Project are also located within the Eldorado National Forest. The type of land uses in the District's service area, throughout which the Project elements are located, include undeveloped open space, rural residential areas, farmland, recreation and scenic uses, power production, and urban development. Several land use plans cover the area around the Project elements, including the El Dorado County General Plan, Eldorado National Forest Land Management Plan, and the District's Integrated Water Resources Master Plan.

4.11.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Eldorado National Forest Land and Resource Management Plan

The purpose of the 1989 National Forest Land and Resource Management Plan is to direct the management of the Eldorado National Forest. This plan proscribes compatible sets of forest practices for the land and resources. Acres are assigned to different resource uses, and targets are set for the production of market and nonmarket goods and services. Environmental protection is gained by applying the management requirements to the approved forest activities. The plan also meets legal requirements and deals with local, state, and national issues. To accomplish its purpose, the plan:

- Names Eldorado National Forest's long-range goals and objectives for a 10-year period;
- Schedules the location and occurrence of forest practices by management areas;
- Establishes Standards and Guidelines for forest practices; and
- Ties management activities directly to the Forest Service budgeting system, linking them with periodic assessments and programs developed at the national level under the Forest and Rangeland Resources Planning Act.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

There are no state plans, policies, regulations, or laws related to land use and planning that would apply to the Project.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County General Plan

The Project is proposed by El Dorado Irrigation District, a special district that supplies water to customers throughout much of El Dorado County. Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance (El Dorado County 2019). However, the District aims to comply to with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The following land use policies are relevant to the Project:

- **Objective 2.1.3: Rural Regions –** Provide a land use pattern that maintains the open character of the County, preserves its natural resources, recognizes the constraints of the land and the limited availability of infrastructure and public services, and preserves the agricultural and forest/timber area to ensure its long-term viability for agriculture and timber operations.
  - **Policy 2.1.3.1:** All lands not contained within the boundaries of a Community Region or a Rural Center are classified as Rural Regions.

- **Objective 2.2.5: General Policy Section**
  - **Policy 2.2.5.14:** Buffers shall be established around future water supplies and other public facilities to protect them from incompatible land uses. Such buffer lands should be contained on-site where possible.
  - **Policy 2.2.5.21:** Development projects shall be located and designed in a manner that avoids incompatibility with adjoining land uses that are permitted by the policies in effect at the time the development project is proposed. Development projects that are potentially incompatible with existing adjoining uses shall be designed in a manner that avoids any incompatibility or shall be located on a different site.

- **Objective 2.4.1: Community Identity –** Identification, maintenance, and enhancement of the unique identity of each existing community.
  - **Policy 2.3.2.1:** The County shall implement a program to promote infill development in existing communities.

    A. Projects site must be consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.

    B. Project sites may not be more than five acres in size and must demonstrate substantially development has occurred on 2 or more sides of the site.

C. Project site has no value as habitat for endangered, rare or threatened species.

D. Approval of a project would not result in any significant effects relating to traffic, noise, air quality, or water quality.

- **Objective 2.5.1: Physical and Visual Separation –** Provision for the visual and physical separation of communities from new development.
    - **Policy 2.5.1.1:** Low intensity land uses shall be incorporated into new development projects to provide for the physical and visual separation of communities. Low intensity land uses may include any one or a combination of the following: parks and natural open space areas, special setbacks, parkways, landscaped roadway buffers, natural landscape features, and transitional development densities.

    - **Policy 2.5.1.2:** Greenbelts or other means of community separation shall be included within a specific plan and may include any of the following: preserved open space, parks, agricultural districts, wildlife habitat, rare plant preserves, riparian corridors, and designated Natural Resource areas.

El Dorado Irrigation District Water and Recycled Water Master Plan

The District's Water and Recycled Water Master Plan (EID 2024) identifies water and recycled water system capital improvement needs through the 2045 planning horizon. The purpose of the Water and Recycled Water Master Plan is to identify system deficiencies and recommend improvements to serve existing customers and continued additional connections from new development approved by El Dorado County. Infrastructure capacity improvements are also evaluated for an estimated buildout demand condition.

El Dorado County Water Agency 2014 West Slope Update to the Water Resources Development & Management Plan

The El Dorado County Water Agency (El Dorado County 2014) is the countywide water resources planning agency and has the responsibility to ensure adequate water supplies for existing and future uses in accordance with the El Dorado County Water Agency Act and the General Plan. The 2007 Water Resources Development & Management Plan, developed in consultation with the El Dorado Irrigation District and other utility districts, was prepared to analyze the need for and to coordinate water planning activities within the County to meet the County's water supply needs into the future.

4.11.3 IMPACT ANALYSIS

METHODOLOGY

The evaluation of the Project's potential effects related to land use and planning is based on a review of the land use designations and policies in the El Dorado County General Plan and the goals set forth in the District's Water and Recycled Water Master Plan. Potential effects were identified and evaluated qualitatively based on the environmental characteristics of the Project Area and the magnitude of activities related to the implementation of the Project.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at

Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek and then to Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.
- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the Project would have a potentially significant impact related to land use and planning if it 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?

ENVIRONMENTAL IMPACTS

Impact 4.11-1. Physically divide an established community?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

The operation of existing water conveyance infrastructure would not physically divide an established community. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree

removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

All construction-related activities involve improvements to existing water conveyance facilities. The improved facilities would generally be constructed in the same location as the existing facilities and therefore these construction activities would not introduce new barriers or linear features that could physically divide an existing community. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations with improved water conveyance facilities would not divide an established community. No impact would occur.

Mitigation Measures

No mitigation is required.

Impact 4.11-2. 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?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not require a change in zoning, nor would it conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No impact would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in

Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction activities associated with the proposed Project would not require a change in zoning. Moreover, as it would involve improvements to existing water conveyance facilities, it would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs.

Long-term water supply planning documents, including the District's 2024 Water and Recycled Water Master Plan and the El Dorado County Water Agency 2014 West Slope Update to the Water Resources Development & Management Plan, show that the District will have increased water demand throughout its service area. The District seeks to efficiently and reliably meet these future water demands with implementation of the proposed Project. The ability to divert at the maximum rate of diversion authorized by Permit 21112 would increase flexibility in the water delivery systems and optimize the beneficial uses of the water right permit, which would be consistent with the goals of these planning documents. The proposed Project would increase water supply reliability by maximizing the flexibility to meet demands with multiple points of diversion of the water supply and would enable the District to divert water higher in the system at times when water is most abundant. Operation at the maximum rate of diversion of up to 156 cfs would accommodate the increase in water demand anticipated by long-term water supply planning forecasts. Post-construction operations would not require a change in zoning, nor would it conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. **No impact** would occur.

Mitigation Measures

No mitigation is required.

4.12 MINERAL RESOURCES

This section provides an analysis of potential impacts on mineral resources associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.12.1 EXISTING CONDITIONS

The Project Area encompasses areas within and near the South Fork American River from Kyburz, California to Folsom Reservoir (Exhibit 3.4, Existing Water Supply Infrastructure) as well as the El Dorado Canal, Hazel Creek Tunnel, and the channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake (Exhibit 3.6, Project Construction Alignment). The Project is located within El Dorado County. Portions of the Project are also located within the Eldorado National Forest.

Mineral Resource Zones (MRZ) were initially mapped in 1980 as a result of the Surface Mining and Reclamation Act of 1975 (SMARA). MRZs are designated into four classes that indicate the potential for a specific area to contain significant mineral resources:

- MRZ-1: Areas where available geologic information indicates that little likelihood exists for the presence of significant mineral resources.
- MRZ-2a: Areas underlain by mineral deposits where geologic data indicate that significant measured or indicated resources are present. Areas classified MRZ-2a contain discovered mineral deposits that are either measured or indicated reserves as determined by such evidence as drilling records, sample analysis, surface exposure, and mine information.
- MRZ-2b: Areas underlain by mineral deposits where geological information indicate that significant inferred resources are present. Areas classified MRZ-2b contain discovered mineral deposits that are significant inferred resources as determined by their lateral extension from proven deposits or their similarity to proven deposits. Further exploration could result in upgrading areas classified MRZ-2b to MRZ-2a
- MRZ-3a: Areas containing known mineral occurrences of undetermined mineral resource significance. Further exploration within these areas could result in the reclassification of specific localities in MRZ-2a or MRZ-2b categories
- MRZ-3b: Areas containing inferred mineral occurrences of undetermined mineral resource significance. Land classified MRZ-3b represents areas in geologic settings that appear to be favorable environments for the occurrence of specific mineral deposits. Further exploration could result in the reclassification of all or part of these areas into the MRZ-3a category or specific localities into the MRZ-2a or MRZ-2b categories.
- MRZ-4: Areas of unknown mineral resource significance.

The Project area primarily traverses land classified as MRZ-1 and MRZ-4. The Project location includes limited areas that have been identified as MRZ-3a for gold deposits formed by mechanical concentration and MRZ-3b for gold deposits formed by metasomatic processes. (CDOC 2001). The Project area briefly traverses one area designated as MRZ-2a and MRZ-2b near Placerville and is designated as a locally important area of known mineral resources under the El Dorado County General Plan (El Dorado County 2003). Hazel Creek Mine is an

inactive mine located on the southern bank along Hazel Creek more than 0.1 mile east from the channel that conveys water from the outfall of Hazel Creek Tunnel to Jenkinson Lake.

4.12.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Surface Mining Control and Reclamation Act

Enacted in 1977, the Surface Mining Control and Reclamation Act prohibits surface coal mining within the boundaries of any unit of the National Park System. This act also provides the National Park System with authority over permitting divisions regarding external surface coal mining. Numerous surface coal mining operations exist or are proposed near National Park System units nationwide. Protection of downstream water resources as well as air, wildlife, habitat, and visual resource impacts are often factors that must be addressed in the development of this resource. If a surface coal mine operation is proposed near a park boundary and the National Park Service (NPS) has reason to believe that the operation will adversely affect park resources, then the National Park System becomes a joint permitting agency with the appropriate lead agency.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code 2710–2796) encourages the production, conservation, and protection of the state's mineral resources. Public Resources Code Section 2207 provides annual reporting requirements for all mines in the state, under which the State Mining and Geology Board is also granted authority and obligations. SMARA provides for the use of a system of MRZ classifications that reflect the known or inferred presence and significance of a given mineral resource. The MRZ classifications are based on available geologic information, including geologic mapping and other information on surface exposures, drilling records, and mine data, and on socioeconomic factors such as market conditions and urban development patterns.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

The El Dorado County General Plan (El Dorado County 2019) provides an overall framework for development of the county and the protection of its natural and cultural resources. The General Plan contains a Land Use Element, which describes goals and policies designed to encourage commercial mining operations within areas designated for such extraction, where environmental, aesthetic, and adjacent land use compatibility impacts can be adequately mitigated. None of the goals or policies are applicable to the proposed Project.

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the*

production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply with those goals and policies and use them as a metric for formulating an impact analysis. The General Plan's goals and policies related to mineral resources include the following:

- **Goal 7.2: Mineral Resources.** Conservation of the County's significant mineral deposits.
  - **Objective 7.2.1: Identify Mineral Sources.** Identification of the County's important mineral resources.
    - **Policy 7.2.1.2.** Areas designated as Mineral Source (-MR) overlay on the General Plan Land Use Map shall be identified by the Mineral Resource (-MR) combining zone districts on the zoning maps when the likely extraction of the resource through surface mining methods will be compatible with adjacent land uses as determined by Policy 7.2.2.2.
    - **Policy 7.2.1.3.** The County shall utilize the most recent State Department of Conservation assessment of the location and value of non-metallic mineral materials. The County shall zone them and the surroundings to allow for mineral resource management.
  - **Objective 7.2.2: Protection from Development.** Protection of important mineral resources from incompatible development.
    - **Policy 7.2.2.1.** The minimum parcel size within, or adjacent to, areas subject to the -MR overlay shall be twenty (20) acres unless the applicant can demonstrate to the approving authority that there are no economically significant mineral deposits on or adjacent to the project site and that the proposed project will have no adverse effect on existing or potential mining operations. The minimum parcel size adjacent to active mining operations which are outside of the -MR overlay shall also be twenty (20) acres.
    - **Policy 7.2.2.2.** The General Plan designations, as shown on the General Plan land use maps, which are considered potentially compatible with surface mining shall include:
      - Natural Resource (NR)
      - Agricultural Land (AL)
      - Open Space (OS)
      - Industrial (I)
      - Public Facilities (PF)
      - Rural Residential (RR)
      - Commercial (C)
      - Low-Density Residential (LDR)

      All other General Plan designations are determined to be incompatible for surface mining. Industrial uses shall be limited to those compatible with mineral exploration.

- **Policy 7.2.2.3.** The County shall require that new non-mining land uses adjacent to existing mining operations be designed to provide a buffer sufficient to protect the mining operation between the new development and the mining operation(s).

- **Objective 7.2.3: Environmental/Land Use Compatibility**. Regulation of extraction of mineral resources to ensure that environmental and land use compatibility issues are considered.

  - **Policy 7.2.3.1.** The extraction of mineral resources within the County shall only be allowed following the approval of a special use permit and a reclamation plan conforming to the California Surface Mining and Reclamation Act (SMARA).

4.12.3 IMPACT ANALYSIS

METHODOLOGY

This analysis of the Project's effects related to mineral resources is based on a review of the designated important mineral resource areas identified in the El Dorado County General Plan. Potential effects were identified and evaluated qualitatively based on the environmental characteristics of the Project Area and the magnitude of activities related to the implementation of the Project.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel

that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure) pre-construction, construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.
- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, an impact related to mineral resources is considered significant if the Project would result in any of the effects identified below.

a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

ENVIRONMENTAL IMPACTS

Impact 4.12-1. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve activities, such as ground disturbance or new development, that would affect the availability of mineral resources. Therefore, there would be **no impact** on known mineral resources that would be a value to the region and the residents of the state.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Areas of proposed construction improvements are not located in a designated regionally important area of known mineral resources. Therefore, there would be **no impact** on known mineral resources that would be a value to the region and the residents of the state.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve activities, such as ground disturbance or new development, that would affect the availability of mineral resources. Therefore, there would be **no impact** on known mineral resources that would be a value to the region and the residents of the state.

Mitigation Measures

No mitigation is required.

Impact 4.12-2. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve activities that would result in the loss of a locally important mineral resource recovery site delineated on the El Dorado County General Plan. Therefore, there would be **no impact** on mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Areas of proposed construction associated with the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake are not located within the Mineral Resource (-MR) overlay of the El Dorado County General Plan Land Use Map (El Dorado County 2019). Therefore, there would be **no impact** on mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve activities that would result in the loss of a locally important mineral resource recovery site delineated on the El Dorado County General Plan. Therefore, there would be **no impact** on mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan.

Mitigation Measures

No mitigation is required.

4.13 NOISE

This section provides an analysis of potential impacts related to noise associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.13.1 EXISTING CONDITIONS

NOISE BASELINE AND TERMINOLOGY

See Table 4.13-1 for terminology and definitions used throughout this section.

Table 4.13-1. Definitions of Acoustical Terms

Term	Definition
dB, Decibel	Unit of measurement of sound level.
dBA, decibel A-Weighted	A unit of measurement of sound level corrected to the A–weighted scale, as defined in American National Standards Institute (ANSI) S1.4–1971 (R1976), using a reference level of 20 micropascals (0.00002 Newtons per square meter).
A – Weighted Scale	A sound measurement scale, which corrects the pressures of individual frequencies according to human sensitivities. The scale is based upon the fact that the region of highest sensitivity for the average ear is between 2,000 and 4,000 Hz. Sound levels are measured on a logarithmic scale in decibels, dB. The universal measure for environmental sound is the A–weighted sound level, dBA.
Hz, Hertz	Unit of measurement of frequency, numerically equal to cycles per second.
Loudness	A listener's perception of sound pressure incident in their ear.
L_{01}, L_{10}, L_{50}, L_{90}	The A–weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
L_{eq}, Equivalent Noise Level	Also called the equivalent continuous noise level. It is the continuous sound level that is equivalent, in terms of noise energy content, to the actual fluctuating noise existing at the location over a given period, usually one hour. L_{eq} is usually measured in hourly intervals over long periods in order to develop 24–hour noise levels.
CNEL, Community Noise Equivalent Level	The CNEL is a measure of the cumulative noise exposure in the community, with greater weights applied to evening and night time periods. This noise descriptor is the equivalent noise level over a 24–hour period mathematically weighted during the evening and night when residents are more sensitive to intrusive noise. The daytime period is from 7 am to 7 pm; evening from 7 pm to 10 pm; and nighttime from 10 pm to 7 am. A weighting factor of 1 dB is added to the measured day levels defined as 7 am to 7 pm, evening levels (7 pm to 10 pm) have a weighting factor of three and 10 dB to the night time levels (10 pm to 7 am). The weighted levels over a 24–hour period are then averaged to produce the single number CNEL rating.
L_{dn}, Day/Night Noise Level	The same as CNEL except that the evening time period is not considered separately, but instead it is included as part of the daytime period. Measurements of both CNEL and L_{dn} in the same residential environments reveal that CNEL is usually slightly higher (by less than 1 dB) than L_{dn} due to the evening factor weighting.
L_{min}, L_{max}	The minimum and maximum A–weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The measurement of any sound level requires language used specifically for the measurement of acoustical conditions. Table 4.13-1 defines technical terms that are used in this section. The dB is the preferred unit used to measure sound levels utilizing a logarithmic scale to account for the large range in audible sound intensities. A general rule for the dB scale is that a 10-dB increase in sound is perceived as a doubling of loudness by the human ear. For example, a 55-dB sound level would sound twice as loud as a 45-dB sound level. The average healthy person cannot detect differences of one-dB whereas a five-dB change is clearly noticeable.

Several sound measurement descriptors are used to assess the effects of sound on the human environment. These include the equivalent sound level (L_{eq}) which is the level of a constant sound that has the same sound energy as the actual fluctuating sound. It is similar to the average sound level. The day-night sound level, L_{dn}, is similar to the 24-hour L_{eq}; except that a 10-dB penalty is added to sound levels between 10 pm and 7 am to account for the greater sensitivity of people to sound at night. The Community Noise Equivalent Level (CNEL) also places a weighted factor on sound events occurring in the evening hours. The L_{90} value is the sound level (L) that is exceeded 90 percent of the time and is often used to describe the background or residual sound level.

The A–weighted decibel (dBA) is a method of sound measurement which assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 10 dBA (the threshold of hearing) to about 110 dBA which is the threshold of pain. Examples of noise and their A–weighted decibel levels are shown in Table 4.13-2. In general, a 3 to 5 dBA change in community noise levels starts to become noticeable, while 1 to 2 dBA changes are generally not perceived. Quiet suburban areas typically have noise levels in the range of 40–50 dBA, while those along arterial streets are in the 50–60 dBA or greater range. Normal conversational levels are in the 60–65 dBA range.

Table 4.13-2. Typical Sound Levels Measured in the Environment

At a Given Distance from Noise Source (feet)	A–Weighted Sound Level in dBA	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130	Rock Music Concert	
Jet Takeoff (200')	120		
	110		Pain Threshold
Diesel Pile Driver (100')	100		
	90	Boiler Room Printing Press Plant	Very Loud
Freight Cars (50')			
Pneumatic Drill (50')	80		
Freeway (100')	70	In Kitchen with Garbage Disposal Running	
Vacuum Cleaner (10')			Moderately Loud
	60	Data Processing Center	
Light Traffic (100')	50	Department Store	
Large Transformer (200')			
	40	Private Business Office	Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
			Threshold of Hearing
	10		

Source: USEPA 1971, Barnes et al. 1976.

Effects of Noise

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. According to the California Department of Industrial Relations, Division of Occupational Safety and Health, which enforces California Occupation Safety and Health Administration (Cal/OSHA), Occupational Noise Exposure Standard is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90-dBA averaged over an eight (8)-hour time period (OSHA 2008).

Sleep and Speech Interference

The thresholds for speech interference indoors are 45-dBA if the noise is steady and 55-dBA if the noise is fluctuating. Outdoor thresholds are 15-dBA higher. Steady noise of sufficient intensity (above 35-dBA), and fluctuating noise levels above 45-dBA have been shown to affect sleep. Interior residential standards for multi-family residences are set by the State of California at 45- dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is equal to the L_{dn}, and nighttime levels are 10-dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses.

Typical structural noise attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is 20-dBA for an older structure and 25-dBA for a newer structure. Sleep and speech interference is therefore possible when exterior noise levels are 57-62 dBA L_{dn} with open windows and 65-70 dBA L_{dn} if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65–70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way (USEPA 1974).

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noise intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include: interference with speech, radio, and television; house vibrations; and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed.

People appear to respond more adversely to aircraft noise as opposed to general community noise levels. When the L_{dn} is 60-dBA; approximately 10-percent of the population is highly annoyed. Each decibel increase up to 70-dBA adds two percentage points to the number of people highly annoyed. Above 70-dBA, each decibel increase results in a three percent increase in the percentage of the population highly annoyed (Gjestland 2024).

Decibel Addition

Because decibels are logarithmic units, sound pressure levels cannot be added or subtracted through ordinary arithmetic. On the dB scale, a doubling of sound energy corresponds to a three-dB increase. In other words, when two identical sources are each producing sound of the same loudness, their combined sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one source produces a sound pressure level of 70-dBA, two identical sources would not produce 140-dBA—rather, they would combine

to produce 73-dBA. The cumulative sound level of any number of sources can be determined using decibel addition.

Vibration

Operation of heavy construction equipment, particularly pile driving and other impact devices such as pavement breakers, create seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and distance would result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes would decrease with increasing distance.

Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV).

Table 4.13-3 summarizes typical vibration levels generated by construction equipment (Federal Transit Administration 2018).

Table 4.13-3. Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 feet (in/sec)
Pile driver (impact)	0.644 to 1.518
Pile drive (sonic/vibratory)	0.170 to 0.734
Vibratory roller	0.210
Hoe ram	0.089
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003

Source: Federal Transit Administration 2018.
in/sec = inches per second

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation can be used to estimate the vibration level at a given distance for typical soil conditions (Federal Transit Administration 2018). PPV ref is the reference PPV from Table 4.13-4:

$$PPV = PPVref \times (25/Distance)^{1.5}$$

Table 4.13-4 summarizes guidelines vibration annoyance potential criteria suggested by Caltrans (California Department of Transportation 2020).

Table 4.13-4. Guideline Vibration Annoyance Potential Criteria

Human Response	Peak Particle Velocity at 25 feet (in/sec) Transient Sources	Continuous/Frequent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: California Department of Transportation 2020.
Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
in/sec = Inches per second

Table 4.13-5 summarizes guideline vibration damage potential criteria suggested by Caltrans.

Table 4.13-5. Guideline Vibration Damage Potential Criteria

Equipment	Peak Particle Velocity at 25 feet (in/sec) Transient Sources	Continuous/Frequent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structure	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: California Department of Transportation 2020
Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
in/sec = inches per second.

Existing Noise Environment

The existing noise environment in the Project area is characterized by the area's general level of development because the level of development and ambient noise levels tend to be closely correlated. Areas that are not urbanized are relatively quiet, whereas areas which are more urbanized are noisier as a result of roadway traffic, industrial activities, and other human activities. Table 4.13-6 summarizes typical ambient noise levels based on level of development. Given the rural residential nature of the Project area, ambient noise levels are expected to be in the range of 40 to 50 dBA.

Table 4.13-6. Population Density and Associated Ambient Noise Levels

Population Density	dBA, L_{dn}
Rural	40-50
Small Town or quiet suburban residential	50
Normal suburban residential	55
Urban residential	60
Noisy urban residential	65
Very noisy urban residential	70
Downtown, major metropolis	75-80
Area adjoining freeway or near major airport	80-90

Source: Hoover and Keith 2000
dBA = A weighted decibels
L_{dn} = Day-Night Average Sound Level

NOISE-SENSITIVE RECEPTORS

The Project area includes the communities of Kyburz and Pollock Pines, which contain noise-sensitive land uses such as residential areas, schools, and churches. These sensitive receptors are not located in the vicinity of the Project construction alignment, which includes segments of the El Dorado Canal between the El Dorado Diversion Dam as well as the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake (see Exhibit 3-6). The closest receptors to the Project construction alignment would be users of the campgrounds at Jenkinson Lake and Sand Flat Campground. These users would primarily be present during the peak camping season, which is between Memorial Day and Labor Day. Other sensitive receptors include residences along Hazel Valley Road and four cabin tracts along the Project construction alignment. Cabin tracts are groups of cabins located on U.S. Forest Service land. The U.S. Forest Service leases this land to the homeowners. Alder Creek Tract and 30 Mile Stone Tract are immediately adjacent to the Project construction alignment, Randall Tract is approximately 1 mile from the Project construction alignment, and Bull Creek Tract is approximately 0.5 mile from the Project construction alignment. There are no other known sensitive receptors in the vicinity of the Project's construction alignment.

4.13.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Federal, State, and local agencies regulate different aspects of environmental noise. Generally, the federal government sets noise standards for transportation-related noise sources closely linked to interstate commerce. These include aircraft, locomotives, and trucks. No federal noise standards are directly applicable to the Project.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

The State government sets noise standards for transportation noise sources such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. Local general plans identify general principles intended to guide and influence development plans.

The State of California General Plan Guidelines (OPR 2017) establishes guidelines for the preparation of local general plan noise elements, including a sound level/land use compatibility chart that categorizes, by land use, outdoor day/night noise level (L_{dn}) ranges in four categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable). For many land uses, the chart shows overlapping L_{dn} ranges for two or more compatibility categories.

The noise element guidelines identify the normally acceptable range of L_{dn} values for low-density residential uses as less than 60 dB and the conditionally acceptable range as 55–70 dB. The normally acceptable range for high-density residential uses is identified as L_{dn} values of less than 65 dB, and the conditionally acceptable range is identified as 60–70 dB. For educational and medical facilities, L_{dn} values of less than 70 dB are considered normally acceptable, and L_{dn} values of 60–70 dB are considered conditionally acceptable. For office and commercial land uses, L_{dn} values of less than 70 dB are considered normally acceptable, and L_{dn} values of 67.5–77.5 are categorized as conditionally acceptable. When noise levels are in the conditionally acceptable range, new construction should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation requirements are included in the design.

These overlapping L_{dn} ranges are intended to indicate that local conditions (existing sound levels and community attitudes toward dominant sound sources) should be considered in evaluating land use compatibility at specific locations.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County General Plan

The Project is proposed by El Dorado Irrigation District, a special district that supplies water to customers throughout much of El Dorado County. Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply to with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to noise include the following:

- **Goal 6.5: Acceptable Noise Levels.** Ensure that County residents are not subjected to noise beyond acceptable levels.

The County has established maximum allowable noise exposure for non-transportation noise sources in rural regions as outlined in Table 4.13-7 below. However, the El Dorado County Municipal Code Chapter 130.70 - Noise Standards states that "noise sources associated with work performed by public or private utilities in the maintenance or modification of its facilities" are considered exempt from the Noise Standard (El Dorado County 2019). Additionally, the Municipal Code also states that construction (e.g., construction, alteration or repair activities) during daylight hours (i.e., 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 5 p.m. on weekends) is also exempt from ordinance noise standards provided that all construction equipment is fitted with factory installed muffling devices and maintained in good working order (El Dorado County 2023).

Table 4.13-7. Maximum Allowable Noise Exposure for Non-Transportation Noise Sources in Rural Regions

		Noise Level, dB	
Land Use Designation	Time Period	L_{eq}	L_{max}
All Residential (LDR)	7 am – 7 pm	50	60
	7 pm – 10 pm	45	55
	10 pm – 7 am	40	50
Commercial (C), Recreation (TR), and Public Facilities (PF)	7 am - 7 pm	65	75
	7 pm - 7 am	60	70
Rural Land (RR), Natural Resources (NR), Open Space (OS), and Agricultural Lands (AL)	7 am – 7 pm	65	75
	7 pm – 7 am	60	70

Source: El Dorado County General Plan 2019

dB = decibels

As stated above, the District is exempt from the County's noise ordinance as a jurisdiction with equal authority. However, the District has incorporated these standards to help define the CEQA significance criteria and establish what would constitute a substantial increase in ambient noise levels.

4.13.3 IMPACT ANALYSIS

METHODOLOGY

The evaluation of the Project's potential effects related to noise is based on a review of the noise level standards in the El Dorado County General Plan. Potential effects were identified and evaluated qualitatively based on the environmental characteristics of the Project Area and the magnitude of activities related to the implementation of the Project. Because only limited design information is available for the Project's construction improvements, this EIR provides a programmatic analysis of those improvements in accordance with CEQA Guidelines Section 15168. If implementation of the improvements is ultimately deemed necessary, additional CEQA analysis for these components would be completed as appropriate when design has advanced and further details are known.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a

control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure) pre-construction, construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.

- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, an impact related to noise is considered significant if the project would result in any of the effects identified below.

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) Generation of excessive groundborne vibration or groundborne noise levels?

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

ENVIRONMENTAL IMPACTS

Impact 4.13-1. 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?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure involves water diversion and conveyance at existing facilities and would not cause an increase in ambient noise levels in the Project Area. Therefore, there would be no impact.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction activities would involve the use of heavy equipment (e.g., haul truck, excavator, backhoe, crane), which would generate noise above ambient conditions. Construction noise would typically occur in bursts with

peak noise levels only lasting a few minutes at a time over the course of several days. Work would generally occur during the daytime, but nighttime work may be necessary to ensure construction activities can be completed within a reasonable amount of time. Sensitive receptors in the vicinity of the Project construction alignment that could be affected by construction noise include residences along Hazel Valley Road, the residences at Alder Creek Tract, residences at 30 Mile Stone Tract, campgrounds at Jenkinson Lake, and the Sand Flat Campground. The Randall Tract and Bull Creek Tract are not immediately adjacent to the Project construction alignment and noise from construction would not be expected to affect these two communities. No other known sensitive receptors, including schools and places of worship, are in the vicinity of the Project construction alignment. Construction traffic including crew vehicles and material deliveries will need to access the Project construction footprint using Hazel Valley Road and access roads through the cabin tracts, campgrounds at Jenkinson Lake, and the Sand Flat Campground. If this is the case, an increase in construction-related traffic could contribute to an increase in noise to sensitive receptors along those roads. Therefore, this impact would be **potentially significant.**

Operational Impacts (Post-Construction)

The proposed modification of operations at El Dorado Diversion Dam and Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements.

Post-construction operations involves water diversion and conveyance through improved facilities at a rate slightly higher (up to 11 cfs) than operations with existing infrastructure and would not cause an increase in ambient noise levels in the Project Area. Therefore, there would be **no impact**.

Mitigation Measures

Mitigation Measure 4.13-1a Restriction of Construction Operational Hours

Construction truck traffic along Hazel Valley Road, and access roads through the cabin tracts, campgrounds at Jenkinson Lake, and the Sand Flat Campground shall be limited to daytime periods between 7 am and 7 pm, Monday through Friday and 8 am and 5 pm on weekends, and on federally recognized holidays, whenever feasible. Additionally, construction activities that occur within 500 feet of sensitive receptors (i.e., residences along Hazel Valley Road, the residences at Alder Creek Tract, residences at 30 Mile Stone Tract, campgrounds at Jenkinson Lake, and the Sand Flat Campground) shall occur only between the daytime hours of 7 am and 7 pm Monday through Friday, and 8 am and 5 pm on weekends and federally recognized holidays. Construction occurring further than 500 feet of sensitive receptors, and not contributing to an increase in traffic along the roads identified, may occur outside of the daytime hours.

All construction equipment shall be fitted with factory installed muffling devices and all construction equipment shall be maintained in good working order.

Mitigation Measure 4.13-1b: Limit Construction Season

Construction activities shall not occur during the peak recreation season, which is generally from Memorial Day weekend to Labor Day weekend.

Significance After Mitigation

Implementation of Mitigation Measure 4.13-1a would reduce exposure to noise levels during construction by limiting work hours and ensuring that equipment is equipped and maintained to minimize noise emissions.

Implementation of Mitigation Measure 4.13-1b would ensure that sensitive receptors in proximity to the Project construction alignment and access routes are not exposed to construction noise during the peak recreation season. These mitigation measures would ensure that construction activities would be consistent with El Dorado County noise policies and would not generate a substantial increase in ambient noise levels in the vicinity of the Project construction alignment. Therefore, this impact would be **less than significant with mitigation incorporated.**

Impact 4.13-2. Generation of excessive groundborne vibration or groundborne noise levels?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve activities or use of equipment that would generate groundbourne vibration or groundbourne noise. Therefore, there would be **no impact**.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

It is possible that the future construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake could generate groundbourne vibration or groundbourne noise, such as through use of excavation equipment. As discussed above, sensitive receptors in the vicinity of the Project construction alignment that could be affected by

groundborne vibrations include residences along Hazel Valley Road, the residences at Alder Creek Tract, residences at 30 Mile Stone Tract, campgrounds at Jenkinson Lake, and the Sand Flat Campground. Because construction equipment could generate groundbourne vibration or groundbourne noise, this impact is **potentially significant.**

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve activities or equipment that would generate groundbourne vibration or groundbourne noise. Therefore, there would be **no impact**.

Mitigation Measures

Mitigation Measure 4.13-1a Restriction of Construction Operational Hours

Construction truck traffic along Hazel Valley Road, and access roads through the cabin tracts, campgrounds at Jenkinson Lake, and the Sand Flat Campground shall be limited to daytime periods between 7 am and 7 pm, Monday through Friday and 8 am and 5 pm on weekends, and on federally recognized holidays, whenever feasible. Additionally, construction activities that occur within 500 feet of sensitive receptors (i.e., residences along Hazel Valley Road, the residences at Alder Creek Tract, residences at 30 Mile Stone Tract, campgrounds at Jenkinson Lake, and the Sand Flat Campground) shall occur only between the daytime hours of 7 am and 7 pm Monday through Friday, and 8 am and 5 pm on weekends and federally recognized holidays. Construction occurring further than 500 feet of sensitive receptors, and not contributing to an increase in traffic along the roads identified, may occur outside of the daytime hours.

All construction equipment shall be fitted with factory installed muffling devices and all construction equipment shall be maintained in good working order.

Mitigation Measure 4.13-1b: Limit Construction Season

Construction activities shall not occur during the peak recreation season, which is generally from Memorial Day weekend to Labor Day weekend.

Significance After Mitigation

Implementation of Mitigation Measure 4.13-1a would reduce exposure to groundborne vibration or noise levels during construction by limiting work hours in proximity to sensitive receptors. Implementation of Mitigation Measure 4.13-1b would ensure that sensitive receptors in proximity to the Project construction alignment and access routes are not exposed to excessive groundborne vibration or noise levels during the peak recreation season. Therefore, this impact would be **less than significant with mitigation incorporated**.

Impact 4.13-3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

There are no airports within two miles of the Project Area. Therefore, operations with existing infrastructure would not expose people residing or working in the project area to excessive noise levels associated with airport facilities, and there would be **no impact**.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

There are no airports within two miles of the Project construction footprint. Therefore, the project would not expose people residing or working in the project area to excessive noise levels associated with airport facilities, and there would be **no impact**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

There are no airports within two miles of the Project construction footprint. Therefore, the project would not expose people residing or working in the project area to excessive noise levels associated with airport facilities, and there would be **no impact.**

Mitigation Measures

No mitigation is required.

4.14 POPULATION AND HOUSING

This chapter provides an analysis of potential impacts on population and housing associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.14.1 EXISTING CONDITIONS

The Project area is located in El Dorado County, California. The county had a population in July 2022 of 192,646 and a housing stock of 94,837 units (U.S. Census Bureau 2022). Most El Dorado County citizens reside outside the two incorporated cities of Placerville (county seat) and South Lake Tahoe. Unincorporated communities in the vicinity of the South Fork American River include Kyburz, White Hall, Riverton, Pacific House, Fresh Pond, Pollock Pines, and Coloma.

4.14.2 REGULATORY SETTING

Population and housing patterns and development in El Dorado County are guided by state housing element law (Government Code Sections 65580–65590), the Sacramento Area Council of Governments' (SACOG 2023) 2021-2029 Regional Housing Needs Plan, and the El Dorado County General Plan (County General Plan), particularly the 2013–2021 Housing Element. Applicable state and local population and housing regulations and policies related to the proposed Project are described below.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

There are no federal plans, policies, regulations, or laws related to population and housing that would apply to the Project.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

State

At the state level, the California Department of Housing and Community Development (HCD) administers population and housing policy and laws, including the review of local general plan housing elements. State housing element law (Government Code Sections 65580–65590) requires HCD to determine the relative share of existing and projected housing needs for each county in California. HCD uses California Department of Finance (DOF) population projections and historic growth trends to estimate the relative share of California's projected population growth that would occur in each county. Where there is a regional council of governments (COG), HCD provides the regional housing need information to the COG. For El Dorado County, HCD provides this information to SACOG, of which El Dorado County is a member. SACOG, in turn, assigns a share of the identified regional housing need to each of its member counties and cities through its Regional Housing Needs Allocation (RHNA) and RHNP process.

Regional Housing Needs Allocation and Regional Housing Needs Plan

The State of California requires every county and city to plan for and accommodate its fair share of regional growth through the RHNA process. As part of the RHNA process, HCD issues a Regional Housing Needs

Determination, which includes an overall housing needs number, as well as a breakdown of the number of units required in four household income categories, every 8 years. The distribution of the county's overall allocation into four income categories, defined by state law, is intended to facilitate the equitable distribution of lower income households throughout the county's communities.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

Local

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below:

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan (El Dorado County 2019) and Zoning Ordinance. However, the District aims to comply with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to population and housing include the following:

Economic Development Element

- **Goal 10-1.1: Cooperation:** The County shall work with all levels of government and with the various economic development organizations including the business community to cooperatively identify and promote the County's positive opportunities and strength.
  - **Objective 10.1.1: Cooperative Approach:** Utilize the Economic Development Providers Network or other Board of Supervisors recognized economic development organizations to advise and recommend to the Board of Supervisors policies and a course of action that will facilitate the County's economic vitality.
    - **Policy 10.1.1.1:** Annually review the success of the Economic Development Element, establish the program for the coming year, and take action to ensure continued productive activities.
    - **Policy 10.1.1.2:** Implement a business education and information program to promote communication and problem solving between business and government.
    - **Policy 10.1.1.3:** Encourage local governments and private business to develop a coordinated and regional approach to a sustainable economy for El Dorado County.
  - **Objective 10.1.5: Business Retention and Expansion:** Assist in the retention and expansion of existing businesses through focused outreach and public and private incentive programs and target new industries which diversify and strengthen our export base.

- **Policy 10.1.5.1:** Assist industries to remain, expand, or to locate in El Dorado County.

- **Policy 10.1.5.2:** Provide services which enable existing companies with emphasis on identified growth industries, to retain and expand their businesses in El Dorado County.

- **Policy 10.1.5.3:** Conduct outreach to targeted industries for potential location in El Dorado County.

- **Policy 10.1.5.4:** Recognize and promote agricultural based industries in El Dorado County and provide for the expansion of value added industries in an economically viable manner consistent with available resources.

- **Policy 10.1.5.5:** Recognize and promote the need to create greater opportunities for El Dorado County residents to satisfy retail shopping demands in El Dorado County.

- **Policy 10.1.5.6:** Encourage the locating of new employment base industries that provide for additional employment opportunities for existing residents currently employed by industries with declining job potential to provide for a better employment future and business climate for the County. Prior to approval of a General Plan amendment to Tourist Recreational or a zone change to implement this land use designation, when a site is adjacent to a residential, agricultural, or Natural Resource designation, a finding shall be made which concludes that the development project will have no significant growth inducement effect on adjacent lands.

- **Objective 10.1.9: Jobs-Housing Relationship:** The County shall monitor the jobs-housing balance and emphasize employment creation.

  - **Policy 10.1.9.1:** The County shall use appropriate land use, zoning, and permit streamlining strategies, and other financial incentives to provide for and encourage a broad mix housing types that are compatible with wage structures associated with existing and forecasted employment.

  - **Policy 10.1.9.2:** Encourage specific plans and large planned developments in Community Regions and Rural Centers to include a broad mix of housing types and relate it to local wage structures to achieve balance with existing and forecasted resident household needs.

  - **Policy 10.1.9.3:** The County shall actively promote job generating land uses while deemphasizing residential development unless it is tied to a strategy that is necessary to attract job generating land uses.

- **Objective 10.2.1: Public and Civic Facilities Investment:** Give a high priority to funding quality civic, public and community facilities, and basic infrastructure that serve a broad range of needs.

  - **Policy 10.2.1.1:** The County shall prepare and coordinate with other service providers long-term capital improvement plans to more efficiently provide infrastructure and services in a manner consistent with the needs of targeted industries and existing residents. This process shall identify cost estimates for each project in current dollars and identify the funding source.

- **Policy 10.2.1.6:** Provision of new infrastructure and facilities shall be coordinated with existing infrastructure and facilities and shall maximize use of existing facilities capacity to the extent that any exists.

- **Policy 10.2.1.8:** Direct new development to land where infrastructure and service levels are adequate so as to minimize development costs.

2021–2029 Housing Element

State housing element law, enacted in 1969, mandates that local governments in California adopt housing elements as part of their general plans and submit draft and adopted elements to HCD for review of compliance with state law. The County General Plan 2021–2029 Housing Element, reviewed and approved by HCD May 10, 2022 guides the County's decisions related to unincorporated El Dorado County's housing needs through May, 2029 (El Dorado County 2022). The 2013–2021 Housing Element contains the following relevant goals and policies; the text of which can be found in Appendix B.

- Goal HO-1, addresses provision of housing to meet the needs of existing and future residents in all income categories, and includes implementing policy HO-1.1.
- Goal HO-2, addresses provision of quality residential environments for all income levels.
- Goal HO-4, addresses meeting the housing needs of special groups of county residents.

4.14.3 IMPACT ANALYSIS

METHODOLOGY

The evaluation of potential impacts on population and housing was based on a detailed review of the proposed Project's activities in light of local population and housing data available from public agencies.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project would result in a significant impact on population and housing if the Project would:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

ENVIRONMENTAL IMPACTS

Impact 4.14-1. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve new residential or commercial development. The Project would utilize water supplies available under an existing water right, Permit 21112, subject to its terms and conditions regarding rate of diversion, season of diversion, total diversion to storage, and total consumptive use. Operations with existing infrastructure would also provide the additional place of storage at Jenkinson Lake, which would allow the District to divert Permit 21112 water to storage when water is abundant and then use that stored water to meet demands during the summer and fall. Therefore, operations with existing infrastructure would provide an additional point of diversion for the Permit 21112 water supply and add the additional place of storage at Jenkinson Lake, which would increase water supply reliability by maximizing the flexibility to meet current and future demands identified in long-term water supply planning forecasts (EID 2021, EID 2024, and EDCWA 2014). However, this increase in water supply reliability would not induce substantial population growth, either directly or indirectly because there would be no increase in the total amount of water allowed to be diverted or stored under the District's water right Permit 21112. Therefore, the proposed Project would not induce substantial population growth. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree

removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The construction activities described above would be implemented in a manner to prevent any impact to water supplies. Construction activities on the El Dorado Canal would likely be conducted during the District's annual maintenance outage, which typically occurs from October through mid-December. The District plans operations each year to ensure adequate water supplies are available during the annual maintenance outage. Likewise, construction activities for the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be planned to occur when Jenkinson Lake had sufficient storage to meet water supply demands during construction without receiving water from the Hazel Creek Tunnel. It is anticipated that the construction workforce would largely be drawn from the local area and region. These construction activities would restore the authorized conveyance capacity of El Dorado Canal and increase the conveyance capacity of the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. However, these construction activities would not alter the storage capacity of Jenkinson Lake, nor would they alter the authorized diversion capacity of existing facilities at the El Dorado Diversion Dam. While these construction activities would enable the District to convey up to the maximum authorized rate under water right Permit 21112 (i.e., 156 cfs), other elements such as the diversion capacity and water treatment capacity operate as constraints on the amount of water the District can reliably divert and deliver. Therefore, this phase of the proposed Project would not induce substantial population growth, either directly or indirectly. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The post-construction operational scenario involves utilizing water that would be diverted and used for hydropower purposes to instead be diverted for consumptive uses. However, the post-construction operational scenario provides the ability to divert Permit 21112 at a higher rate (i.e., from 120 cfs with existing infrastructure to 156 cfs following construction), which would allow the District to maximize the use of Permit 21112 in the winter and spring months when unimpaired flows in the South Fork are high. Post-construction operations would also provide the additional place of storage at Jenkinson Lake, which would allow the District to divert Permit 21112 water to storage when water is abundant and then use that stored water to meet demands in the summer and fall. Therefore, post-construction operations would provide a higher rate of diversion for the Permit 21112 water supply and add the additional place of storage at Jenkinson Lake, which would increase water supply reliability by maximizing the flexibility to meet current and future demands identified in long-term water supply planning forecasts (EID 2021, EID 2024, and EDCWA 2014). The Project would utilize water supplies available under an

existing water right, Permit 21112, subject to its terms and conditions regarding rate of diversion, season of diversion, total diversion to storage, and total consumptive use. The proposed diversion is intended to increase water supply reliability by maximizing the flexibility to meet demands with multiple points of diversion of the water supply and would enable the District to divert water higher in the system at times when water is most abundant. However, this increase in water supply reliability would not induce substantial population growth, either directly or indirectly. There would be no increase in the total amount of water allowed to be diverted or stored under the District's water right Permit 21112. Therefore, the proposed Project would not induce substantial population growth. **No impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.14-2. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

No existing housing would be affected by this phase of the Project. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The construction activities associated with the proposed Project would not displace existing housing, necessitating the construction of replacement housing elsewhere. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

No existing housing would be affected by this phase of the Project. **No impact** would occur.

Mitigation Measures

No mitigation is required.

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4.15 PUBLIC SERVICES

This section provides an analysis of potential impacts on public services associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.15.1 EXISTING CONDITIONS

The Project is located in El Dorado County, California, along the South Fork of the American River. Public services are provided by the county government, including in census-designated communities such as Pollock Pines. Public services are also provided by city governments in incorporated communities such as Placerville.

FIRE PROTECTION

The El Dorado County Fire Protection District serves the communities of Apple Hill, Camino, Coloma, Cool, Gold Hill, Kyburz, Lotus, Oak Hill, Pacific House, Pilot Hill, Placerville, Pleasant Valley, Pollock Pines, Salmon Falls, Shingle Springs, Sierra Springs, Silver Fork, Strawberry, Texas Hill and Twin Bridges with a population of approximately 74,000 residents in 281 square miles (El Dorado County Fire Protection District 2023). As shown in Table 4.15-1, the El Dorado County Fire Protection District operates a number of fire protection stations in the Project Area.

Table 4.15-1. El Dorado County Fire Protection District Stations in the Project Area

#	Location	Communities Served	Staffing
15	16211 U.S. Highway 50, Strawberry, CA	Strawberry	Unstaffed
16	13275 U.S. Highway 50, Kyburz, CA 95720	Kyburz and Silverfork	Unstaffed; during fire season the United States Forest Service, Eldorado National Forest (ENF), has an agreement with El Dorado County Fire to use Station 16 as a base for ENF Engine 64.
17	6430 Pony Express Trail, Pollock Pines, CA 95726	Pollock Pines	Staffed 24 hours a day, 7 days a week by an Engine Company and a Medic Unit.
18	5785 Sly Park Road, Pollock Pines, CA 95726	Sierra Springs and Sly Park Hills	Unstaffed
19	4429 Pleasant Valley Road, Placerville, CA 95667	Pleasant Valley	Staffed 24 hours a day, 7 days a week with an Engine Company and Medic Unit.
21	4040 Carson Road, Camino, CA 95709	Camino and Cedar Grove	Administrative Headquarters for El Dorado County Fire. The offices of the Fire Chief, Shift Division Chiefs, Fire Prevention Bureau, and Training Division are located at this station.
23	1834 Pleasant Valley Road, Placerville, CA 95667	Pleasant Valley and Oak Hill	Unstaffed
25	3034 Sacramento Street, Placerville, CA 95667	Placerville	Staffed 24 hours a day, 7 days a week by an Engine Company, a Medic Unit and the Duty Chief.
26	730 Main Street, Placerville, CA 95667	Placerville	Unstaffed; the Placerville Police Department now occupies the building with the exception of the engine bays.
27	6051 Gold Hill Road, Placerville, CA 95667	Gold Hill	Unstaffed; through a lease agreement, a Bureau of Land Management hand crew is stationed out of this location.

#	Location	Communities Served	Staffing
28	3860 Ponderosa Road, Shingle Springs, CA 95682	Shingle Springs, South Cameron Estates, Crazy Horse and Red Hawk Casino	Staffed 24 hours a day, 7 days a week by an Engine Company and a Medic Unit. Station 28 also houses the Districts' Office of Emergency Services (OES) engine, which is staffed when requested by California Office of Emergency Services (Cal OES).
72	7200 St Florian Court, Cool, CA 95614	Cool, Auburn Lake Trails, and Pilot Hill	Staffed 24 hours a day, 7 days a week by an Engine Company.
73	4302 State Highway 49, Pilot Hill, CA 95664	Pilot Hill	Unstaffed
74	5122 Firehouse Road, Lotus, CA 95651	Coloma and Lotus	Staffed part-time with a Division Chief who is also an accredited Paramedic. The station houses the Districts' Swift Water Rescue boat and vehicle. The Station is also a "move-up and cover" location for Ambulances.

Source: El Dorado County Fire Protection District 2023; compiled by AECOM
Note: #=District numbering for its facilities.

POLICE PROTECTION

Police protection services for the unincorporated portions of the Project Area are provided by the El Dorado County Sheriff. The El Dorado County Sheriff Office is located at 300 Fair Lane in Placerville, California. Sheriff's offices are located in South Lake Tahoe and Placerville, and sub-stations are located in Cameron Park, El Dorado, and Georgetown (El Dorado County Sheriff's Office 2023).

SCHOOLS

The Project Area encompasses the Pollock Pines Elementary School District and the El Dorado Union High School District (El Dorado County 2019). The Pollock Pines Elementary School District operates one elementary school (kindergarten through fourth grade), and one middle school (fifth through eighth grade). The El Dorado Union High School District operates four high schools. The nearest school to proposed construction area is Silver Fork School located at 1325 School Road in Kyburz, California, located approximately 0.75 miles northeast of the Project construction alignment.

4.15.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

No federal plans, policies, regulations, or laws related to the provision of local public services apply to the proposed Project.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Fire Protection

California state fire safety regulations apply to State Responsibility Areas (SRAs) during the time of year designated as having hazardous fire conditions. California Department of Forestry and Fire Protection (CAL FIRE) has developed a fire hazard severity scale that considers vegetation, climate, and slope to evaluate the level of wildfire hazard in all SRAs. A State Responsibility Area is defined as the part of the state where CAL FIRE is primarily responsible for providing basic wildland fire protection assistance. Areas under the jurisdiction of other

fire protection services are considered to be Local Responsibility Areas or on Federal lands are considered Federal Responsibility Areas.

During the fire hazard season, these regulations include: (a) restrict the use of equipment that may produce a spark, flame, or fire; (b) require the use of spark arrestors on any equipment that has an internal combustion engine; (c) specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and (d) specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas. CAL FIRE has primary responsibility for fire protection within SRAs.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below:

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance (El Dorado County 2019). However, the District aims to comply with those goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to public services include the following:

- **Goal 5.1: Provision of Public Services:** Provide and maintain a system of safe, adequate, and cost-effective public utilities and services; maintain an adequate level of service to existing development while allowing for additional growth in an efficient manner; and, ensure a safe and adequate water supply, wastewater disposal, and appropriate public services for rural areas.
  - **Objective 5.1.2: Concurrency:** Ensure through consultation with responsible service and utility purveyors that adequate public services and utilities, including water supply, wastewater treatment and disposal, solid waste disposal capacity, storm drainage, fire protection, police protection, and ambulance service are provided concurrent with discretionary development or through other mitigation measures provided, and ensure that adequate school facilities are provided concurrent with discretionary development to the maximum extent permitted by State law. It shall be the policy of the County to cooperate with responsible service and utility purveyors in ensuring the adequate provision of service. Absent evidence beyond a reasonable doubt, the County will rely on the information received from such purveyors and shall not substitute its judgment for that of the responsible purveyors on questions of capacity or levels of service.
  - **Policy 5.1.2.1:** Prior to the approval of any discretionary development, the approving authority shall make a determination of the adequacy of the public services and utilities to be impacted by that development. Where, according to the purveyor responsible for the service or utility as provided in Table 5-1, demand is determined to exceed capacity, the approval of the development shall be conditioned to require

expansion of the impacted facility or service to be available concurrent with the demand, mitigated, or a finding made that a Capital Improvement Planning (CIP) project is funded and authorized which will increase service capacity.

- **Policy 5.1.2.2:** Provision of public services to new discretionary development shall not result in a reduction of service below minimum established standards to current users, pursuant to Table 5-1.

Table 5-1. Minimum Levels of Service

	Community Region	Rural Center and Region
Public water source	As determined by purveyor	As determined by purveyor, when applicable
Private wells	Environmental Management	Environmental Management
Public water treatment capacity	As determined by purveyor	As determined by purveyor
Public sewer treatment capacity	As determined by purveyor	As determined by purveyor
On-site sewage disposal	Environmental Management	Environmental Management
Storm drainage	Department of Transportation	Department of Transportation
Solid waste	Environmental Management	Environmental Management
County and State road circulation system	E	D
Schools	As determined appropriate by the school districts	As determined appropriate by the school districts
Parks	Specific plan for new communities or Quimby Fee/dedication program for tentative maps	Quimby Fee/dedication program for tentative maps
Fire district response	8-minute response to 80% of the population	15 to 45-minute response
Sheriff	8-minute response to 80% of the population	No standard
Ambulance	10-minute response to 80% of the population	20-minute response in Rural Regions and "as quickly as possible" in wilderness areas* wilderness areas*

*In accordance with State standards

- **Goal 5.7: Emergency Services:** Adequate and comprehensive emergency services, including fire protection, law enforcement, and emergency medical services.

  - **Objective 5.7.1: Fire Protection (Community Regions):** Ensure sufficient emergency water supply, storage, and conveyance facilities are available, and that adequate access is provided for, concurrent with development.

    - **Policy 5.7.1.1:** Prior to approval of new development, the applicant will be required to demonstrate that adequate emergency water supply, storage, conveyance facilities, and access for fire protection either are or will be provided concurrent with development.

  - **Objective 5.7.3: Law Enforcement:** An adequate, comprehensive, coordinated law enforcement system consistent with the needs of the community.

    - **Policy 5.7.3.1:** Prior to approval of new development, the Sheriff's Department shall be requested to review all applications to determine the ability of the department to provide protection services. The ability to provide protection to existing development shall not be reduced below acceptable levels as a consequence of new development. Recommendations such as the need for additional equipment, facilities, and adequate access may be incorporated as conditions of approval.

- **Objective 5.7.4: Medical Emergency Services:** Adequate medical emergency services available to serve existing and new development recognizing that levels of service may differ between Community Regions, and Rural Centers and Regions.
  - **Policy 5.7.4.1:** Prior to approval of new development, the applicant shall be required to demonstrate that adequate medical emergency services are available, and that adequate emergency vehicle access will be provided concurrent with development.
  - **Policy 5.7.4.2:** Prior to approval of new development, the Emergency Medical Services Agency shall be requested to review all applications to determine the ability of the department to provide protection services. The ability to provide protection to existing development shall not be reduced below acceptable levels as a consequence of new development. Recommendations such as the need for additional equipment, facilities, and adequate access may be incorporated as conditions of approval.
- **Objective 6.2.3: Adequate Fire Protection:** Application of uniform fire protection standards to development projects by fire districts.
  - **Policy 6.2.3.2:** As a requirement of new development, the applicant must demonstrate that adequate access exists, or can be provided to ensure that emergency vehicles can access the site and private vehicles can evacuate the area.

4.15.3 IMPACT ANALYSIS

METHODOLOGY

The evaluation of potential impacts on public services was based on a review of available public information on services provided by public agencies in addition to El Dorado County policies regarding level of service objectives. Google Earth was used to determine the proximity of various public services to the Project Area.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively evaluate the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the Project would have a potentially significant impact related to public services if it would:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

- Fire protection
- Police protection
- Schools
- Parks
- Other public facilities

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.15-1. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: fire protection; police protection; schools; parks; or other public facilities?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not require additional public services beyond existing levels in the Project Area. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill,

construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Effects to park facilities are analyzed in Section 4.16, Recreation. No other governmental facilities have been identified that would be affected by Project construction activities. During construction, the increased risk of vandalism and theft of unsecured equipment and supplies from construction areas might result in increased demand for police protection services. However, these types of incidents would be uncommon and would occur only during the construction period, and therefore would not substantially affect service ratios, response times, or other performance objectives for police services. Construction would not affect any school facilities, and it would not contribute to any change in population or other land use modifications that would affect local school districts. Construction activities, which would involve the presence of workers and the use of equipment that could be sources of ignition, would increase fire risk, which in the event of a wildfire incident would increase demand for fire protection services. Therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would be within the currently authorized capacity of the water conveyance facilities and these operations would not require additional public services beyond existing levels in the Project Area. **No impact** would occur.

Mitigation Measures

Mitigation Measure 4.15-1: Implement Mitigation Measure 4.20-1: Prepare and Implement a Fire Safety Plan.

The District shall prepare and implement a Fire Safety Plan prior to construction. This plan shall be implemented by the Contractor during all construction activities. The plan will describe the fire prevention process for treatment activities, weather conditions during which fire risk is elevated and all equipment operation and pile burning shall cease, equipment used to prevent fire and respond to a fire

immediately, other measures taken to reduce fire risk, responsibilities of the work crews during construction. The Fire Safety Plan will also include applicable local, state, and federal requirements, including the California Fire Code and the El Dorado County Ordinance 8.08-Fire Prevention.

Significance after Mitigation

Implementation of Mitigation Measure 4.15-1 would reduce the risk of wildfire during construction and the resulting potential additional demand for fire protection services by requiring preparation and implementation of a plan that would employ various prevention activities and require compliance with applicable local, state, and federal requirements related to fire safety. Impacts related to an increased demand for fire protection services during construction would be **less than significant with mitigation incorporated**.

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4.16 RECREATION

This section provides an analysis of potential impacts on recreation resources associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.16.1 EXISTING CONDITIONS

Recreation resources in the Project area include reservoirs associated with the South Fork American River (South Fork), the South Fork itself, and several whitewater boating runs on the South Fork between Kyburz and Folsom Reservoir. These reservoirs and river sections provide opportunities for swimming, picnicking, boating, camping, hiking, fishing, and whitewater boating.

RESERVOIRS

El Dorado Irrigation District Reservoirs

Jenkinson Lake

The El Dorado Irrigation District (District) owns and operates Jenkinson Lake. Jenkinson Lake is the District's main storage reservoir and is formed by Sly Park Dam and dike. The 41,033 acre-foot Jenkinson Lake is located within the Sly Park Recreation Area managed by the District. The reservoir provides opportunities for swimming, picnicking, camping, fishing, waterskiing, kayaking, canoeing, wake boarding, and sailing. Several popular hiking trails lead around the reservoir. The reservoir is subject to closure when the maximum boating capacity is reached. Surrounding the reservoir are 10 day use areas, 2 boat ramps, 15 campgrounds, and over 9 miles of trails that generally follow the reservoir shoreline. Non-motorized boat and paddleboard rentals are seasonally available at the reservoir. Four of the 15 campgrounds at the lake, one day use area, and parking for a popular waterfall trailhead are located at Hazel Creek upstream of the edge of Jenkinson Lake (District 2022 and 2023). The campgrounds at Hazel Creek (Rainbow, Dogwood, Hazel, and Kamloop) are open from Memorial Day weekend to Labor Day weekend. Campsites at Jenkinson Lake can be booked 6 months in advance and are extremely popular with most of the sites booked weekends from Memorial Day to Labor Day. The Sly Park Recreation Area receives visitation of more than 500,000 people a year with the busiest season from Memorial Day to Labor Day. The spring (mid-March to May) and fall (October to mid-November) are still relatively busy at the recreation area though visitation tends to be more weather dependent (i.e., high rain/snowfall limits visitation).

Forebay Reservoir

The District also owns and manages the 569 acre-foot Forebay Reservoir, which is located at the end of the El Dorado Canal. Water is held in Forebay Reservoir before entering the El Dorado Powerhouse or being delivered to the Reservoir 1 Water Treatment Plant (WTP). There are two day use areas at the reservoir that provide picnicking, bird watching, and fishing opportunities. Boating and body contact (e.g., swimming) are not allowed at the reservoir (AECOM 2013).

Lake Aloha, Caples Lake, Echo Lake and Silver Lake

There are four reservoirs upstream of the proposed Project that ultimately release water into the South Fork that are part of the District's El Dorado Hydroelectric Project, which is licensed by the Federal Energy Regulatory Commission (FERC) as FERC Project #184. Water from these reservoirs is diverted at El Dorado Diversion Dam and into the El Dorado Canal (FERC 2006). The four reservoirs provide a variety of recreation facilities and opportunities. Lake Aloha is 5,179 acre feet in size and is located in the Desolation Wilderness (FERC 2006). Because of its location in the wilderness, Lake Aloha provides opportunities for non-motorized activities such as hiking, primitive camping, swimming, wildlife viewing and photography (Regional and Economic Sciences 2002). The Pacific Crest Trail passes Echo Lake and Lake Aloha. Water from Lake Aloha reaches the South Fork via Pyramid Creek. Echo Lake is 1,943 acre feet in size and developed recreation facilities in the vicinity include the Echo Chalet, Echo Lake trailhead, and the Pacific Crest Trail (FERC 2003). Opportunities for hiking, boating, fishing, and picnicking are provided at Echo Lake (FERC 2003). Water from Echo Lake flows into Echo Creek to the Lake Tahoe Basin; however, water from Echo Lake is also diverted to the South Fork via the Echo Lake Conduit. Silver Lake and Caples Lake are the biggest of the four reservoirs at 8,640 acre feet and 20,338 acre feet respectively (FERC 2006). Developed recreation facilities provided at these reservoirs include campgrounds, fishing access areas, resorts, boat launches, trailheads, and day use areas. Recreation opportunities at these reservoirs include fishing, picnicking, boating, camping, and trail access to the Mokelumne Wilderness (Landmark Environmental Inc. 2016). Water from Silver Lake reaches the South Fork via the Silver Fork of the American River (Silver Fork). Water from Caples Lake reaches the South Fork via Caples Creek and the Silver Fork.

Sacramento Municipal Utility District Reservoirs

Slab Creek Reservoir

The Sacramento Municipal Utility District (SMUD) operates the Upper American River Project (UARP) with facilities located on the South Fork and its tributaries. One UARP component is the Slab Creek Dam, a concrete dam on the South Fork that creates Slab Creek Reservoir. SMUD operates Slab Creek Reservoir to generate power; therefore, water is not stored for any substantial length of time in the 16,600 acre-foot Slab Creek Reservoir.

Due to the steepness of the mountains surrounding the reservoir, public access to SMUD's Slab Creek Reservoir is very limited. There are two recreation sites at the reservoir; one at the east end and one at the west end. The east end of the reservoir receives less frequent use and the recreation site at this end of the reservoir is limited to daylight use only. The east end recreation site is located just downstream of Forebay Road and contains picnic sites, a small beach, a hand-only boat launch, and a restroom. The shoreline at the east end of the reservoir is used for picnicking, swimming, and boat launching. Most use at the reservoir occurs at the west end of the reservoir closer to the dam (SMUD 2016b). The recreation site at the west end of Slab Creek Reservoir contains a boat launch, parking for ten vehicles, and a restroom (SMUD 2016c). The boat launch at the west end is primarily suitable for car top watercraft and is located at elevation 1,820 feet (SMUD 2023b). The site is steep and difficult to access.

The reservoir itself is primarily used for non-motorized boats and small fishing boats (Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004). However, there are some issues with boating at the east end of the reservoir. As the reservoir elevation decreases, more of the river is exposed, resulting in paddlers having to

paddle against the current to go back to the east end boat launch and more rocks being exposed within the river channel. If the reservoir level drops during a boater's excursion on the reservoir, the boater could have difficulty boating back to the east end recreation site (Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004).

Chili Bar Reservoir

Downstream from Slab Creek Reservoir is SMUD's Chili Bar Reservoir (1,339 acre feet). Chili Bar Reservoir is formed by Chili Bar Dam, a concrete dam on the South Fork located upstream of Highway 193. The Chili Bar facilities store and regulate flows from the South Fork and releases from SMUD's White Rock Powerhouse located just upstream of Chili Bar Reservoir. Water from Chili Bar facilities is released to the South Fork and flows to Folsom Reservoir.

Public access to SMUD's Chili Bar Reservoir is difficult given the steep terrain and private lands/roads surrounding the reservoir. The south shoreline of the reservoir immediately downstream of SMUD's White Rock Powerhouse is accessible via the powerhouse access road. Recreation uses at the reservoir include hiking, picnicking, shoreline fishing, and informal camping. Due to strong currents, frequent spills over the dam spillway, and fluctuating water levels, swimming and boating are prohibited at the reservoir, but may still occur (Stewardship Council 2008). Facilities at Chili Bar Reservoir are currently undergoing updates, but will reopen to the public in the future (SMUD 2024).

Union Valley Reservoir

Union Valley Reservoir is a SMUD facility located in the Crystal Basin of Eldorado National Forest. Union Valley Dam on Silver Creek, a tributary to the South Fork, creates the 277,290 acre-foot Union Valley Reservoir. Union Valley Reservoir is operated primarily as a seasonal storage reservoir, capturing winter/spring rain and snowmelt runoff that can be used to generate electricity. Typically, during mid-summer to winter, the reservoir elevation is gradually lowered to generate electricity. From winter to mid-summer, the reservoir elevation gradually increases due to rainstorms and snowmelt (FERC 2014a). Releases from Union Valley Reservoir ultimately flow to the South Fork. Water released from Union Valley Reservoir flows through the powerhouse at Union Valley Dam into Junction Reservoir, then through the Jaybird Tunnel into Camino Reservoir, then into Camino Tunnel to Camino Powerhouse and then to the South Fork upstream of Slab Creek Reservoir. Once flows reach Slab Creek Reservoir, water passes through the White Rock Tunnel into the White Rock Powerhouse and is released into the upstream end of Chili Bar Reservoir. SMUD can release water from Union Valley Reservoir to provide additional water in the South Fork if needed to supplement flows if flows at Chili Bar Reservoir are not high enough to provide the FERC-required releases out of this reservoir.

There are a dozen campgrounds at Union Valley Reservoir, along with several day use areas, a paved bike trail, a resort and three boat launches (Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004). The reservoir is stocked with rainbow trout for fishing (SMUD undated). Boat launch elevations are 4,802 feet (Sunset), 4,808 feet (West Point), and 4,850 feet (Yellow Jacket)[1] (SMUD 2023c). Recreation opportunities at the reservoir include fishing, swimming, motorized and non-motorized boating, camping, picnicking, and biking. The

[1] Boat launching is available at or above these elevations.

majority of recreation use occurs in the summer, though there is fishing and boating use in the winter as well (Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004).

Ice House Reservoir

Located southeast of Union Valley Reservoir in the Crystal Basin is Ice House Reservoir, which is 45,960 acre feet in size (FERC 2014a). Ice House Reservoir is operated primarily as a seasonal storage reservoir, capturing winter/spring rain and snowmelt runoff that can be used to generate electricity. Typically, during mid-summer to winter, the reservoir elevation is gradually lowered to generate electricity. From winter to mid-summer, the reservoir elevation gradually increases due to rainstorms and snowmelt (FERC 2014a).

Recreation facilities at the reservoir include campgrounds, a youth camp, a private resort, day use areas, a boat launch, and a bike trail (Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004). Recreation opportunities at the reservoir include camping, fishing, picnicking, swimming, boating, hiking and biking (SMUD 2016a). Scheduled releases of water from Ice House Reservoir provide whitewater boating opportunities on South Fork Silver Creek between Ice House Dam and Junction Reservoir (SMUD 2016a). SMUD can release water out of Ice House Reservoir into the South Fork if needed to supplement flows if flows at Chili Bar Reservoir are not high enough to provide the FERC-required releases out of this reservoir.

Loon Lake Reservoir

Located at the highest altitude of the Crystal Basin reservoirs at 6,545 feet, Loon Lake Reservoir is 76,200 acre feet in size (FERC 2014a, Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004). Loon Lake is operated primarily as a seasonal storage reservoir, capturing winter/spring rain and snowmelt runoff that can be used to generate electricity. Typically, during mid-summer to winter, the reservoir elevation is gradually lowered to generate electricity. From winter to mid-summer, the reservoir elevation gradually increases due to rainstorms and snowmelt (FERC 2014a).

Recreation facilities at Loon Lake Reservoir include campgrounds, lodges, trails, and a boat launch. Opportunities to participate in a wide variety of recreation activities are available at Loon Lake Reservoir, including opportunities for fishing, boating (motorized and non-motorized), camping, hiking, picnicking, off-highway vehicle (OHV) use, horseback riding, mountain biking, swimming, and scenic viewing (Devine Tarbell and Associates, Inc. and The Louis Berger Group 2004). Trailheads for the Rubicon OHV Route and trails into the Desolation Wilderness are available from Loon Lake Reservoir (SMUD 2016a). Similar to Ice House Reservoir and Union Valley Reservoir, SMUD can release water out of Loon Lake Reservoir into the South Fork if needed to supplement flows if flows at Chili Bar Reservoir are not high enough to provide the FERC-required releases out of this reservoir.

Folsom Reservoir

Flows from the South Fork and the North Fork of the American River combine within Folsom Reservoir. Folsom Reservoir is part of the Central Valley Project (CVP) managed by the Bureau of Reclamation and is 976,000 acre feet in size (Bureau of Reclamation 2023). Folsom Reservoir is surrounded by the Folsom State Recreation Area (SRA), which is managed by California State Parks. The reservoir and SRA provide opportunities for swimming, fishing, boating, camping, boat camping, picnicking, horseback riding, biking, and hiking. Recreation facilities within the SRA include hand and vehicle boat launches, campgrounds (including group and recreational vehicle

[RV] campgrounds), a marina, picnic areas, restrooms, swimming areas, and trails (California State Parks 2022). The water level within Folsom Reservoir normally fluctuates 40 feet between early summer and early winter, which affects the availability of boat ramps, beaches and other water-dependent facilities (California State Parks and Bureau of Reclamation 2010). Also within the SRA and CVP is Lake Natoma, a regulating reservoir for water releases out of Folsom Reservoir. Lake Natoma is immediately downstream of Folsom Reservoir and impounded by Nimbus Dam (Recreation.gov 2024).

RIVERS

South Fork

The South Fork and public lands adjacent to the South Fork provide a range of recreation opportunities including fishing, hiking, biking, camping, horseback riding, picnicking, gold panning, wildlife viewing, hunting, and whitewater boating.

Fishing opportunities are available along the entire South Fork. Game species generally include rainbow and brown trout and California Department of Fish and Wildlife stocks rainbow trout at various locations on the South Fork (USFS 2023b). Public access to the river from Slab Creek Reservoir upstream to Kyburz is provided on National Forest System lands managed by the Eldorado National Forest. From Peavine Ridge Road upstream to Kyburz, US Highway 50 provides primary vehicle access to the South Fork. Highway pull-outs and designated Forest Service sites such as picnic areas and the Sand Flat Campground provide river access for bank fishing. From Peavine Ridge Road downstream to Forebay Road, there is no road access to the river and thus likely little bank fishing occurs in this stretch of the river. Downstream of Chili Bar Reservoir, fishing is popular from both boats and the riverbank. Public river access downstream of Chili Bar Reservoir can be found at Bureau of Land Management (BLM) lands (Dave Moore Nature Area, Greenwood Creek, and from Magnolia Ranch to Salmon Falls), Marshall Gold Discovery State Historic Park managed by California State Parks, and Henningsen Lotus Park managed by El Dorado County. Fishing on the South Fork east of Highway 49, which is located between Lotus and Coloma, is allowed from the last Saturday in April to November 15. Fishing is available year-round west of Highway 49 (generally from Lotus to Folsom Reservoir) (USFS 2023b).

In four areas along the South Fork downstream of Chili Bar Reservoir there are trails along the river that provide opportunities for hiking, horseback riding, and biking. There are trails within the Marshall Gold Discovery State Historic Park, Henningsen Lotus Park, and on BLM lands with trailheads at Old Flume Trail, Dave Moore Nature Area, Greenwood Creek, Magnolia Ranch, and Cronan Ranch (BLM 2018, El Dorado County undated, California State Parks 2017). Many of these same areas also provide picnicking, gold panning, bird watching and wildlife viewing opportunities. Upstream of Chili Bar Reservoir, there are also opportunities for these activities at Forest Service picnic areas and the Forest Service's Sand Flat Campground, as well as from various pull-outs along Highway 50 and from Forebay Road. Hunting opportunities are also available on Forest Service and BLM lands near the South Fork.

In-stream recreation activities also occur in the South Fork such as whitewater boating (described below), swimming, tubing, and wading. These activities occur where there is public access to the river and appropriate river conditions, such as Henningsen Lotus Park. The Henningsen Lotus Park Concept Master Plan notes that the majority of park use occurs between Memorial Day and Labor Day "due to the generally mild weather and corresponding to prime boating season" (El Dorado County 2014).

Lower American River

Downstream of Lake Natoma's Nimbus Dam, the Lower American River passes through several parks that are part of the American River Parkway and provide opportunities for boating, fishing, picnicking, as well as bicycling, walking, and horseback riding along the Jedediah Smith Memorial Trail that follows the river from Folsom Reservoir to the confluence with the Sacramento River (Sacramento County undated, CalWild 2023). The Lower American River is also a state and federal wild and scenic river with a "Recreation" designation (Caltrans 2007a and b).

WHITEWATER BOATING ON THE SOUTH FORK

The South Fork is especially known for its whitewater boating opportunities. As described by the BLM, the South Fork "is one of the most popular (and most populated) whitewater river runs for rafting and kayaking in the state. The river offers short shuttles between access points, several trip options, high spring flows, and dependable boating flows during the summer months when other rivers have dropped too low" (BLM 2023). Many whitewater boating runs, or whitewater boatable river sections, are located on the South Fork. There are seven common whitewater boating runs between Kyburz and Folsom Reservoir, as described in Table 4.16-1. Table 4.16-1 describes the put-in (or beginning) of each run, the take-out (or ending point) of the run, level of difficulty based on the International Scale of River Difficulty, boatable flow range of the run, and whether there are regulatory required recreation flows for each run. The identified put-in and take-out locations are the commonly used locations; other put-in and take-out locations may be available for some runs. The International Scale of River Difficulty includes six classes: Class I, Class II (Novice), Class III (Intermediate), Class IV (Advanced), Class V (Expert), and Class VI (Extreme and Exploratory Rapids) (American Whitewater 2024h). The boatable flow range of each run is the range of flows in which whitewater boating opportunities are generally considered to be available and may vary by craft type and difficulty. The boatable flow ranges and associated difficulty classes in Table 4.16-1 were identified based on a review of *The Best Whitewater in California: The Guide to 180 Runs* by Stanley and Holbek (1998) and the American Whitewater webpages for each South Fork run (American Whitewater 2024a through g).

The four runs upstream of the Chili Bar run are generally more technical, with a higher level of difficulty (III-V) than the runs from Chili Bar downstream to Folsom Reservoir. There is personal whitewater boating use of the South Fork upstream of the Chili Bar run and both personal and commercial whitewater boating use of the South Fork from the Chili Bar run downstream to Folsom Reservoir. The 21 miles of river from Chili Bar to Folsom Reservoir (Salmon Falls) can be commercially boated in one to two days. There is also use of a commercial shuttle service for the Slab Creek run. Though the Coloma to Greenwood run take-out is listed as the BLM Greenwood Creek River Access in Table 4.16-1, users can also end at Henningsen Lotus Park. Likewise, the Gorge run could also start at Henningsen Lotus Park.

Table 4.16-1. South Fork American River Whitewater Runs from Kyburz to Folsom Reservoir (upstream to downstream).

Run	Put-In	Take-out	Difficulty	Boatable Flow Range (in cfs)**	Required Recreation Flows (in cfs)*
Kyburz to Riverton	Kyburz	US Highway 50 bridge at Riverton	III–IV	600–1,200	None
			IV–V	1,200–3,000	None
Riverton to Peavine	US Highway 50 bridge at Riverton	Peavine Ridge Road	III–IV	600–4,000	None
Golden Gate	Peavine Ridge Road	Forebay Road	IV–V(V+)	600–2,000	None
Slab Creek	Slab Creek Dam	White Rock Powerhouse	IV–V	500–2,000	850–1,500*
Chili Bar	Highway 193	Coloma	II–III+	700–1,750	1,300–1,750*
			III–IV	1,750–10,000	
Coloma to Greenwood	Coloma	BLM Greenwood Creek River Access	II	600–12,000	None
The Gorge	BLM Greenwood Creek River Access	Folsom Reservoir (Salmon Falls Road Bridge)	II–III	800–2,000	None
			III–IV	2,000–10,000	None

Sources: Stanley and Holbek 1998, American Whitewater 2024a through g
Notes:
cfs = cubic feet per second
Put-in and take-out locations are the commonly used locations; other put-in and take-out locations may be available for some runs.
Difficulty – A measure of the difficulty of a rapid or river is based on the International Scale of River Difficulty. The scale includes six classes: Class I, Class II (Novice), Class III (Intermediate), Class IV (Advanced), Class V (Expert), and Class VI (Extreme and Exploratory Rapids) (American Whitewater 2024h).
* See related FERC Orders Issuing New License for UARP and Chili Bar Projects (FERC 2014a and b) for additional details on recreation flow requirements.
** A range of boatable flows for each run, and associated difficulty classes, were identified based on a review of The Best Whitewater in California: The Guide to 180 Runs by Stanley and Holbek (1998) and the American Whitewater webpages for each South Fork run (American Whitewater 2024a through g).

There are two portions of the South Fork where minimum recreation flows are required, and flows are released specifically to meet those flow requirements and provide scheduled opportunities for recreation on the river. The two portions of the South Fork where recreation flows are required are below Slab Creek Dam (i.e., Slab Creek run) and below Chili Bar Dam (i.e., the Chili Bar run). In both sections, the required minimum recreation flows depend on the water year type. Per the FERC Order Issuing New License for the UARP, SMUD is required to spill water from Slab Creek Reservoir to provide recreation flows between 850 and 1,500 cubic feet per second (cfs) between 10:00 a.m. and 4:00 p.m. for 6 days in no less than three events in the period beginning March 1 and ending May 31 in below normal, above normal and wet water year types. One of the three required events can be replaced with a three-day event on Memorial Day weekend if conditions permit. The recreation flows are required for the first 15 years of the license period (2014 to 2029). After year 15, additional recreation flows may be required depending on if triggers for increasing recreation flow days are met (FERC 2014a) and could include kayaking and rafting flows in critically dry and dry years and more recreation flow days in other water year types. If triggers are not met, then the existing recreation flow release schedule would continue.

Recreation flows from Chili Bar Dam are more complicated than releases from Slab Creek Reservoir and require a certain number of hours of recreation flow on certain days of the week depending on the water year type and month. Table 4.16-2 provides the recreation flow requirements below Chili Bar Dam as described in the FERC Order Issuing New License for the Chili Bar Project (FERC 2014b). Due to these very consistent required recreation flows, the Chili Bar run and runs downstream of Chili Bar have regular boatable flows in the summer and early fall when other runs experience declining flows and may not be boatable. As indicated from the recreation flow release schedule, the whitewater boating season for the Chili Bar run is generally from March through October. This season applies to the runs downstream of Chili Bar (Coloma to Greenwood and the Gorge)

Table 4.16-2. Minimum Recreation Flows below Chili Bar Dam per the FERC Order Issuing New License for the Chili Bar Project (in cfs).

Water Year Type	Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Super Dry	April 1 – Friday before Memorial Day	3 hrs @ 1,300	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300
	Memorial Day – Labor Day[1]	3 hrs @ 1,300	-	-	3 hrs @ 1,300	3 hrs @ 1,300	5 hrs @ 1,300	5 hrs @ 1,300
	Tuesday after Labor Day – September 30	-	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300
	October 1- March 31	-	-	-	-	-	3 hrs @ 1,300	-
Critically Dry	March 1 – Friday before Memorial Day	3 hrs @ 1,300	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300
	Memorial Day – Labor Day[1]	3 hrs @ 1,300	-	-	3 hrs @ 1,300	3 hrs @ 1,300	5 hrs @ 1,500	5 hrs @ 1,500
	Tuesday after Labor Day – September 30	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,300
	October 1 – February 28/29	-	-	-	-	-	3 hrs @ 1,300	-
Dry	March 1 – Friday before Memorial Day	3 hrs @ 1,300	3 hrs @ 1,300	-	-	3 hrs @ 1,300	3 hrs @ 1,500	3 hrs @ 1,500
	Memorial Day – Labor Day[1]	3 hrs @ 1,300	3 hrs @ 1,300	-	3 hrs @ 1,300	3 hrs @ 1,300	5 hrs @ 1,500	5 hrs @ 1,500
	Tuesday after Labor Day – September 30	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,300
	October 1 – February 28/29	-	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300
Below Normal	March 1 – Friday before Memorial Day	3 hrs @ 1,300	3 hrs @ 1,300	-	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,500	3 hrs @ 1,500
	Memorial Day – Labor Day[1]	3 hrs @ 1,300	3 hrs @ 1,300	-	3 hrs @ 1,300	3 hrs @ 1,300	6 hrs @ 1,500	6 hrs @ 1,500
	Tuesday after Labor Day – September 30	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,500	3 hrs @ 1,500
	October 1 – 31	3 hrs @ 1,300	-	-	-	3 hrs @ 1,300	3 hrs @ 1,500	3 hrs @ 1,500
	November 1 – February 28/29	-	-	-	-	-	3 hrs @ 1,300	3 hrs @ 1,300
Above Normal	March 1 – Friday before Memorial Day	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,300	3 hrs @ 1,300	4 hrs @ 1750	4 hrs @ 1750
	Memorial Day – Labor Day[1]	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	6 hrs @ 1750	6 hrs @ 1750
	Tuesday after Labor Day – September 30	-	-	-	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500
	October 1 – 31	3 hrs @ 1,300	-	-	-	3 hrs @ 1,300	3 hrs @ 1,500	3 hrs @ 1,500
	November 1 – February 28/29	-	-	-	-	-	3 hrs @ 1,500	3 hrs @ 1,500
Wet	March 1 – Friday before Memorial Day	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	6 hrs @ 1750	6 hrs @ 1750
	Memorial Day – Labor Day[1]	4 hrs @ 1,500	4 hrs @ 1,500	4 hrs @ 1,500	4 hrs @ 1,500	4 hrs @ 1,500	6 hrs @ 1750	6 hrs @ 1750
	Tuesday after Labor Day – September 30	-	-	-	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500	3 hrs @ 1,500
	October 1 – 31	3 hrs @ 1,300	-	-	-	3 hrs @ 1,300	3 hrs @ 1,500	3 hrs @ 1,500
	November 1 – February 28/29	-	-	-	-	-	3 hrs @ 1,500	3 hrs @ 1,500

Source: FERC 2014b
Notes
@ = at
cfs = cubic feet per second
hrs = hours
[1] The "Memorial Day – Labor Day" period refers to Saturday of Memorial Day weekend through Monday of Labor Day weekend.

due to the flow releases coming from the Chili Bar run and the general warmer weather during this season. Within this March through October season, peak whitewater boating use occurs from Memorial Day through Labor Day weekend due to required releases and higher air temperatures; there is less use from March through Memorial Day (see e.g., Whitewater Excitement Inc. 2023 and El Dorado County 2018). The runs upstream of Chili Bar, except Slab Creek, likely have less use in the spring as well due to weather and difficulty accessing the runs during late winter snows, and likely have the most use in the early summer (May/June/July) during the snowmelt runoff season before flows decrease naturally to levels below the boatable flow range.

4.16.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

1989 Eldorado National Forest Land and Resource Management Plan

The U.S. Forest Service manages the Eldorado National Forest according to the management direction, standards and guidelines described in the 1989 Eldorado National Forest Land and Resource Management Plan (USFS 2023a). This plan provides direction on management of recreation throughout the entire forest, including the lands surrounding the South Fork between Kyburz and Slab Creek Reservoir.

2008 Sierra Resource Management Plan

The 2008 Sierra Resource Management Plan contains the goals, objectives, and management actions for resources, including recreation, within lands administered by the BLM's Folsom Field Office. The BLM lands west of Chili Bar Reservoir are managed as the South Fork American River Special Recreation Management Area and are managed in accordance with the South Fork American River Management Plan and its amendments (BLM 2008).

El Dorado Hydroelectric Project (Project #184) FERC License

FERC issued a license order to the District in 2006 for the El Dorado Project (FERC Project #184) that provides rules and conditions for operation of the hydroelectric project for 40 years. The license order includes development of a recreation implementation plan and recreation surveys. Most recreation development would occur upstream of Kyburz (FERC 2006). The District has been implementing the plan since adoption of the FERC license, including the rebuild of several recreation facilities at Silver Lake and Caples Lake Campgrounds.

Upper American River Project (#2101) FERC License

FERC issued a license order to SMUD in 2014 for the Upper American River Project (FERC Project #2101) that provides rules and conditions for operation of the hydroelectric project for 50 years. The license order identifies minimum recreational flows below Slab Creek Dam, reservoir level requirements for Slab Creek Reservoir, and requires several plans to be developed for recreation, including Recreation Access Plan for Slab Creek Reservoir at Forebay Road, Recreation Implementation Plan, Slab Creek Reservoir West End Boating Access Plan, Union Valley Reservoir Boating Management Plan, Crystal Basin Reservoirs Recreation Plan, and Whitewater Boating Monitoring Plan. These plans outline improvements to access at Slab Creek Reservoir, improvements and restoration at Union Valley Reservoir, management of boating use at Union Valley Reservoir, and monitoring of whitewater boating use on the Slab Creek run (FERC 2014a, SMUD 2023a, SMUD 2015, SMUD 2016a-d).

SMUD has been developing and implementing these plans, including updating recreation facilities at Slab Creek Reservoir and Union Valley Reservoir.

Chili Bar Project (#2155) FERC License

FERC issued a license order for the Chili Bar Project (FERC Project #2155) to Pacific Gas & Electric Company (PG&E) in 2014 that provides rules and conditions for the operation for the hydroelectric project for 49 years. The license order identifies the minimum recreation flows to be provided below Chili Bar Dam (see Table 4.16-2 above), as well as development of a recreation plan that describes implementation of the recreation improvements required by BLM (parking, trail, kiosk, picnic table) (FERC 2014b). The Chili Bar Project was acquired by SMUD from PG&E and the FERC license was transferred to SMUD in 2021 (FERC 2021). SMUD continues to implement all FERC required recreation conditions associated with the Chili Bar Project.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Government Code Section 65560(b)

California Government Code Section 65560(b) defines "open space land" as any parcel or area of land or water that is unimproved and devoted to an open space use. State law requires that the local general plans include an Open Space element to promote the retention of open space for recreational purposes.

State Water Resources Control Board – Water Right Permit 21112

Conditions 8, 9 and 10 of the State Water Resources Control Board (SWRCB) Water Right Permit 21112 identify End of Month Lake Level Operational Requirements to protect summer recreational uses at Caples Lake, Silver Lake, and Lake Aloha (SWRCB 2023). The end of month lake levels must remain above historic minimum levels, and average end of month lake levels, as reviewed at five-year intervals, must remain at or above historic average levels at each reservoir. Conditions 8, 9, and 10 include a table identifying the minimum and average lake level requirements by month and water year type for each reservoir.

2010 Folsom Lake State Recreation Area General Plan and Resource Management Plan

The 2010 Folsom Lake SRA plan is a combined State Parks General Plan and Bureau of Reclamation Resource Management Plan that meets state planning requirements and Reclamation land planning and management requirements. The plan provides a framework for development, use and management of the SRA, including goals and guidelines for both the SRA and specific areas (California State Parks and Bureau of Reclamation 2010). The plan includes one whitewater rafting goal, to "improve water access and minimize congestion at whitewater rafting facilities in the SRA" (California State Parks and Bureau of Reclamation 2010).

2023 Folsom Lake State Recreation Area and Folsom Powerhouse State Historic Park Road and Trail Management Plan

The recent Road and Trail Management Plan for Folsom Lake SRA includes management direction for the development and operations and maintenance of roads and trails within the SRA, including allowable uses on trails, facility needs, and decommissioning/restoration of roads and trails (California State Parks 2023).

1979 General Plan for Marshall Gold Discovery State Historic Park

Management direction for the Marshall Gold Discovery State Historic Park is provided in the 1979 General Plan (El Dorado County 2012).

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply with those goals and policies and use them as a metric for formulating an impact analysis (El Dorado County 2004, as amended).

- **Goal 9.1:** Parks and Recreation Facilities: Provide adequate recreation opportunities and facilities including developed regional and community parks, trails, and resource-based recreation areas for the health and welfare of all residents and visitors of El Dorado County.
  - **Policy 9.1.1.7:** Encourage and support efforts of independent recreation districts to provide parks and recreation facilities. The joint efforts of Community Services Districts, independent recreation districts, school districts, cities, and the County to provide parks and recreation facilities shall also be encouraged.
  - **Policy 9.1.2.8:** Integrate and link, where possible, existing and proposed National, State, regional, County, city and local hiking, bicycle, and equestrian trails for public use.
- **Objective 9.1.3:** Incorporation of Parks and Trails: Incorporate parks and non-motorized trails into urban and rural areas to promote the scenic, economic, and social importance of recreation and open space areas.
  - **Policy 9.1.3.3:** Coordinate with Federal, State, other agencies, and private landholders to provide public access to recreational resources, including rivers, lakes, and public lands.

2012 El Dorado County Parks and Trails Master Plan

The El Dorado County Parks and Trails Master Plan provides "direction and implementation strategies to guide the acquisition, development, and operation of County-owned parks and trails in the Plan Area" (El Dorado County 2012). Henningsen Lotus Park is an El Dorado County Park and thus was included in this Master Plan. El Dorado County also developed a Conceptual Master Plan for Henningsen Lotus Park in June 2014 that includes proposed improvements to the park such as improved river access trails, and recommends further study regarding potential whitewater boating features that could be incorporated into the park (El Dorado County 2014).

Relevant goals and policies from the El Dorado County Parks and Trails Master Plan (El Dorado County 2012) are:

- **Goal 1:** Health and Wellness: El Dorado County residents will have reasonable access to a variety of park and trail facilities to enhance their opportunities for physical, mental, and social health, and well-being.
    - **Objective 1.1:** Park and Trail Locations: Park and trails facilities shall be located taking into consideration the potential to provide recreational opportunities to underserved populations and to expand the diversity of recreational experiences available to County residents.
        - **Policy 1.1.2:** Some trails should be located to provide connections to neighborhoods or public places such as schools, parks, and civic areas to encourage residents to incorporate walking and cycling as a regular activity.

4.16.3 IMPACT ANALYSIS

METHODOLOGY

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 WTP and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or

grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.
- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

The following subsections describe the methodology for determining impacts to recreation at affected reservoirs, rivers, and whitewater boating runs on the South Fork. Hydrologic modeling conducted for the Project was the primary data source of information about potential changes to water levels that may impact recreation. The Hydrologic Engineering Center Reservoir System Simulation (HEC-ResSim) computer model was used to perform an hourly analysis of the Project's potential effects on flows in the American River basin upstream of Folsom Reservoir. A technical report with detailed information regarding this hydrologic modeling conducted in support of the proposed Project can be found in Appendix B. All hydrologic modeling included four scenarios (baseline, project, future baseline, future project) and at least two comparisons between scenarios: baseline versus project and future baseline versus future project conditions. The future baseline was used to identify baseline conditions with future increases in water demands that would occur absent the Project. The characteristics of the baselines include:

- Baseline: Current water demands are based on an average water use for all District sources (34,512 acre feet) for the years 2017 to 2021.
- Future Baseline: Forecasted future water demands based on water use projections from the District's 2020 Urban Water Management Plan (UWMP; Table 4-11; District 2021) for the year 2045 for all District sources (43,320 acre feet). This forecasted increase in water demands would occur with or without the proposed Project.

HEC-ResSim hydrologic modeling has shown that there would be no effects to reservoir storage or elevations from the proposed Project at District reservoirs upstream of the El Dorado Diversion Dam (Lake Aloha, Caples Lake, Echo Lake, and Silver Lake) or at two of the SMUD reservoirs (Ice House Reservoir and Loon Lake Reservoir) (Appendix F). Thus, these reservoirs are not discussed further in the analysis below. Under the proposed Project, the first location on the South Fork where District diversions would increase would be at the El Dorado Diversion Dam. The South Fork upstream of the El Dorado Diversion Dam would not be affected by the Project and is not discussed further in the analysis below. In addition, there is no recreation use allowed at the El Dorado Canal or Hazel Creek Tunnel. Therefore, there is no discussion of recreation impacts at these facilities. Reservoirs and rivers described in the impact analysis below include all those where modeling shows a change in elevation or flow resulting from the proposed Project.

Reservoirs

HEC-ResSim hydrologic modeling was conducted to determine potential changes to reservoirs that could be affected by the Project due to their location on the South Fork or their interconnectedness to operation of reservoirs on the South Fork. HEC-ResSim modeling results for water years 1975 through 2021 were used to determine potential changes to end of month reservoir elevations. Changes to the average, maximum, and minimum end of month reservoir elevation were reviewed for all water years combined. In addition, changes in end of month reservoir elevation for each month of each water year in the data set under baseline versus project and future baseline versus future project conditions were also reviewed to identify trends in changes by month, water year type, and magnitude. Any changes in reservoir elevations were then reviewed to determine potential effects on the usability of each reservoir for recreation activities. Modeling results specific to the reservoirs listed in Section 4.16.1 are described in detail in Appendix F. HEC-ResSim modeling does not include Folsom Reservoir; therefore, detailed modeling results for this reservoir are not available.

Rivers

Changes in streamflow on the South Fork in cfs were identified by reviewing HEC-ResSim hydrologic modeling results for the Project for the water years 1975 to 2021 under both baseline versus project conditions and future baseline versus future project conditions. A summary of all the years for each water year type was reviewed to identify average changes by month in each water year type. Any changes in streamflow were reviewed for trends in changes by month, water year type, and magnitude. These changes were then analyzed for potential effects on river recreation uses considering access to the river, ability to use the streambank, and in-channel conditions for instream activities. Modeling results for the South Fork from the El Dorado Diversion Dam to the confluence with Folsom Reservoir are described in detail in Appendix F. HEC-ResSim modeling does not include the Lower American River; therefore, detailed modeling results for this river section are not available.

Whitewater Boating on the South Fork

The basis for quantifying whitewater boating recreation opportunities on the South Fork and how the Project may change these opportunities was the American Whitewater's boatable days study framework (American Whitewater 2023). First, the boatable flows were identified for each run on the South Fork from Kyburz to Folsom Reservoir. The whitewater boating run upstream of Kyburz, the Lover's Leap run from Strawberry to Kyburz, was not included as flows upstream of the El Dorado Diversion Dam at Kyburz would not be affected by the Project as described in Appendix F. A range of boatable flows for each run (Table 4.16-1) was based on a review of *The Best Whitewater in California: The Guide to 180 Runs* by Stanley and Holbek (1998) and the American Whitewater webpages for each South Fork run (American Whitewater 2024a through g). There could be other boatable flow ranges depending on personal preference, personal experience, and/or craft used. However, the analysis in this EIR uses the boatable flows based on the published sources identified above, as these are based on available literature, rather than individual interpretations, which may vary widely with user experience and preference. HEC-ResSim hydrologic modeling results were then reviewed to determine how many days these boatable flows were present on each run. The days where boatable flows were present are referred to as boatable days. A boatable day was defined for this analysis as three consecutive hours of flows within the run's specified boatable flow range between the hours of 7am and 7pm. The duration of three hours was used as the basis for a boatable day because this is the shortest amount of time for FERC-required Chili Bar recreational flows, and most runs can be accomplished in three hours. Though daylight hours vary over the course of a year, 7am to 7pm was used to generally cover most daylight hours in a day. Hourly river modeling results were post-processed to determine if boatable day conditions were met for each day in each month of the dataset (1975 to 2021). Flows for each whitewater run were based on the put-in location (beginning point of the run). If a run had different boatable ranges based on difficulty class, then an analysis of boatable days was conducted for each boatable range separately.

The number of boatable days under baseline, project, future baseline, and future project conditions were calculated for each month in the dataset and then averaged together by water year type and month. These monthly averages of boatable days by water year type were then rounded to the nearest whole day to be consistent with other studies that used the American Whitewater boatable days study framework. The average number of boatable days in each month for each water year type were then compared – baseline versus project and future baseline versus future project conditions – to identify changes in the number of boatable days for each month by water year type. The number of boatable days in each month for each water year type was also compared – baseline versus project and future baseline versus future project conditions – to identify the maximum change, both positive and negative, in the number of boatable days by month for each water year type.

The changes in the number of boatable days were then analyzed for potential effects on whitewater boating recreation uses considering run difficulty, timing of changes in boatable days (season), and commercial or public use. Impacts to whitewater boating are discussed by run, as the effects are different for each run.

THRESHOLDS OF SIGNIFICANCE

Recreation thresholds based on Appendix F of the State CEQA guidelines are based on increased use of neighborhood and regional parks and other recreational facilities that result in substantial physical deterioration of the facility or if the project includes recreational facilities or requires new recreation facilities that would result in construction with adverse physical effects on the environment. As noted in California Code of Regulations Title 14, Section 15064(b), an activity's significance may vary with the setting. Due to the Project's potential effects on

water-dependent recreation activities such as whitewater boating, the thresholds based on Appendix F of the State CEQA guidelines were not appropriately tailored to address impacts from the proposed Project. Thus, consistent with guidance in the State CEQA guidelines and California Code of Regulations Title 14, Section 15064.7, the District developed its own threshold of significance for the proposed Project's potential impacts on recreation. The following is the Project-specific threshold:

The Project would result in a significant impact on recreation if it would:

- Result in substantial adverse changes to, or loss of, recreational uses affecting a substantial number of people.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.16-1. Would the Project result in substantial adverse changes to, or loss of, recreational uses affecting a substantial number of people?

Operational Impacts (Existing Infrastructure)

The existing infrastructure phase of the proposed Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam. Existing infrastructure would be operated to increase consumptive diversions in the winter/spring and, at times, decrease consumptive diversions in the summer. The following describes potential impacts to recreation from operation of existing infrastructure at the diversion and conveyance rates described above. Impacts to recreation are described below in the same structure as Section 4.16.1 – reservoirs, rivers and whitewater boating on the South Fork.

Reservoirs

Recreation opportunities at Project area reservoirs include water-based uses such as motorized and non-motorized boating activities (waterskiing, kayaking, canoeing, wake boarding, sailing, etc.), boat fishing, and swimming, as well as land-based uses such as picnicking, camping, shoreline fishing, hiking, biking, horseback riding, wildlife viewing, bird watching, and OHV use.

District Reservoirs

Under Project operations utilizing existing infrastructure, Jenkinson Lake would have an increased minimum end of month reservoir elevation and increased average end of month reservoir elevation as shown in the modeling results (Appendix F, Tables 1 and 2). The increases in the minimum end of month reservoir elevation of Jenkinson Lake shown in modeling range from 20-41 feet in the comparison of the baseline to project conditions and from 51-81 feet in the comparison of the future baseline to future project conditions. The increases in minimum end of month reservoir elevation associated with the Project are the result of P-21112 water being re-diverted to Jenkinson Lake for immediate use or diversion to storage, which effectively conserves or supplements storage in Jenkinson Lake. Conserving or supplementing storage results in a fuller reservoir throughout the year (i.e., increased reservoir elevation), especially during the peak summer recreation use period, which typically extends from Memorial Day to Labor Day. A fuller reservoir results in more shoreline length for bank fishing and other shoreline uses, less distance to walk to the water's edge, less exposure of in-water hazards, as well as more surface area for boating. The reservoir can close to additional boaters when the maximum boating capacity is reached; with more surface area for boating, the boating capacity could remain at higher levels compared to existing conditions. Therefore, there would be **beneficial** impacts to recreation at Jenkinson Lake.

Due to water being routed through the Hazel Creek Tunnel to Jenkinson Lake for consumptive purposes under the Project, less water would continue down the El Dorado Canal to Forebay Reservoir for power generation. Forebay Reservoir is a re-regulating reservoir that routinely fluctuates in reservoir elevation. Modeling results show that even with slight changes in end of month reservoir elevations under existing infrastructure operations, Forebay Reservoir elevations would remain within the existing range of operations as dictated by demands for consumptive use and hydropower generation similar to current conditions. Swimming and boating are not allowed at the reservoir and thus Project operations with existing infrastructure would not affect these activities. Under Project operations with existing infrastructure, the reservoir would still be accessible to fishing and land-based recreation uses at the reservoir (picnicking, bird watching) would not be substantially affected by continued fluctuation in reservoir elevation within the existing operational range. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** at Forebay Reservoir.

SMUD Reservoirs

Under Project operations with existing infrastructure, the District would increase diversions for consumptive use purposes and decrease non-consumptive diversions for hydropower purposes at the El Dorado Diversion Dam. This change in operations would result in less water being returned to the South Fork below the El Dorado Powerhouse. This reduction in flow in the South Fork may affect the water levels or operation of SMUD's reservoirs. Project operations also include some shifting of the timing of the District's consumptive diversions, with more consumptive diversions occurring in the winter/spring and, at times, less consumptive diversions occurring in the summer.

With Project operations using existing infrastructure, there may be changes in the amount of water that reaches SMUD reservoirs on the South Fork, resulting in changes to reservoir elevations for SMUD reservoirs on the South Fork (Chili Bar and Slab Creek Reservoirs) and Union Valley Reservoir, which SMUD uses to provide additional water to Chili Bar Reservoir when needed to meet FERC-required flow releases. Modeling results show that these three reservoirs operated by SMUD (Chili Bar, Slab Creek and Union Valley Reservoirs) may have small changes to end of month reservoir elevations in some critically dry years (Appendix F). These changes include a one foot decrease in end of month reservoir elevation in the spring (February, April), with a small increase in end of month reservoir elevation (one to two feet) in the summer (June through September) in baseline versus project conditions and a one to two foot decrease in the summer in future baseline versus future project conditions.

Because these changes in reservoir surface elevation are relatively minor and only occur during a few months in critically dry years, they would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities. Though visitors may have to walk a few additional feet to reach the shoreline in spring or summer months in some critically dry years, the reservoir would still be accessible to fishing, swimming, and other shoreline uses. An increase in reservoir elevation in the summer would result in beneficial effects for shoreline uses as visitors would have less distance to walk to reach the shoreline and more shoreline length upon which to fish/use. Small changes in reservoir elevation would also likely not substantially affect the ability of people to participate in non-motorized boating because often the craft used for non-motorized boating are hand-launched; therefore, although participants may have to walk a few additional feet to reach the shoreline in some months of critically dry years the reservoir would still be accessible to non-motorized boating. At Slab Creek Reservoir, a slightly lower reservoir elevation could also expose more rocks and require boaters to

paddle slightly further upstream to take out. These conditions currently occur as well when certain releases happen. Conversely, in the summer, when most reservoir boating occurs, the shoreline at SMUD reservoirs could be closer to reach for hand-launching of non-motorized boats with a slight increase in end of month reservoir elevation under baseline versus project conditions. In addition, with a slightly higher reservoir elevation in the summer at Slab Creek Reservoir, there would be less rock exposure and less paddling upstream required. Motorized boating is generally restricted by the reservoir elevations at which the existing boat launches are usable. A one to two foot reservoir elevation decrease in the spring or summer of some critically dry years would likely not result in an increased inability of boaters to launch from the existing boat launches at Union Valley and Slab Creek Reservoirs based on modeling results. An increase in reservoir elevation in the summer may result in fewer navigation hazards exposed and would benefit the most recreationists compared to other seasons of use as most on-water recreation at the reservoirs occurs during the summer. Changes in reservoir elevation would not affect the ability of recreationists to participate in land-based activities such as picnicking, hiking, biking, OHV use, and camping. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** at Slab Creek, Chili Bar, and Union Valley Reservoirs.

Folsom Reservoir

Project operations with existing infrastructure would change river diversions upstream of Folsom Reservoir on the South Fork, resulting in a change in inflow to Folsom Reservoir from the South Fork that could affect the elevation of Folsom Reservoir. However, the changes in inflow to Folsom Reservoir would be relatively minor.

As described in Section 4.16.1, existing changes in reservoir elevation already affect the availability of water-based recreation facilities such as boat ramps and beaches at Folsom Reservoir. The reservoir water levels "normally fluctuate between 440 feet in early summer and 405 feet in early winter" (California State Parks and Bureau of Reclamation 2010). Currently, based on this existing change in elevation over the summer and fall, several existing boat ramps at Folsom Reservoir would be unusable by early winter (at 405 feet elevation) (California State Parks and Bureau of Reclamation 2010). The existing General Plan/Resource Management Plan for the Folsom Lake State Recreation Area and Folsom Powerhouse State Historic Park notes that the "availability of boat ramps for launching and the desirability of the recreation experience drops significantly when Folsom Lake levels dip below the 420 foot elevation" (California State Parks and Bureau of Reclamation 2010). Based on a 2005 sedimentation survey and the resulting elevation/area/capacity table, for Folsom Reservoir to drop from 425 feet to 420 feet or from 420 feet to 415 feet elevation would require a reduction in capacity of 39,564 to 41,199 acre feet (Bureau of Reclamation 2005), over double the entire proposed Project diversion amount of 15,000 acre feet. Therefore, even at lower reservoir levels (around 420 feet), the potential change in elevation at Folsom Reservoir would be expected to be minimal (on the order of 2 feet) from the proposed Project if the entire maximum diversion of 15,000 acre feet were to occur at the same time. Thus, the proposed Project would not result in significant changes to reservoir elevation such that boaters would not be able to use existing boat launches, unless existing reservoir elevations were at the minimum usable elevation of a specific boat launch (each boat launch has a different minimum usable elevation). Apart from these circumstances, Folsom Reservoir would remain accessible to fishing, swimming, and boating even with minimal reservoir elevation changes from the proposed Project. Changes in reservoir elevation would not affect the ability of recreationists to participate in land-based activities such as picnicking, hiking, biking, horseback riding, and camping. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** at Folsom Reservoir.

Rivers – Non-Whitewater Boating Uses

In the Project area, recreation opportunities that occur in the South Fork and Lower American River include water-related uses such as fishing, swimming, gold panning, tubing, and wading, as well as land-based uses including hiking, biking, camping, horseback riding, picnicking, wildlife viewing, hunting, and birdwatching. Whitewater boating opportunities are discussed separately below.

South Fork

In the Project's existing infrastructure operational phase, existing facilities would be operated at their current capacities and thus the maximum rate of diversion of Permit 21112 water at the El Dorado Diversion Dam would be limited to 120 cfs. Therefore, no additional diversions would occur at the El Dorado Diversion Dam and flows on the South Fork would not change until downstream of the El Dorado Powerhouse, due to the shift from non-consumptive diversions for hydropower purposes under the baseline to consumptive diversions under the Project. Water that is currently diverted at the El Dorado Diversion Dam under other water rights and used for hydropower purposes would be replaced by P-21112 water for consumptive uses under the proposed Project. This change from non-consumptive diversion for hydropower purposes to a consumptive diversion to meet water demands would result in reduced return flows downstream of the El Dorado Powerhouse. Thus, there would be slight reductions in flow downstream of the El Dorado Powerhouse because the consumptive use water would be permanently diverted and not returned to the South Fork. Therefore, changes in streamflow associated with the Project under operations with existing infrastructure would begin in the South Fork downstream of the El Dorado Powerhouse.

Average monthly South Fork streamflow levels downstream of the El Dorado Powerhouse range from 149 to 2,013 cfs (based on existing baseline conditions HEC-REsSim results). HEC ResSim modeling results for the Project (Appendix F) show decreased South Fork streamflow levels downstream of the El Dorado Powerhouse in January of all water year types and streamflow decreases extending through April in dry and critically dry water year types, with small decreases (1-10 cfs) also occurring from May to September (except June) in critically dry years under future baseline versus future project conditions. Streamflow decreases would be up to 16 cfs in wet, above normal, and below normal water years in baseline versus project conditions and up to 35 cfs in these water year types in future baseline versus future project conditions. Dry and critically dry water year types would have higher streamflow decreases, with up to 57 cfs reduction in critically dry years and 46 cfs in dry years under both baseline versus project and future baseline versus future project conditions. Lower streamflow can sometimes result in more difficult conditions for recreation use (more exposed snagging hazards for fishing, congregated fish, less water to swim in) but can also make wading and swimming easier due to weaker currents. However, fishing is not allowed upstream of the Highway 49 bridge until late April and there is likely much less recreation use of the river in the winter for fishing (below Highway 49 bridge), gold panning, swimming, tubing, etc. due to colder river and air temperatures. Therefore, any changes to non-whitewater boating river recreation uses from lower stream flows during the winter would not affect a substantial number of people and would not have a substantial effect on non-whitewater boating river recreation uses. Summer and fall streamflow increases or slight decreases would be unlikely to substantially change river non-whitewater boating recreation uses (fishing, swimming, gold panning, tubing, wading) as the river would be within normal streamflow ranges and thus within normal conditions experienced by recreationists along the river currently. Changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting. Therefore, there would not be a

substantial adverse change to recreational uses affecting a substantial number of people and the impact to recreation would be **less than significant** for South Fork non-whitewater boating recreation uses.

Lower American River

Based on the magnitude of the Project's streamflow changes to the South Fork and the relative size of the Lower American River (downstream of Folsom Reservoir), the decrease in South Fork streamflow entering Folsom Reservoir would likely result in minor changes to streamflow primarily in the winter and spring on the Lower American River (downstream of Nimbus Dam). As stated in Section 4.10 Hydrology and Water Quality, under the Project flow in the lower American River at Nimbus Dam would be reduced by about 2 to 6 cfs on an average annual basis, which is consistent with Project changes in average annual inflows to Folsom Reservoir. These minor changes in streamflow would not be beyond the existing fluctuation of the streamflow in the river and would not affect the ability of recreationists to boat or fish on the river. Changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, bicycling, and walking. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** for recreation uses on the Lower American River.

Whitewater Boating on the South Fork

The South Fork is especially known for its whitewater boating opportunities, which include seven common whitewater boating runs, or whitewater boatable river sections, between Kyburz and Folsom Reservoir. The four runs upstream of the Chili Bar run are generally more technical, with a higher level of difficulty than the runs from Chili Bar downstream to Folsom Reservoir. There is personal whitewater boating use of the South Fork upstream of the Chili Bar run and both personal and commercial whitewater boating use of the South Fork from the Chili Bar run downstream to Folsom Reservoir.

Kyburz to Riverton Run, Riverton to Peavine Run, and Golden Gate Run

Under Project operations with existing infrastructure, existing diversion limitations at the El Dorado Diversion Dam would continue and therefore there would be no additional diversions at the El Dorado Diversion Dam. Thus, streamflow changes to the South Fork under Project operations with existing infrastructure would not begin until downstream of the El Dorado Powerhouse. South Fork streamflow would be decreased under the Project's existing infrastructure operations downstream of the El Dorado Powerhouse due to increased use of water for consumptive use rather than hydropower and therefore release of less water from the El Dorado Powerhouse into the South Fork. Thus, because the Kyburz to Riverton, Riverton to Peavine, and Golden Gate runs are upstream of the El Dorado Powerhouse, there would be no change in the number of whitewater boating days under baseline versus project and future baseline versus future project conditions under existing infrastructure operations (Appendix F Tables 45, 46, 55, and 60). There would be **no impact** on recreation for these whitewater runs.

Slab Creek Run

Generally, there are boatable flows on the Class IV-V Slab Creek run when SMUD spills water from Slab Creek Reservoir either due to FERC recreation flow requirements or because there is so much flow that not all of the flow can be diverted to the Slab Creek or White Rock Powerhouses. As described in Section 4.16.1, until 2029, SMUD is required to spill water to provide recreation flows from Slab Creek Reservoir for 6 days in no less than three events between March 1 and May 31 in below normal, above normal, and wet water year types. There may

be other times when Slab Creek Reservoir spills and provides boatable days, particularly in below normal, above normal and wet water year types when spills would be more likely due to higher South Fork flows.

The Slab Creek run is located downstream of the El Dorado Powerhouse and therefore would experience variation in streamflow under the Project's existing infrastructure operations. Based on modeling data, most boatable days on the Slab Creek run are between March and June in below normal, above normal and wet years, though there are some boatable days during these months in dry years and in the winter of all water year types (December, January, February). As shown in Appendix F, Table 65, there would be no changes to the monthly average number of boatable days on the Slab Creek run under baseline versus project conditions. Under future baseline versus future project conditions, on average there would be a decrease of one boatable day in March in below normal water years (Table 4.16-3). This boatable day would not be one of the FERC-required recreation flow days, but a separate day that occurred naturally in March. The decrease of a boatable day on average in March in below normal water years would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in the spring due to colder weather and water conditions.

Table 4.16-3 Changes in Monthly Average Number of Boatable Days by Water Year Type for Slab Creek Run – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	-1	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-4 and Table 4.16-5 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the Slab Creek run. Though there may be no change in the average number of boatable days under baseline versus project conditions, the modeling data by month by water year type showed four months out of the 504 months modeled where there may be a change to the number of boatable days under baseline versus project conditions in three water year types. These changes in boatable days reflect the maximum change in the number of boatable days under baseline versus project conditions and are shown in Table 4.16-4. Under future baseline versus future project conditions, there were 10 months out of 504 months modeled that showed a change in the number of boatable days in one to three months in all but dry water year types. The results for both baseline versus project and future baseline versus future project conditions generally show a decrease of one of boatable day in January through March (2 days in March under future conditions) and an increase of one boatable day in April and May (Table 4.16-5). As described above, this reduction or addition of boatable days would not affect the FERC-required recreation flow days. The decrease of one to two boatable days in January, February or March would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in these months due to colder weather and water conditions. The additional boatable day in April or May would benefit recreation.

Table 4.16-4 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Slab Creek Run – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	-1	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	-1	0	+1	0	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-5 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Slab Creek Run – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	+1/-1	0	0	0	+1	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	-1	-2	0	+1	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	-1	0	+1	0	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Slab Creek run would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Slab Creek whitewater run.

If triggers are met that change the recreation flow regime for the Slab Creek run after 2029, SMUD would be required to meet the flow release schedule regardless of changes in streamflow from the Project. Therefore, the Project would not affect SMUD releasing recreation flows on the Slab Creek run or affect whitewater use of the Slab Creek run during these recreation flow releases. However, there could be additional changes in reservoir elevation at Union Valley Reservoir if there is a need for SMUD to augment flows on the South Fork to meet the required recreation flow releases.[2]

Chili Bar Run

Unlike the whitewater runs upstream of the Chili Bar run, there is substantial commercial use of the Chili Bar whitewater run, and the run has a lower difficulty than upstream runs (at lower water levels), meaning a larger population of boaters would be capable of using this run compared to more advanced or expert level runs upstream. In addition, with the FERC-required flow schedule, there are guaranteed boatable flows in the summer and fall on the Chili Bar run when other runs have become unboatable due to low flows. Therefore, there is substantially more use of the Chili Bar run compared to upstream runs. Though the Project would affect flows within the Chili Bar run, SMUD would still have to make FERC-required recreation flow releases and the Project would not alter the obligation of SMUD to make these releases. Thus, Project-related changes to boatable days would occur on days when there were no FERC-required flow releases (generally weekdays). As indicated from the recreation flow release schedule (Table 4.16-2), the whitewater boating season for the Chili Bar run is generally from March through October. Within this March through October season, peak whitewater boating use occurs from Memorial Day through Labor Day weekend due to required releases and higher air temperatures;

[2] Potential future Slab Creek run recreational flow releases beyond the existing recreation flow regime for the run were not included in the HEC-ResSim hydrologic modeling for the proposed Project because it is unknown when or if the 5-year daily average of 95 boater launches per release day trigger for requiring additional recreational flows will be met.

there is less use from March through Memorial Day (see e.g., Whitewater Excitement Inc. 2023 and El Dorado County 2018).

The Chili Bar run is located downstream of the El Dorado Powerhouse and therefore would experience variation in streamflow under the Project's existing infrastructure operations. For the lower difficulty conditions (Class II-III), on average there would be a one boatable day reduction in January in critically dry years under baseline versus project and future baseline versus future project conditions (Table 4.16-6 and Table 4.16-7), as well as in wet and dry water year types under future baseline versus future project conditions only. In February, on average there would be a one boatable day reduction in critically dry years under baseline versus project and future baseline versus future project conditions, and in dry water years under future baseline versus future project conditions only. Under baseline versus project conditions, on average there would be a one boatable day increase in February in below normal water years. In March, on average there would be a reduction of one boatable day in critically dry water years under both baseline versus project and future baseline versus future project conditions, with a one boatable day increase in above normal water years under future baseline versus future project conditions only. On average, there would be a one boatable day reduction in April in dry years under baseline versus project and future baseline versus future project conditions and in critically dry years under baseline versus project conditions only. Though whitewater boating use would be reduced due to one less boatable day on average in January through April (or slightly increased with one additional boatable day in these months) in certain water year types, whitewater boating use is lower in these months than in the summer months due to colder air and water temperatures. Thus, the decrease of one boatable day on average would not result in a substantial change to whitewater boating use or affect a substantial number of people.

There would also be changes to the average number of boatable days for the lower difficulty conditions on the Chili Bar run from May to September. Under baseline versus project conditions, on average there would be one additional boatable day in July and August in dry years, and one additional boatable day in September in critically dry years. In above normal water years, on average there would be a one boatable day reduction in May under future baseline versus future project conditions. The additional boatable days in the summer/early fall on the Chili Bar run would benefit personal and commercial boaters as this is the main recreation season for the run. In particular, the additional day in September in critically dry years would benefit boaters because there are fewer FERC-required flow days in September after Labor Day in this water year type. A reduction of one boatable day on average in May would reduce some potential recreational use as this day would occur during the most popular use season.

Table 4.16-6 Changes in Monthly Average Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	**+1**	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	**-1**	0	0	**+1**	**+1**	0
Critically Dry	0	0	0	**-1**	**-1**	**-1**	**-1**	0	0	0	0	**+1**

Greyed out cells have a change in boatable days.

Table 4.16-7 Changes in Monthly Average Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	+1	0	-1	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	-1	-1	0	-1	0	0	0	0	0
Critically Dry	0	0	0	-1	-1	-1	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-8 and Table 4.16-9 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the lower level of difficulty flows on the Chili Bar run. The results in these tables show that though there may be no change in the average number of boatable days in some months and/or water year types, the modeling data by month by water year type showed there may be a change in the number of boatable days in these months/water year types. Table 4.16-8 and Table 4.16-9 show the maximum change in boatable days in the fall/winter (November to February) may be an increase of one to three boatable days or a decrease of up to four boatable days, depending on the month and water year type. At the beginning of the whitewater season (March and April) and end of the season (October), based on modeling results the maximum change in boatable days could be an increase of two boatable days or a decrease of up to five boatable days, depending on the month and water year type. A decrease of up to five boatable days in one of these months (between October and April) would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in these months due to colder weather and water conditions.

During the peak season (Memorial Day through Labor Day – generally May through September in the modeling results), the modeling results show the maximum change in boatable days would be an increase of two boatable days or a decrease of one boatable day, except in May, which could have an increase of three boatable days or a decrease of three boatable days. The maximum changes in boatable days in May (both increase and decrease of days) occurred in the same water year type (dry). The reduction in boatable days would occur on the one to two weekdays where recreation flows are not required under the Chili Bar license between Memorial Day and Labor Day (see Table 4.16-2). A reduction of one to three boatable days in May through September would reduce some potential whitewater use as the reduction of these days would occur during the most popular use season. The additional boatable days in the peak season would benefit recreation use.

Table 4.16-8 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	+2/-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	+1	0	0	0	+1	+1	0	-1	-1	+1	0	0
Dry	0	0	0	0	+1/-2	-1	-1	+1	-1	+2	+1	0
Critically Dry	0	0	0	-3	-2	+1/-5	-2	+1/-1	-1	0	0	+2

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-9 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	-1	0	0	+3/-2	0	0	0	0	0	0	0	0
Above Normal	0	0	+1	+1	-1	+1	+2	-1	0	0	0	0
Below Normal	-1	0	0	-2	+1/-1	+1	+1/-1	0	+1/-1	+1	0	0
Dry	0	0	0	-3	+2/-4	-1	-2	+3/-3	0	0	0	0
Critically Dry	0	0	-1	-3	-2	+1/-5	+1/-1	-2	+1/-1	0	0	+1/-1

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

At higher flow levels, the Chili Bar run has a higher difficulty – Class III-IV. According to modeling results, there would be some changes to the average number of boatable days for the run at this higher difficulty, but the changes would be mostly beneficial and all occur only under future baseline versus future project conditions (Table 4.16-10). On average, there would be a reduction of one boatable day in January in above normal years. As described above, use is lower in the winter and therefore, the decrease of one boatable day in January would not result in a substantial change to whitewater boating use or affect a substantial number of people. There would be on average one additional boatable day in April and June in below normal years and one additional boatable day in May in dry years. The additional boatable days in May and June would be beneficial as this is the main use season and could increase potential recreational use of the run slightly. There would be no changes in the average number of boatable days per month under baseline versus project conditions.

Table 4.16-10 Changes in Monthly Average Number of Boatable Days by Water Year Type for Chili Bar Run at 1,750 to 10,000 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	+1	0	+1	0	0	0
Dry	0	0	0	0	0	0	0	+1	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

In reviewing the maximum change to boatable days based on modeling results by month for each year in the dataset (1975 to 2021), there were only 14 and 19 of 504 months that showed changes in boatable days for the higher difficulty Chili Bar run under baseline versus project conditions and future baseline versus future project conditions, respectively. Table 4.16-11 and Table 4.16-12 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the higher level of difficulty flows on the Chili Bar run. The maximum change in boatable days in January and February would be a decrease of one or two boatable days under either baseline versus project conditions or future baseline versus future project conditions. In March and April, the maximum change in boatable days would range between an increase of two boatable days and a decrease of three boatable days in certain water year types. A decrease of up to three boatable days in these months would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in these months due to colder weather and water conditions. With slightly reduced flows, the run would still be usable for whitewater boating on the days where there was a decrease in boatable days at the higher flows, but at a lower difficulty level (Class II-III). In the peak whitewater boating season, the maximum change in

boatable days would be an increase of up to three boatable days in certain water year types. An increase in boatable days in the peak season would benefit recreation use.

Table 4.16-11 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 1,750 to 10,000 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	+1	+1	+1	0	0	0
Dry	0	0	0	0	-1	0	-1	0	+3	0	0	0
Critically Dry	0	0	0	0	-1	+1	0	+2	+1	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-12 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 1,750 to 10,000 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	-2	+2	0	+1	0	0	0
Dry	0	0	0	0	-2	0	-1	+2	0	0	0	0
Critically Dry	0	0	0	0	-1	-3	+1	+1	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Chili Bar run at either the higher or lower difficulty level would not substantially change whitewater boating use on this run and the impact to recreation would be **less than significant** for the Chili Bar whitewater run.

Coloma to Greenwood Run

This run is a low difficulty (Class II – Novice) run that can be combined with the Chili Bar run for commercial trips. The Coloma to Greenwood run also benefits from the FERC-required releases for the Chili Bar run as those flows continue down through the Coloma to Greenwood run all the way to Folsom Reservoir. Thus, most days between April and August in all water year types are boatable days on the Coloma to Greenwood run (minimum of 25 days of the month) according to modeling results for baseline conditions, allowing this run to be used in later summer and fall months when other runs have reduced flows and may not be boatable.

The Coloma to Greenwood run is located downstream of the El Dorado Powerhouse and therefore would experience variation in streamflow under the Project's existing infrastructure operations. Modeling results show Project effects to the average number of boatable days on the Coloma to Greenwood run would primarily occur in the winter and spring. In January, a reduction of one boatable day on average would occur in dry and critically dry years under both baseline versus project conditions and future baseline versus future project conditions (Table 4.16-13 and Table 4.16-14). In February, there would be a reduction of two boatable days on average in critically dry years under both baseline versus project conditions and future baseline versus future project conditions, and a reduction of one boatable day on average in dry years under only future baseline versus future project conditions. On average, there would be a one boatable day decrease in March in dry and critically dry years in baseline versus

project conditions and future baseline versus future project conditions. April would also be affected in critically dry years under baseline versus project and future baseline versus future project conditions, with a reduction of one boatable day on average. There would be an increase of one boatable day on average in July in critically dry years under baseline versus project conditions. Reductions in the number of boatable days by one to two days on average between January and April would not substantially affect whitewater boating use and would not affect a substantial number of people as use is lower in these months due to colder weather and water conditions. The additional boatable day on average in July in critically dry years may slightly increase potential recreational use in this month.

Table 4.16-13 Changes in Monthly Average Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	-1	0	-1	0	0	0	0	0	0
Critically Dry	0	0	0	-1	-2	-1	-1	0	0	+1	0	0

Greyed out cells have a change in boatable days.

Table 4.16-14 Changes in Monthly Average Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	-1	-1	-1	0	0	0	0	0	0
Critically Dry	0	0	0	-1	-2	-1	-1	0	0	0	0	0

Greyed out cells have a change in boatable days.

In reviewing the maximum change to boatable days based on modeling results by month for each year in the dataset (1975 to 2021), the changes in critically dry years compared to other years are noticeable on the Coloma to Greenwood run. Table 4.16-15 and Table 4.16-16 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions. The model results show changes to boatable days between October and December ranging from an increase of one boatable day to a decrease of two boatable days in wet, below normal and critically dry years. There would be changes to the monthly number of boatable days from January through March for most water year types. The maximum change in the number of boatable days in these months would range from an increase of one boatable day to a decrease of six boatable days, with the largest decreases occurring in critically dry years. There would also be a decrease of four boatable days in April in critically dry years. Reductions in the number of boatable days by up to six days between October and April would not substantially affect whitewater boating use and would not affect a substantial number of people as use is lower in these months due to colder weather and water conditions. From May to September, the maximum change in boatable days would be an increase of one boatable day in July in below normal and dry years. However in critically dry years, the maximum change between May and September would range from an increase of three boatable days to a decrease of two boatable days. Additional boatable days between May and September may slightly increase potential recreational use in these months. A decrease of one to two boatable days in May, July or August in critically dry years would reduce some potential recreational use as these days would occur during the most popular use season.

Table 4.16-15 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	+1	0	0	-3	+1	-1	0	0	0	+1	0	0
Dry	0	0	0	-3	-1	-3	0	0	0	+1	0	0
Critically Dry	0	0	0	-6	-5	-4	-4	+1/-2	0	+3	+3	+2

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-16 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	-1	0	-2	-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	-1	0	0	-3	-1	-1	0	0	0	+1	0	0
Dry	0	0	0	-5	-3	-3	0	0	0	0	0	0
Critically Dry	0	0	-1	-6	-5	-4	-4	-2	+1	-1	-1	+1/-1

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Coloma to Greenwood run would not substantially change whitewater boating use on this run and the impact to recreation would be **less than significant** for the Coloma to Greenwood whitewater run.

The Gorge Run

Similar to the upstream run (Coloma to Greenwood), the Gorge run also benefits from FERC-required releases on the Chili Bar run, allowing the run to be usable in the late summer and fall months when other runs have reduced flows and may not be boatable. The Gorge run can also be combined with the Chili Bar and Coloma to Greenwood runs for a full day commercial trip. At higher flows on the Gorge run, the difficulty of the run increases from Class II-III to Class III-IV. The Gorge run is located downstream of the El Dorado Powerhouse and therefore would experience variation in streamflow under the Project's existing infrastructure operations. Modeling results show boatable flows at least 18 days a month in all water year types for July, August and September at the lower difficulty level/flows under existing baseline conditions.

Modeling results show some changes to the average number of boatable days at the lower difficulty level due to Project operations mainly in the winter and spring. In January, there would be a one boatable day decrease on average in below normal water years under baseline versus project and future baseline versus future project conditions (Table 4.16-17 and Table 4.16-18). There would also be a one boatable day decrease on average in dry years under only future baseline versus future project conditions. In March, there would be a one boatable day decrease on average in critically dry years under baseline versus project and future baseline versus future project conditions. In April, on average there would be a one boatable day decrease in critically dry years under baseline versus project and future baseline versus future project conditions and a decrease of one boatable day on average in above normal and dry years under future baseline versus future project conditions only. In the main recreation season, there would be a one boatable day decrease on average in May in dry years and a one boatable day decrease on average in June in below normal water years under future baseline versus future project conditions only. Reductions in the average number of boatable days from January to April would not substantially affect

whitewater use of the Gorge run as use is lower in these months due to colder weather and water conditions. The reduction of one boatable day on average in May and one in June may reduce recreational use slightly as this day would occur during the most popular use season.

Table 4.16-17 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	0	-1	-1	0	0	0	0	0

Greyed out cells have a change in boatable days.

Table 4.16-18 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	-1	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	0	0	-1	0	0	0
Dry	0	0	0	-1	0	0	-1	-1	0	0	0	0
Critically Dry	0	0	0	0	0	-1	-1	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-19 and Table 4.16-20 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the lower level of difficulty flows on the Gorge run. From October to April, the maximum change in the number of boatable days would range from an increase of two boatable days to a decrease of seven boatable days. Reductions in the number of boatable days from October to April would not substantially affect whitewater use of the Gorge run as use is lower in these months due to colder weather and water conditions. From May to September, the maximum change in the number of boatable days would range from an increase of two boatable days to a decrease of two boatable days. A decrease of two boatable days between May and September would reduce some potential recreational use as these days would occur during the most popular use season.

Table 4.16-19 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	+1/-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	+1	0	0	-2	+1	0	-1	-1	-1	+1	0	0
Dry	0	0	0	0	+1/-1	+2/-1	+1	0	0	+1	+1	0
Critically Dry	0	0	0	+1/-3	-1	+2/-7	-3	+1/-1	0	0	0	+2

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-20 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	-1	0	-1	+2/-4	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	-1	0	0	0	0	0
Below Normal	-1	0	0	-4	+1	-1	-1	-1	-2	+1	0	0
Dry	0	0	0	-5	+2/-1	0	-2	-1	0	+1	0	0
Critically Dry	0	0	0	+1/-3	-1	+2/-4	-2	+1/-1	+1	+1	0	+1/-1

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

At higher flows and therefore increased difficulty, the hydrologic modeling shows there would be very little change to the average number of boatable days due to Project operations with existing infrastructure. In January, there would be a reduction of one boatable day on average in wet years under baseline versus project and future baseline versus future project conditions (Table 4.16-21 and Table 4.16-22) and in above normal water years under future baseline versus future project conditions only. In March there would be an increase of one boatable day on average in below normal water years under future baseline versus future project conditions only. Similarly in April, there would be an increase of one boatable day on average in above normal and dry years under future baseline versus future project conditions only. The reduction in the average number of boatable days in January would not substantially affect whitewater use of this run as use is lower in this month due to colder weather and water conditions. The average increase in boatable days would benefit whitewater recreation and may slightly increase the potential recreational use of the run.

Table 4.16-21 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

Table 4.16-22 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	+1	0	0	0	0	0
Below Normal	0	0	0	0	0	+1	0	0	0	0	0	0
Dry	0	0	0	0	0	0	+1	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

At the higher flows, modeling results show that changes in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions would primarily be limited to the months of January through May. Table 4.16-23 and Table 4.16-24 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the higher level of difficulty flows on the Gorge run. The maximum change in the number of boatable days between January and April would range from an increase of two

boatable days to a decrease of three boatable days. The reduction in the number of boatable days in January through April would not substantially affect whitewater use of this run as use is lower in these months due to colder weather and water conditions. In May, the maximum change in the number of boatable days would range from an increase of two boatable days to a decrease of one boatable day. A decrease of one boatable day in May would reduce some potential recreational use as this day would occur during the most popular use season. With slightly reduced flows, the run would still be usable for whitewater boating on the days where there was a decrease in boatable days at the higher flows, but at a lower difficulty level (Class II-III). In June, modeling results show a maximum change in the number of boatable days as an increase of one boatable day in below normal water years. An increase in boatable days in any month, particularly in May and June when use is higher, would benefit recreation use.

Table 4.16-23 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Baseline versus Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	+1	+1	0	+2	0	0	0	0
Dry	0	0	0	-2	-1	0	-1	+1	0	0	0	0
Critically Dry	0	0	0	-1	-1	+1/-3	+1	+1	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-24 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Future Baseline versus Future Project Conditions, Existing Infrastructure.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	+1	0	0	0	0	0
Below Normal	0	0	0	-1	0	+1	0	+1	+1	0	0	0
Dry	0	0	0	-2	-2	0	+2/-1	+1	0	0	0	0
Critically Dry	0	0	0	-1	-1	-1	+1/-1	+1/-1	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Gorge run would not substantially change whitewater boating use on this run and the impact to recreation would be **less than significant** for the Gorge whitewater run.

Construction Impacts

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel

crossings. The exact location and extent of these Project activities are not known at this time and would likely require future CEQA analysis. Therefore, construction related impacts of the Project are covered in this EIR at a programmatic level only. Construction activities may include vegetation and tree removal at any of the construction locations for access, excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel below the Hazel Creek Tunnel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Construction activities would be limited to portions of the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake; construction activities would not affect stream reaches or reservoirs.

There is no recreation use of the El Dorado Canal. Construction activities would not affect access to the Forest Service's Sand Flat Campground as this area can be reached directly from Highway 50. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake could result in temporary access delays or detours on roads around Jenkinson Lake, noise near the day use area and four campgrounds at Hazel Creek, and potentially closure of one or more campgrounds due to their location close to the channel being improved. Primary access for construction vehicles for the improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake is anticipated to occur along existing roads within the Sly Park Recreation Area. If roads used by the public to access recreation sites along the channel to Jenkinson Lake, or around Jenkinson Lake, were temporarily closed during the peak recreation season (primarily between Memorial Day and Labor Day weekends) such that recreation sites were inaccessible and therefore not usable, then there could be a substantial adverse change to, or loss of, recreation uses affecting a substantial number of people. Similarly, if campgrounds at Hazel Creek were closed during peak recreation season due to construction, a substantial adverse change to, or loss of, recreation uses affecting a substantial number of people could occur. Therefore, the impact of the Project on recreation would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam and into the Hazel Creek Tunnel. Post-construction operations assume the improvements result in the restoration of the authorized capacity of El Dorado Canal and therefore up to an additional 11 cfs could be diverted at the El Dorado Diversion Dam (i.e., 145 cfs canal capacity in existing infrastructure scenario versus 156 cfs canal capacity in post-construction scenario).

Hydrologic modeling conducted for the Project shows that diverting water at El Dorado Diversion Dam at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs), would result in impacts to select reservoirs and rivers and all whitewater boating runs on the South Fork from Kyburz to Folsom Reservoir. The modeling results specific to the reservoirs and rivers listed in Section 4.16.1 as well as the whitewater runs on the South Fork listed in Table 4.16-1, are described in more detail in Appendix F. Impacts to recreation from post-construction Project operations are described below in the same structure as Section 4.16.1 – reservoirs, rivers and whitewater boating on the South Fork.

Reservoirs

District Reservoirs

Under the Project, additional water could be seasonally stored in Jenkinson Lake to allow for later delivery of this water during dry months of the year to meet District demands, resulting in more water within Jenkinson Lake. Therefore, similar to Project operations with existing infrastructure, under post-construction Project operations Jenkinson Lake would have an increased minimum end of month reservoir elevation and increased average end of month reservoir elevation (Appendix F). As discussed for the Project's existing infrastructure operations, the increases in the minimum end of month reservoir elevation of Jenkinson Lake (20 to 85 feet) would result in a fuller reservoir throughout the year (i.e., increased reservoir elevation), providing more shoreline length for bank fishing and other shoreline uses, less distance to walk to the water's edge, less exposure of in-water hazards, as well as more surface area for boating. The reservoir can close to additional boaters when the maximum boating capacity is reached; with more surface area for boating, the boating capacity could remain at higher levels. Therefore, there would be **beneficial** impacts to recreation at Jenkinson Lake.

As discussed for existing infrastructure operations, less water would continue down the El Dorado Canal to Forebay Reservoir for power generation under the proposed Project. As mentioned previously, Forebay Reservoir is a re-regulating reservoir that routinely fluctuates in reservoir elevation. Modeling results show that even with slight changes in end of month reservoir elevations under post-construction operations, Forebay Reservoir elevations would remain within the existing range of operations as dictated by demands for consumptive use and hydropower generation similar to current conditions. Swimming and boating are not allowed at the reservoir and thus post-construction operations would not affect these activities. Under post-construction operations, the reservoir would still be accessible to fishing and land-based recreation uses at the reservoir (picnicking, bird watching) would not be substantially affected by continued fluctuation in reservoir elevation within the existing operational range. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** at Forebay Reservoir.

SMUD Reservoirs

Under post-construction Project operations, modeling results show small changes (1–2 feet) to end of month reservoir elevations in some critically dry years for Chili Bar, Slab Creek and Union Valley Reservoirs in the spring and summer, similar to the modeling results for Project operations with existing infrastructure. As discussed for the Project's existing infrastructure operations, these small changes in reservoir elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating. Changes in reservoir elevation would not affect the ability of recreationists to participate in land-based activities such as picnicking, hiking, biking, and camping. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** at Slab Creek, Chili Bar, and Union Valley Reservoirs.

Folsom Reservoir

Due to an additional 11 cfs diversion at the El Dorado Diversion Dam under post-construction Project operations, additional streamflow decreases would occur as compared to Project operations with existing infrastructure. Therefore, South Fork flows into Folsom Reservoir would be slightly lower under the Project's post-construction operations, which could affect the elevation of Folsom Reservoir. Similar to Project operations with existing

infrastructure, the potential changes in elevation at Folsom Reservoir would be minimal and would not result in significant changes to reservoir elevation such that boaters would not be able to use existing boat launches. The reservoir would remain accessible to fishing, swimming, and boating. Changes in reservoir elevation would not affect the ability of recreationists to participate in land-based activities such as picnicking, hiking, biking, horseback riding, and camping. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** at Folsom Reservoir.

Rivers

South Fork

Under post-construction operations, the Project would slightly increase diversions at the El Dorado Diversion Dam, but most South Fork streamflow changes would still occur downstream of the El Dorado Powerhouse, similar to Project operations with existing infrastructure. The Project would use more water for consumptive use and less water for power generation and thus less water would be returned to the South Fork through the El Dorado Powerhouse compared to baseline conditions. However, unlike Project operations with existing infrastructure, post-construction the South Fork flows would be reduced by a maximum of 11 cfs between the El Dorado Diversion Dam and El Dorado Powerhouse due to the Project's restoration of the authorized capacity of El Dorado Canal.

Modeling results for the Project's post-construction operations show decreased South Fork streamflow levels from January through March, and extending into April in dry and critically dry water year types. Compared to Project operations with existing infrastructure, South Fork streamflow decreases under the Project's post-construction operations would be larger. Similar to Project operations with existing infrastructure, South Fork streamflow decreases would primarily occur in the winter under post-construction operations when there is less instream recreation use of the South Fork.

Lower streamflow can sometimes result in more difficult conditions for recreation use, but can also make wading and swimming easier due to weaker currents. However, fishing is not allowed upstream of the Highway 49 bridge until late April and there is likely much less recreation use of the river in the winter for fishing (below Highway 49 bridge), gold panning, swimming, tubing, etc. due to colder river and air temperatures. Therefore, any changes to non-whitewater boating river recreation uses from lower stream flows during the winter would not affect a substantial number of people and would not have a substantial effect on non-whitewater boating river recreation uses. Summer and fall streamflow increases or slight decreases would be unlikely to substantially change river non-whitewater boating recreation uses as the river would be within normal streamflow ranges and thus within normal conditions experienced by recreationists along the river currently. Changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river. Therefore, there would not be a substantial adverse change to recreational uses affecting a substantial number of people and impacts to recreation would be **less than significant** for South Fork non-whitewater boating recreation uses.

Lower American River

Though streamflow decreases in the South Fork would be slightly higher under the Project's post-construction operations, these streamflow changes would likely result in minor changes to streamflow on the Lower American River primarily in the winter, similar to the Project's existing infrastructure operations, due to the large size of the river. Similar to Project operations with existing infrastructure, very minor changes in streamflow under post-

construction operations would not be beyond the existing fluctuation of the streamflow on the river and thus would not affect the ability of recreationists to participate in instream or land-based recreation uses. Therefore, there would not be a substantial adverse change to recreational uses and the impact to recreation would be **less than significant** for recreation uses on the Lower American River.

Whitewater Boating on the South Fork

Because the proposed Project's effects to whitewater boating would be different for each run, the following subsections describe the impacts to each run individually.

Kyburz to Riverton Run

Modeling results show that the Kyburz to Riverton whitewater run primarily has boatable days in March through June. The difficulty of the run is higher (Class IV-V) with higher flows. Streamflow changes on this run resulting from the Project's post-construction operations would be limited to a reduction of up to 11 cfs maximum due to Project's restoration of the authorized capacity of El Dorado Canal. At the lower difficulty (Class III-IV), under baseline versus project and future baseline versus future project conditions, modeling results show there would be minimal change in the average number of boatable days on the Kyburz to Riverton run due to the small reduction in flows in this section of the river from the Project (11 cfs maximum). At the lower difficulty (Class III-IV), there would be changes to the average number of boatable days in wet and above normal water years (Table 4.16-25). In wet years, there would be a decrease of one boatable day on average in December and July, but a gain of one boatable day on average in January and June. Overall, this would result in the same average number of boatable days for the summer season, which is the main whitewater boating use season and thus use would likely remain fairly similar over the summer. In above normal years, on average there would be a decrease of one boatable day in April and a gain of one boatable day in June. The decrease of a boatable day in April on average would not substantially affect whitewater boating use and would not affect a substantial number of people as whitewater boating use is typically lower in the spring, particularly at higher elevations, due to colder weather and water conditions. The gain of a boatable day in June on average would be beneficial and could potentially slightly increase summer whitewater boating use opportunities.

Table 4.16-25 Changes in Monthly Average Number of Boatable Days by Water Year Type for Kyburz to Riverton Run at 600 to 1,200 cfs – Baseline versus Project and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	-1	+1	0	0	0	0	+1	-1	0	0
Above Normal	0	0	0	0	0	0	-1	0	+1	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-26 and Table 4.16-27 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the lower level of difficulty flows on the Kyburz to Riverton run. As shown in the tables, changes in the number of boatable days would occur from December through July. From December to April, the maximum change in the number of boatable days would range from an increase of two

boatable days to a decrease of two boatable days. Reductions in the number of boatable days from December to April would not substantially affect whitewater use of the Kyburz to Riverton run because boating use is typically lower in the spring, particularly at higher elevations, due to colder weather and water conditions. From May to July, the maximum change in the number of boatable days would range from an increase of two boatable days to a decrease of two boatable days. A decrease of two boatable days between May and July would reduce some potential recreational use as these days would occur during the most popular use season. An increase in boatable days in any month, particularly in May and June when use is higher, would benefit recreational use.

Table 4.16-26 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Kyburz to Riverton Run at 600 to 1,200 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	-1	+1	-1	+1/-2	+2/-1	+2	+1/-1	-2	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	-1	-1	0	+1/-1	+1/-1	0	0	0	0	0
Dry	0	0	0	-1	0	-1	0	-1	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-27 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Kyburz to Riverton Run at 600 to 1,200 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	-1	+1	-1	+1/-2	+2/-1	+2	+1/-1	-2	0	0
Above Normal	0	0	0	0	0	0	-1	+1/-1	-2	0	0	0
Below Normal	0	0	-1	-1	0	+1/-1	+1/-1	0	0	0	0	0
Dry	0	0	0	-1	0	-1	0	-1	0	0	0	0
Critically Dry	0	0	0	0	0	0	-1	-2	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year

At higher flows, the Kyburz to Riverton run is more difficult -–advanced (Class IV) up to expert level (Class V). At this difficulty, modeling results for the Project's post-construction operations show there would be changes to the average number of boatable days in above normal and dry water years (Table 4.16-28). In above normal years, on average there would be a decrease of one boatable day in June. With slightly reduced flows, the run would still be usable for whitewater boating in June on this day, but at a lower difficulty level (Class III-IV). The run would still have boatable days in June (in above normal years) at the higher difficulty level though there may be some slight reduction in potential whitewater boating use of the run in above normal years by advanced/expert level boaters. In dry years, on average there would be one less boatable day in April at the higher difficulty level. As stated above, this one day reduction on average would not substantially affect whitewater boating use and would not affect a substantial number of people as whitewater boating use is typically lower in the spring, particularly at higher elevations, due to colder weather and water conditions. The changes to the average number of boatable days in above normal and dry water years would not substantially change potential whitewater boating use on the Kyburz to Riverton run at the higher difficulty level.

Table 4.16-28 Changes in Monthly Average Number of Boatable Days by Water Year Type for Kyburz to Riverton Run at 1,200 to 3,000 cfs – Baseline versus Project and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	-1	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	-1	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

At the higher flows, modeling results show that changes in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions would generally be limited to the months of April through June for multiple water year types. Table 4.16-29 shows the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the higher level of difficulty flows on the Kyburz to Riverton run. The maximum change in the number of boatable days in April would range from a decrease of one to three boatable days. In below normal water years, there would be a maximum change in the number of boatable days in February and March as well, with a reduction of one boatable day in each month. The reduction in the number of boatable days in February through April would not substantially affect whitewater use of the Kyburz to Riverton run because boating use is typically lower in the spring, particularly at higher elevations, due to colder weather and water conditions. In May and June, the maximum change in the number of boatable days would range from an increase of one boatable day to a decrease of three boatable days. In wet water years, there would be a maximum change in the number of boatable days in July as well, with a reduction of one boatable day. A decrease of two to three boatable days in May and June and one boatable day in July would reduce some potential recreational use as these days would occur during the most popular use season. With slightly reduced flows, the run would still be usable for whitewater boating on the days where there was a decrease in boatable days at the higher flows, but at a lower difficulty level (Class III-IV).

Table 4.16-29 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Kyburz to Riverton Run at 1,200 to 3,000 cfs – Baseline versus Project Conditions and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	-3	+1/-2	+1/-3	-1	0	0
Above Normal	0	0	0	0	0	0	-1	0	-2	0	0	0
Below Normal	0	0	0	0	-1	-1	-1	-1	-1	0	0	0
Dry	0	0	0	0	0	0	-1	-1	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Kyburz to Riverton run would not substantially change whitewater boating use on this run and the impact to recreation would be **less than significant** for the Kyburz to Riverton whitewater run.

Riverton to Peavine Run

Similar to the Kyburz to Riverton run, modeling results show that the Class III-IV Riverton to Peavine whitewater run has the most boatable days in March through June with some boatable days in November to February and in July in wet years under baseline conditions. Because the Riverton to Peavine run is located upstream of the El

Dorado Powerhouse, the Project's post-construction operational streamflow changes on this run would be limited to a reduction of 11 cfs maximum due to the Project's restoration of the authorized capacity of El Dorado Canal. Under baseline versus project and future baseline versus future project conditions, modeling results show there would be some decrease in the average number of boatable days in most water year types (Table 4.16-30). In above normal and critically dry years, the average number of boatable days would be reduced by one day in April. In below normal and dry years, on average there would be one less boatable day in the winter (December or January) and one less day in June. Whitewater boating use is typically lower in the winter and spring, particularly at higher elevations, due to colder weather and water conditions. Therefore, a reduction of one boatable day on average in December, January and April would not substantially affect whitewater boating use and would not affect a substantial number of people. The decrease of one boatable day on average in June in below normal and dry years would slightly reduce potential whitewater boating use of this run in those water year types. However, the decrease of one boatable day would not be expected to substantially change potential whitewater use or effect a substantial number of people.

Table 4.16-30 Changes in Monthly Average Number of Boatable Days by Water Year Type for Riverton to Peavine Run – Baseline versus Project and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	-1	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	0	0	-1	0	0	0
Dry	0	0	-1	0	0	0	0	0	-1	0	0	0
Critically Dry	0	0	0	0	0	0	-1	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-31 shows the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the Riverton to Peavine run. The model results show changes to boatable days between December and March for only one to two water year types in each month. The maximum change to boatable days between December and March would be a decrease of one boatable day. Modeling results show a maximum change to boatable days in April for all water year types as a decrease of one or two boatable days. Reductions in the number of boatable days from December to April would not substantially affect whitewater use of the Riverton to Peavine run because boating use is typically lower in the spring, particularly at higher elevations, due to colder weather and water conditions. In May and June, the maximum change in boatable days would be a decrease of one to two boatable days. In July and August, modeling results show a change in boatable days would only occur in wet years, with a decrease of one boatable day. A decrease of one to two boatable days in May through August would reduce some potential recreational use as these days would occur during the most popular use season.

Table 4.16-31 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Riverton to Peavine Run – Baseline versus Project Conditions and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	-1	-1	-1	0	0	-1	-1	0
Above Normal	0	0	0	0	0	0	-1	0	-1	0	0	0
Below Normal	0	0	-1	-1	0	-1	-2	0	-1	0	0	0
Dry	0	0	-1	0	0	0	-1	-1	-2	0	0	0
Critically Dry	0	0	0	0	0	0	-2	-2	-1	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Riverton to Peavine run would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Riverton to Peavine whitewater run.

Golden Gate Run

Modeling results for the Class IV-V Golden Gate run show that the run has the most boatable days primarily from March to June, with some boatable days in November to February and in July in wet years under baseline conditions. This run ends about 0.5 miles downstream of the El Dorado Powerhouse and therefore the Project's post-construction operational streamflow changes would primarily be limited to a reduction of 11 cfs maximum, similar to the upstream Riverton to Peavine run. Under baseline versus project and future baseline versus future project conditions, modeling results show there would be some decrease in the average number of boatable days in all water year types (Table 4.16-32). In wet, above normal and dry years on average there would be a reduction of one boatable day in February (wet and above normal) or March (dry). In above normal water years on average there would be a reduction of two boatable days in April, but a gain of one boatable day in May. In dry years there would be a reduction of one boatable day in April and May on average. There would also be a reduction of one boatable day in May in critically dry years on average. In below normal years, there would a one boatable day reduction on average in June.

The decrease of a boatable day on average in February and March and one to two days in April in wet, above normal and dry years would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in the winter and spring, particularly at higher elevations, due to colder weather and water conditions. The decrease of one boatable day on average in May in dry and critically dry years and one boatable day on average in June in below normal water years would reduce potential whitewater boating use of this run in these water year types. However, the decrease of one boatable day on average would not be expected to substantially change potential whitewater use or effect a substantial number of people. The gain of one boatable day on average in May in above normal years would provide a benefit and could slightly increase potential use of the run in this water year type.

Table 4.16-32 Changes in Monthly Average Number of Boatable Days by Water Year Type for Golden Gate Run – Baseline versus Project and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	-1	0	0	0	0	0	0	0
Above Normal	0	0	0	0	-1	0	-2	+1	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	-1	0	0	0
Dry	0	0	0	0	0	-1	-1	-1	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	-1	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-33 shows the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the Golden Gate run. Between December and April, the maximum change in the number of boatable days would range from an increase of one boatable day to a decrease of three boatable days. Reductions in the number of boatable days from December to April would not substantially affect whitewater use of the Golden Gate run because boating use is typically lower in the spring, particularly at higher elevations, due to colder weather and water conditions. From May to August, the maximum change in the number of boatable days would range from an increase of one boatable day to a decrease of two boatable days. A decrease of one to two boatable days between May and August would reduce some potential recreational use as these days would occur during the most popular use season.

Table 4.16-33 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Golden Gate Run – Baseline versus Project Conditions and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	-1	-1	-1	-2	+1/-2	+1	+1	-1	-1	0
Above Normal	0	0	0	0	-1	0	-3	+1	+1/-1	0	0	0
Below Normal	0	0	0	-1	-1	-1	+1/-1	+1	-1	0	0	0
Dry	0	0	0	0	-1	-1	-1	-1	-1	0	0	0
Critically Dry	0	0	0	0	0	-1	-1	-2	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Golden Gate run would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Golden Gate whitewater run.

Slab Creek Run

Similar to Project operations with existing infrastructure, under the Project's post-construction operations there would be a decrease of one boatable day on average in March on the Slab Creek whitewater run in below normal water years (Table 4.16-34). This one day decrease on average would occur under both baseline versus project and future baseline versus future project conditions. This boatable day would not be one of the FERC-required recreation flow days, but a separate boatable day that occurred naturally in March. The decrease of a boatable day on average in March in below normal years would not substantially affect potential whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in the spring due to colder weather and water conditions.

Table 4.16-34 Changes in Monthly Average Number of Boatable Days by Water Year Type for Slab Creek Run – Baseline versus Project and Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	-1	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-35 and Table 4.16-36 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the Slab Creek run. The modeling results for both baseline versus project and future baseline versus future project conditions show a decrease of one boatable day in December through March and an additional boatable day in April, as well as May and June (under future baseline versus future project conditions only). As described above, this reduction or addition of boatable days would not affect the FERC-required recreation flow days but would be a separate boatable day that occurred naturally. The decrease of one boatable day in December through March would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in these months due to colder weather and water conditions. The additional boatable day in April, May or June would benefit recreation.

Table 4.16-35 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Slab Creek Run – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	-1	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	-1	0	0	-1	0	0	0	0	0	0
Dry	0	0	0	0	-1	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	-1	0	+1	0	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-36 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Slab Creek Run – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	-1	0	+1	+1	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	0	0	-1	-1	0	-1	0	+1	0	0	0	0
Dry	0	0	0	0	-1	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	-1	0	+1	0	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Slab Creek run would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Slab Creek whitewater run.

Chili Bar Run

For the lower difficulty conditions (Class II-III) of the Chili Bar run, modeling of the Project's post-construction operations shows the same increases and decreases in the average number of boatable days as the Project's existing infrastructure operations, with a few additional boatable day decreases. Under the Project's post-construction operations, on average there would be a one boatable day reduction in January in critically dry years under baseline versus project conditions and future baseline versus future project conditions (Table 4.16-37 and Table 4.16-38), as well as in wet and dry water year types under future baseline versus future project conditions only. In February, there would be a one boatable day reduction on average in dry and critically dry years under baseline versus project and future baseline versus future project conditions, and a one boatable day increase on average in below normal water years under baseline versus project conditions. In March, there would be a reduction of one boatable day on average in dry and critically dry water years under both baseline versus project and future baseline versus future project conditions, with a one boatable day increase on average in above normal water years under future baseline versus future project conditions only. There would be a one boatable day reduction on average in April in dry and critically dry years under baseline versus project and future baseline versus future project conditions. As described for the Project's existing infrastructure operations, though whitewater boating use would be reduced due to one less boatable day on average in January through April (or slightly increased with one additional boatable day in these months) in certain water year types, whitewater boating use is lower in these months than in the summer months. Thus, the decrease of one boatable day on average would not result in a substantial change to whitewater boating use or affect a substantial number of people.

Under the Project's post-construction operations, there would also be changes to the average number of boatable days for the lower difficulty conditions on the Chili Bar whitewater run from May to September. Modeling of the Project's post-construction operations shows a one boatable day increase on average in July and August in dry years, and an increase of one boatable day on average in September in critically dry years under baseline versus project conditions. There would be a one boatable day reduction on average in May in above normal and dry years under future baseline versus future project conditions only. As described under the Project's existing infrastructure operations, the additional boatable days (on average) in the summer/early fall on the Chili Bar run would benefit personal and commercial boaters as this is the main recreation season for the run. In particular, the additional day in September in critically dry years would benefit boaters because there are fewer FERC-required flow days in September after Labor Day in this water year type. A reduction of one boatable day on average in May would reduce some potential whitewater use as this day would occur during the most popular use season.

Table 4.16-37 Changes in Monthly Average Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	+1	0	0	0	0	0	0	0
Dry	0	0	0	0	-1	-1	-1	0	0	+1	+1	0
Critically Dry	0	0	0	-1	-1	-1	-1	0	0	0	0	+1

Greyed out cells have a change in boatable days.

Table 4.16-38 Changes in Monthly Average Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	+1	0	-1	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	-1	-1	-1	-1	-1	0	0	0	0
Critically Dry	0	0	0	-1	-1	-1	-1	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-39 and Table 4.16-40 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the lower level of difficulty flows on the Chili Bar run. Modeling results show the maximum change in boatable days in the fall/winter (November to February) may be an increase of one to two boatable days or a decrease of up to five boatable days, depending on the month and water year type. At the beginning of the whitewater season (March and April) and end of the season (October), based on modeling results the maximum change in boatable days could be an increase of two boatable days or a decrease of two boatable days, except in March in critically dry years, which had a decrease of eleven or twelve boatable days. A decrease of boatable days of this size was an outlier in the modeling data and only occurred in 1 month of the 564 months modeled and was over double the next largest decrease of boatable days in any water year type, which was 3 days in baseline versus project conditions and 5 days in future baseline versus future project conditions.

A decrease of up to five boatable days in one of the months between October and April would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in these months due to colder weather and water conditions. The whitewater boating season for the Chili Bar run is generally from March through October. Within this March through October season, peak whitewater boating use occurs from Memorial Day through Labor Day weekend due to required releases and higher air temperatures; there is less use from March through Memorial Day (see e.g., Whitewater Excitement Inc. 2023 and El Dorado County 2018). Therefore, a decrease of eleven or twelve boatable days in March of critically dry years would reduce some potential boatable use, but would not substantially affect whitewater boating use or affect a substantial number of people as there is less use of the Chili Bar run from March through Memorial Day. FERC-required recreation flows would still be provided on the Chili Bar run in critically dry years 3 days a week, including on weekends, which would likely be the days where most use would occur.

During the peak season (Memorial Day through Labor Day – generally May through September in the modeling results), the modeling results show the maximum change in boatable days would range from an increase of two boatable days to a decrease of one boatable day, except in May, which could have an increase of one boatable day or a decrease of three boatable days. The reduction in boatable days would occur on the one to two weekdays where recreation flows are not required under the Chili Bar license between Memorial Day and Labor Day (see Table 4.16-2). A reduction of one to three boatable days in May through September would reduce some potential whitewater use as the reduction of these days would occur during the most popular use season. However, the reduction in boatable days would occur on weekdays, when recreational use is typically lower. The additional boatable days in the peak season would benefit recreation use.

Table 4.16-39 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	+2/-2	0	0	0	0	0	+1	+1	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	+1	0	0	-1	+1	+1	+1	-1	0	+1	0	0
Dry	0	0	0	+2	-2	-2	-1	0	0	+2	+1	0
Critically Dry	0	0	-1	-3	-3	+2/-11	+1/-2	+1/-1	0	0	0	+2

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-40 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 700 to 1,750 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	-1	0	0	+2/-2	0	0	0	0	0	0	0	0
Above Normal	0	0	+1	+1	-1	+1	+2	-1	0	0	0	0
Below Normal	-1	0	0	-3	+1/-1	+2	+1/-1	-1	+1/-1	+1	0	0
Dry	0	0	0	-2	+2/-5	-2	-2	-3	+1	0	0	0
Critically Dry	0	0	-1	-3	-3	+2/-12	-2	-2	+1	0	0	+1

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

At higher flow levels, the Chili Bar run has a higher difficulty – Class III-IV. Modeling results for the Project's post-construction operations show the same changes to the average number of boatable days for the run at this higher difficulty as Project operations with existing infrastructure. According to modeling results, changes to the average number of boatable days under the Project's post-construction operations would be mostly beneficial and all occur only under future baseline versus future project conditions (Table 4.16-41). On average, there would be a reduction of one boatable day in January in above normal years. There would be one additional boatable day in April and June on average in below normal years and one additional boatable day in May on average in dry years. The reduction of one boatable day on average in January would not result in a substantial change to whitewater boating use or affect a substantial number of people because use is lower in the winter due to colder weather and water conditions. The additional boatable days on average in May and June would be beneficial as this is the main use season and could increase potential use of the run slightly.

Table 4.16-41 Changes in Monthly Average Number of Boatable Days by Water Year Type for Chili Bar Run at 1,750 to 10,000 cfs – Future Baseline versus Future Project Conditions, Post Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	+1	0	+1	0	0	0
Dry	0	0	0	0	0	0	0	+1	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

At the higher flows, modeling results show that changes in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions would be limited to the months of January through June. Table 4.16-42 and Table 4.16-43 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the higher level of difficulty flows on the Chili Bar run. The

maximum change in boatable days in January and February would be a decrease of one or two boatable days under either baseline versus project conditions or future baseline versus future project conditions. In March and April, the maximum change in boatable days would range between an increase of two boatable days and a decrease of two boatable days in certain water year types. A decrease of up to two boatable days in these months would not substantially affect whitewater boating use and would not affect a substantial number of people because whitewater boating use is typically lower in these months due to colder weather and water conditions. During the peak season (Memorial Day through Labor Day – generally May through September in the modeling results), the maximum change in boatable days would be an increase of up to three boatable days in certain water year types, except in below normal water years, which showed both an increase of one boatable day and a decrease of one boatable day. An increase in boatable days in the peak season would benefit recreation use. A decrease of one boatable day in below normal water years in May would not substantially affect whitewater boating use and would not affect a substantial number of people. With slightly reduced flows, the run would still be usable for whitewater boating on the days where there was a decrease in boatable days at the higher flows, but at a lower difficulty level (Class II-III).

Table 4.16-42 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 1,750 to 10,000 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	+1	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	+1	+1	+1	0	0	0
Dry	0	0	0	0	0	0	-1	0	+3	0	0	0
Critically Dry	0	0	0	0	-1	+1/-2	+1	+2	+1	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-43 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Chili Bar Run at 1,750 to 10,000 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	+1	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	-2	+2/-1	+1/-1	+1	0	0	0
Dry	0	0	0	0	-2	0	-1	+2	+2	0	0	0
Critically Dry	0	0	0	0	-1	+1/-2	+1	+2	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Chili Bar run at either the higher or lower difficulty level would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Chili Bar whitewater run.

Coloma to Greenwood Run

Modeling results for the Project's post-construction operations show similar changes to the average number of whitewater boating days on the Coloma to Greenwood whitewater run as described for the Project's existing infrastructure operations. In January, with post-construction operations there would be a reduction of one boatable day on average in dry and critically dry years under both baseline versus project conditions and future baseline versus future project conditions (Table 4.16-44 and Table 4.16-45) and a reduction of one boatable day on

average in below normal water years under future baseline versus future project conditions only. In February, there would be a reduction of two boatable days on average in critically dry years under both baseline versus project conditions and future baseline versus future project conditions, and a reduction of one boatable day on average in dry years under only future baseline versus future project conditions. There would be a one boatable day decrease on average in March in dry and critically dry years in baseline versus project conditions and future baseline versus future project conditions. April would also be affected in critically dry years under future baseline versus future project conditions, with a reduction of one boatable day on average. There would be a one boatable day increase on average in July in critically dry years under baseline versus project conditions.

As described for the Project's existing infrastructure operations, reductions in the average number of boatable days by one to two days between January and April would not substantially affect whitewater boating use and would not affect a substantial number of people, as use is lower in these months due to colder weather and water conditions. The additional boatable day on average in July in critically dry years may slightly increase potential whitewater use in this month.

Table 4.16-44 Changes in Monthly Average Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	-1	0	-1	0	0	0	0	0	0
Critically Dry	0	0	0	-1	-2	-1	0	0	0	+1	0	0

Greyed out cells have a change in boatable days.

Table 4.16-45 Changes in Monthly Average Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Dry	0	0	0	-1	-1	-1	0	0	0	0	0	0
Critically Dry	0	0	0	-1	-2	-1	-1	0	0	0	0	0

Greyed out cells have a change in boatable days.

In reviewing the maximum change to boatable days based on modeling results by month for each year in the dataset (1975 to 2021), the changes in critically dry years compared to other years are noticeable on the Coloma to Greenwood run. Table 4.16-46 and Table 4.16-47 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the Coloma to Greenwood run. The model results show changes to boatable days between October and December ranging from an increase of one boatable day to a decrease of two boatable days in wet, below normal and critically dry years. There would be changes to the monthly number of boatable days from January through March for most water year types. The maximum change in the number of boatable days in these months would range from an increase of one boatable day to a decrease of six boatable days, with the largest decreases occurring in critically dry years in baseline versus project conditions and dry and critically dry years under future baseline versus future project conditions. There would also be a decrease of six or seven boatable days in April in critically dry years. Reductions in the number of boatable days by up to seven days between October and April would not substantially affect whitewater boating use and would not affect a substantial number of people as use

is lower in these months due to colder weather and water conditions. From May to September, the maximum change in boatable days would be an increase of one boatable day in July in below normal and dry years. However in critically dry years, the maximum change between May and September would range from an increase of three boatable days to a decrease of two boatable days. Additional boatable days between May and September may slightly increase potential recreational use in these months. A decrease of one to two boatable days in May or August in critically dry years would reduce some potential recreational use as these days would occur during the most popular use season.

Table 4.16-46 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	+1	0	0	-5	+1	0	0	0	0	+1	0	0
Dry	0	0	0	-3	-1	-4	0	0	0	+1	0	0
Critically Dry	0	0	0	-6	-5	-4	-7	+1/-1	0	+3	+3	+2

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-47 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	-1	0	-2	-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Below Normal	-1	0	0	-5	-1	-1	0	0	0	+1	0	0
Dry	0	0	0	-5	-6	-4	0	0	0	0	0	0
Critically Dry	0	0	-1	-6	-6	-6	-6	-2	+1	0	-1	+1

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Coloma to Greenwood run would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Coloma to Greenwood whitewater run.

The Gorge Run

Modeling results for the Project's post-construction operations show fairly similar changes to the average number of whitewater boating days on the Gorge run at both lower and higher flows, as under the Project's existing infrastructure operations. At the lower flow level (800 to 2,000 cfs), under the Project's post-construction operations there would be a one boatable day decrease on average in January in below normal water years under baseline versus project and future baseline versus future project conditions (Table 4.16-48 and Table 4.16-49) and in dry water years under future baseline versus future project conditions only. On average, there would be a one boatable day decrease in February in critically dry years and a two boatable day decrease in March in baseline versus project and future baseline versus future project conditions. In April, on average there would be a one boatable day decrease in above normal and dry water years under future baseline versus future project conditions only. In the main recreation season, on average there would be a one boatable day decrease in May in dry years and a one boatable day decrease in June in below normal water years under future baseline versus future project conditions only. In September, there would be an increase of one boatable day on average in wet years under future baseline versus future project conditions only. Reductions in the average number of boatable days from

January to April would not substantially affect whitewater use of this run, as use is lower in these months due to colder weather and water conditions. The reduction of one boatable day on average in May and one in June may reduce recreation use slightly as this day would occur during the most popular use season. The increase in boatable days on average in September in wet years would benefit whitewater recreation and may slightly increase potential use of the run.

Table 4.16-48 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	-1	-2	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

Table 4.16-49 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	0	0	0	0	0	0	0	0	+1
Above Normal	0	0	0	0	0	0	-1	0	0	0	0	0
Below Normal	0	0	0	-1	0	0	0	0	-1	0	0	0
Dry	0	0	0	-1	0	0	-1	-1	0	0	0	0
Critically Dry	0	0	0	0	-1	-2	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

The number of boatable days by month for each year in the dataset (1975-2021) under baseline, project, future baseline and future project conditions was reviewed to identify the maximum change in the number of boatable days by month for each water year type. Table 4.16-50 and Table 4.16-51 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the lower level of difficulty flows on the Gorge run. From October to April, the maximum change in the number of boatable days would range from an increase of three boatable days to a decrease of five boatable days. Reductions in the number of boatable days from October to April would not substantially affect whitewater use of the Gorge run as use is lower in these months due to colder weather and water conditions. From May to September, the maximum change in the number of boatable days would range from an increase of three boatable days to a decrease of three boatable days. A decrease of three boatable days between May and September would reduce some potential recreational use as these days would occur during the most popular use season.

Table 4.16-50 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	+2/-2	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	+1	0	0	0	+1	+1	0	-1	-1	+1	0	0
Dry	0	0	0	0	+1/-2	-1	-1	+1	-1	+2	+1	0
Critically Dry	0	0	0	-3	-2	+1/-5	-2	+1/-1	-1	0	0	+2

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-51 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 800 to 2,000 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	-1	0	0	+3/-2	0	0	0	0	0	0	0	0
Above Normal	0	0	+1	+1	-1	+1	+2	-1	0	0	0	0
Below Normal	-1	0	0	-2	+1/-1	+1	+1/-1	0	+1/-1	+1	0	0
Dry	0	0	0	-3	+2/-4	-1	-2	+3/-3	0	0	0	0
Critically Dry	0	0	-1	-3	-2	+1/-5	+1/-1	-2	+1/-1	0	0	+1/-1

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

At higher flows and therefore increased difficulty, the hydrologic modeling shows there would be very little change to the average number of boatable days under the Project's post-construction operations. With post-construction operations, in January there would be a reduction of one boatable day on average in wet years under baseline versus project and future baseline versus future project conditions (Table 4.16-52 and Table 4.16-53). In April, there would be an increase of one boatable day on average in above normal and dry years under future baseline versus future project conditions only. The reduction in the average number of boatable days in January would not substantially affect whitewater use of this run as use is lower in this month due to colder weather and water conditions. The average increase in boatable days would benefit whitewater recreation and may slightly increase potential use of the run.

Table 4.16-52 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

Table 4.16-53 Changes in Monthly Average Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	+1	0	0	0	0	0
Below Normal	0	0	0	0	0	0	0	0	0	0	0	0
Dry	0	0	0	0	0	0	+1	0	0	0	0	0
Critically Dry	0	0	0	0	0	0	0	0	0	0	0	0

Greyed out cells have a change in boatable days.

At the higher flows, modeling results show that changes in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions would primarily be limited to the months of January through June. Table 4.16-54 and Table 4.16-55 show the maximum change in the monthly number of boatable days for each water year type under baseline versus project conditions and future baseline versus future project conditions for the higher level of difficulty flows on the Gorge run. The maximum change in the number of boatable days between January and April would range from an increase of two boatable days to a decrease of four boatable days. The reduction in the number of boatable days in January through April would not substantially affect whitewater use of this run as use is lower in these months due to colder weather and water conditions. In May and June, the maximum change in the number of boatable days would range from an increase of two boatable days to a decrease of one boatable day. In July, the modeling shows a decrease of one boatable day in wet years under future baseline versus future project conditions only. A decrease of one boatable day in June and July would reduce some potential recreational use as this day would occur during the most popular use season. With slightly reduced flows, the run would still be usable for whitewater boating on the days where there was a decrease in boatable days at the higher flows, but at a lower difficulty level (Class II-III). An increase in boatable days in any month, particularly in May and June when use is higher, would benefit recreational use.

Table 4.16-54 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Baseline versus Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	0	-1	0	0	0	0	0	0	0	0
Above Normal	0	0	0	0	0	0	0	0	-1	0	0	0
Below Normal	0	0	0	-1	+1	+1	0	+2	0	0	0	0
Dry	0	0	0	-2	-1	0	-1	+1	0	0	0	0
Critically Dry	0	0	0	-1	-1	+1/-4	+1	+1	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Table 4.16-55 Maximum Change in the Monthly Number of Boatable Days by Water Year Type for the Gorge Run at 2,000 to 10,000 cfs – Future Baseline versus Future Project Conditions, Post-Construction Operations.

Water Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Wet	0	0	+1	-1	0	0	0	0	0	-1	0	0
Above Normal	0	0	0	0	0	+1	+1	0	0	0	0	0
Below Normal	0	0	0	-1	0	+1/-2	-1	+2	+1	0	0	0
Dry	0	0	0	-2	-2	0	+2/-1	+1	0	0	0	0
Critically Dry	0	0	0	-1	-1	+1/-2	+1	+1	0	0	0	0

Greyed out cells have a change in boatable days.
The maximum change in the number of boatable days in each month would not necessarily occur within the same year.

Overall, the changes to boatable days on the Gorge run would not substantially change potential whitewater boating use on this run and the impact to recreation would be **less than significant** for the Gorge whitewater run.

Mitigation Measures

Mitigation Measure 4.16-1: Implement Mitigation Measure 4.13-1b: Limit Construction Season

Construction activities within the Sly Park Recreation Area shall occur outside of the peak recreation season, which is generally from Memorial Day weekend to Labor Day weekend.

Significance after Mitigation

Implementation of Mitigation Measure 4.16-1 would prohibit construction activities from occurring during the peak recreation season, from Memorial Day weekend to Labor Day weekend. By limiting the construction season to months/days outside of the peak recreation season, the campgrounds in the Hazel Creek area would not need to be closed for construction and roads around Jenkinson Lake would not have access delays or detours when recreation use at the lake is at its highest level. Therefore, potential loss of recreation use at the Hazel Creek campgrounds would be minimized as construction would occur when the campgrounds were already closed. In addition, though there may still be noise impacts near the day use area and potential temporary access delays or detours on roads around Jenkinson Lake while construction activities were occurring, these effects would occur when there were less visitors present at the lake (in the spring and fall) and therefore a substantial number of people would not be affected. Therefore, implementation of Mitigation Measure 4.16-1 would reduce this impact to a **less-than-significant level**.

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4.17 TRANSPORTATION AND TRAFFIC

This section provides an analysis of potential impacts on transportation associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.17.1 EXISTING CONDITIONS

ROADWAYS

U.S. Highway 50 is the primary transportation corridor extending through the Project area from west to east connecting Sacramento County and the State of Nevada and serves all of the County's major population centers, including El Dorado Hills, Cameron Park, Diamond Springs, Placerville, Camino, Pollock Pines, and South Lake Tahoe. Roadways in the vicinity of the Project construction alignment include Icehouse Road, Hazel Valley Road, Sly Park Road, Mormon Emigrant Trail, White Meadows Road, and Pony Express Trail.

BICYCLES

Bikeways are classified as Class 1, Class 2, and Class 3 (bike paths, bike lanes, and bike routes respectively). The El Dorado County Bicycle Transportation Plan, under the proposed improvements section, lists proposed bikeways that would occur in the vicinity to the Project area along Sly Park Road, Pony Express Trail, Ridgeway Drive, and Carson Road (El Dorado County 2020).

PUBLIC TRANSIT

The County public transit services are provided by the El Dorado County Transit Authority (EDCTA). El Dorado Transit Route 60 services the Pollock Pines area, which is in close proximity to the proposed Project area (El Dorado Transit 2016). In particular, the Safeway Plaza on Pony Express Trail and the Pollock Pines Post Office on Sanders Drive are transit stops in close proximity to the Project area. Additionally, student bussing services throughout the Project area are provided by the Pollock Pines Elementary School District, El Dorado Union High School District, and El Dorado County Office of Education.

4.17.2 REGULATORY SETTING

Federal, state, and local plans, policies, laws, and regulations provide a framework for addressing aspects of transportation and traffic that may be affected by the Project. The following is a summary of that information as it relates to the impact analysis provided below.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

1989 Eldorado National Forest Land and Resource Management Plan

The U.S. Forest Service (USFS) manages the Eldorado National Forest according to the management direction, standards and guidelines described in the 1989 Eldorado National Forest Land and Resource Management Plan (USFS 1989). This plan provides direction on management of roads and trails throughout the entire forest, including federal lands located within the Project area.

Federal Power Act 16 U.S.C. §§ 797(e) and 808 (2000)

The Federal Power Act (FPA) is the primary federal statute governing the wholesale transmission and sale of electric power, as well as the regulation of hydroelectric power (CRS 2020). The FERC licenses and regulates the construction and operation of non-federal hydropower projects under the FPA. The District owns and operates the El Dorado Hydroelectric Project (Project No. 184) under a license with FERC. The District, as the Licensee of Project No. 184 is responsible to comply with the articles and conditions contained in the FERC license, including the following condition relevant to transportation:

Condition No. 57 - Transportation System Management Plan: The plan establishes the District's maintenance responsibilities for the use of roads on or affecting National Forest System lands (EID 2017).

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Senate Bill 743

The California Natural Resources Agency adopted CEQA Guidelines Section 15064.3(b) in December 2018 to implement SB 743. These revisions to the CEQA Guidelines criteria for determining the significance of transportation impacts focus primarily on projects within transit priority areas and shift the focus from driver delay (i.e., level of service) to reduction of greenhouse gas (GHG) emissions, creation of multimodal networks, and promotion of a mix of land uses. The revisions require lead agencies to begin evaluating transportation impacts for automobiles based on vehicle miles traveled (VMT) no later than July 1, 2020. VMT is a measure of the total number of miles driven to or from a project and sometimes is expressed as an average number of miles per trip or per person.

California Department of Transportation

The California Department of Transportation (Caltrans) manages interregional transportation, including the management and construction of the California highway system. U.S. Highway 50 is the main traffic artery in the Project vicinity and would serve as the primary regional access route for construction traffic to and from the Project area. In addition, Caltrans is responsible for the permitting and regulation of state roadways and requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

Sacramento Area Council of Governments

The Sacramento Area Council of Governments (SACOG) is a cooperative organization representing the six counties comprising the Greater Sacramento metropolitan region (Sacramento, Yolo, El Dorado, Placer, Sutter, and Yuba counties), that works to provide planning and funding for transportation within the region. This organization has been granted the responsibility of developing the federal and state mandated metropolitan transportation plan every four years. The *Metropolitan Transportation Plan/Sustainable Communities Strategy* (MTP/SCS) (SACOG 2020) is the mandated transportation plan that includes the regional planning for roadway improvements and is crucial for receiving federal transportation funding.

El Dorado County Regional Transportation Plan

Regional transportation planning (RTP) is conducted by several agencies at all levels of government in the County and the City of Placerville. The plans and programs related to the RTP include local general plans, the short- and long-range transit plan, non-motorized and bicycle facilities plans, other agencies' RTPs, the SACOG MTP, the Regional Transportation Improvement Program (RTIP), the State Transportation Improvement Program (STIP), the California Transportation Plan, the California Interregional Strategic Plan, the regional clean air plan, and Caltrans concept reports. The County RTP is designed to be consistent with the adopted plans and programs.

El Dorado County General Plan

The Project is proposed by the District, a special district that supplies water to customers throughout much of the County. Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code.*

As a special district with equal authority, the District is exempt from following goals and policies within the County's General Plan and Zoning Ordinance. However, the District aims to comply with those goals and policies outlined in the El Dorado County General Plan (El Dorado County 2019) and uses these goals and policies as a metric for formulating an impact analysis. The following goals and policies related to transportation are applicable to the Project:

- **Goal TC-1:** To plan for and provide a unified, coordinated, and cost-efficient countywide road and highway system that ensures the safe, orderly, and efficient movement of people and goods.
  - **Policy TC-1q:** The County shall utilize road construction methods that seek to reduce air, water, and noise pollution associated with road and highway development.
- **Goal TC-2:** To promote a safe and efficient transit system that provides service to all residents, including senior citizens, youths, the disabled, and those without access to automobiles that also helps to reduce congestion, and improves the environment.
- **Goal TC-4:** To provide a safe, continuous, and easily accessible non-motorized transportation system that facilitates the use of the viable alternative transportation modes.

4.17.3 Impact Analysis

Methodology

The Project would result in vehicle trips to the transportation network during Project construction. The analysis of the Project's effects related to transportation is based on a review of the regional and local transportation network and the regulations governing its usage. Because detailed information on construction activities is not available, analysis of the effects of construction-related trips is qualitative.

As described above, Section 15064.3(b) of the CEQA Guidelines was enacted to fulfill a directive of SB 743. This section of the CEQA Guidelines states that a lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the

programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts. However, in order to disclose what potential impacts the proposed Project could have on transportation, the District is providing information for comparable past projects for illustrative purposes in this EIR, as discussed in the impact analysis sections below.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.
- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Consistent with CEQA Guidelines Appendix G, the Project would result in a significant impact on transportation if it 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(b);

c) Substantially increases hazards due to a geometric design feature (such as sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or

d) Result in inadequate emergency access.

ENVIRONMENTAL IMPACTS

Impact 4.17-1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not increase vehicle trips. Therefore, there would be no conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Access and staging of equipment and material may occur at various locations along the El Dorado Canal and near the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Primary access is anticipated to occur along existing roads and along the El Dorado Canal bench; however, some road improvements and/or temporary access roads may be necessary to access portions of the channel. Equipment and

material staging would generally be located in remote previously disturbed areas. These road improvements and temporary access roads would not permanently or substantially affect the circulation system. However, vehicle trips associated with construction workers as well as with delivery of construction equipment and materials could temporarily affect the performance of the local circulation system due to traffic delays and roadway obstructions, which could conflict with a program, plan, ordinance or policy addressing this system. Therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

This operational phase of the Project will not increase vehicle trips. Because post-construction operations would have no effect on circulation systems, there would be no conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. Therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.17-1: Prepare and Implement Traffic Control Plan

Prior to construction, the construction contractor and/or the District shall prepare a traffic control plan. The traffic control plan shall contain detailed measures in order to ensure acceptable levels of traffic flow, emergency response notification and response times, and public and school bus transit coordination and detours. The Plan shall include at a minimum: discussion of expected construction schedule and locations, traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. The construction contractor and/or the District shall implement the traffic control plan during construction activities associated with the project.

Significance after Mitigation

Implementation of Mitigation Measure 4.17-1 would minimize motorist delay due to construction activities, which would ensure that the Project would not conflict with a program, plan, ordinance or policy addressing the circulation system. Impacts related to conflicts with a program, plan, ordinance, or policy during construction would be **less than significant with mitigation incorporated.**

Impact 4.17-2. Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b)?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve increases in vehicle trips and therefore would not increase VMT associated with the Project. **No impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts. However, in order to disclose what potential impacts the proposed Project could have on transportation, the District is providing information for comparable past projects for illustrative purposes in this EIR.

The District routinely conducts infrastructure improvements along the El Dorado Canal and other water conveyance facilities that are comparable in size and scope to the construction activities associated with the proposed Project. The types of construction activities (e.g., vegetation removal, demolition of existing structures, localized excavation and backfill, grading, placement of concrete, slope and channel stabilization, construction of conveyance structures, and site restoration), as well as the types of construction equipment utilized for these types of infrastructure projects are likewise similar. These past projects can therefore provide a useful metric to illustrate the potential impacts to transportation associated with construction activities for future infrastructure improvements under the proposed Project. While these past projects provide insight into the potential impacts to transportation that would be associated with the proposed Project, a subsequent project-level analysis would be performed prior to implementation of infrastructure improvements associated with the proposed Project and appropriate mitigation described herein would be implemented as necessary to ensure potential impacts are reduced to a less than significant level.

The transportation analysis is provided for the following recent comparable infrastructure projects:

- Sly Park Intertie Improvements Project (EID 2024)

- Upper Main Ditch Piping Project (EID 2018a)
- Flumes 38, 39/40, 44 and Canal Replacement Project (EID 2018b)

A transportation analysis was performed for each project. The analysis incorporated estimates for the types of construction equipment to be used, construction crew size, worker and vendor vehicle haul trips, and construction schedule. Additional details for each project and the results of the transportation analysis are provided below.

Sly Park Intertie Improvements Project

The Sly Park Intertie (SPI) Improvements Project involves the replacement of approximately 6 miles of an existing 22- to 24-inch diameter steel pipeline, which extends between the District's Reservoir 1 Water Treatment Plant and Reservoir A Water Treatment Plant and continues to the Sly Park Hills Tank. The SPI Project would replace the SPI with a new pipeline and also include installation of a new pump station and associated appurtenances. Key construction activities would include site preparation and vegetation clearing, excavation and removal of the existing pipeline, placement of bedding materials as required, placement of the new sections of piping (typically 20- to 40-foot sections), backfilling and compaction of the trench, placement of appurtenances such as isolation valves, blow-offs, air relief valves and manways along the pipeline, and restoration of the disturbed area. Additionally, a new pump station, electrical service, and backup power supply generator would be constructed at Reservoir A Water Treatment Plant. Construction is planned to occur over a period of approximately 18-months. As a pipeline replacement, post-construction operations of the pipeline is anticipated to be similar to existing conditions.

Construction of the SPI Improvements Project would result in temporary increase in material haul trips and worker trips to the SPI Improvements Project area throughout the construction activities. These truck trips would be limited in duration and daily quantity, with a maximum of approximately 30 truck trips per day over 18 months during short-duration peak construction periods, and would be sporadic over the duration of construction, with more truck trips during material delivery and fewer truck trips during installation of SPI Improvements Project features. These additional truck trips would not result in a substantial increase in VMT and, therefore, construction of the SPI Improvements Project would also be consistent with the CEQA Guidelines Section 15064.3(b). The construction impact would be less than significant.

Upper Main Ditch Piping Project

The Upper Main Ditch Piping Project involved the conversion of an earthen lined ditch to a 3-mile buried 42-inch pipe. The pipeline connects the El Dorado Forebay to the Reservoir 1 Water Treatment Plant. The project included appurtenant facilities such as tying into the outlet pipe downstream of the Forebay Reservoir Valve House and improvements to the inlet facility at the Water Treatment Plant. Project activities included tree removal, excavation and trenching for pipeline placement, grading and compaction, and placement of appurtenances such as isolation valves, blow-offs, air relief valves and manways along the pipeline. Construction related activities were estimated to occur over 12-months (approximately 30 weeks), spread over two construction seasons, during the annual ditch outage that typically occurs each fall and winter. Operational activities were considered to be similar to existing conditions and therefore, no operations-related analysis was necessary to conclude that there would be no long-term impacts to VMT.

During construction, the Upper Main Ditch Piping Project was expected to generate a light amount of construction traffic, including worker and material hauling trips. It was estimated that the project would generate

an average of 10 worker commute trips per day and a total of 660 materials and equipment hauling trips over the entire construction period (over 12-months of construction in a two-year period). These materials and equipment hauling trips would be intermittent, with trips mainly focused around construction start-up and shut-down and would not conflict with any local or regional transportation plan, ordinance, or policy. Although traffic levels would slightly increase during the construction of the Upper Main Ditch Piping Project, the additional construction traffic would not significantly alter the existing traffic flows of the access roads. Construction of the Upper Main Ditch Piping Project would remain within the District's easement and secured temporary construction easements and would not involve permanent changes to nearby roadways. Because the construction period would be limited to 12 months and would not involve large construction crews, the impact related to construction VMT would be less than significant.

Flumes 38, 39/40, 44, and Canal Replacement Project

The Flumes 38, 39/40, 44, and Canal Replacement Project involved the conversion of approximately 1,200 feet of wooden flumes to concrete structures and relining of approximately 1,900 feet of concrete canal. Project activities include tree and vegetation removal, demolition of the existing facilities, grading, hillside stabilization, and construction of mechanically stabilized earth walls to support the new concrete conveyances, improvements to the canal bench, and application of air-placed concrete to the existing segments of the canal and conversion of wooden flume structures to pre-cast or air-placed concrete canal or box culvert. Construction related activities were estimated to occur in two phases over 11-months with phase 1 occurring August to December in the first year and phase 2 occurring July to December during the second year.

It was estimated that the Flumes 38, 39/40, 44, and Canal Replacement Project would generate up to 34 average daily trips, including 20 worker trips and 14 vendor trips per day and a total of 454 truck materials and equipment haul trips over the life of the Flumes 38, 39/40, 44, and Canal Replacement Project. These trips would generally occur on US 50 and local roadways and access roads. Increased construction traffic would be temporary and would occur from approximately August through mid-December in 2018 and 2019. No increase in traffic would occur once construction of the Flumes 38, 39/40, 44, and Canal Replacement Project is complete. Local roads serving this project site are lightly traveled and construction would be temporary and would not result in a substantial increase in traffic that would be anticipated to degrade any roadway or intersection level of service and impacts would be less than significant**.**

Table 4.17-1. Flumes 38, 39/40, 44, and Canal Replacement Project Construction Scenario Assumptions

	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment	Quantity	Hours/Day
Flumes 38-40 and 44 Construction Activity	20	14	454	Air Compressors	1	2
				Cement and Mortar Mixers	1	8
				Excavators	1	8
				Concrete/Industrial Saws	3	12
				Generator Sets	2	12
				Other Construction Equipment (Gator/Quad)	2	3
				Compactors	1	10
				Pumps	2	2
				Tractors/Loaders/Backhoes	1	4

Data source: Table 6 from EID 2018b

The analysis of these three comparable projects illustrates that projects of similar size and scope to the proposed Project would not generate significant VMT. Although the best available evidence indicates impacts would be less than significant even without mitigation, a definitive determination of significance is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve increases in vehicle trips and therefore would not increase VMT associated with the Project. **No impact** would occur.

Impact 4.17-3. Substantially increases hazards due to a geometric design feature (such as sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve substantial changes to the design or usage of the roadway network. Therefore, there would not be increased hazards due to a geometric design feature or incompatible uses, and **no impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a

programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Access and staging of equipment and material may occur at various locations along the El Dorado Canal and near the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Primary access is anticipated to occur along existing roads and along the El Dorado Canal bench; however, some road improvements and/or temporary access roads may be necessary to access portions of the channel. Equipment and material staging would generally be located in previously disturbed areas. Temporary single lane closures along with the movement of oversized vehicles could temporarily result in new or increased roadway hazards. Therefore, construction traffic impacts would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve substantial changes to the design or usage of the roadway network. Therefore, there would not be increased hazards due to a geometric design feature or incompatible uses. **No impact** would occur.

Mitigation Measures

Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)

Significance after Mitigation

Implementation of Mitigation Measure 4.17-1 would minimize motorist delay and would ensure that motorists can travel safely through Project work zones. Impacts related to geometric design hazards or incompatible uses would be **less than significant with mitigation incorporated**.

Impact 4.17-4. Result in inadequate emergency access?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not affect access by emergency vehicles on the roadway network. Therefore, **no impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Access and staging of equipment and material may occur at various locations along the El Dorado Canal and near the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Primary access is anticipated to occur along existing roads and along the El Dorado Canal bench. Lane closures and/or detours could hinder access by emergency vehicles. Therefore, construction traffic impacts would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not affect access by emergency vehicles on the roadway network. Therefore, **no impact** would occur.

Mitigation Measures

Implement Mitigation Measure 4.17-1: Prepare and Implement Traffic Control Plan

Significance after Mitigation

Implementation of Mitigation Measure TRA-1 would ensure emergency access remains possible at all times. Impacts related to emergency access would be **less than significant with mitigation incorporated**.

4.18 TRIBAL CULTURAL RESOURCES

This section provides an analysis of potential impacts on known and unknown tribal cultural resources (TCRs) associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions in the Project area, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.18.1 ENVIRONMENTAL SETTING

The Project area encompasses areas within and near the South Fork of the American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake.

To adequately characterize Native American culture in the context of the environmental setting, it is important to consider both traditional Native American culture and as well as the current and vibrant Native American culture. This approach provides a context and set of values maintained by the current Native American community related to their history and the landscape. Tribes view themselves as contemporary stewards of their culture and the landscape, representing a continuum from the past to the present. They are resilient, vibrant, and active in the community. Tribes maintain their connection to their history and ongoing culture by practicing traditional ceremonies, engaging in traditional practices (e.g., basketry), and conducting public education and interpretation. The acknowledgment of Native American history and the persistence of Tribes cannot be overlooked and should be recognized.

PRE-COLONIAL ENVIRONMENTAL SETTING

Prior to the arrival of Euroamericans in the region, California was inhabited by groups of Native Americans speaking more than 100 different languages and occupying a variety of ecological settings. Kroeber (1925, 1936), and others (i.e., Murdock 1960; Driver 1961), recognized the uniqueness of California Native Americans and classified them as belonging to the California culture area. Kroeber (1925, 1936) further subdivided California into four subculture areas, Northwestern, Northeastern, Southern, and Central. The Central area, which encompasses the Project area, and includes the Nisenan or Southern Maidu and Northern Sierra Miwok. The Washoe also utilized the Project area but are included in the Great Basin culture area. Kroeber (1925:916), however, states that California and the Great Basin are regions of close cultural kinship that should be joined into a larger culture area with the Sacramento River Delta area as a center of major cultural development.

The Project area is situated at the intersection of the Nisenan (sometimes referred to as the Southern Maidu) and Washoe traditional territories. Archaeological evidence suggests that the area now occupied by Union Valley Reservoir was utilized by both groups, based on the mixed projectile point styles found in the area (Deal and Bennett 1996). While the Nisenan belong to the Penutian linguistic family, the Washoe are Hokan speakers. A brief review of the ethnographic literature for each group follows. This discussion is provided to help assess the indigenous archaeological sites that are the static remains of past activity within the Project area. As noted by Binford (1980), although archaeological data alone has the potential to help reconstruct patterns of former dynamic cultural systems through critical analysis, it is when the use of ethnographic data can be applied to the archaeological data that the archaeologist has the best chance to accurately re-create past cultural adaptations (Binford 1980).

Nisenan

Kroeber (1925) recognized three Nisenan dialects—Northern Hill, Southern Hill, and Valley. The Nisenan territory included the drainages of the Yuba, Bear, and American rivers, and the lower drainages of the Feather River, extending from the crest of the Sierra Nevada to the banks of the Sacramento River. According to Bennyhoff (1961), the southern boundary with the Miwok was probably a few miles south of the American River, bordering a shared area used by both Miwok and Nisenan groups that extended to the Cosumnes River. It appears that, while the foothill Nisenan distrusted the valley peoples, the relationship between the Nisenan and Washoe was primarily friendly. Elders recall inter-group marriage and trade primarily involving the exchange of acorns for fish procured by the Washoe (Wilson 1972).

In the Nisenan territory, several political divisions, constituting tribelets, each had their own respective headmen who lived in the larger villages. However, which of these larger population centers wielded more influence than others is not known, although they were all located in the foothill areas. In general, more substantial and permanent Nisenan villages were not established on the valley plain between the Sacramento River and the foothills, although this area was utilized as a rich hunting and gathering ground. Hill Nisenan, located near Placerville, formed one such tribelet with strong affiliations with groups along the ridges and lower drainages of the American River (Wilson and Towne 1978). According to Kroeber (Kroeber 1925), the larger villages could have had populations in excess of 500 individuals, although small settlements consisting of 15 to 25 people and extended families were more common.

Dance houses for political and ceremonial functions were located in major village sites and were semisubterranean structures that were excavated to a depth of 3 to 4 feet and constructed with large beams and two to four main support posts (Beals 1933). Other structures built in the village sites included sweathouses and conical-shaped dwellings constructed of a framework with a covering of bark slabs, brush, and animal skins. Smaller brush structures or sunshades for outdoor summer work were also present and most village sites had bedrock mortars located within or very near the habitation areas.

As with most valley and foothill groups, the Nisenan utilized a wide variety of floral and faunal food sources. The primary staple food was acorns, and gathering expeditions to oak groves were organized seasonally, with hunting, fishing, and the gathering of other vegetal foodstuffs occurring throughout the year. The seasonal harvests were often based on communal property and important social behaviors were intricately related to these harvests. Various roots; nuts; wild onion; wild sweet potato; and many varieties of grasses, berries, and fruits were also gathered at various times. Many of these foodstuffs were processed and stored for winter use, although fruits such as various berries, wild plums, grapes, and other native fruits were consumed while they were fresh. Studies within the Project area indicate that Native Americans deliberately burned the meadows to increase forage and improve the habitat, clear the areas around habitations, kill insects, improve wild seed crops, and facilitate travel and hunting (Deal and Alblinger 1998; Deal and Bennett 1996). This is consistent with work conducted elsewhere by Anderson (1990, 1991, 1993).

The acquisition of faunal species was accomplished through any number of techniques and implements including the bow and arrow, game drives, and decoys. Nets, traps, rodent hooks, and fire were all put to use in hunting small game. Fish were caught with nets, gorges, hooks, and harpoons. One technique apparently involved using soaproot and turkey mullein to poison the water so fish could be easily gathered. Freshwater clams and mussels were also gathered in the larger water courses, such as the lower American River. Other aquatic food sources

available to native populations within the western portion of the Project area would have included fish such as salmon and sturgeon, which would have been netted or caught with the aid of weirs.

The decimation of the Nisenan culture in the nineteenth century as a result of European colonization, coupled with a reluctance to discuss Nisenan spiritual beliefs and practices, makes it difficult to describe these practices in any detail. However, historic records document a number of observances and dances, some of which are still performed today, that were important ceremonies in early historic times. The Kuksu religion, the basic religious system noted throughout Central California, appeared among the Nisenan. Membership was restricted to those initiated in its spirit and deity-impersonating rites. However, the Kuksu was only one of several levels of religious practice among the Nisenan. Various dances associated with mourning and the change of seasons were also important. One of the last major additions to Nisenan spiritual life occurred sometime shortly after 1872 with a revival of the Kuksu as an adaptation to the Ghost Dance religion (Wilson and Towne 1978). Today, Nisenan descendants are reinvesting in their traditions and represent a growing and thriving community.

United Auburn Indian Community

The United Auburn Indian Community is a federally recognized Tribe comprised of both Miwok and Maidu (Nisenan) Tribal members who are traditionally and culturally affiliated with the Project area. The Tribe has a deep spiritual, cultural, and physical ties to their ancestral land and are contemporary stewards of their culture and landscapes. The Tribal community represents the continuity and endurance of their ancestors by maintaining their connection to their history and culture. It is the Tribe's goal to ensure the preservation and continuance of their cultural heritage for current and future generations.

Following documentation by the Department of Interior for the existence of a separate, cohesive band of Maidu and Miwok Indians, occupying a village on the outskirts of the City of Auburn in Placer County, the United States acquired land in trust for the Auburn Band in 1917 near the City of Auburn and formally established a reservation, known as the Auburn Rancheria. Tribal members continued to live on the reservation as a community despite great adversity.

However, in 1967, the United States terminated federal recognition of the Auburn Band, and, in 1970, President Nixon declared the policy of termination a failure. In 1976, both the United States Senate and House of Representatives expressly repudiated this policy in favor of a new federal policy entitled Indian Self-Determination.

In 1991, surviving members of the Auburn Band reorganized their tribal government as the United Auburn Indian Community and requested that the United States formally restore their federal recognition. In 1994, Congress passed the Auburn Indian Restoration Act, which restored the Tribe's federal recognition. The Act provided that the Tribe may acquire land in Placer County to establish a new reservation (UAIC 2024).

Today, Nisenan descendants and other tribes are reinvesting in their traditions and represent a growing and thriving community that is actively involved in defining their role as stewards of their ancestor's sites including the identification of TCRs. TCRs provide the backdrop to religious understanding, traditional stories, knowledge of resources such as varying landscapes, bodies of water, animals and plants, and self-identity. Knowledge of place is central to the continuation and persistence of culture, even if former Nisenan and Miwok occupants live removed from their traditional homeland. Consulting tribes view these interconnected sites and places as living entities; their associations and feeling persist and connect with descendant communities.

Wilton Rancheria

Members of Wilton Rancheria are descendants of the Penutian linguistic family identified as speaking the Miwok dialect. The Tribe's Indigenous territory encompasses the Project area and the land the Tribe's ancestors inhabited were located along a path of massive death and destruction of California Indians caused by Spanish, Mexican, and American military incursions, disease, and slavery, and the violence accompanying mining and settlements (Wilton Rancheria 2024). Between March 1851 and January 1852, three commissioners hastily negotiated eighteen treaties with representatives of some of the indigenous population in California. The Treaty of the Forks of the Cosumnes River ceded the lands on which the Wilton Rancheria in Sacramento County was later established, but promised to establish a rancheria on the Cosumnes River.

The Tribe's ancestors came back from nearly being annihilated only to have their children taken to boarding schools that stripped their indigenous language and culture further. Finally, in July 1928, the United States acquired land in trust for the Miwok people who were living in Sacramento County. A 38.77-acre tract of land in Wilton was purchased from the Cosumnes Company which formally established the Wilton Rancheria. However, under the California Rancheria Act of 1958, the federal government terminated federal recognition of the tribe in 1964.

In 1991, surviving members of Wilton Rancheria reorganized their tribal government and in 1999 requested the United States formally restore their federal recognition. A U.S. District Court Judge restored Wilton Rancheria as a Federally Recognized Tribe in 2009 and is the only federally recognized tribe in Sacramento County. The Tribe passed its constitution in 2011. It stated its four branches of government that include the Office of the Chair & Vice Chair, the Tribal Council, a Tribal-Court, and the General Council. The Tribe's administration office is located in the City of Elk Grove, Sacramento County in California (Wilton Rancheria 2024).

Shingle Springs Band of Miwok Indians

The Shingle Springs Band of Miwok Indians is a federally recognized tribe with knowledge of cultural resources in the Project area. Members are descendants of the Miwok and Southern Maidu "Nisenan" Indians who thrived in California's fertile central valley for thousands of years before contact with Europeans. Although early encounters between Indians and Spanish colonizers in the late 1700s resulted in some violence and spread of disease, it was not until the California gold rush of 1849 that the Miwok and Southern Maidu "Nisenan" Indians experienced devastating and sustained genocide. As a result of the gold rush, Indians in northern California lost the use and control of their aboriginal territories, which forced whole tribes to scatter. The impact of the gold rush era is revealed in population statistics. In 1769, an estimated 310,000 native people lived within the borders of modern-day California. By 1913, only 17,000 Indian people remained in the area.

Despite these harrowing obstacles, Miwok and Southern Maidu "Nisenan" Indians survived the 19th century. In 1916, while conducting a census of Indian people, an agent of the Department of the Interior discovered Indians living along the Sacramento River. The federal government called these native peoples the "Sacramento-Verona Band of Homeless Indians" and set about acquiring land for them. That land is known as the Shingle Springs Rancheria, just off present-day U.S. Highway 50. In 1970, the Tribe formally organized under their Articles of Association and set up home sites on the Rancheria. In 1976, the Tribe's Articles of Association were approved by the Secretary of the Interior. Since the adoption of the Tribe's Articles of Association in 1976, the Tribe has sought to honor and protect its territory and cultural heritage to benefit future generations.

The Rancheria has changed significantly from its humble beginnings and today is a bustling, vibrant community. The Tribe is financially independent and has diverse enterprises and programs including, most notably, Red Hawk Casino, the Shingle Springs Health & Wellness Center and the Tribal Temporary Assistance for Needy Families (TANF) Program. Its Business Development Board is dedicated to developing other enterprises for the Tribe's long-term sustainability (SSBMI 2024).

Washoe

Ethnographic overviews of the Washoe have been produced by d'Azevedo (1986); Barrett (1917); Downs (1966); Liftlejohn (1928); Lowie (1939); Powers (1876); Siskin (1938); and Tilley and McBride (2013). Culturally, the Washoe people are linked to both California and the Great Basin. Their language is, however, unique—the only non-Numic language group in the Great Basin. Although early and still commonly classified as a member of the Hokan stock (cf., Shipley 1978) with 10 other branches in California that are largely concentrated on the central coast, the relationships among the branches have not been established beyond controversy (Jacobsen 1986; Moratto 1984). There is no firmly established proto-language or homeland for the stock. For this reason, there is no linguistic support for either a California origin or a "formerly widespread Hokan-speaking area in the Great Basin" (Jacobsen 1986). Instead, Jacobsen suggests that the Washoe have long occupied their core area as implied by a residue of unanalyzable place names and of apparent older loanwords from the surrounding (linguistic) stocks. This is consistent with archaeological findings of continuity in settlement location between Martis and Kings Beach phases (Elston 1971; Zeier and Elston 1986; cf., Moratto 1984). It does not, however, confirm the hypothesized "cultural continuity between the Martis and Kings Beach Complexes" as Elston (1971) concluded.

Washoe core territory extended from Honey Lake on the north to the West Walker River on the south, and from the Pine Nut Range on the east, west to the Sierra Nevada crest. Northerners (Wel mel ti) used areas from Eagle Valley north to Honey Lake; southerners (Hunga lel ti) occupied the area south of Woodfords; and valley dwellers (Pau wa lu) wintered in the Truckee Meadows (Nevers 1976). The presence of Washoe place names on the western slope of the Sierra Nevada and ethnographic accounts of seasonal rounds extending from the edges of Yosemite Valley north to the town of Colusa (Freed 1966; d'Azevedo 1956), indicate that seasonal rounds extended well beyond the core territory, and may have encompassed a large portion of the current Project area. Two camp sites are indicated by Freed (Freed 1966), one being a short one to two nights' stay at Rubicon Springs, where the mineral water was said to be good for "internal complaints," and the other at Bunker Lake where they camped for a few days hunting deer, before proceeding west toward Georgetown to obtain acorns.

Washoe population estimates are generally low, from 550 in 1861 to 300–400 in 1900 (d'Azevedo 1966), although d'Azevedo's Washoe associates might agree with John Reese, a Carson Valley businessman of the 1850s, who estimated the Carson Valley Washoe population at 2,000–3,000 individuals at the time of historic contact (d'Azevedo 1966).

Washoe subsistence exhibited a pattern of seasonal resource exploitation, relying on extensive knowledge of the environment (Figure 4.18-1 and Table 4.18-1). They gathered plants in earliest spring and moved to Lake Tahoe, as snow conditions allowed, to fish and socialize. In summer, family groups gathered plant foods and hunted in mountain valleys, moving to lower elevations for seed harvests in mid to late summer, when communal rabbit and antelope drives were held. A major celebration began the pine nut harvest, and from September through late October, nuts to be stored for winter subsistence were gathered whenever the opportunity presented itself. In

summer, shelters were temporary, semicircular brush affairs. Winter homes were more sturdy circular bark or wood slab-covered pole frames, dispersed in groups of two to 10.

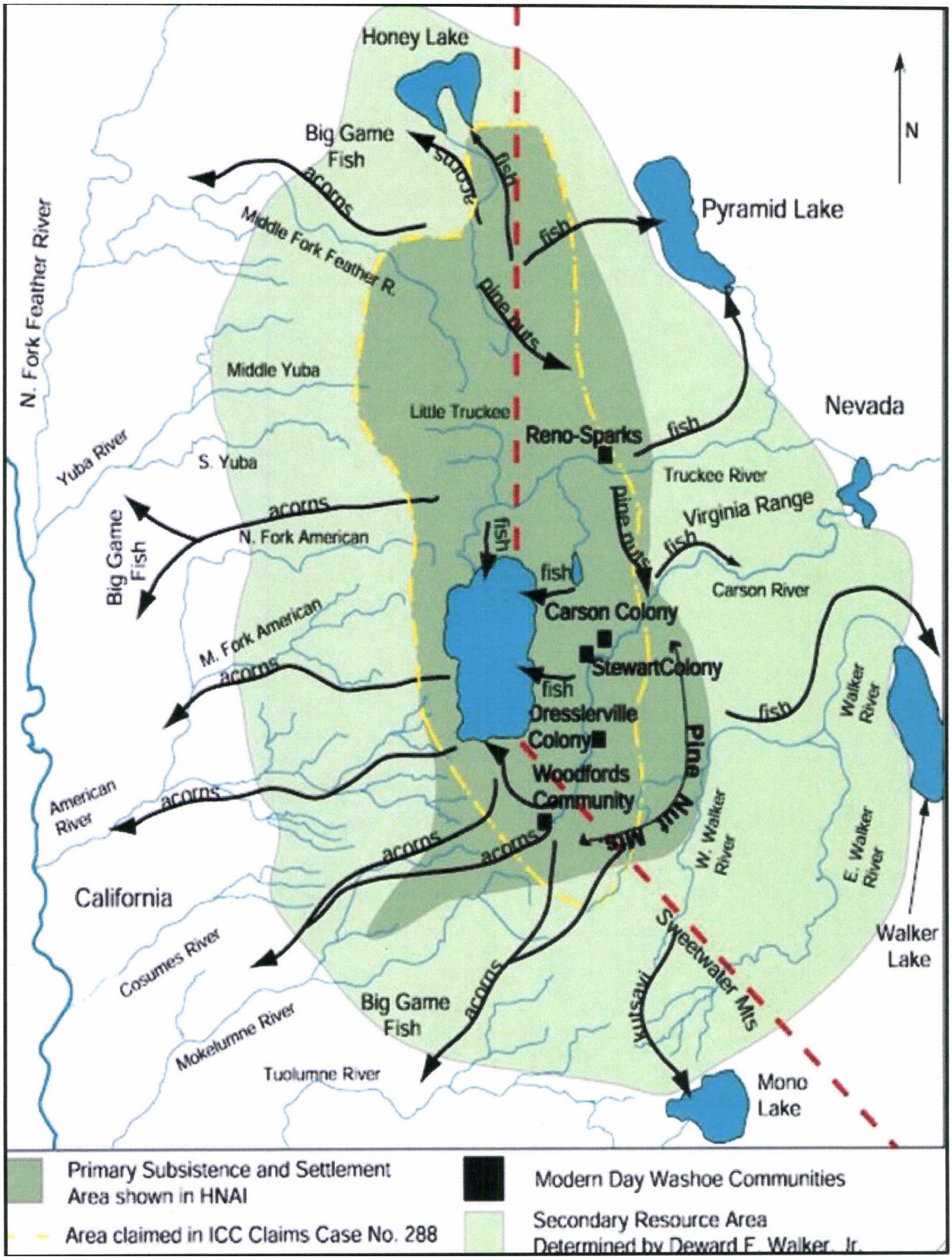
The Washoe, a hunter-gatherer society, combined the techniques of foragers, who moved to a resource patch and ranged out from the residential base daily to gather, and those of collectors, who gathered specific resources in organized groups and stored food for at least part of the year, making fewer residential moves than foragers as defined by Binford (Binford 1980). The Washoe lived in dispersed winter villages and consumed stored foods gathered by organized groups (pine nut harvests, game drives). Washoe groups fished together in the spring, but split into small family parties during the summer, occupying forager-type bases and moving from one resource patch to another. In the fall, accounts indicate that trips to western slopes to procure acorns occurred frequently. Elders recount making family trips to the Placerville area to collect acorns (Rucks 1995). Consultants also describe camping and acorn gathering trips to Colfax, Auburn, and along the Tuolumne, Cosumnes, Calaveras, and American rivers, bringing back the cached harvest in stages (d'Azevedo 1986; Nevers 1976).

Today, Washoe descendants and other tribes are reinvesting in their traditions and represent a growing and thriving community that is actively involved in defining their role as stewards of their ancestors' sites, including the identification of Traditional Cultural Properties (TCP)/TCR. TCPs/TCRs provide the backdrop to religious understanding, traditional stories, knowledge of resources such as varying landscapes, bodies of water, animals and plants, and self-identity. Knowledge of place is central to the continuation and persistence of culture, even if former Washoe occupants live removed from their traditional homeland. Consulting representatives view these interconnected sites and places as living entities; their associations and feeling persist and connect with descendant communities. Native American Heritage Commission Consultation and Sacred Lands File Search

The Native American Heritage Commission (NAHC) was contacted via email on June 20, 2023 with a request to conduct a Sacred Lands File Search for the Project area. The NAHC responded via email on July 7, 2023, with negative results from the search and attached a list of Native American tribes that may have knowledge of cultural resources in the Project area. The District added these tribes to the distribution list for the Draft EIR and will provide the notice of availability to the tribes when the Draft EIR is released for public review.

Tribal Cultural Resources

In addition to archaeological and historical sites, TCRs may also be present. TCRs can be subjected to the same types of impacts (e.g., ground disturbance) as archaeological sites. Historically, lands near or around Silver Lake have been occupied or used by Washoe, and Nisenan peoples. To date, no TCRs have been identified within the Project area.



Source: https://washoetribe.us/about/washoe-history.html

Figure 4.18-1. Washoe Seasonal Rounds

Table 4.18-1. Summary of Seasonal Round and Exploited Resources

Season/ Time of Year	Resource	Place
Spring	Camas	Sierra Valley
	Chubs, minnows	Truckee River, Washoe Lake
Summer	Sunflowers	Peterson Range (eastern portion), Peavine Mountain
	Chokecherries	Washoe Valley, Eagle Valley
	Elderberries	Sierra Valley
	Service Berries	Sierra Valley
	Seepweed seeds	Honey Lake Valley, Sierra Valley
	Fish (trout and whitefish)	Long Valley Creek, Truckee River, Lake Tahoe
	Wild onions	Washoe Valley
Fall	Rabbits	Ft. Sage Mountains, Sierra Valley, Washoe Valley, Eagle Valley
	Pine Nuts	Steamboat Hills, Virginia Range, Flowery Range, Pine Nut Mountains, Lake Tahoe
	Deer, waterfowl	Sierra Valley, Huffaker Hills, Washoe Valley
	Acorns	Long Valley, Central Valley of California

Source: Tilley and McBride 2013:11

Tribal Consultation

TCRs, as defined by AB 52, Statutes of 2014, in Public Resources Code Section 21074, are sites, features, places, cultural landscapes, sacred places and objects, with cultural value to a Tribe. A Tribal Cultural Landscape is defined as a geographic area (including both cultural and natural resources and the wildlife therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. Unanticipated Native American human remains would also be considered a TCR.

Pursuant to Public Resources Code 21090.3.1(b)(1), tribal notifications were sent by the District on September 22, 2022, to participating tribes Wopumnes Nisenan-Mewuk Nation of El Dorado County, Torres Martinez Desert Cahuilla Indians, United Auburn Indian Community of the Auburn Rancheria, Wilton Rancheria Cultural Preservation Department, and Shingle Springs Band of Miwok Indians, describing the Project and requesting a response within 30 days if the group would like to consult regarding the potential for TCRs in the Project study area. No responses were received from these groups. Additionally, the Notice of Preparation for the Project was provided to Tribal representatives identified on the list provided by the Native American Heritage Commission. No responses were received from these groups.

4.18.2 REGULATORY SETTING

FEDERAL

National Register of Historic Places

The National Register of Historic Places (NRHP) is the nation's master inventory of known historic properties. It is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and

districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level.

The formal criteria (36 Code of Federal Regulations (CFR) 60.4) for determining NRHP eligibility are as follows:

1. The property is at least 50 years old (however, properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP);

2. It retains integrity of location, design, setting, materials, workmanship, feeling, and associations; and

3. It possesses at least one of the following characteristics:

Criterion A — Is associated with events that have made a significant contribution to the broad patterns of history (events).

Criterion B — Is associated with the lives of persons significant in the past (persons).

Criterion C — Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction (architecture).

Criterion D — Has yielded, or may be likely to yield, information important in prehistory or history (information potential).

Listing in the NRHP does not entail specific protection or assistance for a property but it does guarantee consideration in planning for federal or federally-assisted projects, eligibility for federal tax benefits, and qualification for federal historic preservation assistance. Additionally, project effects on properties listed in the NRHP must be evaluated under CEQA.

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act of 1990 sets provisions for the inadvertent discovery and/or intentional removal of human remains and other cultural items from federal and tribal lands. It clarifies the ownership of human remains and sets forth a process for repatriation of human remains and associated funerary objects and sacred religious objects to the Native American groups claiming to be lineal descendants or culturally affiliated with the remains or objects. It requires any federally funded institution housing Native American remains or artifacts to compile an inventory of all cultural items within the museum or with its agency and to provide a summary to any Native American tribe claiming affiliation.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act of 1978 was enacted to protect and preserve the traditional religious rights and cultural practices of Native Americans. These rights include, but are not limited to, access of sacred sites, freedom to worship through ceremonial and traditional rights and use, and possession of objects considered sacred. The act requires that federal agencies evaluate their actions and policies to determine if changes are needed to ensure that Native American religious rights and practices are not disrupted by agency practices. Such evaluations are made in consultation with native traditional religious leaders.

STATE

California Register of Historical Resources

All properties in California that are listed in or formally determined eligible for listing in the NRHP are also listed in the California Register of Historical Resources (CRHR). The CRHR is a listing of State of California resources that are significant in the context of California's history. It is a Statewide program with a scope and with criteria for inclusion similar to those used for the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR.

A historical resource must be significant at the local, state, or national level under one or more of the criteria defined in the California Code of Regulations Title 15, Chapter 11.5, Section 4850 to be included in the CRHR. The CRHR criteria are tied to CEQA because any resource that meets the criteria below is considered a significant historical resource under CEQA. As noted above, all resources listed in or formally determined eligible for listing in the NRHP are automatically listed in the CRHR.

The CRHR uses four evaluation criteria:

Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

Criterion 2. Is associated with the lives of persons important to local, California, or national history.

Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of a master; or possesses high artistic values.

Criterion 4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Similar to the NRHP, a historical resource must meet one of the above criteria and retain integrity to be listed in the CRHR. The CRHR uses the same seven aspects of integrity used by the NRHP.

California Environmental Quality Act (AB 52– Tribal Consultation)

CEQA requires public agencies to consider the effects of their actions on "Tribal Cultural Resources." Public Resources Code Section 21084.2 establishes that "[a] project with an effect that may cause a substantial adverse change in the significance of a Tribal Cultural Resource is a project that may have a significant effect on the environment." Public Resources Code Section 21074 states:

a) "Tribal Cultural Resources" are either of the following:

    1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are either of the following:

        i.) Included or determined to be eligible for inclusion in the CRHR.

        ii.) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

2) 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American Tribe.

b) A cultural landscape that meets the criteria of subdivision (a) is a Tribal Cultural Resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a Tribal Cultural Resource if it conforms with the criteria of subdivision (a).

AB 52, signed by the California Governor in September of 2014, established a new class of resources under CEQA: "Tribal Cultural Resources," defined in Public Resources Code Section 21074. Pursuant to CEQA requirements, lead agencies undertaking CEQA review must, upon written request of a California Native American Tribe, begin consultation before the release of an EIR, negative declaration, or mitigated negative declaration.

Discovery of Human Remains

Section 7050.5 of the California Health and Safety Code (CHSC) states the following regarding the discovery of human remains:

a. Every person who knowingly mutilates or disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor, except as provided in Section 5097.99 of the [PRC]. The provisions of this subdivision shall not apply to any person carrying out an agreement developed pursuant to subdivision (l) of Section 5097.94 of the [PRC] or to any person authorized to implement Section 5097.98 of the [PRC].

b. In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the California Government Code [CGC], that the remains are not subject to the provisions of Section 27491 of the CGC or any other related provisions of law concerning investigation of the circumstances, manner and cause of any death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the PRC. The coroner shall make his or her determination within two working days from the time the person responsible for the excavation, or his or her authorized representative, notifies the coroner of the discovery or recognition of the human remains.

c. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC).

Of particular note to cultural and tribal resources is subsection (c), which requires the coroner to contact the NAHC within 24 hours if discovered human remains are determined to be Native American in origin. After notification, NAHC will follow the procedures outlined in PRC Section 5097.98, which include notification of most likely descendants (MLDs), if possible, and recommendations for treatment of the remains. The MLD will have 24 hours after notification by the NAHC to make their recommendation (PRC Section 5097.98). In addition, knowing or willful possession of Native American human remains or artifacts taken from a grave or cairn is a felony under State law (PRC Section 5097.99).

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act (Public Resources Code Section 5097.9) applies to both State and private lands. The act requires, upon discovery of human remains, that construction or excavation activity cease and that the county coroner be notified. If the remains are those of a Native American, the coroner must notify the NAHC, which notifies (and has the authority to designate) the most likely descendants (MLD) of the deceased. The act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

Public Resource Code Section 5097

Public Resources Code Section 5097 specifies the procedures to be followed in the event of the unexpected discovery of human remains on nonfederal land. The disposition of Native American human burials falls within the jurisdiction of the NAHC. Section 5097.5 of the Public Resources Code states the following:

> *No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.*

LOCAL

Policies addressing historic and archaeological resources are presented in Chapter 4, Section 5. There are no specific local policies that address TCRs.

4.18.3 IMPACT ANALYSIS

METHODOLOGY

Information related to TCRs is based on findings reported in the NAHC Sacred Lands File database search, as well as the results of AB 52 tribal notification (see above). The analysis is also informed by the provisions and requirements of federal, state, and local laws and regulations that apply to cultural resources.

Public Resources Code Section 21074 (a), defines tribal cultural resources as either of the following:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are also either:

(A) Included or determined to be eligible for inclusion in the CRHR

(B) Included in a local register of historical resources as defined in Public Resources Code Section 5020.1(k);

(2) 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 Section 5024.1 (CRHR criteria described above). In applying the criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

TCRs, including those yet to be discovered, may contain human burials. Although human remains from archaeological contexts are rarely found in Sierran sites, it is necessary to develop a strategy for dealing with this possibility. Two basic approaches could be applicable, based on whether the finding is on National Forest land or other, non-federal land. Regardless of location, any treatment of Native American remains, which would be recognized for their significance as a TCR, must be carried out in consultation with the appropriate tribe.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of

conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure) pre-construction, construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.
- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project would result in a potentially significant impact on tribal cultural resources if it would cause a substantial adverse change in the significance of a Tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe; or, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.18-1. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

There are no TCRs in the Project area that are included in a local register of historic resources. In addition, no tribe contacted through the AB 52 notification process responded to provide information regarding the significance of TCRs in the Project area. Therefore, no TCRs have been identified based on the above criteria. It is possible that unidentified TCRs could exist in the Project area. However, because operations with existing infrastructure would not involve ground disturbance or other activities that would cause a substantial adverse change in the significance of a tribal cultural resource, there would be **no impact.**

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary

and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

There are no TCRs in the Project area that are included in a local register of historic resources. In addition, no tribe contacted through the AB 52 notification process responded to provide information regarding the significance of TCRs in the Project area. Therefore, no TCRs have been identified based on the above criteria. However, it is possible that unknown TCRs could be located in the area of future improvements, and that these resources could be subjected to substantial adverse changes during construction. Therefore, this impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

There are no TCRs in the Project area that are included in a local register of historic resources. In addition, no tribe contacted through the AB 52 notification process responded to provide information regarding the significance of TCRs in the Project area. Therefore, no TCRs have been identified based on the above criteria. It is possible that unidentified TCRs could existing in the Project area. However, because post-construction operations would not involve ground disturbance or other activities that would cause a substantial adverse change in the significance of a tribal cultural resource, this impact would be **no impact**.

Mitigation Measures

Mitigation Measure 4.18-1a: Implement Best Management Practices to Reduce or Avoid Impacts on Tribal Cultural Resources

The District shall implement the following measure to reduce or avoid impacts on TCRs. If interested Native American tribe(s) provide information demonstrating the significance of the Project site and specific evidence supporting the determination that the site is sensitive for TCRs, the District will conduct a site visit with tribal representatives to evaluate the potential for TCRs at the Project site. If tribal representatives and the District determine the site is sensitive for TCRs and that the proposed Project may have a significant impact on TCRs, the District, in consultation with tribal representatives, will develop and implement best management practices (BMPs) to reduce or avoid impacts on TCRs. BMPs may include but are not limited to: 1) modify the proposed Project to preserve the TCRs in place, 2) establish exclusion zones and/or minimize work activities in proximity to TCRs, or (3) implement other recommendations developed in consultation with tribal representatives to minimize potential impact

Mitigation Measure 4.18-1b: Tribal Cultural Resource Awareness Training

The District shall provide TCR awareness training for workers prior to beginning Project construction activities. The District shall utilize information provided by culturally affiliated tribal representatives to develop the training materials (i.e., printed handouts) that provide information on the following topics:

- How to recognize TCRs
- What to do if TCRs are suspected or encountered in the Project area
- Information on avoidance and other measures relevant to TCRs
- Confidentiality and culturally appropriate treatment of TCRs
- Information on regulations and applicable civil and criminal penalties for violations

The training materials will be shared with tribal representatives and tribal representatives will be invited to participate in the training. The training shall be presented to Project personnel at the Project kickoff. Printed handouts shall be distributed and used for future reference by Project personnel. A roster of trained Project personnel shall be maintained in the Project construction office and made available for review by regulatory agencies and culturally affiliated tribal representatives if needed. This training may be conducted in coordination with the biological resource awareness training (M 4.4-1a), cultural resources awareness training (MM 4.5.2), and paleontological resources training (MM 4.7-3a).

Mitigation Measure 4.18-1c: Proper Handling of Inadvertent Discovery of Tribal Cultural Resources

The District shall implement the following measure to reduce or avoid impacts and address the evaluation and treatment of inadvertent discoveries of potential TCRs during Project activities. If any suspected TCRs are discovered during Project construction activities, all work shall cease within 100-feet of the discovery. The District shall invite a tribal representative from culturally affiliated tribes to visit the site and examine the discovery to determine whether or not the discovery represents a TCR (PRC §21074). Tribal representatives shall have 48 hours to respond to the District's notification and schedule a site visit.

If the discovery represents a TCR, the District will work with tribal representatives to develop recommendations for culturally appropriate treatment. Recommendations may include but are not limited to: (1) modifying the Project to preserve the TCR in place, (2) establishing exclusion zones and/or minimizing work activities in proximity to the TCR, or (3) implementing other recommendations developed in consultation with tribal representatives to minimize potential impacts to the TCR. Work at the discovery location will not resume until the agreed upon treatment has been implemented to the satisfaction of the District. Also see MM 4.5-1a in Section 4.5 Cultural Resources of this DEIR for measures to treat an inadvertent discovery that qualifies as a historical or a unique archaeological resource.

Significance after Mitigation

Implementation of Mitigation Measure 4.18-1a-c would reduce impacts associated with undiscovered TCRs to a **less-than-significant** level because it would require the performance of professionally and Native American-accepted and legally-compliant procedures for the discovery of previously undocumented significant TCRs.

Impact 4.18-2. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Operational Impacts (Pre-Construction Operations)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Although unlikely, the presence of human burials, which could be considered a TCR, may be located in the Project area. However, because operations with existing infrastructure would not involve ground disturbance or other activities that would disturb undiscovered human remains, this impact would be **no impact.**

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Although unlikely, the presence of human burials, which could be considered a TCR, may be located in the Project area. Construction of future improvements could disturb undiscovered human remains through ground-disturbing activities, such as grading or trenching. Therefore, this impact would be **potentially significant.**

Operational Impacts (Post-Construction Operations)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Although unlikely, the presence of human burials, which could be considered a TCR, may be located in the Project area. However, because post-construction operations would not involve ground disturbance or other activities that would disturb undiscovered human remains, therefore operation impacts would result in **no impact** to human burials.

Mitigation Measures

Mitigation Measure 4.18-2 Unanticipated Discovery of Human Remains

Although human remains from archaeological contexts are rarely found in Sierran sites, it is necessary to develop a strategy for dealing with this possibility. If human remains are encountered, work shall halt in the vicinity and the El Dorado County Coroner shall be notified immediately pursuant to Public Resources Code (PRC) Section 7050.5. If human remains are of Native American origin, the coroner shall notify the Native American Heritage Commission (NAHC) within 24 hours of this identification. The NAHC shall identify the person or persons it believes to be the most likely decedent (MLD) from the deceased Native American. The MLD shall have an opportunity to make a recommendation to the landowner or the person responsible for the excavation work for means of treating, with appropriate dignity, the human remains, and any associated grave goods as provided in PRC Section 5097.98.

Significance after Mitigation

Implementation of Mitigation Measure 4.18-2 would reduce impacts associated with inadvertent discovery of human remains to **less-than-significant** because it would require notification of the appropriate agencies and provide an opportunity for MDLs to make recommendations should human remains be of Native American origin.

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4.19 UTILITIES AND SERVICE SYSTEMS

This section provides an analysis of potential impacts to utilities and service systems associated with implementation of the proposed Project. The analysis includes a description of the existing baseline conditions, the associated regulatory framework including applicable policies, the methodology used to assess potential impacts, and an assessment of potential Project impacts based on applied significance criteria.

4.19.1 EXISTING CONDITIONS

WATER SUPPLY

The District is a public water agency that provides potable and recycled water directly to retail customers throughout the approximately 220 square mile service area boundary including the City of Placerville. The District serves a combination of municipal and agricultural customers throughout the County in 16 unique service zones. While the population of nearly 130,000 residential customers are the primary water users, the number of connections, ratio of different user classifications, and water use characteristics vary across each service zone. The District serves these customers from an array of surface water supplies, diversion points, treatment plants and water infrastructure under a variety of water rights.

The District's average year water supply availability is described in the District's Urban Water Management Plan (UWMP; (Tully & Young 2021). The District's total water entitlements under its existing and planned supplies are not representative of the supply available on average. Rather, as a result of operational management policies and practices, the average supply equates to 70,794 acre-feet per year (AFY) of existing supplies and 7,500 AFY of planned supplies. Combined, the District anticipates the total average future water supplies to equal 78,294 AFY by 2045. Water supply availability is based on the following assumptions:

- Ditches / Weber Reservoir Rights (License 2184 and pre-1914 Water Rights) are appropriative water rights associated with Slab, Hangtown, Mill, and Weber Creeks. The maximum value of 4,560 AFY has historically been available in average years and is assumed to be available in future average years.
- Sly Park Reservoir (Licenses 11835 and 11836 and pre-1914 Camp Creek right), also called Jenkinson Lake, is the District's only existing supply source whose value during average years is less than the maximum water right. Although the rights allow up to 33,400 AFY, and the District has diverted as much as 25,745 AFY, 23,000 AFY is used for planning purposes for an average year due to the need to set aside carryover storage for future years.
- Central Valley Project water (Contract 14-06-200-1375A-LTR1-P) has historically been available at its maximum value of 7,550 acre feet (AF) in average years and is assumed to be available in future average years.
- Project 184 (Pre-1914 appropriative rights from the Upper South Fork American River) have an early priority date that has allowed this source of water, 15,080 AF, to be fully available in average years and is assumed to be available in future average years. Supplies for the District's Strawberry system are included in this supply.
- Permit 21112 allows the District to divert up to 17,000 AFY at Folsom Reservoir through a Warren Act Contract. This supply has not historically been available in its full amount pending the completion of a temperature control device at the District's intake from Folsom Reservoir, which was completed in 2022. Based upon the availability of the supply in Permit 21112, the ability to store the water in Caples, Silver, and

Lake Aloha, and the long-term Warren Act Contract with U.S. Bureau of Reclamation, the average-year availability of this supply is 17,000 AFY.

- Outingdale/Middle Fork Cosumnes Supplies (Permit 4071) provides up to 104 AFY of water during average years, and is expected to remain at this level in future average years.
- Recycled Water is projected to provide 3,500 AF in average years. Note that this supply is non-potable, in contrast to the other District supplies presented in this section.
- Central Valley Project Fazio Water is expected to include 7,500 AFY or more as authorized by federal law. Once secured, projected to occur by 2035, the District is expected to receive its full entitlement in average years. While the District's existing supplies are sufficient to meet demands, securing the Fazio CVP Supply will further improve future reliability.

SOLID WASTE

Construction and demolition debris associated with the Project would likely be disposed of at a regional landfill, such as the Kiefer Landfill in Sacramento, California. The Kiefer Landfill is a Class II and III municipal landfill that is permitted to accept general residential, commercial, and industrial refuse for disposal, including municipal solid waste, construction and demolition debris, green materials, ash, and agricultural debris. According to California Integrated Waste Management Board (CalRecycle), the Kiefer Landfill has a maximum permitted throughput of 10,815 tons per day (tpd) and has a total maximum permitted capacity of 117.4 million cubic yards. The Kiefer Landfill has a remaining capacity of approximately 112.9 million cubic yards and a closure date of January 1, 2064 (CalRecycle 2024).

4.19.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Clean Water Act

Clean Water Act The Federal Water Pollution Control Act (33 USC 1251 et seq.), otherwise known as the CWA, sets forth national goals that waters shall be "fishable, swimmable" waters (CWA Section 101 [a][2]). To enforce the goals of the CWA, the USEPA established the NPDES program. NPDES is a national program for regulating and administering permits for discharges to receiving waters, including non-point sources. Under Section 1251 (b) of the CWA, the U.S. Congress and the USEPA must recognize and preserve the primary responsibilities and rights of states concerning the reduction of pollution in water resources.

Safe Drinking Water Act (1974)

The Safe Drinking Water Act was established in 1974 to protect the quality of drinking water in the U.S. This law focuses on all waters actually or potentially designed for drinking use, whether from surface or underground sources. The State has expanded the federal requirements through passage of an Antidegradation Policy – State Water Board Resolution 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California"). Resolution 68-16 has been approved by the USEPA to be consistent with the federal antidegradation policy.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Porter-Cologne Water Quality Control Act

The SWRCB oversees the nine RWQCBs through the Porter-Cologne Act, as discussed in Section 3.4. Through the enforcement of the Porter-Cologne Act, the SWRCB determines the beneficial uses of the waters (surface and groundwater) of the State, establishes narrative and numerical water quality standards, and initiates policies relating to water quality. The SWRCB, and more specifically, the RWQCB, is authorized to prescribe Waste Discharge Requirements for the discharge of waste, which may impact waters of the State. Furthermore, the development of water quality control plans, or Basin Plans, are required by the Porter-Cologne Act to protect water quality. The SWRCB issues both general construction permits and individual permits under the auspices of the federal NPDES program.

California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of by transformation (i.e., recycling) and land disposal, the State Legislature passed the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. According to AB 939, all cities and counties are required to divert 25 percent of all solid waste from landfill facilities by January 1, 1995, and 50 percent by January 1, 2000. Solid waste plans are required to explain how each city's AB 939 plan will be integrated within the respective county's plan. They must promote (in order of priority) source reduction, recycling and composting, and environmentally safe transformation, and land disposal. Cities and counties that do not meet this mandate are subject to $10,000-per-day fines.

California Constitution, Article X

Article X (10), Section 2, of the California Constitution recognizes the need to put the State's water resources to maximum beneficial use:

> *It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.*

Urban Water Management Planning Act

California Water Code Sections 10610-10656 and Section 10608 outline the requirements for Urban Water Management Plans (UWMPs). Every urban water supplier that either provides over 3,000 acre-feet of water annually, or serves more than 3,000 urban connections is required to submit an UWMP every 5 years. Within UWMPs, urban water suppliers must:

- Assess the reliability of water sources over a 20-year planning time frame.
- Describe demand management measures and water shortage contingency plans.
- Report progress toward meeting a targeted 20 percent reduction in per-capita (per-person) urban water consumption by the year 2020.

- Discuss the use and planned use of recycled water.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.*

As a special district with equal authority, the District is exempt from following the goals and policies described in the County's General Plan and Zoning Ordinance (El Dorado County 2019). However, the District aims to comply with the goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to utilities and service systems include the following:

- **Goal 5.1: Provision of Public Services:** Provide and maintain a system of safe, adequate, and cost-effective public utilities and services; maintain an adequate level of service to existing development while allowing for additional growth in an efficient manner; and ensure a safe and adequate water supply, wastewater disposal, and appropriate public services for rural areas.
- **Goal 5.2: Water Supply:** The development or acquisition of an adequate water supply consistent with the geographical distribution or location of future land uses and planned developments.
    - **Policy 5.2.1.10:** The County shall support water conservation and recycling programs and projects that can reduce future water demand consistent with the policies of this General Plan. The County will develop and implement a water use efficiency program for existing and new residential, commercial/ industrial, and agricultural uses. The County will also work with each of the County's water purveyors to develop a list of the type of uses that must utilize reclaimed water if feasible. The feasibility of using reclaimed water will be defined with specific criteria developed with public input and with the assistance of the District and will be coordinated with their ongoing reclaimed water (also referred to as recycled water) planning and implementation process. The County shall encourage all water purveyors to implement the water conservation-related Best Management Practices already implemented by the District and in compliance with the related criteria established by U.S. Bureau of Reclamation.

    - **Policy 5.2.1.13:** The County shall encourage water purveyors to design water supply and infrastructure projects in a manner that avoids or reduces significant environmental effects to the maximum extent feasible in light of the water supply objectives of a given project.

4.19.3 IMPACT ANALYSIS

METHODOLOGY

Impacts related to utilities and service systems attributable to the Project were identified by comparing existing service capacity against future demand associated with proposed Project implementation. Evaluation of potential utilities and service systems impacts was based on a review of the District's Urban Water Management Plan (Tully & Young 2021).

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant [WTP] and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek and then to Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Section 3.6.4. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure

improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction, and operational impacts (post-construction).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.
- The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, implementation of the Project would result in a potentially significant impact related to utilities and service systems if it would:

a) require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects;

b) not have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;

c) result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments;

d) generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; or

e) fail to comply with federal, State, and local management and reduction statutes and regulations related to solid waste.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.19-1. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not include new development that would require or result in the relocation or construction of new or expanded water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities. **No impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction would not include new development that would require or result in the relocation or construction of new or expanded wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications

facilities. However, the improvements associated with the proposed Project would result in expanded capacity of water conveyance facilities. It is possible that the construction activities associated with the proposed Project could cause significant environmental effects. However, this EIR identifies mitigation measures intended to reduce potentially significant environmental effects for construction activities associated with the proposed Project to less than significant levels. The mitigation measures incorporated into this EIR include:

- Mitigation Measure 4.3-1a: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed El Dorado County Air Pollution Control District thresholds (Air Quality)
- Mitigation Measure 4.3-1b: Implement Best Available Fugitive Dust Control Measures (Air Quality)
- Mitigation Measure 4.5-1: Cease Work If Cultural Resources Are Encountered during Project-Related Ground Disturbing Activities, Assess the Significance of the Resource, and Implement Appropriate Avoidance or Treatment Measures (Cultural Resources)
- Mitigation Measure 4.5-2: Accidental Damage and Discovery Protocols (Cultural Resources)
- Mitigation Measure 4.5-3: Unanticipated Discovery of Human Remains (Cultural Resources
- Mitigation Measure 4.6-1: Implement Energy-Efficient Construction Practices (Energy)
- Mitigation Measure 4.7-2: Perform Geotechnical Studies and Implement Design Recommendations (Geology, Soils, and Paleontological Resources)
- Mitigation Measure 4.7-3a: Paleontological Resources Awareness Training (Geology, Soils, and Paleontological Resources)
- Mitigation Measure 4.7-3b: Proper Handling of the Unanticipated Discovery of Paleontological Resources or Unique Geologic Features (Geology, Soils, and Paleontological Resources)
- Mitigation Measure 4.8-1: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed applicable thresholds (Greenhouse Gas)
- Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials (Hazards and Hazardous Materials)
- Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan (Hazards and Hazardous Materials)
- Mitigation Measure 4.10-1: Prepare and Implement SWPPP (Hydrology and Water Quality)
- Mitigation Measure 4.13-1 Restriction of Construction Operational Hours (Noise)
- Mitigation Measure 4.16-1: Limit Construction Season (Recreation)
- Mitigation Measure 4.17-1: Prepare and Implement Traffic Control Plan (Transportation)
- Mitigation Measure 4.20-2: Prepare and Implement a Fire Safety Plan (Wildfire)

Implementation of these mitigation measures would ensure that the construction of expanded water conveyance facilities under the proposed Project would not cause significant environmental effects related to relocation or construction of utility service systems. Therefore, this impact would be **less than significant with mitigation incorporated**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not include new development that would require or result in the relocation or construction of new or expanded water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities. **No impact** would occur.

Mitigation Measures

- Mitigation Measure 4.3-1a: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed El Dorado County Air Pollution Control District thresholds (Air Quality)
- Mitigation Measure 4.3-1b: Implement Best Available Fugitive Dust Control Measures (Air Quality)
- Mitigation Measure 4.5-1: Cease Work If Cultural Resources Are Encountered during Project-Related Ground Disturbing Activities, Assess the Significance of the Resource, and Implement Appropriate Avoidance or Treatment Measures (Cultural Resources)
- Mitigation Measure 4.5-2: Accidental Damage and Discovery Protocols (Cultural Resources)
- Mitigation Measure 4.5-3: Unanticipated Discovery of Human Remains (Cultural Resources
- Mitigation Measure 4.6-1: Implement Energy-Efficient Construction Practices (Energy)
- Mitigation Measure 4.7-2: Perform Geotechnical Studies and Implement Design Recommendations (Geology, Soils, and Paleontological Resources)
- Mitigation Measure 4.7-3a: Paleontological Resources Awareness Training (Geology, Soils, and Paleontological Resources)
- Mitigation Measure 4.7-3b: Proper Handling of the Unanticipated Discovery of Paleontological Resources or Unique Geologic Features (Geology, Soils, and Paleontological Resources)
- Mitigation Measure 4.8-1: Conduct a detailed quantification of all construction-related emissions and implement emissions reductions if mass emissions exceed applicable thresholds (Greenhouse Gas)
- Mitigation Measure 4.9-1a: Comply with all Regulations on the Transport and Use of Hazardous Materials (Hazards and Hazardous Materials)
- Mitigation Measure 4.9-1b: Prepare and Implement a Hazardous Materials Release Prevention Plan (Hazards and Hazardous Materials)
- Mitigation Measure 4.10-1: Prepare and Implement SWPPP (Hydrology and Water Quality)
- Mitigation Measure 4.13-1 Restriction of Construction Operational Hours (Noise)
- Mitigation Measure 4.16-1: Limit Construction Season (Recreation)
- Mitigation Measure 4.17-1: Prepare and Implement Traffic Control Plan (Transportation)
- Mitigation Measure 4.20-2: Prepare and Implement a Fire Safety Plan (Wildfire)

Impact 4.19-2. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Under this operational scenario, water that is currently diverted and used for hydropower purposes would instead be diverted for consumptive uses. The Project would utilize water supplies available under an existing water right, Permit 21112, subject to its terms and conditions regarding rate of diversion, season of diversion, total diversion to storage, and total consumptive use. Operations with existing infrastructure would also provide the additional place of storage at Jenkinson Lake, which would allow the District to divert Permit 21112 water to storage when water is abundant and then use that stored water to meet demands during the summer and fall. Therefore, operations with existing infrastructure would provide an additional point of diversion for the Permit 21112 water supply and add the additional place of storage at Jenkinson Lake, which would increase water supply reliability by maximizing the flexibility to meet current and future demands defined in the District's UWMP during normal, dry, and multiple dry years. Because the Project would have a beneficial effect on the availability of water supplies, **no impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The construction activities described above would be implemented in a manner to prevent any impact to water supplies. Construction activities on the El Dorado Canal would likely be conducted during the District's annual maintenance outage, which typically occurs from October through mid-December. The District plans operations each year to ensure adequate water supplies are available during the annual maintenance outage. Likewise, construction activities for the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be planned to occur when Jenkinson Lake had sufficient storage to meet water supply demands during construction without receiving water from the Hazel Creek Tunnel. Therefore, **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Similar to the existing infrastructure operational scenario, the post-construction operational scenario involves utilizing water that would be diverted and used for hydropower purposes to instead be diverted for consumptive uses. However, the post-construction operational scenario provides the ability to divert Permit 21112 at a higher rate (i.e., from 120 cfs with existing infrastructure to 156 cfs following construction), which would allow the District to maximize the use of Permit 21112 in the winter and spring months when unimpaired flows in the South Fork are high. Post-construction operations would also provide the additional place of storage at Jenkinson Lake, which would allow the District to divert Permit 21112 water to storage when water is abundant and then use that stored water to meet demands in the summer and fall. Therefore, post-construction operations would provide a higher rate of diversion for the Permit 21112 water supply and add the additional place of storage at Jenkinson Lake, which would increase water supply reliability by maximizing the flexibility to meet current and future demands defined in the District's UWMP during normal, dry, and multiple dry years. The Project would utilize water supplies available under an existing water right, Permit 21112, subject to its terms and conditions regarding rate of diversion, season of diversion, total diversion to storage, and total consumptive use. Because this diversion would have a beneficial effect on the availability of water supplies, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.19-3. Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not generate wastewater flows. Therefore, operations with existing infrastructure would not exceed a wastewater treatment provider's capacity. Therefore, **no impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements

to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Construction activities would not generate wastewater flows. Therefore, construction would not exceed a wastewater treatment provider's capacity. Therefore, **no impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not generate wastewater flows. Therefore, post-construction would not exceed a wastewater treatment provider's capacity. Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.19-4. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not generate solid waste requiring disposal at a municipal landfill. Therefore, **no impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of

conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

Project construction could result in the generation of various construction-generated wastes, including scrap lumber, scrap finishing materials, various scrap metals, and other recyclable and nonrecyclable construction-related wastes. In addition, grading and vegetation removal could be required during construction of new facilities. Soils excavated during construction would be reused on-site, with a minor amount of types of unusable material listed above hauled to a regional landfill such as the Kiefer Landfill. According to CalRecycle, the Kiefer Landfill has a maximum permitted throughput of 10,815 tpd and has a total maximum permitted capacity of 117.4 million cubic yards (CalRecycle 2024). The Kiefer Landfill has a remaining capacity of approximately 112.9 million cubic yards and an anticipated closure date of January 1, 2064 (CalRecycle 2024). The solid waste generated from construction of the Project would not be expected to exceed the daily maximum capacity of the Keifer Landfill. Therefore, the proposed Project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure. Therefore, impacts related to increased generation of solid waste from construction for the improvements at the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake would be **less than significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operation would not generate solid waste requiring disposal at a municipal landfill. Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.19-5. Comply with Federal, State, and Local Management and Reduction Statutes and Regulations Related to Solid Waste?

Operational Impacts (Existing infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not generate solid waste that would violate federal, state, and local management and reduction statutes and regulations related to solid waste. Therefore, **no impact** would occur.

Construction Impacts

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

As discussed above in Impact 4.19-4, the solid waste generated from construction of the Project would not be expected to exceed the daily maximum capacity of the Keifer Landfill, which has a remaining capacity of approximately 112.9 million cubic yards and an anticipated closure date of January 1, 2064. Given the above, construction activities associated with the Project would not exceed available permitted landfill capacity and would comply with federal, state, and local statutes and regulations related to solid waste diversion. This impact would **be less than significant**.

Operational Impacts (Post-Construction Operations)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operation would not generate solid waste that would violate federal, state, and local management and reduction statutes and regulations related to solid waste. Therefore, **no impact** would occur.

Mitigation Measures

No mitigation is required.

4.20 WILDFIRE

Appendix G of the State CEQA Guidelines requires an analysis of wildfire if a proposed project is located in or near state responsibility areas (SRAs) for wildfire control or lands classified as very high fire hazard severity zones. The Project location encompasses areas within and near the South Fork American River (South Fork) from Kyburz, California to Folsom Reservoir, including Jenkinson Lake (see Figure 3-1 in Chapter 3, "Project Description"). As discussed further below, these areas are within an SRA.

4.20.1 EXISTING CONDITIONS

Fire hazard severity zones are measured qualitatively, based on vegetation, topography, weather, crown fire potential (a fire's tendency to burn upward into trees and tall brush), and ember production and movement within the area in question.

Fire prevention areas considered to be under state jurisdiction are referred to "state responsibility areas" or SRAs, and the California Department of Forestry and Fire Protection (CAL FIRE) is responsible for controlling vegetation fires within SRA lands. In general, SRA lands contain trees producing or capable of producing forest products; timber, brush, undergrowth, and grass, whether of commercial value or not, that provide watershed protection for irrigation or for domestic or industrial use; or lands in areas that are principally used, or are useful for, range or forage purposes.

Public Resources Code Sections 4201–4204 and Government Code Sections 51175–51189 require identification of fire hazard severity zones within the State of California. In SRAs, CAL FIRE is required to delineate three wildfire hazard ranges: moderate, high, and very high.[1] The El Dorado Diversion Dam, the El Dorado Canal, the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake, and Jenkinson Lake are within an SRA and the Project Area in general is located on or adjacent to lands identified as a very high fire hazard severity zone (CAL FIRE 2008, 2023). This SRA is served by Battalion 1 of CAL FIRE's Amador-El Dorado Unit (CAL FIRE 2020).

4.20.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Federal Power Act 16 U.S.C. §§ 797(e) and 808 (2000)

The Federal Power Act (FPA) is the primary federal statute governing the wholesale transmission and sale of electric power, as well as the regulation of hydroelectric power (CRS 2020). The Federal Energy Regulatory Commission (FERC) licenses and regulates the construction and operation of non-federal hydropower projects under the FPA. The District owns and operates the El Dorado Hydroelectric Project (Project No. 184) under a license with FERC (FERC 2006). The District, as the Licensee of Project No. 184 is responsible to comply with the articles and conditions contained in the FERC license, including the following articles relevant to wildfire:

[1] CAL FIRE has developed a Fire and Resource Assessment Program (FRAP) that uses a series of computer models to assess fire hazard. FRAP's data collection and models provide detailed analysis and mapping of fuels, fire weather, historical fire occurrences, and ignition location and frequency, all of which they have analyzed and modeled to develop fire hazard severity rankings for lands throughout California.

- **Article 22.** The Licensee shall do everything reasonably within its power, and shall require its employees, contractors, and employees of contractors to do everything reasonably within their power, both independently and upon the request of officers of the agency concerned, to prevent, to make advance preparations for suppression of, and to suppress fires on the lands to be occupied or used under the license. The Licensee shall be liable for and shall pay the costs incurred by the United States in suppressing fires caused from the construction, operation, or maintenance of the project works or of the works appurtenant or accessory thereto under the license.
- **Article 23.** The Licensee shall interpose no objection to, and shall in no way prevent, the use by the agency of the United States having jurisdiction over the lands of the United States affected, or by persons or corporations occupying lands of the United States under permit, of water for fire suppression from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license, or the use by said parties of water for sanitary and domestic purposes from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license.

Federal Land Policy and Management Act Title 36, Code of Federal Regulations, Section 251 Subpart B, as amended

The U.S. Forest Service (USFS) issues special use permits for the use or occupancy of National Forest System lands. Some District facilities, including portions of the El Dorado Canal, are located on federal lands managed by the USFS. The District holds special use permits with the Eldorado National Forest for District facilities located on National Forest System lands. USFS special use permits typically include conditions requiring the permittee to prepare a project fire plan for construction-related projects. The permittee is responsible for preparing a project fire plan that describes the permittee's responsibilities for prevention and suppression of fires during any on-the ground construction. The project fire plan is subject to Forest Service approval.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Public Resources Code

Section 4290

California Public Resources Code 4290 was adopted for establishing minimum wildfire protection standards in conjunction with building, construction, and development in SRAs. Under Section 4290, the future design and construction of structures, subdivisions, and developments in SRAs must provide for basic emergency access and perimeter wildfire protection measures as specified in Section 4290. These measures provide for road standards for emergency access, signing and building numbering, water supply reserves, and fuel breaks and greenbelts. Local standards that exceed those of Section 4290 supersede Section 4290.

Section 4291

Section 4291 of the Public Resources Code defines and describes fire protection measures and responsibilities for mountainous, forest, brush, and grass covered lands. These measures include, but are not limited to, the following:

- Maintenance of defensible space of 100 feet from each side and from the front or rear of a structure, but not beyond the property line.

- Removal of a portion of a tree that extends within 10 feet of the outlet of a chimney or stovepipe.
- Maintenance of a tree, shrub, or other plant adjacent to or overhanging a building free of dead or dying wood. Construction or rebuilding of a structure must comply with all applicable state and local building standards.

Section 4427

Public Resources Code Section 4427 limits the use of any motor, engine, boiler, stationary equipment, welding equipment, cutting torches, tarpots, or grinding devices from which a spark, fire, or flame may originate, when the equipment is located on or near land covered by forest, brush, or grass. Before such equipment may be used, all flammable material, including snags, must be cleared away from the area around such operation for a distance of 10 feet. A serviceable round point shovel with an overall length of not less than 46 inches and a backpack pump water-type fire extinguisher, fully equipped and ready for use, must be maintained in the immediate area during the operation.

Section 4428

Public Resources Code Section 4428 limits industrial operations on or near any land covered by forest, brush, or grass between April 1 and December 1 of any year, or other times when ground litter and vegetation will sustain combustion permitting the spread of fire. Such operations must provide and maintain, for firefighting purposes only, suitable and serviceable tools in the following amounts, manner, and locations:

- A sealed box of tools must be located in the operating area, at a point accessible in the event of fire. The fire toolbox must contain a backpack pump-type fire extinguisher filled with water, two axes, two McLeod fire tools, and enough shovels for each employee at the operation to be equipped to fight fire.
- Each passenger vehicle used must be equipped with a shovel and an ax, and any other vehicle used must be equipped with a shovel. Each tractor used must also be equipped with a shovel.

Section 4431

Public Resources Code Section 4431 requires users of gasoline-fueled internal combustion–powered equipment operating within 25 feet of flammable material on or near land covered by forest, brush, or grass to have a tool for firefighting purposes at the immediate location of use. This requirement is limited to periods when burn permits are necessary. Under Section 4431, the Director of Forestry and Fire Protection specifies the type and size of fire extinguisher necessary to provide at least a minimum assurance of controlling fire caused by use of portable power tools during various climatic and fuel conditions.

Section 4442

Public Resources Code Section 4442 prohibits the use of internal combustion engines running on hydrocarbon fuels on any land covered by forest, brush, or grass unless the engine is equipped with a spark arrestor and is constructed, equipped, and maintained in good working order when traveling on any such land.[2]

[2] A spark arrester is a device constructed of nonflammable materials specifically for the purpose of removing and retaining carbon and other flammable particles larger than 0.0232 inch from the exhaust flow of an internal combustion engine that uses hydrocarbon fuels or which is qualified and rated by the U.S. Forest Service.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

El Dorado County General Plan

Pursuant to Government Code sections 53091(D) and (E), many of the District's activities are not subject to local zoning or land use requirements, as stated below.

> *Building and zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.*

As a special district with equal authority, the District is exempt from following the goals and policies described in the County's General Plan and Zoning Ordinance (El Dorado County 2019). However, the District aims to comply with the goals and policies outlined in the General Plan and uses these goals and policies as a metric for formulating an impact analysis. The General Plan's goals and policies related to wildfire include the following:

- **Objective 6.1.1: El Dorado County Multi-Jurisdictional Local Hazard Mitigation Plan.** The El Dorado County Multi-Jurisdictional Local Hazard Mitigation Plan shall serve as the implementation program for this Goal.
  - **Policy 6.1.1.1:** The El Dorado County Multi-jurisdictional Local Hazard Mitigation Plan (LHMP) shall serve as the implementation program for the coordination of hazard planning and disaster response efforts within the County and is incorporated by reference to this Element. The County will ensure that the LHMP is updated on a regular basis to keep pace with the growing population.

- **Goal 6.2: Fire Hazards.** Minimize fire hazards and risks in both wildland and developed areas.
  - **Objective 6.2.1: Defensible Space.** All new development and structures shall meet "defensible space" requirements and adhere to fire code building requirements to minimize wildland fire hazards.
  - **Objective 6.2.2: Limitations to Development.** Regulate development in areas of high and very high fire hazard as designated by the California Department of Forestry and Fire Prevention Fire Hazard Severity Zone Maps.
    - **Policy 6.2.2.1:** Fire Hazard Severity Zone Maps shall be consulted in the review of all projects so that standards and mitigation measures appropriate to each hazard classification can be applied. Land use densities and intensities shall be determined by mitigation measures in areas designated as high or very high fire hazard.
    - **Policy 6.2.2.2:** The County shall preclude development in areas of high and very high wildland fire hazard or in areas identified as wildland-urban interface (WUI) communities within the vicinity of Federal lands that are a high risk for wildfire, as listed in the Federal Register Executive Order 13728 of May 18, 2016, unless such development can be adequately protected from wildland fire hazard, as demonstrated in a WUI Fire Safe Plan prepared by a qualified professional as approved by the El

Dorado County Fire Prevention Officers Association. The WUI Fire Safe Plan shall be approved by the local Fire Protection District having jurisdiction and/or California Department of Forestry and Fire Protection (Resolution 124-2019, August 6, 2019).

- **Objective 6.2.3: Adequate Fire Protection.** Application of uniform fire protection standards to development projects by fire districts.
  - **Policy 6.2.3.1:** As a requirement for approving new development, the County must find, based on information provided by the applicant and the responsible fire protection district that, concurrent with development, adequate emergency water flow, fire access, and firefighting personnel and equipment will be available in accordance with applicable State and local fire district standards.
  - **Policy 6.2.3.4:** All new development and public works projects shall be consistent with applicable State Wildland Fire Standards and other relevant State and federal fire requirements.
- **Objective 6.2.4: Area-Wide Fuel Management Program.** Reduce fire hazard through cooperative fuel management activities.
  - **Policy 6.2.4.1:** Discretionary development within high and very high fire hazard areas shall be conditioned to designate fuel break zones that comply with fire safe requirements to benefit the new and, where possible, existing development.
  - **Policy 6.2.4.2:** The County shall cooperate with the California Department of Forestry and Fire Protection and local fire protection districts to identify opportunities for fuel breaks in zones of high and very high fire hazard either prior to or as a component of project review.

Community Wildfire Protection Plan (CWPP)

The El Dorado County Fire Safe Council has developed a CWPP based on the requirements of the Healthy Forest Restoration Act of 2003, which identifies measures that protect and restore forest land, and the 2010 Federal Land Assistance Management and Enhancement Act, which led to the development of a cohesive strategy of interagency cooperation to address wildfire problems. The CWPP coordinates with the LHMP on wildfire issues. The CWPP provides educational opportunities for the public to understand the complex issues of fire and fuels and to engage in the decision-making process for community safety. The February 15, 2022, Western El Dorado County CWPP is the latest CWPP for the area (El Dorado Fire Safe Council 2022).

4.20.3 Impact Analysis

Methodology

This analysis of the Project's effects related to wildfire is based on a review of CAL FIRE's Fire Hazard Severity Zone maps for El Dorado County. Potential effects were identified and evaluated qualitatively based on the environmental characteristics of the Project Area and the magnitude of activities related to the implementation of the Project.

The proposed Project involves adding an additional authorized upstream point of diversion at the District's existing El Dorado Diversion Dam and an additional place of storage and point of re-diversion to storage at

Jenkinson Lake to an existing water right permit (i.e., Permit 21112). The District already diverts water at the El Dorado Diversion Dam for consumptive use and hydropower generation under various water rights. Water currently diverted for hydropower generation is returned to the South Fork below the El Dorado Powerhouse. To implement the proposed Project, the District would reduce the amount diverted for power generation by the amount designated for consumptive use under a modified Permit 21112.

No new physical infrastructure would be needed for the District to divert Permit 21112 water at the El Dorado Diversion Dam in Kyburz. After being diverted at the El Dorado Diversion Dam, this water would be delivered two ways: 1) to Forebay Reservoir for delivery to the Reservoir 1 Water Treatment Plant (WTP) and 2) to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP. Water delivered to Forebay Reservoir would be conveyed via the Main Pipeline to the Reservoir 1 WTP. Water diverted at the El Dorado Diversion Dam can also be routed to Jenkinson Lake for consumptive use via the Hazel Creek Tunnel, which provides conveyance between the El Dorado Canal and Jenkinson Lake. Water re-diverted through the Hazel Creek Tunnel is conveyed along a partially rip-rapped and lined drainage channel to Hazel Creek which flows into Jenkinson Lake. Water delivered to Jenkinson Lake would be delivered through an existing raw water pipeline to the Reservoir A WTP.

To re-divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

To effectively analyze the potential impacts associated with implementation of the Project, the impact analysis considers three phases of the Project including: operational impacts (existing infrastructure), construction activities, and operational impacts (post-construction operation).

- Existing infrastructure operations: This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). This operational regime assumes the maximum rate of diversion at the El Dorado Diversion Dam is 145 cfs and limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Conveyance of water to Jenkinson Lake is limited to 80 cfs due to the estimated capacity of the current channel that conveys water from the outlet of the Hazel Creek Tunnel to Jenkinson Lake and conveyance of water to Reservoir 1 is limited to 40 cfs due to the capacity of the Main Pipeline.
- The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for a maximum rate of diversion of up to 156 cfs.
- The post-construction operational phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the Project would have a significant wildfire impact if it would be located in or near state responsibility areas or lands classified as very high fire hazard severity zones and would:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan;

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment; or

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 4.20-1. Substantially impair an adopted emergency response plan or emergency evacuation plan?

To evaluate whether the Project could substantially impair an adopted emergency response plan or emergency evacuation plan this section analyzed the potential for Project related vehicle trips to interfere with adopted emergency response or evacuation plans. Project related vehicle trips are the only way the Project would potentially interact with emergency response or evacuations in the Project vicinity.

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not increase vehicle trips compared to existing operations and would not alter the local or regional transportation network. Therefore, there would be **no impact** on an adopted emergency response plan or emergency evacuation plan.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction could temporarily increase traffic in proximity to the Project Area associated with construction worker vehicle trips as well as delivery of construction equipment and materials. This increase in traffic could temporarily affect the performance of the local circulation system due to traffic delays and roadway obstructions. Without traffic management procedures, emergency access on local roads could be impaired during construction. This impact would be **potentially significant**.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not increase vehicle trips compared to existing operations and would not alter the local or regional transportation network. Therefore, there would be **no impact** on an adopted emergency response plan or emergency evacuation plan.

Mitigation Measures

Mitigation Measure 4.20-1: Implement Mitigation Measure 4.17-1 (Prepare and Implement Traffic Control Plan)

Prior to construction, the construction contractor and/or the District shall prepare a traffic control plan. The traffic control plan shall contain detailed measures in order to ensure acceptable levels of traffic flow, emergency response notification and response times, and public and school bus transit coordination and detours. The traffic control plan shall include at a minimum: discussion of expected construction schedule and locations, traffic control measures, and coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times. The construction contractor and/or the District shall implement the traffic control plan during construction activities associated with the project.

Significance after Mitigation

Implementation of Mitigation Measure 4.20-1 would avoid impairment of adopted emergency response or evacuation plans by notifying emergency response agencies of the location and timing of construction activities and ensure passage of emergency vehicles through Project work zones, thereby reducing this impact to **less than significant with mitigation incorporated**.

Impact 4.20-2. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve activities, such as construction that are potential sources of ignition. Therefore, operation and maintenance of the existing facilities would not exacerbate wildfire risks or potentially cause the uncontrolled spread of a wildfire. Therefore, **no impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of

temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts.

Construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake (see Exhibit 3-6) would occur in an area that is heavily forested, primarily with conifers, interspersed with deciduous trees and shrubs. During construction, equipment and on-site diesel fuel could pose a risk for wildfire, from potential ignition sources (e.g., internal combustion engines, gasoline-powered tools, and equipment) that could produce a spark, fire, or flame. For these reasons, construction activities could exacerbate wildfire risks. Therefore, this impact would be **potentially significant.**

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve activities, such as construction that are potential sources of ignition. Therefore, post-construction operations would not exacerbate wildfire risks or potentially cause the uncontrolled spread of a wildfire. Therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure 4.20-2: Prepare and Implement a Fire Safety Plan.

The District shall require the Project contractor to prepare a Fire Safety Plan prior to construction. This plan shall be implemented by the Contractor during all construction activities. The plan shall describe the preventative measures for fire protection, fire-related roles and responsibilities of construction personnel, procedures for evaluating weather conditions during which fire risk is elevated (and identify conditions under which activities would cease due to elevated fire conditions), equipment required to prevent fire

and respond to a fire immediately, relevant emergency services agency contacts, and other measures taken to reduce fire risk.

Significance after Mitigation

Implementation of Mitigation Measure 4.20-2 would reduce wildfire risks associated with construction activities by requiring measures to prevent fire and providing procedures for responding to a fire.. Therefore, impacts related to the potential for construction activities to exacerbate wildfire risks would be **less than significant with mitigation incorporated**.

Impact 4.12-3. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Operational Impacts (Existing Infrastructure)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not install or maintain infrastructure, such as roads, fuel breaks, or other utilities that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel.

The Project involves improvements to existing water conveyance facilities. The Project would not install or maintain infrastructure, such as roads, fuel breaks, or other utilities that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. **No impact** would occur.

Operational Impacts (Post-Construction)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve the installation or maintenance of infrastructure, such as roads, fuel breaks, or other utilities that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. **No impact** would occur.

Mitigation Measures

No mitigation is required.

Impact 4.20-4. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Operational Impacts (Pre-Construction Operations)

This phase of the Project involves the operation of existing facilities with their existing operational capacities to divert Permit 21112 water at the El Dorado Diversion Dam.

Operations with existing infrastructure would not involve activities, such as construction, that could expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. **No impact** would occur.

Construction Impacts

The construction phase of the Project involves implementation of the construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake to allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Reasonably foreseeable construction activities associated with the improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake are described in Chapter 3 Project Description of this EIR. Anticipated construction activities may include vegetation and tree removal and improvements to existing roads (e.g., grading, all weather surfacing) and/or construction of temporary access roads along the El Dorado Canal and the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake to facilitate construction. Improvements to the El Dorado Canal would involve demolition of existing structures, rock scaling and/or slope stabilization, localized excavation and backfill, construction of retaining walls, placement of concrete, construction of conveyance structures, and site restoration. Improvements at the Hazel Creek Tunnel inlet would involve localized excavation of the canal liner, installation of gate(s) and gate support structures, and installation of a control building. Improvements to the channel that conveys water from the Hazel Creek Tunnel to Jenkinson Lake would include excavation and backfill for culvert replacement and/or bridge construction, excavation and/or grading within the channel to increase conveyance capacity, and placement of rip-rap or other material to stabilize the channel. Because only limited information is currently available for these improvements, this EIR provides a programmatic analysis of these improvements in accordance with CEQA Guidelines Section 15168. At the time infrastructure improvements are deemed necessary and sufficient design details are available, the District would evaluate the impacts of these components to

determine whether they were within the scope of the impacts analyzed in this EIR. If potential impacts associated with these future improvements are identified in the programmatic analysis provided herein, the improvements would be within the scope of this EIR, and their implementation would be subject to compliance with appropriate mitigation measures. If the improvements would result in new or substantially more severe significant impacts than those analyzed in this EIR, the District would prepare a supplemental CEQA document to address the impacts

Construction activities would involve vegetation clearing and ground disturbance in sloped areas. If areas disturbed by construction activities are not adequately stabilized, the Project could expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of postfire slope instability, runoff, or other drainage changes during construction. This impact is **potentially significant**.

Operational Impacts (Post-Construction Operations)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam.

Post-construction operations would not involve activities, such as construction, that could expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. **No impact** would occur.

Mitigation Measures

Mitigation Measure 4.20-3: Implement Mitigation Measure 4.10-1: Stormwater Management During Construction

The District shall require the construction contractor to implement a Water Pollution Control Plan (WPCP) or Stormwater Pollution Prevention Plan (SWPPP) during Project-related construction activities. A site-specific WPCP will be required if disturbed areas are less than one acre. Compliance with the Construction General Permit, including the development and implementation of a SWPPP, will be required if disturbed areas are one or more acres. The construction site best management practices (BMPs) listed below will be included in the plan, as applicable.

- Spill prevention and control
- Stabilized construction entrance/exit
- Material delivery and storage
- Solid waste management
- Stockpile management
- Storm drain inlet protection
- Street sweeping and vacuuming
- Vehicle and equipment maintenance, cleaning, and fueling
- Concrete waste management
- Silt fencing, fiber rolls, or gravel bags
- Hydroseeding

The District will prepare the WPCP or SWPPP prior to the start of construction. The plan will during construction by the construction contractor. The District and/or a third-party consultant shall monitor performance and compliance with the WPCP or SWPPP.

Significance after Mitigation

With Implementation of Mitigation Measure 4.10-1, BMPs to manage soil erosion and stormwater runoff would be implemented during construction activities, which would reduce the potential for downslope or downstream flooding or landslides as a result of postfire slope instability, runoff, or other drainage changes during construction (see Chapter 4.10, "Hydrology and Water Quality," for further discussion). Therefore, this impact would be reduced to **less than significant with mitigation incorporated**.

5 ALTERNATIVES

5.1 INTRODUCTION

The State California Environmental Quality Act (CEQA) Guidelines (Section 15126.6[a]) require that an Environmental Impact Report (EIR) 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 purpose of the alternatives analysis is to describe the comparative effects of a range of reasonable alternatives that would reduce or eliminate one or more significant project impacts within the basic framework of the project objectives (State CEQA Guidelines, Section 15126.6[b]).

Alternatives considered in an EIR should be potentially feasible and should attain most of the basic project objectives. As described in Chapter 3, "Project Description," of this Draft EIR, the specific objectives of the Modification of Water Right Permit 21112 (Project) are:

- **Meet future water demand as identified in long-term water supply planning efforts.** Long-term water supply planning documents show that the El Dorado Irrigation District (District) will have increased water demand throughout its service area. The District seeks to efficiently and reliably meet future water demands with implementation of the Project.

- **Reduce cost of water conveyance and delivery.** Water conveyance utilizing pumping facilities can increase costs of operations compared to a water conveyance system that is gravity-fed or a diversion point that is close to its place of use. The District aims to use the most economical option for water conveyance and delivery with implementation of the Project.

- **Increase flexibility and reliability in water delivery systems.** Water delivery systems are more reliable and efficient when the systems are designed to allow for operational flexibility, including redundancies in the event of infrastructure constraints, supply reductions, or emergencies. The District seeks to increase operational flexibility and reliability with implementation of the Project.

- **Optimize beneficial use of Water Right Permit 21112.** The existing authorized point of diversion for consumptive use of Permit 21112 is currently at Folsom Reservoir, which constrains the service area that the District can effectively utilize for this water supply. The District seeks to optimize beneficial use of this existing water right by adding a strategic upstream point of diversion and place of storage and re-diversion with implementation of the Project.

5.2 RANGE OF ALTERNATIVES CONSIDERED

The range of alternatives considered in an EIR is governed by the "rule of reason," which requires evaluation of only those alternatives "necessary to permit a reasoned choice" (State CEQA Guidelines, Section 15126.6[f]). Further, an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (State CEQA Guidelines, Section 15126.6[f][3]). The analysis should focus on alternatives that are feasible (i.e., that may be accomplished in a successful manner within a reasonable period of time) and that take economic, environmental, social, and technological factors into account.

CEQA requires that, among other alternatives, a "no project" alternative be evaluated in relation to the project. Moreover, the "no project" analysis must "discuss the existing conditions, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (State CEQA Guidelines, Section 15126.6[e]). Accordingly, a No-Project Alternative is analyzed in this Draft EIR at a level of detail sufficient to allow for a meaningful evaluation, analysis, and comparison with the Project.

This discussion identifies and addresses the following five alternatives in detail:

- No Project Alternative
- Direct Diversion Only Alternative
- Reduced Season of Diversion Alternative
- Existing Infrastructure Alternative
- Reduced Diversion Alternative

5.3 ALTERNATIVE SELECTION

In identifying alternatives, primary consideration was given to alternatives that could reduce potentially significant impacts identified in this EIR while still meeting most of the project objectives. A preliminary exercise was conducted to screen additional alternatives beyond those listed above. These additional alternatives not carried forward to detailed analysis are described below, along with the reason for their dismissal.

5.3.1 ALTERNATIVES REJECTED FROM DETAILED ANALYSIS

As required by CEQA, the term "feasible" is defined as, "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (14 California Code of Regulations [CCR] Section 15364). CEQA does not require that an EIR determine the ultimate feasibility of a selected alternative, but rather that an alternative be potentially feasible. Accordingly, no studies have been prepared regarding the economic feasibility of the selected alternatives.

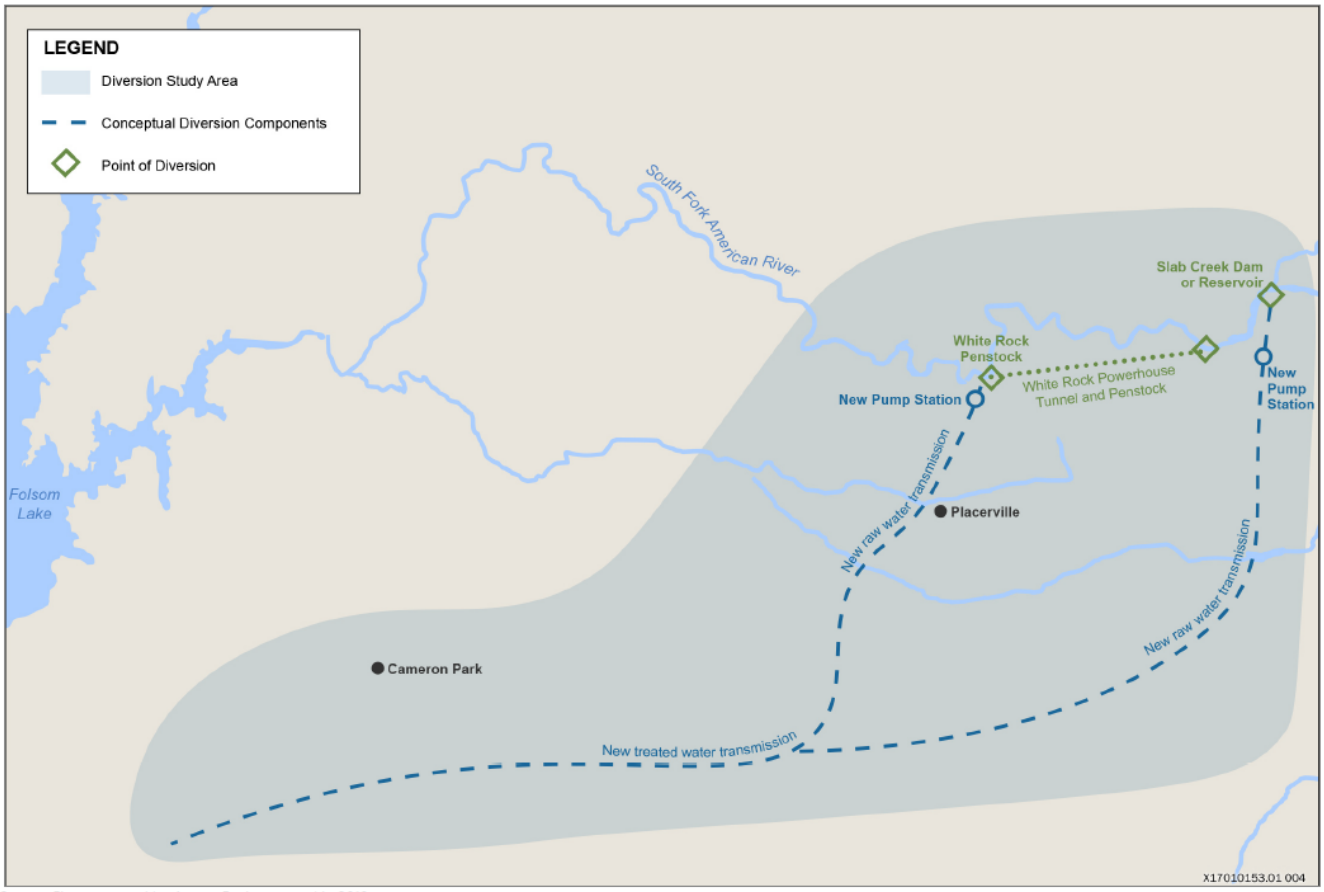
The District's development of feasible alternatives and the range of feasible alternatives considered for this EIR are discussed in a manner to foster meaningful public participation and informed decision-making. Pursuant to the CEQA Guidelines, factors taken into consideration for assessing the feasibility of alternatives include the following:

> *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 the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.*

The following alternatives were considered but ultimately rejected from detailed analysis because they either did not meet most of the project objectives or because they were found infeasible pursuant to 14 CCR Section 15364.

WHITE ROCK POWERHOUSE PENSTOCK OR SLAB CREEK DAM/RESERVOIR ADDITIONAL POINT OF DIVERSION

This alternative would utilize an additional point of diversion at either the Sacramento Municipal Utility District's (SMUD) White Rock Powerhouse Penstock north of Placerville near Chili Bar, or at SMUD's Slab Creek Dam/Reservoir. The White Rock Powerhouse Penstock or Slab Creek Dam/Reservoir diversion would require new water diversion, transmission and treatment facilities and would require significant energy demands to pump the water out of the South Fork American River canyon into the Placerville area where it would be treated and distributed. This alternative would also require approval from SMUD to connect to their infrastructure. Additionally, this alternative would not include a storage component, and water would need to be diverted and delivered based on real-time customer demands. The figure below provides a conceptual map of the general vicinity in which facilities associated with this alternative may be located.



Source: Figure created by Ascent Environmental in 2019

Figure 5-1. White Rock Powerhouse Penstock or Slab Creek Dam/Reservoir Additional Point of Diversion Alternative

This alternative was rejected from further analysis because it failed to meet Project objectives. This alternative did not meet the objective to reduce cost of water conveyance and delivery because of the extensive capital costs required to construct new facilities and the ongoing energy costs to operate pumping facilities to move the water out of the South Fork American River canyon into the Placerville area for treatment. This alternative also did not meet the objective to increase flexibility and reliability in water delivery systems because the point of diversion would be connected to SMUD's infrastructure, which would limit operational flexibility, as the District's operations would need to be continually coordinated with SMUD's operations. This alternative also did not meet

the objective to optimize beneficial use of Water Right Permit 21112 because while this alternative would add an additional point of diversion, this point of diversion would not provide a place of storage for the water. This reduces the amount of Permit 21112 water put to beneficial use because the diversion pattern would be limited to match real-time customer demands, rather than allowing water to be diverted to storage when it is abundant and then utilizing the water during periods when customer demands are highest and natural flows are lowest. For these reasons, the White Rock Powerhouse Penstock or Slab Creek Dam/Reservoir Point of Diversion alternative was considered but rejected from further analysis.

Water Demand Management

This alternative would rely on reducing customer water demands through a variety of water demand management measures to meet current and future water demands without implementation of the Project. As described in the District's Urban Water Management Plan (UWMP; EID 2021), the District currently implements a variety of foundational demand management measures including water waste prevention ordinances, water metering, conservation pricing, public education and outreach, programs to assess and manage distribution system real loss, and water conservation program coordination and staffing support. Recent demand management measures implemented by the District include offering water efficiency rebates, providing complimentary devices (e.g., low-flow faucet aerators, showerheads, moisture meters) to customers, conducting site visits with customers to identify recommendations to save water, providing toilet leak detection supplies, conducting site visits with customers to evaluate and advise on home landscaping water efficiency, enforcing state mandated potable water use restrictions, and offering irrigation management service to assist commercial agricultural customers save water.

This alternative was rejected from further analysis because it failed to meet Project objectives. This alternative did not meet the objective to meet future water demand as identified in long-term water supply planning efforts because the District's future forecasted demands already assume implementation of water demand management measures. This alternative also did not meet the objective to increase flexibility and reliability in water delivery systems because implementation of water demand management measures alone would not increase operational flexibility or provide redundancies in the event of infrastructure constraints, supply reductions, or emergencies. This alternative also did not meet the objective to optimize beneficial use of Water Right Permit 21112 because it does not provide an additional point of diversion for Permit 21112 and therefore limits the amount of water that can be put to beneficial use under Permit 21112. Additionally, this alternative would not result in reduced cost of water conveyance and delivery because the sole point of diversion would remain at Folsom Reservoir. Diversions from Folsom Reservoir would be subject to ongoing costs associated with the use of pumping facilities to convey water to its treatment and distribution system. For these reasons, the Water Demand Management Alternative was considered but rejected from further analysis.

5.4 ALTERNATIVES SELECTED FOR FURTHER EVALUATION

The following sections describe each of the alternatives identified and carried forward for further consideration in this Draft EIR. These alternatives were identified as feasible, even though they would not achieve all project objectives.

5.4.1 NO-PROJECT ALTERNATIVE

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam. Under the No Project Alternative, there would be no Project-related hydrologic changes in the South Fork watershed. There would be no Project-related changes to District operations at the El Dorado Diversion Dam, the El Dorado Canal, the Hazel Creek Tunnel, the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake, or Jenkinson Lake. Likewise, there would be no Project-related changes to SMUD's facilities at Union Valley Reservoir, Slab Creek Reservoir, or Chili Bar Reservoir. The District would continue to make facility improvements to restore the authorized capacity of the El Dorado Canal to 165 cubic feet per second (cfs).

Under the No Project Alternative, the District would continue to exercise Permit 21112 as currently authorized under the existing permit conditions, including the time extension provided by State Water Resources Control Board (SWRCB) December 18, 2023, Order Approving Petition for Extension of Time (Order; WR 2023-0066-EXEC). Under the No Project Alternative, the use of Permit 21112 would be limited by the infrastructure available to serve water from Folsom Lake to the western portion of the District's service area. Permit 21112 water would be pumped from Folsom Lake to the El Dorado Hills Water Treatment Plant and then pumped for delivery to District's water distribution system. Full utilization of the Permit 21112 water right from Folsom Reservoir will also require new and expanded infrastructure. Future anticipated construction projects to allow the full beneficial use of Permit 21112 water include: 1) replacement of pumps at the intake facility to reliably meet a future expanded capacity of 30 million gallon per day (mgd); 2) expansion of the El Dorado Hills Water Treatment Plant to 30 mgd; 3) construction of a new raw water line to provide additional capacity from the intake to the El Dorado Hills Water Treatment Plant; and 4) construction of several conveyance pipelines and an additional pump station to meet future water demands. The existing terms of Permit 21112 require the District to complete construction work and apply the water to full beneficial use by December 31, 2040.

5.4.2 DIRECT DIVERSION ONLY ALTERNATIVE

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 acre-feet (AF) of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 water treatment plant (WTP) and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

This alternative assumes the maximum rate of diversion at the El Dorado Diversion Dam is 156 cfs, which is the authorized maximum rate of direct diversion under Permit 21112. The maximum rate of diversion into the Hazel Creek Tunnel under this alternative is 156 cfs. To convey Permit 21112's maximum rate of diversion of 156 cfs from the El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. These improvements would be same as the proposed Project. However, because Permit 21112 water is limited to use only as direct diversion under this alternative, the rate of diversion at any given time will depend upon the combined demands of Reservoir 1 WTP and Reservoir A WTP.

The season of diversion for Permit 21112 is November 1 to July 31.

5.4.3 REDUCED SEASON OF DIVERSION ALTERNATIVE

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

The maximum rate of diversion into the Hazel Creek Tunnel under this alternative is 156 cfs. To convey Permit 21112's maximum rate of diversion of 156 cfs from the El Dorado Diversion Dam to Jenkinson Lake, future improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. These improvements would be same as the proposed Project.

5.4.4 EXISTING INFRASTRUCTURE ALTERNATIVE

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Due to capacity limits of existing conveyance infrastructure, this alternative limits the maximum rate of diversion of Permit 21112 water to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. The season of diversion for Permit 21112 is November 1 to July 31.

Because this alternative would maintain the same physical infrastructure constrains as currently existing, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake in order divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, as proposed with the Project.

5.4.5 REDUCED DIVERSION ALTERNATIVE

The Reduced Diversion Alternative is similar to the Existing Infrastructure Alternative, but with more restrictive constraints on the maximum flow rate of Hazel Creek Tunnel and the total annual volume of Permit 21112 water allowed through the tunnel, thus effectively reducing diversion to storage of Permit 21112 water in Jenkinson Lake.

The Reduced Diversion Alternative represents operations with the same physical infrastructure constraints as the Baseline scenario, but with project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to Reservoir 1 WTP and/or to Jenkinson Lake via the Hazel Creek Tunnel for either storage or immediate delivery to Reservoir A WTP. Only 9,000 AF of Permit 21112 water is allowed to pass

through Hazel Creek Tunnel each year under this scenario, and the maximum flow rate of Permit 21112 water through Hazel Creek Tunnel is limited to 45 cfs.

Due to capacity limits of existing conveyance infrastructure, this operational regime limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. The season of diversion for Permit 21112 is November 1 to July 31.

Because this alternative would maintain the same physical infrastructure constraints as currently existing, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, as proposed with the Project.

5.5 ABILITY OF THE SELECTED ALTERNATIVES TO MEET BASIC PROJECT OBJECTIVES

Table 5.5-1 provides a summary of whether the alternatives meet the four basic project objectives as presented in Chapter 3 Project Description of this Draft EIR.

Table 5.5-1. Ability of Project Alternatives to Meet Basic Project Objectives

Project Objective	No Project Alternative	Direct Diversion Only Alternative	Reduced Season of Diversion Alternative	Existing Infrastructure Alternative	Reduced Diversion Alternative
Meet future water demand as identified in long-term water supply planning efforts	Partial	Partial	Partial	Partial	Partial
Reduce cost of water conveyance and delivery	No	Partial	Partial	Partial	Partial
Increase flexibility and reliability in water delivery systems	No	Partial	Partial	Partial	Partial
Optimize beneficial use of Water Right Permit 21112	No	No	Partial	Partial	Partial

5.6 EVALUATION OF PROPOSED ALTERNATIVES

5.6.1 APPROACH TO ALTERNATIVES EVALUATION

The evaluation of alternatives is presented below by resource topic, following the order of topics in Chapter 4, Impact Analysis. For each resource topic, a table is presented that compares impact conclusions for the alternative to impact conclusions for the proposed Project. Specifically, the tables list each of the alternatives and the impact conclusion for the specific resource topic, followed by a comparison of alternatives' impacts to the proposed Project impacts. The comparison of alternatives' impacts to the proposed Project impacts are categorized as "**lesser**", "**similar**", or "**greater**." For example, for impacts related to aesthetics in the line comparing the No Project Alternative to the proposed Project for construction, construction the No Project Alternative would have **less-than-significant impacts** (**LTS**) impact on scenic vistas, scenic resources, visual character, and light and glare. Compared to the Project which would have less-than-significant impacts on aesthetics, this impact is similar (**Similar**). This comparison is provided for each of the three phases of the Project including: (1) current operations (*i.e.,* operations with current water demands), (2) construction, and (3) future operations (*i.e.,* operations with future water demands).

If the table does not indicate discernable differences in impact conclusions among alternatives, only a brief discussion is provided following the table. For resource topics where discernable differences in impact conclusions exist among alternatives, a more detailed discussion of these impacts is provided. The level of detail of the discussion varies among topics and is generally more extensive for those topics analyzed based on model output. Model output used to support the alternatives analysis and additional descriptions of some alternative analysis are provided in the following Appendices:

Appendix H1. Energy (model output for alternatives analysis)

Appendix H2. Hydrology and Biology (model output for alternatives analysis)

Appendix H3. Recreation (written analysis and model output for alternatives)

5.6.2 ALTERNATIVES EVALUATION

AESTHETICS

Table 5.6-1. Impact Conclusions and Comparison Among Alternatives for Aesthetics

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**LTS**	**LTS**	**LTS**
No Project Alternative	NI; Lesser	LTS; Similar	LTS; Similar
Direct Diversion Only Alternative	LTS; Similar	LTS; Similar	LTS; Similar
Reduced Season of Diversion Alternative	LTS; Similar	LTS; Similar	LTS; Similar
Existing Infrastructure Alternative	LTS; Similar	NI; Lesser	LTS; Similar
Reduced Diversion Alternative	LTS; Similar	NI; Lesser	LTS; Similar

LTS = Less than significant; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative under current operations would have **no impact** (**NI**) on scenic vistas, scenic resources, visual character, and light and glare. Compared to the Project which would have less-than-significant impacts on aesthetics, this impact is lesser (**Lesser**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from

Folsom Reservoir, as described in Section 5.4.1. The extent of construction associated with the No Project Alternative is anticipated to have **less-than-significant** (**LTS**) impacts on scenic vistas, scenic resources, visual character, and light and glare. Compared to the Project, which also involves less-than-significant construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the current baseline scenario. The No Project Alternative would have **less-than-significant** (**LTS**) impacts on scenic vistas, scenic resources, visual character, and light and glare. Compared to the Project which would have less-than-significant impacts on aesthetics, this impact is similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have a **less-than-significant** (**LTS**) impact on scenic vistas, scenic resources, visual character, and light and glare. Compared to the Project, which also involves less than significant construction related impacts on these resources, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor hydrologic changes in the South Fork watershed and fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Reduced Season of Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have a **less-than-significant** (**LTS**) impacts on scenic vistas, scenic resources, visual character, and light and glare. Compared to the Project, which also would result in construction related impacts that are less than significant, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor hydrologic changes in the South Fork watershed and fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the Project, which also would result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on scenic vistas, scenic resources, visual character, and light and glare from construction. Compared to the Project which would result in less-than-significant impacts on aesthetics from construction, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**)

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which would also result in less-than-significant impacts on aesthetics, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on aesthetic resources related to construction. Compared to the proposed Project which would result in less-than-significant impacts on scenic vistas, scenic resources, visual character, and light and glare from construction, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Impacts on scenic vistas, scenic resources, visual character, and light and glare would be **less than significant** (**LTS**). Compared to the proposed Project, which would also result in less-than-significant impacts on aesthetics during future operations, these impacts would be similar (**Similar**).

Table 5.6-2. Impact Conclusions and Comparison Among Alternatives for Agriculture and Forestry Resources

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS**	**NI**
No Project Alternative	NI; Similar	LTS; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS = Less than significant; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not involve changes to the physical environment that would affect agricultural or forest land. The No Project Alternative would have **no impact** (**NI**) on agricultural or forest land. Compared to the Project, which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. The infrastructure improvements associated with the diversion at Folsom would generally occur in a developed suburban landscape that lacks forest land, timberland, or timberland zoned Timber Production. However, the infrastructure improvements along the El Dorado Canal are generally located in remote areas that are heavily forested. The extent of construction associated with the No Project Alternative is anticipated to have a **less-than-significant** (**LTS**) impact on the surrounding forested landscape including forest land, timberland, or timberland zoned Timber Production. Compared to the Project, which also involves less-than-significant construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the current baseline scenario. There would be no changes to the physical environment that would affect agricultural or forest land. The No Project Alternative would have **no impact** (**NI**)

on agricultural or forest land. Compared to the Project, which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have a **less-than-significant** (**LTS**) impact on the surrounding forested landscape including forest land, timberland, or timberland zoned Timber Production. Compared to the Project, which also involves less-than-significant construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which would also result in no impacts on agricultural or forest land during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there

would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact on agricultural or forest land, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have a **less-than-significant** (**LTS**) impact on the surrounding forested landscape including forest land, timberland, or timberland zoned Timber Production. Compared to the Project, which also involves less-than-significant construction related impacts, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Reduced Season of Diversion Alternative would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which would also result in no impacts on agricultural or forest land during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**) on agricultural or forest land. Compared to the Project, which also would result in no impacts on agricultural or forest land, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on agricultural or forest land. Compared to the Project which would result in less-than-significant impacts on the surrounding forested landscape including forest land, timberland, or timberland zoned Timber Production, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there be **no impact** (**NI**) on agricultural or forest land. Compared to the proposed Project, which also would result in no impact on agricultural or forest land, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**) on agricultural or forest land. Compared to the proposed Project which would also result in no impact on agricultural or forest land, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on agricultural or forest land. Compared to the proposed Project which would result in less-than-significant impacts on the surrounding forested landscape including forest land, timberland, or timberland zoned Timber Production, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect agricultural or forest land. Therefore, there would be **no impact** (**NI**) on agricultural or forest land. Compared to the proposed Project, which also would result in no impact on agricultural or forest land, these impacts would be similar (**Similar**).

AIR QUALITY

Table 5.6-3. Impact Conclusions and Comparison Among Alternatives for Air Quality

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**Speculative**	**LTS**
No Project Alternative	NI; Similar	Speculative; Similar	LTS; Similar
Direct Diversion Only Alternative	NI; Similar	Speculative; Similar	LTS; Similar
Reduced Season of Diversion Alternative	NI; Similar	Speculative; Similar	LTS; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	LTS; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	LTS; Similar

LTS = Less than significant;; NI = No impact; Speculative = Cannot be determined with certainty at this time

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would use existing facilities and equipment, resulting in **no impact** (**NI**) on air quality compared to existing conditions. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because construction activities would still occur under this alternative, there would still be a potential to conflict or obstruct implementation of an applicable air quality plan, result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment, and expose sensitive receptors to substantial pollutant concentrations. While implementation of mitigation measures requiring detailed quantification of all construction-related emissions and implementation of a Dust and Emissions Control Plan would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates impacts would be less than significant related to air quality even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations includes operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, that are anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, future operations would not expose

sensitive receptors to substantial pollutant concentrations, and the No Project Alternative would have **less-than-significant** (**LTS**) impacts on air quality. Compared to the proposed Project, which also would result in less-than-significant impacts on air quality, these impacts would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would use existing facilities and equipment, resulting in **no impact** (**NI**) on air quality compared to existing conditions. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because construction activities would still occur under this alternative, there would still be a potential to conflict or obstruct implementation of an applicable air quality plan, result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment and expose sensitive receptors to substantial pollutant concentrations. While implementation of mitigation measures requiring quantification of all construction-related emissions and implementation of a Dust and Emissions Control Plan would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates impacts would be less than significant related to air quality even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations includes operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, that are anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, future operations would not expose sensitive receptors to substantial pollutant concentrations, and this alternative would have **less-than-significant** (**LTS**) impacts on air quality under future operations. Compared to the proposed Project which would also result in less-than-significant impacts on air quality during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from

November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Reduced Season of Diversion Alternative under current operations would use existing facilities and equipment, resulting in **no impact** (**NI**) on air quality. Compared to the proposed Project, which also would result in no impacts on air quality, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because construction activities would still occur under this alternative, there would still be a potential to conflict or obstruct implementation of an applicable air quality plan, result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment and expose sensitive receptors to substantial pollutant concentrations. While implementation of mitigation measures requiring a detailed quantification of all construction-related emissions and a Dust and Emissions Control Plan would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates impacts would be less than significant related to air quality even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations includes operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, that are anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, future operations would not expose sensitive receptors to substantial pollutant concentrations, and this alternative would result in **less-than-significant** (**LTS**) impacts on air quality under future operations. Compared to the proposed Project which would also result in less-than-significant impacts on air quality during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would use existing facilities and equipment, resulting in **no impact** (**NI**) on air quality compared to existing conditions. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on air quality. Compared to the proposed Project, which would result in speculative impacts related to air quality construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations includes operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, that are anticipated to remain similar to existing conditions and would not result in a change in any emissions sources. Therefore, future operations would not expose sensitive receptors to substantial pollutant concentrations, and this alternative would result in **less-than-significant** (**LTS**) impacts on air quality under future operations. Compared to the proposed Project which would also result in less-than-significant impacts on air quality during future operations, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would use existing facilities and equipment, resulting in **no impact** (**NI**) on air quality compared to existing conditions. Compared to the proposed Project, which would also result in no impact on air quality, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on air quality. Compared to the proposed Project, which would result in speculative impacts related on air quality, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations includes operations and maintenance activities, such as equipment use or vehicle trips for maintenance work, that are anticipated to remain similar to existing

conditions and would not result in a change in any emissions sources. Therefore, future operations would not expose sensitive receptors to substantial pollutant concentrations, and this alternative would have **less-than-significant impacts** (**LTS**) impacts on air quality under future operations. Compared to the proposed Project, which also would result in less-than-significant impacts on air quality during future operations, these impacts would be similar (**Similar**).

BIOLOGICAL RESOURCES

Table 5.6-4. Impact Conclusions and Comparison Among Alternatives for Biological Resources

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**LTS**	**LTS/M**	**LTS**
No Project Alternative	NI; Lesser	LTS/M; Similar	LTS; Similar
Direct Diversion Only Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Reduced Season of Diversion Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Existing Infrastructure Alternative	LTS; Similar	NI; Lesser	LTS; Similar
Reduced Diversion Alternative	LTS; Similar	NI; Lesser	LTS; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact

Extensive hydrologic modeling analysis was conducted to assess the effects of the proposed Project and alternatives on stream flows, water temperature and reservoir levels. The results of these analyses relevant to Biological Resources are presented in Appendices B and H. Appendix H2 compares modeled results for flow and temperature for the proposed Project and the alternatives. Changes in flow and temperature are compared to baseline conditions by month and water year type for current and future operations. Appendix H3 compares modeled results for change in end of month reservoir elevation for the proposed Project and the alternatives. Changes in reservoir elevations are compared to baseline conditions by month and water year type for current and future operations. In addition, detailed model output is provided in Appendices B2 and B3. Appendix B2 contains modeling output for the proposed Project and the alternatives for reservoir levels (end of month elevation and storage) and river flow within the South Fork American River watershed and at Jenkinson Lake (i.e., in areas above Folsom Reservoir). Appendix B3 contains modeling output for the proposed Project and the alternatives for Folsom Reservoir releases and for the Lower American River.

Table 5.6-5 provides an example of the type of tables that can be found in Appendix H2. This table shows average changes in river flow in the South Fork American River below Chili Bar Dam by month and water year type as compared to baseline conditions. The example below and the other tables in Appendix H2 are designed to facilitate a direct comparison of the effects of the proposed Project with effects of the alternatives.

Table 5.6-5. Changes in Average Streamflow in the South Fork American River Downstream of Chili Bar Dam, in cfs – Baseline vs Project, All Alternatives

Water Year Type/Alternative	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet												
Proposed Project (Post-Construction)	2	0	-1	-10	-1	-1	-1	-1	-1	-1	0	0
Direct Diversion Only	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0
Reduced Season of Diversion	2	0	-1	-10	-1	-1	-1	-1	-1	-1	0	0
Existing Infrastructure	2	0	-1	-8	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	-1	-7	0	0	0	0	0	0	0	0
Above Normal												
Proposed Project (Post-Construction)	0	0	0	-4	-1	-1	0	-1	-1	0	0	0
Direct Diversion Only	0	0	0	-1	-1	-1	-1	-1	-1	0	0	0
Reduced Season of Diversion	0	0	0	-4	-1	-1	0	-1	-1	0	0	0
Existing Infrastructure	0	0	0	-5	0	0	1	0	0	0	0	0
Reduced Diversion	0	0	0	-9	0	0	1	0	0	0	0	0
Below Normal												
Proposed Project (Post-Construction)	2	0	0	-18	-2	2	4	4	3	2	0	4
Direct Diversion Only	-2	0	0	0	0	1	0	1	-1	0	0	-1
Reduced Season of Diversion	2	0	0	-18	-2	2	4	4	3	2	0	4
Existing Infrastructure	2	0	0	-15	-2	3	5	5	4	2	0	4
Reduced Diversion	-1	0	-1	-12	-4	2	5	5	4	2	0	4
Dry												
Proposed Project (Post-Construction)	0	0	0	-7	-30	-12	-8	8	10	13	6	0
Direct Diversion Only	-1	0	0	0	0	0	0	0	-1	0	-9	-2
Reduced Season of Diversion	0	0	0	-7	-30	-12	-8	8	10	13	6	0
Existing Infrastructure	0	0	0	-7	-28	-7	-8	5	11	13	6	0
Reduced Diversion	0	0	0	-8	-21	-4	-5	3	6	11	6	0
Critically Dry												
Proposed Project (Post-Construction)	0	0	0	-19	-77	-66	-1	15	12	10	15	20
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	-8	-23
Reduced Season of Diversion	0	0	0	-19	-77	-66	-1	15	12	10	15	20
Existing Infrastructure	0	0	0	-18	-56	-47	-26	11	10	9	15	19
Reduced Diversion	0	0	0	-13	-34	-23	-13	3	2	3	5	5

Source: Appendix H2

cfs = cubic feet per second

Table 5.6-6 provides an additional example of the type of tables found in Appendix H2. This table shows average changes in water temperature that would occur for each alternative as compared to baseline conditions. The example below and the other tables in Appendix H2 are designed to facilitate a direct comparison of the effects of the proposed Project with effects of the alternatives.

Table 5.6-6. Average Monthly Changes in Water Temperature in the Lower American River at Watt Avenue (°C), Baseline vs Project, All Alternatives

Water Year Type/Alternative	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	-0.1	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	-0.1	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	-0.1	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Dry												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Critically Dry												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0.1	0.1	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0.1
Reduced Season of Diversion	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0.1	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0.1	0	0	0.1

Source: Appendix H2

Note: Modeled temperature increase indicated in red and modeled temperature decrease indicated in blue.

°C = degrees Celsius

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

Under the No Project Alternative with current operations there would be no Project-related changes in flows or water temperature in the South Fork. Fluctuations in water levels within reservoirs would be the same as the fluctuations that occur with the current baseline. The No Project Alternative would have **no impact** (**NI**) on sensitive biological resources. Compared to the Project, which would have less-than-significant impacts on sensitive biological resources, this impact is lesser (**Lesser**).

Construction

The No Project Alternative includes facility improvements at the El Dorado Canal to restore its authorized conveyance capacity. In addition, full utilization of the Permit 21112 water right from Folsom Reservoir will require new and expanded infrastructure (*i.e.*, replacement of pumps, expanded capacity at the El Dorado Hills WTP, new pipelines, and new pump stations). Construction impacts associated with the diversion, conveyance, and treatment of Permit 21112 water near Folsom Reservoir are expected to vary in location, scale, and magnitude when compared to the proposed Project. For example, construction would occur in primarily urbanized areas (e.g., at an existing water treatment plant) rather than in areas that might support native plant communities such as mixed conifer forest or riparian woodland. Construction is anticipated to have a **less-than-significant impact with mitigation incorporated** (**LTS/M**) on sensitive biological resources with implementation of pre-construction surveys and avoidance and minimization measures to protect special-status species, wetlands, and other sensitive natural communities. Both the proposed Project and the No Project Alternative involve less-than-significant impact with mitigation construction-related impacts, although in a different geographic and habitat setting, and these construction impacts on sensitive biological resources would be similar (**Similar**).

Future Operations

Under the No Project Alternative with future operations, there would only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. Future operations of the No Project Alternative are anticipated to result in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the project area (e.g., flows and water temperatures), and only minor fluctuations in water levels within some reservoirs. The impacts on sensitive biological resources would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, as well as the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project. With implementation of preconstruction surveys and avoidance and minimization measures, potential impacts on

sensitive biological resources would be minimized or avoided and would be **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the proposed Project, which involves the same less-than-significant construction-related impacts on sensitive biological resources with mitigation incorporated, these impacts would be similar (**Similar**).

Future Operations

Under the Direct Diversion Only Alternative with future operations, flows in the South Fork would generally be similar to baseline conditions except for September and October of below normal years, and July through September of dry and critically dry years. In those months and water year types, demands would be met by Permit 21112 water and less water would be returned to the South Fork at the El Dorado Powerhouse. This contrasts with the proposed Project, where flow in the South Fork would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types. Changes to water temperature in the Lower American River are expected to be minimal in both the Direct Diversion Only Alternative and the proposed Project (see Appendix H2).

The Direct Diversion Only Alternative is expected to have only minor changes in flow compared to baseline conditions resulting in changes that are less pronounced than the proposed Project in January through March, but more pronounced than the proposed Project in July through September of dry and critically dry years. Effects on water temperature are expected to be minor in the Direct Diversion Only Alternative (see Appendix H2). Therefore, impacts on sensitive biological resources from operation of the Direct Diversion Only Alternative to meet future water demands would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in changes in streamflow in the South Fork that would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions (see Table 5.6-5 and Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, as well as the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, to allow for diversion and conveyance of up to 156 cfs. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project. With implementation of avoidance and minimization measures, potential impacts on sensitive biological resources would be minimized and substantially avoided to **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the proposed Project, which also would result in less-than-significant impacts with mitigation on sensitive biological resources, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Reduced Season of Diversion Alternative would result in seasonal changes in streamflow, with reductions in flow typically occurring in January through March in below normal water years and January through April in dry and critically dry years as compared to baseline conditions (see Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minor (see Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative is the same scenario as the proposed Project and has the same physical infrastructure as constraints as the baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Under current operations, the Existing Infrastructure Alternative would result in changes in streamflow in the South Fork American River that would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions (see Table 5.6-5 and Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2). The seasonality and the magnitude of the changes in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Under the Existing Infrastructure Alternative, no construction would occur and therefore there would be **no impacts** (**NI**) on sensitive biological resources. Compared to the proposed Project, which would result in less-than-significant impacts with mitigation on sensitive biological resources due to construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Existing Infrastructure Alternative would result in seasonal changes in streamflow, with reductions in flow typically occurring in January through March in below normal water years and January through April in dry and critically dry years as compared to baseline conditions (see Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River would be minor under this alternative (see Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

Under current operations, the Reduced Diversion Alternative would result in changes in streamflow in the South Fork American River that would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions (see Table 5.6-5 and Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2). The seasonality and the magnitude of the changes in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Under the Reduced Diversion Alternative, no construction would occur and therefore there would be **no construction impacts** (**NI**) on sensitive

biological resources. Compared to the proposed Project, which would result in less-than-significant impacts with mitigation on sensitive biological resources due to construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Reduced Diversion Alternative would result in seasonal changes in streamflow, with reductions in flow typically occurring in January through March in below normal water years, January through April in dry years, and January through April and July through September in critically dry years as compared to baseline conditions (see Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minor (see Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on sensitive biological resources. Compared to the proposed Project, which also would result in less-than-significant impacts on sensitive biological resources, these impacts would be similar (**Similar**).

CULTURAL RESOURCES

Table 5.6-7. Impact Conclusions and Comparison Among Alternatives for Cultural Resources

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

Under the No Project Alternative, there would be no Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. In addition, the No Project Alternative under current operations does not involve physical changes or have ground disturbance, resulting in **no impact** (**NI**) on cultural resources. Compared to the Project which would have no impact on cultural resources, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from

Folsom Reservoir, as described in Section 5.4.1. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential to impact historical resources or unrecorded cultural resources. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on cultural resources. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on cultural resources. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential to impact historical resources or unrecorded cultural resources. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. This alternative would have **no impact** (**NI**) on cultural resources under future operations because it does not involve physical changes. Compared to the proposed Project which would also result in no impact on cultural resources during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Reduced Season of Diversion Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on cultural resources. Compared to the proposed Project, which also would result in no impact on cultural resources, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential to impact historical resources or unrecorded cultural resources. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on cultural resources under future operations because it does not involve physical changes. Compared to the proposed Project which would also result in no impact on cultural resources during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on cultural resources. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on cultural resources. Compared to the proposed Project, which would result in less-than-significant impacts related to potential construction impacts on cultural resources, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. Therefore, there would be **no impact** (**NI**) on cultural resources. Compared to the proposed Project, which also would result in **no impact** (**NI**) on cultural resources, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. This would have **no impact** (**NI**) on cultural resources. Compared to the proposed Project which would also result in no impact on cultural resources, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on cultural resources. Compared to the Project, which would result in less-than-significant impacts related to construction impacts on cultural resources, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on cultural resources. Compared to the proposed Project, which also would result in no impact on cultural resources, these impacts would be similar (**Similar**).

ENERGY

Table 5.6-8. Impact Conclusions and Comparison Among Alternatives for Energy

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**LTS**	**LTS/M**	**LTS**
No Project Alternative	NI; Lesser	LTS/M; Similar	LTS; Greater
Direct Diversion Only Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Reduced Season of Diversion Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Existing Infrastructure Alternative	LTS; Similar	NI; Lesser	LTS; Similar
Reduced Diversion Alternative	LTS; Similar	NI; Lesser	LTS; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact

Extensive modeling analysis was conducted and presented in various appendices to evaluate the potential impacts of the Proposed project and the alternatives on energy resources. Appendix H1 compares modeled results for hydropower generation (megawatt hours) for the proposed Project and the alternatives. Changes in hydropower generation are compared to baseline conditions by month and water year type for current and future operations. Appendix B2 contains modeling output for the proposed Project and the alternatives for hydropower generation along the South Fork American River and in tributary areas. Power data were compiled for the El Dorado Powerhouse, Camino Powerhouse, Jaybird Powerhouse, Jones Fork Powerhouse, Loon Lake Powerhouse, Robbs Peak Powerhouse, White Rock Powerhouse, Union Valley Powerhouse, and Chili Bar Powerhouse.

Table 5.6-9 provides an example of the type of tables that can be found in Appendix H1. This table shows change in power generation, in megawatt-hours (MWH) by month and water year type as compared to baseline conditions. The example below and the other tables in Appendix H1 are designed to facilitate a direct comparison of the effects of the proposed Project with effects of the alternatives.

Table 5.6-9. Average Monthly Difference in Generation at El Dorado Powerhouse (Baseline vs Project), in MWH, All Alternatives

Alternative Compared to Baseline	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet												
Proposed Project (Post-Construction)	0	0	71	-620	237	334	369	562	794	686	167	646
Direct Diversion Only	0	0	164	360	237	334	369	562	794	686	167	646
Reduced Season of Diversion	0	0	71	-620	237	334	369	562	794	686	167	646
Existing Infrastructure	0	0	-95	-740	0	0	0	0	0	0	0	608
Reduced Diversion	0	0	-95	-642	0	0	0	0	0	0	0	608
Above Norma												
Proposed Project (Post-Construction)	2	0	150	97	228	536	705	668	846	255	0	0
Direct Diversion Only	2	0	150	388	228	536	634	668	846	255	0	0
Reduced Season of Diversion	2	0	150	97	228	536	705	668	846	255	0	0
Existing Infrastructure	2	0	0	-467	0	0	108	0	0	0	0	0
Reduced Diversion	2	0	0	-820	0	0	108	0	0	0	0	0
Below Normal												
Proposed Project (Post-Construction)	0	0	130	-1,337	168	879	1,317	1,470	1,139	205	40	374
Direct Diversion Only	-1	0	155	392	334	686	902	1,137	782	55	15	-62
Reduced Season of Diversion	0	0	130	-1,337	168	879	1,317	1,470	1,139	205	40	374
Existing Infrastructure	0	0	-27	-1,494	-161	381	485	475	396	156	40	374
Reduced Diversion	-1	0	-109	-1,101	-358	256	487	476	396	156	40	374
Dry												
Proposed Project (Post-Construction)	2	0	113	-645	-2,656	-728	110	1,903	1,909	1,077	674	4
Direct Diversion Only	1	0	113	48	116	453	788	1,047	801	27	-865	-214
Reduced Season of Diversion	2	0	113	-645	-2,656	-728	110	1,903	1,911	1,076	674	4
Existing Infrastructure	2	0	0	-712	-2,615	-700	-763	454	1,145	1,053	674	0
Reduced Diversion	2	0	-62	-701	-1,898	-230	-362	276	599	986	644	0
Critically Dry												
Proposed Project (Post-Construction)	0	0	55	-1,794	-6,724	-5,788	933	2,492	2,116	1,840	1,666	331
Direct Diversion Only	-1	0	86	69	211	612	893	920	357	11	-931	-2,108
Reduced Season of Diversion	0	0	55	-1,794	-6,724	-5,788	933	2,492	2,118	1,839	1,666	331
Existing Infrastructure	0	0	-31	-1,756	-5,049	-4,507	-2,380	1,124	1,504	1,762	1,658	331
Reduced Diversion	0	0	-47	-1,275	-2,953	-1,854	-939	325	391	808	847	-458

Source: Appendix H1

MWH = megawatt-hours

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

Under the No Project Alternative, operations needed to meet current water demands would be the same as current operations, *i.e.*, Permit 21112 water would be pumped from Folsom Lake to the El Dorado Hills WTP and then pumped for delivery within the western portion of the District's water distribution system. This alternative would have no hydrologic changes in the South Fork American River watershed. There would be no change to diversions, the non-consumptive use of water, or power generation as compared to baseline conditions. Therefore,

the No Project Alternative would have **no impact** (**NI**) on energy resources. Compared to the Project, which would have less-than-significant impacts on energy resources, this impact is lesser (**Lesser**).

Construction

The No Project Alternative includes facility improvements at the El Dorado Canal to restore its authorized conveyance capacity. Additionally, full utilization of the Permit 21112 water right from Folsom Reservoir will require new and expanded infrastructure (*i.e.*, replacement of pumps, expanded capacity at the El Dorado Hills WTP, new pipelines, and new pump stations). Construction activities are anticipated to have **less-than-significant impacts with mitigation incorporated** (**LTS/M**) on energy resources when mitigation that includes energy-efficient construction practices and compliance with state and local regulations related to energy use are adopted during construction. Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

Under the No Project Alternative with future operations, the point of diversion for the consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. A portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills and at a higher elevation than is currently being served. Delivering water to these higher elevation areas of the District's service area would require extensive energy-intensive pumping of raw water from Folsom Reservoir and treated water from the El Dorado Hills WTP. However, the No Project Alternative also includes facility improvements to the El Dorado Canal to restore the canal's authorized conveyance capacity. Restoration of the El Dorado Canal's conveyance capacity can result in increased conveyance through the canal of additional water designated for hydropower generation.

Future operations of the No Project Alternative are anticipated to result in **less-than-significant** (**LTS**) impacts on energy resources. However, compared to the proposed Project, which would allow Permit 21112 water to be diverted at the District's existing El Dorado Diversion Dam near Kyburz and then delivered to customers at lower elevations via gravity flow (i.e., no increased pumping) to meet demands throughout the District's service area without excessive use of energy, the impacts of this alternative would be greater (**Greater**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Direct Diversion Only Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting Renewable Portfolio Standards (RPS) milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project (*i.e.*, implementing energy-efficent construction practices and compliance with state and local plans and policies related to energy use during construction). Therefore, impacts on energy resources during construction would be **less-than-significant with mitigation incorporated** (**LTS/M**). Compared to the Project, which would result in less-than-significant construction-related impacts on energy resources with mitigation incorporated, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Direct Diversion Only Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the proposed Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project (*i.e.*, implementing energy-efficent construction practices and compliance with state and local plans and policies related to energy use during construction). Therefore, impacts on energy resources during construction would be **less-than-significant with mitigation incorporated** (**LTS/M**). Compared to the Project,

which would result in less-than-significant construction-related impacts with mitigation incorporated on energy resources, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Reduced Season of Diversion Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Existing Infrastructure Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on energy resources from construction. Compared to the Project which would result in less-than-significant impacts on energy resources from construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Existing Infrastructure Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the

Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative is similar to the Existing Infrastructure Alternative, but with more restrictive constraints on the maximum flow rate of Hazel Creek Tunnel and the total annual volume of Permit 21112 water allowed through the tunnel, thus effectively reducing diversion to storage of Permit 21112 water in Jenkinson Lake. Under current operations, the Reduced Diversion Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on energy resources from construction. Compared to the Project which would result in less-than-significant impacts on energy resources from construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Reduced Diversion Alternative would not result in inefficient, unnecessary, or wasteful consumption of energy resources and changes in power generation would not preclude utilities from procuring renewable energy and meeting RPS milestone requirements, resulting in **less-than-significant** (**LTS**) impacts on energy resources. Compared to the Project, which also would result in less-than-significant impacts on energy resources, these impacts would be similar (**Similar**).

GEOLOGY AND SOILS

Table 5.6-10. Impact Conclusions and Comparison Among Alternatives for Geology and Soils

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be similar as the fluctuations that would be observed in the current baseline. The No Project Alternative would have **no impact** (**NI**) related to geology, soils, and paleontological resources. Compared to the Project which would have no impact related to geology, soils, and paleontological resources, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential for soil erosion or loss of topsoil, on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse due to unstable geologic units or soils, or accidental damage to or destruction of unique paleontological resources, if present. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

Under the No Project Alternative with future operations, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. Thus, there would be no Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the future baseline scenario. There would be impact related to geology, soils, and paleontological resources. The No Project Alternative would have **no impact** (**NI**) related to geology, soils, and paleontological resources. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative current operations would result in only minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment resulting in impacts to geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Because ground-disturbing activities would occur under this alternative, there would be a potential for soil erosion or loss of topsoil, on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse due to unstable geologic units or soils, or accidental damage to or destruction of unique paleontological resources, if present. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves the same construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment resulting in impacts to geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to geology, soils, and paleontological resources during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in minor fluctuations in the South Fork and reservoirs, and there would be no changes to the physical environment resulting in impacts to geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impacts related to geology, soils, and paleontological resources, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Because ground-disturbing activities would occur under this alternative, there would be a potential for soil erosion or loss of topsoil, on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse due to unstable geologic units or soils, or accidental damage to or destruction of unique paleontological resources, if present. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves the same construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment resulting in impacts to geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to geology, soils, and paleontological resources during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in minor fluctuations in the South Fork and reservoirs, and there would be no changes to the physical environment resulting in impacts to geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) related to geology, soils, and paleontological resources. Compared to the proposed Project, which would result in less-than-significant impacts related to potential construction impacts on geologic and paleontological resources, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in **no impact** (**NI**) related to geology, soils, and paleontological resources, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in minor fluctuations in the South Fork and reservoirs, and there would be no changes to the physical environment resulting in impacts to geology, soils, and paleontological resources. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impact related to geology, soils, and paleontological resources, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) related to geology, soils, and paleontological resources. Compared to the Project, which would result in less-than-significant impacts related to potential construction impacts on geologic and paleontological resources, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on geology, soils, and paleontological resources. Compared to the proposed Project, which also would result in no impact related to geology, soils, and paleontological resources, these impacts would be similar (**Similar**).

GREENHOUSE GAS EMISSIONS

Table 5.6-11. Impact Conclusions and Comparison Among Alternatives for Greenhouse Gas Emissions

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**LTS/Less than cumulatively considerable**	**Speculative**	**LTS/Less than cumulatively considerable**
No Project Alternative	LTS/Less than cumulatively considerable; Similar	Speculative; Similar	LTS/Less than cumulatively considerable; Similar
Direct Diversion Only Alternative	LTS/Less than cumulatively considerable; Similar	Speculative; Similar	LTS/Less than cumulatively considerable; Similar
Reduced Season of Diversion Alternative	LTS/Less than cumulatively considerable; Similar	Speculative; Similar	LTS/Less than cumulatively considerable; Similar
Existing Infrastructure Alternative	LTS/Less than cumulatively considerable; Similar	NI; Lesser	LTS/Less than cumulatively considerable; Similar
Reduced Diversion Alternative	LTS/Less than cumulatively considerable; Similar	NI; Lesser	LTS/Less than cumulatively considerable; Similar

LTS = Less than significant; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

Under the No Project Alternative, operations needed to meet current water demands would be the same as current operations, *i.e.*, Permit 21112 water would be pumped from Folsom Lake to the El Dorado Hills WTP and then pumped for delivery within the western portion of the District's water distribution system. This alternative would have no hydrologic changes in the South Fork American River watershed. There would be no change to diversions, the non-consumptive use of water, or power generation as compared to baseline conditions. Thus, the No Project Alternative would result in **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the Project, which would have less-than-significant/less than cumulatively considerable impacts, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because construction activities would still occur under this alternative, there would still be a potential to generate significant construction-related greenhouse gas emissions. While mitigation measures requiring detailed quantification of all construction-related emissions and implementation of emissions reductions if mass emissions exceed applicable thresholds would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates the Project's potential greenhouse gas emissions impacts would be less than significant even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

Under the No Project Alternative with future operations, the point of diversion for the consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. A portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills and at a higher elevation than is currently being served. Delivering water to these higher elevation areas of the District's service area would require extensive energy-intensive pumping of raw water from Folsom Reservoir and treated water from the El Dorado Hills WTP. However, the No Project Alternative also includes facility improvements to the El Dorado Canal to restore the canal's authorized conveyance capacity. Restoration of the El Dorado Canal's conveyance capacity can result in increased conveyance through the canal of additional water designated for hydropower generation.

In addition to increased pumping in the District's service area, the No Project Alternative under future operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. These changes are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project, which also would result in less-than-significant impacts on greenhouse gas emissions, these impacts would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. Operations for current water demands are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project, which also would result in less-than-significant/less than cumulatively considerable impacts, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because construction activities would still occur under this alternative, there would still be a potential to generate significant construction-related greenhouse gas emissions. While mitigation measures requiring detailed quantification of all construction-related emissions and implementation of emissions reductions if mass emissions exceed applicable thresholds would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates the Project's potential greenhouse gas emissions impacts would be less than significant even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. These changes are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project which would also result in less-than-significant/less than cumulatively considerable impacts on greenhouse gas emissions during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be

delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in minor fluctuations in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. Operations for current water demands are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project, which also would result in LTS/less than cumulatively considerable impacts on greenhouse gas emissions, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because construction activities would still occur under this alternative, there would still be a potential to generate significant construction-related greenhouse gas emissions. While mitigation measures requiring detailed quantification of all construction-related emissions and implementation of emissions reductions if mass emissions exceed applicable thresholds would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates the Project's potential greenhouse gas emissions impacts would be less than significant even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. These changes are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project which would also result in LTS/less than cumulatively considerable impacts on greenhouse gas emissions during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in minor changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities.

Operations for current water demands are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the Project, which also would result in LTS/less than cumulatively considerable impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on greenhouse gas emissions. Compared to the proposed Project, which would result in speculative impacts related to greenhouse gas emissions construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. These changes are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project which would also result in less-than-significant/less than cumulatively considerable impacts on greenhouse gas emissions during future operations, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional hydroelectric facilities. Operations for current water demands are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project which would also result in LTS/less than cumulatively considerable impacts on greenhouse gas emissions, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on greenhouse gas emissions. Compared to the proposed Project, which would result in speculative impacts related to greenhouse gas emissions construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in minor fluctuation changes in the South Fork and reservoirs and can result in a change total annual hydroelectric generation at regional

hydroelectric facilities. These changes are expected to have **less-than-significant (LTS)/less than cumulatively considerable** impacts on greenhouse gas emissions. Compared to the proposed Project, which also would result in less-than-significant/less than cumulatively considerable impacts on greenhouse gas emissions during future operations, these impacts would be similar (**Similar**).

HAZARDS AND HAZARDOUS MATERIALS

Table 5.6-12. Impact Conclusions and Comparison Among Alternatives for Hazards and Hazardous Materials

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative would have **no impact (NI)** related to hazards and hazardous materials. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because the use of hazardous materials would still occur during construction under this alternative, there would still be potential for construction worker and public exposure to hazards, construction activities to impair implementation or physically interfere with an emergency response plan or emergency evacuation plan, and fire risk through unintended release of sparks or heat from construction equipment. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated (LTS/M)**. Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

Under the No Project Alternative with future operations, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. Thus, there would be no Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the future baseline scenario. There would be no impact related to hazards and hazardous materials. The No Project Alternative would have **no impact** (**NI**) related to hazards and hazardous materials. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be **no impact** (**NI**) related to hazards and hazardous materials. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, there would still be potential for construction worker and public exposure to hazards, construction activities to impair implementation or physically interfere with an emergency response plan or emergency evacuation plan, and fire risk through unintended release of sparks or heat from construction equipment. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect hazards and hazardous materials. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to hazards and hazardous materials during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from

November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, resulting in **no impact** (**NI**) related to hazards and hazardous materials. Compared to the proposed Project, which also would result in no impacts related to hazards and hazardous materials, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, there would still be potential for construction worker and public exposure to hazards, construction activities to impair implementation or physically interfere with an emergency response plan or emergency evacuation plan, and fire risk through unintended release of sparks or heat from construction equipment. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect hazards and hazardous materials. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to hazards and hazardous materials during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) related to hazards and hazardous materials. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) related to hazards and hazardous materials. Compared to the proposed Project, which would result in less-than-significant impacts related to potential hazards and hazardous materials construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect hazards and hazardous materials. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in **no impact** (**NI**) related to hazards and hazardous materials, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) related to hazards and hazardous materials. Compared to the proposed Project which would also result in no impact related to hazards and hazardous materials, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) related to hazards and hazardous materials. Compared to the proposed Project, which would result in less-than-significant construction impacts related to potential hazards and hazardous materials, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on hazards and hazardous materials. Compared to the proposed Project, which also would result in no impact related to hazards and hazardous materials, these impacts would be similar (**Similar**).

HYDROLOGY AND WATER QUALITY

Table 5.6-13. Impact Conclusions and Comparison Among Alternatives for Hydrology and Water Quality

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**LTS**	**LTS/M**	**LTS**
No Project Alternative	NI; Lesser	LTS/M; Similar	LTS; Similar
Direct Diversion Only Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Reduced Season of Diversion Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Existing Infrastructure Alternative	LTS; Similar	NI; Lesser	LTS; Similar
Reduced Diversion Alternative	LTS; Similar	NI; Lesser	LTS; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact

Extensive modeling analysis was conducted and presented in various appendices to evaluate the potential impacts to hydrology and water quality for the Project and alternatives. Appendix H2 compares modeled results for flow, water temperature, and reservoir storage for the proposed Project and the alternatives. Changes in flow, temperature, and storage are compared to baseline conditions by month and water year type for current and future operations. In addition, detailed model output is provided in Appendices B2 and B3. Appendix B2 contains modeling output for the proposed Project and the alternatives for lake levels (end of month elevation and storage) and river flow within the South Fork American River watershed and at Jenkinson Lake (i.e., in areas above Folsom Reservoir). Appendix B3 contains modeling output for the proposed Project and the alternatives for Folsom Reservoir releases and for the Lower American River.

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

Under the No Project Alternative, operations needed to meet current water demands would be the same as current operations, *i.e.*, Permit 21112 water would be pumped from Folsom Lake to the El Dorado Hills WTP and then pumped for delivery within the western portion of the District's water distribution system. This alternative would have no Project-related hydrologic changes in the South Fork American River watershed and no Project-related changes to District operations at the El Dorado Diversion Dam, the El Dorado Canal, the Hazel Creek Tunnel, the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake, or Jenkinson Lake. Likewise, there would be no Project-related changes to storage at SMUD's facilities at Union Valley Reservoir, Slab Creek Reservoir, or Chili Bar Reservoir. There would be no change in diversions, pumping, and streamflow as compared to baseline conditions. Therefore, the No Project Alternative would have **no impact** (**NI**) on hydrology and water quality. Compared to the Project, which would have less-than-significant impacts on hydrology and water quality, this impact is lesser (**Lesser**).

Construction

The No Project Alternative includes facility improvements at the El Dorado Canal to restore its authorized conveyance capacity. Additionally, full utilization of the Permit 21112 water right from Folsom Reservoir will require new and expanded infrastructure (*i.e.*, replacement of pumps, expanded capacity at the El Dorado Hills WTP, new pipelines, and new pump stations). Construction impacts associated with the diversion, conveyance,

and treatment of Permit 21112 water near Folsom Reservoir are expected to vary in location, scale, and magnitude when compared to the Project. For example, construction would occur in primarily urbanized areas (*e.g.,* at an existing water treatment plant) instead of remote areas. The extent of construction associated with the No Project Alternative is anticipated to have a **less-than-significant impact with mitigation incorporated** (**LTS/M**) on hydrology and water quality due to the required conformance with the Construction General Permit and implementation of industry-standard best management practices during construction. Compared to the Project, which also involves construction related impacts on hydrology and water quality, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

Under the No Project Alternative with future operations, the point of diversion for the consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. Effects to Folsom Reservoir from the full utilization of the Permit 21112 water right at Folsom Reservoir is expected to be minor due to the storage capacity of the reservoir. Thus, there would be only limited hydrologic changes in the South Fork American River watershed and no changes to District operations at the Hazel Creek Tunnel, the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake, or Jenkinson Lake. The No Project Alternative includes facility improvements to the El Dorado Canal to restore the canal's authorized conveyance capacity. Restoration of the El Dorado Canal's conveyance capacity can result in increased conveyance through the canal of additional water designated for non-consumptive use (*i.e.,* hydropower generation). Future operations of the No Project Alternative are anticipated to result in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

Because Permit 21112 water would only be used for direct diversions under the Direct Diversion Only Alternative, flow in the South Fork American River would generally be similar to baseline conditions except for August and September of dry and critically dry years with operations to meet current water demands (refer to Table 5.6-5 and Appendix H2). In those months and water year types, water demands would be met by Permit 21112 water and less water would be returned to the South Fork American River at the El Dorado Powerhouse. This contrasts with the proposed Project, where flow in the South Fork American River would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions. Changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2).

The Direct Diversion Only Alternative is expected to have only minor changes in flow compared to baseline conditions, resulting in changes that are less pronounced than the proposed Project except in late summer of critically dry water years. Effects on water temperature are expected to be minor and changes in temperatures are not expected to increase above numeric water quality objectives. In addition, effects from temperature on sensitive aquatic resources and associated beneficial uses are expected to be similar to, or less than, those modeled for the proposed Project. Therefore, impacts to hydrology and water quality from operation of the Direct Diversion Only Alternative to meet current water demands would be **less than significant** (**LTS**). Compared to the Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar but on a slightly reduced scale (**Similar**).

Construction

The Direct Diversion Only Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project. Therefore, impacts to hydrology and water quality during construction would be **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which involves the same less than significant construction-related impacts with mitigation incorporated, these impacts would be similar (**Similar**).

Future Operations

Because Permit 21112 water would only be used for direct diversions under the Direct Diversion Only Alternative, flow in the South Fork American River would generally be similar to baseline conditions except for September and October of below normal years, and July through September of dry and critically dry years (see Appendix H2) with operations to meet future water demands. In those months and water year types, water demands would be met by Permit 21112 water and less water would be returned to the river at the El Dorado Powerhouse. This contrasts with the proposed Project, where flow in the South Fork American River would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types. Changes to water temperature in the Lower American River are expected to be minimal under this alternative (see Appendix H2).

The Direct Diversion Only Alternative is expected to have only minor changes in flow compared to baseline conditions, resulting in changes that are less pronounced than the proposed Project except for changes in flow in July through September of dry and critically dry years. Effects on water temperature are expected to be minor (see Appendix H2). Therefore, impacts to hydrology and water quality from operation of the Direct Diversion Only Alternative to meet future water demands would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of

Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in changes in streamflow in the South Fork American River that would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions (see Table 5.6-5 and Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the proposed Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project. Therefore, impacts to hydrology and water quality during construction would be **less-than-significant with mitigation incorporated** (**LTS/M**). Compared to the Project, which involves the same less-than-significant construction-related impacts with mitigation incorporated, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Reduced Season of Diversion Alternative would result in seasonal changes in streamflow, with reductions in flow typically occurring in January through March in below normal water years and January through April in dry and critically dry years as compared to baseline conditions (see Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minor under this alternative (see Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the proposed Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure as constraints as the baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Under current operations, the Existing Infrastructure Alternative would result in changes in streamflow in the South Fork American River that would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions (see Table 5.6-5 and Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2). The seasonality and the magnitude of the changes in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the proposed Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on hydrology and water quality from construction. Compared to the Project which would result in less-than-significant impacts on hydrology and water quality from construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Existing Infrastructure Alternative would result in seasonal changes in streamflow, with reductions in flow typically occurring in January through March in below normal water years and January through April in dry and critically dry years as compared to baseline conditions (see Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minor (see Appendix H2). The seasonality and the magnitude of the changes in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative is similar to the Existing Infrastructure Alternative, but with more restrictive constraints on the maximum flow rate of Hazel Creek Tunnel and the total annual volume of Permit 21112 water allowed through the tunnel, thus effectively reducing diversion to storage of Permit 21112 water in Jenkinson

Lake. Under current operations, the Reduced Diversion Alternative would result in changes in streamflow in the South Fork American River that would vary seasonally, with reductions in flow typically occurring in the winter and early spring and increases in flow typically occurring in late spring and summer in below normal, dry, and critically dry water year types as compared to baseline conditions (see Table 5.6-5 and Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minimal under this alternative (refer to Table 5.6-6 and Appendix H2). The seasonality and the magnitude of the changes in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the Project, which also would result in less-than-significant impacts on hydrology and water quality, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on hydrology and water quality from construction. Compared to the Project which would result in less-than-significant impacts on hydrology and water quality from construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Reduced Diversion Alternative would result in seasonal changes in streamflow, with reductions in flow typically occurring in January through March in below normal water years, January through April in dry years, and January through April and July through September in critically dry years as compared to baseline conditions (see Appendix H2). In addition, modeling indicates that changes to water temperature in the Lower American River are expected to be minor (see Appendix H2). The seasonality and the magnitude of the change in flow are similar to the proposed Project, resulting in **less-than-significant** (**LTS**) impacts on hydrology and water quality. Compared to the proposed Project, which also would result in less-than-significant impacts on hydrology and water quality these impacts would be similar but with a slightly decreased magnitude (**Similar**).

LAND USE AND PLANNING

Table 5.6-14. Impact Conclusions and Comparison Among Alternatives for Land Use and Planning

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**NI**	**NI**
No Project Alternative	NI; Similar	NI; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	NI; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	NI; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Similar	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Similar	NI; Similar

NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. There would be no changes to the physical environment that would introduce new barriers or linear features that could physically divide an existing community or conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The No Project Alternative would have **no impact** (**NI**) related to land use and planning. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. The extent of construction associated with the No Project Alternative is anticipated to have **no impact** (**NI**) related to land use and planning. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the future baseline scenario. There would be no changes to the physical environment that would introduce new barriers or linear features that could physically divide an existing community or conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The No Project Alternative would have **no impact** (**NI**) related to land use and planning. Compared to the Project which would also have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

Because the Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would no changes to the physical environment that would introduce new barriers or linear features that could physically divide an existing community or conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have **no impact** (**NI**) related to land use and planning. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment related to land use and planning. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to land use and planning during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, resulting in **no impact** (**NI**) related to land use and planning. Compared to the proposed Project, which also would result in no impact related to land use and planning, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have **no impact** (**NI**) related to land use and planning. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment related to land use and planning. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to land use and planning during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) related to land use and planning. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) related to land use and planning. Compared to the Project, which would also result in no impacts related to land use and planning, these impacts would be similar (**Similar**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment related to land use and planning. Therefore, there would be**no impact** (**NI**) related to land use and planning. Compared to the proposed Project, which also would result in no impact related to land use and planning, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) related to land use and planning. Compared to the proposed Project which would also result in no impact related to land use and planning, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) related to land use and planning. Compared to the proposed Project which would result in no impact related to land use and planning, these impacts would be similar (**Similar**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) related to land use and planning. Compared to the proposed Project, which also would result in no impact related to land use and planning, these impacts would be similar (**Similar**).

MINERAL RESOURCES

Table 5.6-15. Impact Conclusions and Comparison Among Alternatives for Mineral Resources

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**NI**	**NI**
No Project Alternative	NI; Similar	NI; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	NI; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	NI; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Similar	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Similar	NI; Similar

NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative would have **no impact** (**NI**) on known mineral resources or mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. The extent of construction associated with the No Project Alternative is anticipated to have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the future baseline scenario. The No Project Alternative would have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, resulting in **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect mineral resources or mineral resource recovery sites. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on mineral resources during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, resulting in **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the proposed Project, which also would result in no impact on mineral resources, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect mineral resources or mineral resource recovery sites. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on mineral resources during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the Project, which would also result in no impacts on mineral resources, these impacts would be similar (**Similar**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect mineral resources or mineral resource recovery sites. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would also result in no impact on mineral resources, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the proposed Project which would also result in no impact on mineral resources, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on mineral resources or mineral resource recovery sites. Compared to the proposed Project which would result in no impact on mineral resources, these impacts would be similar (**Similar**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on mineral resources. Compared to the proposed Project, which also would result in no impact on mineral resources, these impacts would be similar (**Similar**).

NOISE

Table 5.6-16. Impact Conclusions and Comparison Among Alternatives for Noise

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would utilize existing facilities and equipment, and have no impact (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because ground-disturbing activities would occur under this alternative, there would be a potential for an increase in ambient noise levels and generation of groundborne vibration or groundborne noise. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect ambient noise levels, groundborne vibration, or groundborne noise levels. Therefore, there would be **no impact** (**NI**). Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and have **no impact** (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because ground-disturbing activities would occur under this alternative, there would be a potential for an increase in ambient noise levels and generation of groundborne vibration or groundborne noise. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect ambient noise levels, groundborne vibration, or groundborne noise levels. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on ambient noise levels, groundborne vibration, or groundborne noise levels during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, resulting in **no impact** (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the proposed Project, which also would result in no impacts on ambient noise levels, groundborne vibration, or groundborne noise levels, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because ground-disturbing activities would occur under this alternative, there would be a potential for an increase in ambient noise levels and generation of groundborne vibration or groundborne noise. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect ambient noise levels, groundborne vibration, or groundborne noise levels. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on ambient noise levels, groundborne vibration, or groundborne noise levels during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be **no impact** (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the proposed Project, which would result in less-than-significant impacts related to ambient noise levels, groundborne vibration, or groundborne noise levels construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect ambient noise levels, groundborne vibration, or groundborne noise levels. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact on ambient noise levels, groundborne vibration, or groundborne noise levels, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the

Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the proposed Project which would also result in no impact on ambient noise levels, groundborne vibration, or groundborne noise levels, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on ambient noise levels, groundborne vibration, or groundborne noise levels. Compared to the proposed Project, which would result in less-than-significant impacts related on ambient noise levels, groundborne vibration, or groundborne noise levels construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs, and there would be no changes to the physical environment that would affect ambient noise levels, groundborne vibration, or groundborne noise levels. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact on ambient noise levels, groundborne vibration, or groundborne noise levels, these impacts would be similar (**Similar**).

POPULATION AND HOUSING

Table 5.6-17. Impact Conclusions and Comparison Among Alternatives for Population and Housing

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**NI**	**NI**
No Project Alternative	NI; Similar	NI; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	NI; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	NI; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Similar	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Similar	NI; Similar

NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations

that would be observed in the current baseline. The No Project Alternative would have **no impact** (**NI**) related to population growth and housing. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. The extent of construction associated with the No Project Alternative is anticipated to have **no impact** (**NI**) related to population growth and housing. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the future baseline scenario. The No Project Alternative would have **no impact** (**NI**) related to population growth and housing. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to population and housing during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project, which also would result in no impact related to population growth and housing, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. The extent of construction is anticipated to have **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project, which also would result in no impact related to population growth and housing, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to population growth and housing during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**) related to population growth and housing. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) related to population growth and housing. Compared to the Project, which would result in no impacts related to population growth and housing, these impacts would be similar (**Similar**).

Future Operations

The Existing Infrastructure Alternative under future operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact related to population growth and housing, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Therefore, there would be **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project which would also result in no impact related to population growth and housing, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project which would result in no impact related to population growth and housing, these impacts would be similar (**Similar**).

Future Operations

The Reduced Diversion Alternative under future operations would increase water supply reliability but would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected.

Therefore, there would be **no impact** (**NI**) related to population growth and housing. Compared to the proposed Project, which also would result in no impact related to population growth and housing, these impacts would be similar (**Similar**).

PUBLIC SERVICES

Table 5.6-18. Impact Conclusions and Comparison Among Alternatives for Public Services

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative would have **no impact** (**NI**) on public services. Compared to the Project, which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because construction activities, which would involve the presence of workers and the use of equipment that could be sources of ignition, would still occur under this alternative, there would still be a potential for increased fire risk, which in the event of a wildfire incident, would increase demand for fire protection services. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the

fluctuations that would be observed in the future baseline scenario. The No Project Alternative would have **no impact** (**NI**) on public services. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor fluctuation changes in the South Fork and reservoirs, and there would be **no impact** (**NI**) on public services. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because construction activities, which would involve the presence of workers and the use of equipment that could be sources of ignition, would occur under this alternative, there would be a potential for increased fire risk, which in the event of a wildfire incident, would increase demand for fire protection services. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect public services. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on public services during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in minor fluctuations in the South Fork and reservoirs, resulting in **no impact** (**NI**) on public services. Compared to the proposed Project, which also would result in no impacts on public services, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because construction activities, which would involve the presence of workers and the use of equipment that could be sources of ignition, would occur under this alternative, there would be a potential for increased fire risk, which in the event of a wildfire incident, would increase demand for fire protection services. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect public services. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on public services during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) on public services. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on public services. Compared to the proposed Project, which would result in less-than-significant impacts related to public services construction impacts, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect public services. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in **no impact** (**NI**) on public services, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on public services. Compared to the proposed Project which would also result in no impact on public services, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on public services. Compared to the proposed Project, which would result in less-than-significant impacts related to public services, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on public services. Compared to the proposed Project, which also would result in no impact on public services, these impacts would be similar (**Similar**).

RECREATION

Table 5.6-19. Impact Conclusions and Comparison Among Alternatives for Recreation

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**LTS**	**LTS/M**	**LTS**
No Project Alternative	NI; Lesser	Speculative/TBD	LTS; Similar
Direct Diversion Only Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Reduced Season of Diversion Alternative	LTS; Similar	LTS/M; Similar	LTS; Similar
Existing Infrastructure Alternative	LTS; Similar	NI; Lesser	LTS; Similar
Reduced Diversion Alternative	LTS; Similar	NI; Lesser	LTS; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact; TBD =– To be determined; Speculative = Cannot be determined with certainty at this time

Extensive modeling was performed to evaluate the potential impacts of the proposed Project and the alternatives on whitewater recreational boating, as well as to evaluate potential impacts on water-based recreation at reservoirs. Appendix H3 compares modeled results for the change in the monthly average number of boatable days associated with the proposed Project and the alternatives. Change in the number of boatable days are provided by month and water year type for current and future operations. Appendix H3 also compares modeled results for change in end-of-month reservoir elevation for the proposed Project and the alternatives. Changes in reservoir elevations are compared to baseline conditions by month and water year type for current and future operations. In addition, detailed model output is provided in Appendices B2 and B3. Appendix B2 contains modeling output for the proposed Project and the alternatives for boatable days in the South Fork American River and for lake levels (end of month elevation) and river flow within the South Fork American River watershed and at Jenkinson Lake (i.e., in areas above Folsom Reservoir). Appendix B3 contains modeling output for the proposed Project and the alternatives for Folsom Reservoir releases and for the Lower American River.

Table 5.6-20 provides an example of the type of tables found in Appendix H3. This table shows changes in the monthly average number of boatable days for the Coloma to Greenwood run that would occur for the proposed Project and each alternative as compared to baseline conditions. The example below and the other tables in Appendix H3 are designed to facilitate a direct comparison of the effects of the proposed Project with effects of the alternatives.

Table 5.6-20. Changes in Monthly Average Number of Boatable Days by Water Year Type for Coloma to Greenwood Run – Baseline vs Project, All Alternatives.

Water Year Type/Alternative	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal												
Proposed Project (Post-Construction)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Existing Infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Diversion	0	0	0	0	0	0	0	0	0	0	0	0
Dry												
Proposed Project (Post-Construction)	0	0	0	-1	0	-1	0	0	0	0	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	-1	0	-1	0	0	0	0	0	0
Existing Infrastructure	0	0	0	-1	0	-1	0	0	0	0	0	0
Reduced Diversion	0	0	0	-1	0	-1	0	0	0	0	0	0
Critically Dry												
Proposed Project (Post-Construction)	0	0	0	-1	-2	-1	0	0	0	1	0	0
Direct Diversion Only	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Season of Diversion	0	0	0	-1	-2	-1	0	0	0	1	0	0
Existing Infrastructure	0	0	0	-1	-2	-1	-1	0	0	1	0	0
Reduced Diversion	0	0	0	-1	-1	0	0	0	0	0	0	0

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

Under the No Project Alternative, operations needed to meet current water demands would be the same as current operations, *i.e.*, Permit 21112 water would be pumped from Folsom Lake to the El Dorado Hills WTP and then pumped for delivery within the western portion of the District's water distribution system. This alternative would have no Project-related hydrologic changes in the South Fork American River watershed and no Project-related changes to District operations at the El Dorado Diversion Dam, the El Dorado Canal, the Hazel Creek Tunnel, the channel that conveys water from the Hazel Creek Tunnel outlet to Jenkinson Lake, or Jenkinson Lake. Likewise, there would be no Project-related changes to storage at SMUD's facilities at Union Valley Reservoir, Slab Creek Reservoir, or Chili Bar Reservoir. As compared to existing conditions, no impacts are anticipated that would cause a substantial physical deterioration of recreation facilities or result in substantial adverse changes to, or loss of, recreational uses affecting a substantial number of people. Therefore, the No Project Alternative is expected to have **no impact** (**NI**) on recreation. Compared to the Project, which would have less-than-significant impacts on recreation, this impact is lesser (**Lesser**).

Construction

The No Project Alternative includes facility improvements at the El Dorado Canal to restore its authorized conveyance capacity. Additionally, full utilization of the Permit 21112 water right from Folsom Reservoir will require new and expanded infrastructure (*i.e.*, replacement of pumps, expanded capacity at the El Dorado Hills WTP, new pipelines, and new pump stations). New water infrastructure could pass through or near parks or other recreational facilities depending on final location of infrastructure. Therefore, the construction of new water infrastructure under the No Project Alternative could result in temporary impacts to the use of existing neighborhood and regional parks or other recreation facilities. Without knowing the location of new water infrastructure, length of construction, and potential recreation facilities that may be affected, it would be difficult to determine at this time if the impacts to recreation would be such that substantial physical deterioration of recreation facilities would occur or be accelerated.

While the information from comparable projects and implementation of applicable mitigation measures indicates that potential impacts to recreation from the construction of the above-mentioned facility improvements would likely be less than significant with mitigation, this impact conclusion is still **speculative** given the lack of project-level details regarding these infrastructure improvements. Because the potential impacts are speculative, a direct comparison to the proposed Project, which would result in less-than-significant impacts with mitigation on recreation, is not possible at this time. Therefore, the impacts associated with this alternative would need to be determined (**TBD**) in the future when additional information is known about the new and expanded infrastructure.

Future Operations

Under the No Project Alternative, the point of diversion for the consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. Effects to Folsom Reservoir recreational facilities from the full utilization of the Permit 21112 water right at Folsom Reservoir is expected to be minor due to the storage capacity of the

reservoir. Future operations of the No Project Alternative are anticipated to result in **less-than-significant** (**LTS**) impacts on recreation. Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Direct Diversion Only Alternative would cause changes in reservoir surface elevation that are relatively minor and only occur during a few months in critically dry years – they would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating. Changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting. In addition, changes to the monthly average number of boatable days on the Chili Bar, Coloma to Greenwood and Gorge runs would not substantially change whitewater boating opportunities on these runs. Impacts to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project (*i.e.*, prohibit construction activities from occurring within the Sly Park Recreation Area during the peak recreation season, from Memorial Day weekend to Labor Day weekend). Therefore, impacts to recreation during construction would be **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which involves less than significant construction-related impacts with mitigation incorporated, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Direct Diversion Only Alternative would cause changes in reservoir surface elevation that are relatively minor and only occur during a few months in critically dry years – they would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating. Changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting. In addition, changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these runs.

Impact to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would have the same or similar effects on reservoir elevations, non-whitewater boating recreation opportunities, and changes to the monthly average number of boatable days on South Fork whitewater runs as the proposed Project. Changes in reservoir surface elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating; changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting; and changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these runs. Impact to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative includes infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet, and improvements to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. These improvements are the same as the proposed Project and would require implementation of the same mitigation measures as described for the proposed Project (*i.e.*, prohibit construction activities from occurring within the Sly Park Recreation Area during the peak recreation season, from Memorial Day weekend to Labor Day weekend). Therefore, impacts to recreation during construction would be **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which involves less than significant construction-related impacts with mitigation incorporated, these impacts would be similar (**Similar**).

Future Operations

Under future operations, the Reduced Season of Diversion Alternative would have the same or similar effects on reservoir elevations, non-whitewater boating recreation opportunities, and changes to the monthly average number of boatable days on South Fork whitewater runs as the proposed Project. Changes in reservoir surface elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating; changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting; and changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these

runs. Impacts on recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less than significant impacts on recreation, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Existing Infrastructure Alternative would have the same or similar effects on reservoir elevations, non-whitewater boating recreation opportunities, and changes to the monthly average number of boatable days on South Fork whitewater runs as the proposed Project. Changes in reservoir surface elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating; changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting; and changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these runs. Impact to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on recreation from construction. Compared to the Project which would result in less-than-significant impacts on recreation from construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Existing Infrastructure Alternative would have the same or similar effects on reservoir elevations, non-whitewater boating recreation opportunities, and changes to the monthly average number of boatable days on South Fork whitewater runs as the proposed Project. Changes in reservoir surface elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating; changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting; and changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these runs. Impact to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative is similar to the Existing Infrastructure Alternative, but with more restrictive constraints on the maximum flow rate of Hazel Creek Tunnel and the total annual volume of Permit 21112 water allowed through the tunnel, thus effectively reducing diversion to storage of Permit 21112 water in Jenkinson Lake. Under current operations, the Reduced Diversion Alternative would have the same or similar effects on reservoir elevations, non-whitewater boating recreation opportunities, and changes to the monthly average number of boatable days on South Fork whitewater runs as the proposed Project. Changes in reservoir surface elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating; changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting; and changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these runs. Impact to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on recreation from construction. Compared to the Project which would result in less-than-significant impacts on recreation from construction, these impacts would be lesser (**Lesser**).

Future Operations

Under future operations, the Reduced Diversion Alternative would have the same or similar effects on reservoir elevations, non-whitewater boating recreation opportunities, and changes to the monthly average number of boatable days on South Fork whitewater runs as the proposed Project. Changes in reservoir surface elevation would not substantially affect the ability of people to participate in shoreline fishing, swimming or other shoreline activities, non-motorized boating, or motorized boating; changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, birdwatching, wildlife viewing, hiking, horseback riding, biking, or hunting; and changes to the monthly average number of boatable days on South Fork whitewater runs would not substantially change whitewater boating opportunities on these runs and the impact to recreation would be **less than significant** (**LTS**). Compared to the proposed Project, which also would result in less-than-significant impacts on recreation, these impacts would be similar (**Similar**).

TRANSPORTATION AND TRAFFIC

Table 5.6-21. Impact Conclusions and Comparison Among Alternatives for Transportation and Traffic

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**Speculative**	**NI**
No Project Alternative	NI; Similar	Speculative; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	Speculative; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	Speculative/; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

NI = No impact; Speculative = Cannot be determined with certainty at this time

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative would have **no impact** (**NI**) on transportation. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because trips associated with construction workers as well as with delivery of construction equipment and materials would occur under this alternative, there would be a potential to generate significant vehicle miles travelled (VMT) and temporarily affect the performance of the local circulation system due to traffic delays and roadway obstructions, which could hinder emergency vehicle access or conflict with a program, plan, ordinance or policy addressing this system. While implementation of mitigation would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates that impacts related to generating significant VMT would be less than significant even without mitigation, a definitive determination of significance is **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the No Project Alternative. Compared to the Project, which also involves potential construction related impacts to transportation, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the

fluctuations that would be observed in the current baseline scenario. The No Project Alternative would have **no impact** (**NI**) on transportation. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor fluctuation changes in the South Fork and reservoirs, and there would be **no impact** (**NI**) on transportation. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because trips associated with construction workers as well as with delivery of construction equipment and materials would occur under this alternative, there would be a potential to generate significant VMT and temporarily affect the performance of the local circulation system due to traffic delays and roadway obstructions, which could hinder emergency vehicle access or conflict with a program, plan, ordinance or policy addressing this system. While implementation of mitigation would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates that impacts related to generating significant VMT would be less than significant even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the Direct Diversion Alternative. Compared to the Project, which also involves construction related impacts to transportation, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect transportation. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on transportation during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be

delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in minor fluctuations in the South Fork and reservoirs, resulting in **no impact** (**NI**) on transportation. Compared to the proposed Project, which also would result in no impacts on transportation, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because trips associated with construction workers as well as with delivery of construction equipment and materials would occur under this alternative, there would be a potential to generate significant VMT and temporarily affect the performance of the local circulation system due to traffic delays and roadway obstructions, which could hinder emergency vehicle access or conflict with a program, plan, ordinance or policy addressing this system. While implementation of mitigation would help reduce the extent of construction impacts to be less-than-significant, and the best available evidence indicates that impacts related to generating significant VMT would be less than significant even without mitigation, a definitive determination of significance is still **speculative** given the lack of project-level details regarding the infrastructure improvements associated with the Reduced Season of Diversion Alternative. Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect transportation. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts on transportation during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) on transportation. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on transportation. Compared to the proposed Project, which would result in less-than-significant impacts related to transportation, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect transportation. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in **no impact** (**NI**) on transportation, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on transportation. Compared to the proposed Project which would also result in no impact on transportation, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on transportation. Compared to the proposed Project, which would result in less-than-significant impacts related on transportation, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) on transportation. Compared to the proposed Project, which also would result in no impact on transportation, these impacts would be similar (**Similar**).

TRIBAL CULTURAL RESOURCES

Table 5.6-22. Impact Conclusions and Comparison Among Alternatives for Tribal Cultural Resources

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS = Less than significant; LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. In addition, the No Project Alternative under current operations does not involve physical changes or have ground disturbance. Therefore, the No Project Alternative would have **no impact** (**NI**) on tribal cultural resources. Compared to the Project which would have no impact on tribal cultural resources, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential to impact tribal cultural resources or undiscovered human remains. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would not result in hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative under future operations does not involve physical changes or have ground disturbance, and therefore, would have **no impact** (**NI**) on tribal cultural resources. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on tribal cultural resources. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential to impact tribal cultural resources or undiscovered human remains. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. This alternative would have **no impact** (**NI**) on tribal cultural resources under future operations because it does not involve physical changes. Compared to the proposed Project which would also result in no impact on tribal cultural resources during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Reduced Season of Diversion Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on tribal cultural resources. Compared to the proposed Project, which also would result in no impact on tribal cultural resources, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, because ground-disturbing activities would still occur under this alternative, there would still be a potential to impact tribal cultural resources or undiscovered human remains. Implementation of mitigation measures would apply to this alternative and would reduce the extent of construction impacts to be a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on tribal cultural resources under future operations because it does not involve physical changes. Compared to the proposed Project which would also result in no impact on tribal cultural resources during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) on tribal cultural resources. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) on tribal cultural resources. Compared to the proposed Project, which would result in less-than-significant impacts related to potential construction impacts on tribal cultural resources, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in **no impact** (**NI**) on tribal cultural resources, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. This would have **no impact** (**NI**) on tribal cultural resources. Compared to the proposed Project which would also result in no impact on tribal cultural resources, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) on tribal cultural resources. Compared to the Project, which would result in less-than-significant impacts related to potential construction impacts on tribal cultural resources, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs and does not involve physical changes or have ground disturbance. There would be **no impact** (**NI**) on tribal cultural resources. Compared to the proposed Project, which also would result in no impact on tribal cultural resources, these impacts would be similar (**Similar**).

UTILITIES AND SERVICE SYSTEMS

Table 5.6-23. Impact Conclusions and Comparison Among Alternatives for Utilities and Service Systems

	Current Operations	Construction	Future Operations
Proposed Project	NI	LTS/M	NI
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operations would not result in changes to water diversion and conveyance and **no impact** (**NI**) related to utilities and service system. Compared to the Project, which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Although construction activities would not include new development that would require or result in the relocation or construction of new or expanded wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities, construction activities would result in the expanded capacity of water conveyance facilities. Mitigation measures would apply to this alternative and would reduce the extent of construction impacts to a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in minor changes to water diversion and conveyance, but the No Project Alternative would have **no impact** (**NI**) related to utilities and service systems. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor changes to water diversion and conveyance, but there would be **no impact** (**NI**) related to utilities and service systems. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Although construction activities would not include new development that would require or result in the relocation or construction of new or expanded wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities, construction activities would result in the expanded capacity of water conveyance

facilities. Mitigation measures would apply to this alternative and would reduce the extent of construction impacts to a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes to water diversion and conveyance, but there would be no changes to the physical environment resulting in impacts to utilities and service systems. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to utilities and service systems during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in minor changes to water diversion and conveyance, but there would be **no impact** (**NI**) related to utilities and service systems. Compared to the proposed Project, which also would result in no impacts related to utilities and service systems, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Although construction activities would not include new development that would require or result in the relocation or construction of new or expanded wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities, construction activities would result in the expanded capacity of water conveyance facilities. Mitigation measures would apply to this alternative and would reduce the extent of construction impacts to a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes to water diversion and conveyance, but there would be no changes to the physical environment resulting in impacts to utilities and service systems. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which would also result in no impacts related to utilities and service systems during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in minor changes to water diversion and conveyance, but there would be **no impact** (**NI**) related to utilities and service systems. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because the Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact** (**NI**) related to utilities and service systems. Compared to the proposed Project, which would result in less-than-significant impacts related to utilities and service systems during construction, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes to water diversion and conveyance, but there would be no changes to the physical environment that would affect utilities and service systems. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in no impact related to utilities and service systems, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in minor changes to water diversion and conveyance, but there would have **no impact** (**NI**) related to utilities and service systems. Compared to the proposed Project which would also result in no impact related to related to utilities and service systems, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) related to utilities and service systems. Compared to the proposed Project, which would result in less-than-significant impacts related to utilities and service systems during construction, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in minor changes to water diversion and conveyance, but there would have **no impact** (**NI**) related to utilities and service systems. Compared to the proposed Project, which also would result in no impact related to utilities and service systems, these impacts would be similar (**Similar**).

WILDFIRE

Table 5.6-24. Impact Conclusions and Comparison Among Alternatives for Wildfire

Alternatives	Current Operations	Construction	Future Operations
Proposed Project	**NI**	**LTS/M**	**NI**
No Project Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Direct Diversion Only Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Reduced Season of Diversion Alternative	NI; Similar	LTS/M; Similar	NI; Similar
Existing Infrastructure Alternative	NI; Similar	NI; Lesser	NI; Similar
Reduced Diversion Alternative	NI; Similar	NI; Lesser	NI; Similar

LTS/M = Less-than-significant impact with mitigation; NI = No impact

No Project Alternative

Under the No Project Alternative, the point of diversion for consumptive use of Permit 21112 water would remain limited to Folsom Reservoir. The District would not modify Permit 21112 to add an upstream point of diversion at the El Dorado Diversion Dam.

Current Operations

The No Project Alternative under current operation would not result in Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs would be the same as the fluctuations that would be observed in the current baseline. The No Project Alternative would have **no impact** (**NI**) related to wildfire risk. Compared to the Project, which would have no impact, this impact would be similar (**Similar**).

Construction

The No Project Alternative would involve limited construction to the El Dorado Canal to restore its authorized capacity but would not involve construction on the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake, and this alternative would use the existing infrastructure and water rights at these locations. However, full utilization of the Permit 21112 water right from Folsom Reservoir under the No Project Alternative would require construction of new and expanded infrastructure associated with the diversion from Folsom Reservoir, as described in Section 5.4.1. Potential construction-related impacts associated with increased traffic, wildfire risk from onsite ignition sources, postfire slope instability, and changes to runoff or drainage would be addressed through implementation of mitigation measures. The extent of construction impacts would be

reduced to a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, though in a different geographic setting, these impacts would be similar (**Similar**).

Future Operations

The No Project Alternative under future operations would result in only minor Project-related hydrologic changes in the South Fork watershed and fluctuations in water levels within the reservoirs are expected to be similar as the fluctuations that would be observed in the current baseline. No Project Alternative would have **no impact** (**NI**) related to wildfire risk. Compared to the Project which would have no impact, this impact would be similar (**Similar**).

Direct Diversion Only Alternative

The Direct Diversion Only Alternative represents Project operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam but without the ability to store Permit 21112 water in Jenkinson Lake. Hence, Permit 21112 water is only available for direct diversion at the El Dorado Diversion Dam under this scenario. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for immediate delivery to the Reservoir A WTP.

Current Operations

The Direct Diversion Only Alternative under current operations would result in minor fluctuation changes in the South Fork and reservoirs, and there would be **no impact** (**NI**) related to wildfire risk. Compared to the proposed Project, which also would result in no impact, these impacts would be similar (**Similar**).

Construction

The Direct Diversion Only Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Potential construction-related impacts associated with increased traffic, wildfire risk from onsite ignition sources, postfire slope instability, and changes to runoff or drainage would be addressed through implementation of mitigation measures. The extent of construction impacts would be reduced to a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Direct Diversion Only Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment related to wildfire risk. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project which would also result in no impacts related to wildfire risk during future operations, these impacts would be similar (**Similar**).

Reduced Season of Diversion Alternative

The Reduced Season of Diversion Alternative is similar to the proposed Project (Post-Construction) scenario, except that the season of diversion for Permit 21112 at the El Dorado Diversion Dam is shortened from November 1 to July 31, to November 1 to May 31. This scenario allows the diversion of up to 15,000 AF of

Permit 21112 water at the El Dorado Diversion Dam at the maximum rate of 156 cfs. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

Under current operations, the Reduced Season of Diversion Alternative would result in minor fluctuations in the South Fork and reservoirs, resulting in **no impact** (**NI**) related to wildfire risk. Compared to the proposed Project, which also would result in no impacts related to wildfire risk, these impacts would be similar (**Similar**).

Construction

The Reduced Season of Diversion Alternative would involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Potential construction-related impacts associated with increased traffic, wildfire risk from onsite ignition sources, postfire slope instability, and changes to runoff or drainage would be addressed through implementation of mitigation measures. The extent of construction impacts would be reduced to a **less-than-significant impact with mitigation incorporated** (**LTS/M**). Compared to the Project, which also involves construction related impacts, these impacts would be similar (**Similar**).

Future Operations

The Reduced Season of Diversion Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment related to wildfire risk. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which would also result in no impacts related to wildfire risk during future operations, these impacts would be similar (**Similar**).

Existing Infrastructure Alternative

The Existing Infrastructure Alternative is the same scenario as the proposed Project (Existing Infrastructure) and has the same physical infrastructure constraints as the Baseline scenario, but with operations allowing the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam. Permit 21112 water may be delivered to Forebay Reservoir for immediate delivery to the Reservoir 1 WTP and/or to Jenkinson Lake for either storage or immediate delivery to the Reservoir A WTP.

Current Operations

The Existing Infrastructure Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. These changes would have **no impact** (**NI**) related to wildfire risk. Compared to the Project, which also would result in no impacts, these impacts would be similar (**Similar**).

Construction

Because The Existing Infrastructure Alternative would maintain the same physical infrastructure as the current baseline scenario, it would not involve construction of improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake. Therefore, it would have **no impact**

(**NI**) related to wildfire risk. Compared to the proposed Project, which would result in less-than-significant impacts related to wildfire risk during construction, these impacts would be lesser (**Lesser**).

Future Operations

The Existing Infrastructure Alternative under future operations would result in minor changes in the South Fork and reservoirs, and there would be no changes to the physical environment that would affect wildfire risk. Therefore, there would be **no impact** (**NI**). Compared to the proposed Project, which also would result in **no impact** (**NI**) related to wildfire risk, these impacts would be similar (**Similar**).

Reduced Diversion Alternative

The Reduced Diversion Alternative allows the diversion of up to 15,000 AF of Permit 21112 water at the El Dorado Diversion Dam for consumptive use. This alternative limits the maximum rate of diversion of Permit 21112 water to 85 cfs at the El Dorado Diversion Dam, with up to 45 cfs conveyed to Jenkinson Lake via the Hazel Creek Tunnel and up to 40 cfs conveyed to Reservoir 1 WTP. Only 9,000 AF of Permit 21112 water is allowed to pass through Hazel Creek Tunnel each year under this scenario.

Current Operations

The Reduced Diversion Alternative under current operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) related to wildfire risk. Compared to the proposed Project which would also result in no impact related to wildfire risk, these impacts would be similar (**Similar**).

Construction

Because the Reduced Diversion Alternative would not involve construction, it would result in **no impact** (**NI**) related to wildfire risk. Compared to the proposed Project, which would result in less-than-significant impacts related to wildfire risk during construction, these impacts would be lesser (**Lesser**).

Future Operations

The Reduced Diversion Alternative under future operations would result in only minor hydrologic changes in the South Fork watershed and only minor fluctuations in water levels within some reservoirs. This would have **no impact** (**NI**) related to wildlife risk. Compared to the proposed Project, which also would result in no impact related to wildfire risk, these impacts would be similar (**Similar**).

5.7 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines require identification of an environmentally superior alternative (Section 15126.6[e][2]). If the No-Project Alternative is environmentally superior, CEQA requires identification of the "environmentally superior alternative other than the no project alternative" from among the alternatives evaluated. The following information is intended make this identification.

Table 5.7-1 through Table 5.7-3 identify whether each of the alternatives evaluated in this EIR would have no impact, a less-than-significant impact, or a significant impact for each of the environmental topics evaluated in

this EIR for current operations, construction, and future operations respectively. It also identifies if the alternative would have a similar impact, a lesser impact, or a greater impact than the proposed Project.

Table 5.7-1. Comparison of Project and Alternatives Impacts for Current Operations

Environmental Topic	Proposed Project	No Project Alternative	Direct Diversion Only Alternative	Reduced Season of Diversion Alternative	Existing Infrastructure Alternative	Reduced Diversion Alternative
Aesthetics	LTS	NI; Lesser	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Agricultural and forestry resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Air quality	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Biological resources	LTS	NI; Lesser	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Cultural resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Energy	LTS	NI; Lesser	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Geology and soils	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Greenhouse gas emissions	LTS/Less than cumulatively considerable	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar
Hazards and hazardous materials	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Hydrology and water quality	LTS	NI; Lesser	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Land use and planning	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Mineral resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Noise	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Population and housing	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Public services	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Recreation	LTS	NI; Lesser	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Tribal cultural resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Transportation/traffic	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Utilities and service systems	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Wildfire	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar

Notes: LTS = less than significant; NI = no impact.

As shown in Table 5.7-1 and Table 5.7-3, implementing the alternatives considered in this analysis during operations would have mostly less-than-significant impacts or no impact on the environment depending on environmental topic. As shown in Table 5.7-2, the No Project Alternative, the Direct Diversion Only Alternative, and the Reduced Season of Diversion Alternative would have construction-related impacts (*i.e.,* less-than-significant impacts or less-than-significant impacts with incorporation of mitigation measures), while implementing the Existing Infrastructure Alternative and the Reduced Diversion Alternative would not result in construction-related impacts.

The Existing Infrastructure Alternative and the Reduced Diversion Alternative could be considered environmentally superior alternatives because these would not result in the temporary physical changes to the environment associated with construction. These alternatives would have similar effects on the environment and would affect similar resources and environmental qualities.

Table 5.7-2. Comparison of Project and Alternatives Impacts for Construction

Environmental Topic	Proposed Project	No Project Alternative	Direct Diversion Only Alternative	Reduced Season of Diversion Alternative	Existing Infrastructure Alternative	Reduced Diversion Alternative
Aesthetics	LTS	LTS; Similar	LTS; Similar	LTS; Similar	NI; Lesser	NI; Lesser
Agricultural and forestry resources	LTS	LTS; Similar	LTS; Similar	LTS; Similar	NI; Lesser	NI; Lesser
Air quality	Speculative	Speculative; Similar	Speculative; Similar	Speculative; Similar	NI; Lesser	NI; Lesser
Biological resources	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Cultural resources	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Energy	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Geology and soils	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Greenhouse gas emissions	Speculative	Speculative; Similar	Speculative; Similar	Speculative; Similar	NI; Lesser	NI; Lesser
Hazards and hazardous materials	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Hydrology and water quality	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Land use and planning	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Mineral resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Noise	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Population and housing	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Public services	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Recreation	LTS/M	Speculative/ TBD	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Tribal cultural resources	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Transportation/traffic	Speculative	Speculative; Similar	Speculative Similar	Speculative; Similar	NI; Lesser	NI; Lesser
Utilities and service systems	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser
Wildfire	LTS/M	LTS/M; Similar	LTS/M; Similar	LTS/M; Similar	NI; Lesser	NI; Lesser

Notes: LTS = less than significant; LTS/M = less than significant with incorporation of mitigation; NI = no impact; TBD = to be determined.

Based on the data and analysis presented in Table 5.7-1 through Table 5.7-3 and in the preceding discussion, the Existing Infrastructure Alternative and the Reduced Diversion Alternative are considered co-equal environmentally superior alternatives. This conclusion is based on the finding that temporary physical changes to the environment associated with construction can be avoided. However, CEQA requires lead agencies to identify which alternative they consider the environmentally superior alternative. Based on the slight differences in diversion characteristics among the two alternatives that do not involve construction, the District considers the Reduced Diversion Alternative the environmentally superior alternative because it limits the overall rate of diversion to a lower level than the Existing Infrastructure Alternative.

Table 5.7-3. Comparison of Project and Alternatives Impacts for Future Operations

Environmental Topic	Proposed Project	No Project Alternative	Direct Diversion Only Alternative	Reduced Season of Diversion Alternative	Existing Infrastructure Alternative	Reduced Diversion Alternative
Aesthetics	LTS	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Agricultural and forestry resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Air quality	LTS	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Biological resources	LTS	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Cultural resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Energy	LTS	LTS; Greater	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Geology and soils	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Greenhouse gas emissions	LTS/Less than cumulatively considerable	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar	LTS/Less than cumulatively considerable; Similar
Hazards and hazardous materials	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Hydrology and water quality	LTS	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Land use and planning	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Mineral resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Noise	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Population and housing	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Public services	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Recreation	LTS	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar	LTS; Similar
Tribal cultural resources	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Transportation/traffic	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Utilities and service systems	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar
Wildfire	NI	NI; Similar	NI; Similar	NI; Similar	NI; Similar	NI; Similar

Notes: LTS = less than significant; NI = no impact.

6 CUMULATIVE IMPACT ANALYSIS

The California Environmental Quality Act (CEQA) requires an Environmental Impact Report (EIR) to include a discussion of cumulative impacts when they are significant and the project's incremental contribution to that significant impact is "cumulatively considerable." (CEQA Guidelines Section 15130(a).) An effect is cumulatively considerable when it is significant viewed in connection with the effects of past projects, other current projects, and future projects (CEQA Guidelines Section 15065[a][3]).

A "cumulative impact" is an impact that is created as a result of the combination of a project together with other projects causing related impacts. Therefore, the cumulative impact analysis identifies, for each impact of the project, whether there are other projects (past, current, or future) that could have related impacts, whether the combined impacts are significant, and if so, whether the project's contribution to the overall impact is "cumulatively considerable."

The CEQA Guidelines also state that the cumulative impacts discussion does not need to provide as much detail as is provided in the analysis of project-only impacts and should be guided by the standards of practicality and reasonableness.

In addition, Section 15130 of the CEQA Guidelines identifies that one of the following two options may be used to complete an adequate cumulative analysis:

1. List Method – A list of past, present, and reasonable anticipated future projects producing related or cumulative impacts, including those projects outside the control of the lead agency (i.e., the list approach), Section 15130(a).

2. General Plan Method – A summary of projections contained in an adopted General Plan or related planning document designed to evaluate regional or area-wide conditions. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency (i.e., the plan approach) Section 15130(b).

The above-mentioned CEQA Guidelines provide that the cumulative context may be described through either the list approach or the plan/projections approach. The list approach involves identifying and listing the past, present, and reasonably foreseeable probable future projects that contribute to a given significant cumulative impact. The plan/projections approach relies on an adopted plan or reliable projection that describes the significant cumulative impact. For purposes of this cumulative impacts analysis, the list method is utilized.

6.1 GEOGRAPHIC SCOPE

The geographic area that could be affected by implementing the Modification of Water Right Permit 21112 (Project) varies, depending on the type of environmental topic being considered. When the impacts of the Project are considered in combination with those of other past, present, and reasonably foreseeable projects to identify potential cumulative impacts, the geographic area of other projects considered may also vary, depending on the type of environmental impacts being assessed.

The general geographic area associated with the different environmental impacts of the Project defines the boundaries of the area used to compile the list of projects considered in the cumulative impact analysis. However,

the impacts of this Project vary depending upon whether they would result from construction or changes in operations (i.e. diversion-related impacts). Therefore, the geographic scope for cumulative analysis also varies by whether impacts are related to construction or diversion. Table 6-1 presents the general geographic areas associated with the different resources addressed in this EIR and identifies whether they are related to construction or diversion.

Table 6-1. Geographic Scope for Cumulative Analysis

Issue Area	Geographic Area	
	Construction-Related	Diversion-Related
Aesthetics	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Agricultural and Forestry Resources	El Dorado County and Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Air Quality	Region / El Dorado County AQMD	Region / El Dorado County AQMD
Biological Resources	Region	Watershed of South Fork American River, Folsom Reservoir, and the Lower American River to Watt Avenue bridge
Cultural Resources	Region	Watershed of South Fork American River to Folsom Reservoir
Energy	Region	Watershed of South Fork American River to Folsom Reservoir
Geology and Soils	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Greenhouse Gas Emissions	Global	Global
Hazards and Hazardous Materials	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Hydrology and Water Quality	Vicinity of Project construction	Watershed of South Fork American River, Folsom Reservoir, and the Lower American River to Watt Avenue bridge
Land Use	Vicinity of Project construction	El Dorado County
Mineral Resources	Vicinity of Project construction	El Dorado County
Noise	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Population and Housing	Region	Region
Public Services	El Dorado County	El Dorado County
Recreation	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Transportation/traffic	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Tribal Cultural Resources	Region	Watershed of South Fork American River to Folsom Reservoir
Utilities and Service Systems	Vicinity of Project construction	Watershed of South Fork American River to Folsom Reservoir
Wildfire	Region	Watershed of South Fork American River to Folsom Reservoir

AQMD = Air Quality Management District

6.2 LIST OF PLANS AND OTHER RELATED PROJECTS

The list of past, present, and reasonably foreseeable projects used for this cumulative impact analysis includes projects expected to occur that are geographically close enough to have a potential cumulative impact, or sufficiently similar to have potential impacts on the same environmental resources. These projects are described in Table 6-2 and include construction-related projects that are planned in the region as well as diversion-related projects that may affect hydrology in stream reaches and/or reservoirs within the Project area.

6.3 METHODOLOGY

The analysis below evaluates the potential cumulative impacts of the Project for each of the resource topics analyzed in Chapter 4. A cumulative impact analysis is provided for any impact that is concluded to be less than significant or greater (i.e., less than significant with mitigation or significant and unavoidable.) In accordance with Section 15130(a)(i) of the CEQA Guidelines, cumulative analysis is not provided for any no-impact determinations, because if the Project would not result in a direct or indirect impact on a resource, it would not contribute to a cumulative impact on that resource or need to be evaluated with respect to potential cumulative impacts.

The analysis first identifies whether a significant cumulative impact condition exists for the topical area. If there is a significant cumulative impact, the analysis then identifies whether the Project's contribution is cumulatively considerable, as defined above. Because the Project includes both operational (diversion-related) and construction phases, which occur in different geographic areas (see Table 6-1) and tend to produce different environmental effects, cumulative impacts are analyzed by the following phases:

- Operations with Existing Infrastructure and Post Construction Operations
- Construction

Table 6-2. List of Past, Present, and Reasonably Anticipated Future Projects in the Region

Lead Agency	Project Name	Date of Construction or Implementation	Project Description	Potential Cumulative Impacts
Construction-Related Projects				
El Dorado Irrigation District	Capital Improvement Plan (CIP) Projects	2025-2029	The District's five-year CIP is updated annually and describes various infrastructure improvement projects planned for implementation throughout the District's service area. (EID 2024a.)	Construction-related impacts if construction were to occur concurrently with the Project. Specific CIP projects in the vicinity of the Project are provided in this table.
El Dorado Irrigation District	Sly Park Intertie Improvements Project	2024-2026	Replacement of the pipeline connection between Reservoir A and Reservoir 1 drinking water treatment plant facilities 1.5 miles southwest of Pollock Pines (EID 2024b).	Construction-related impacts if construction occurs concurrently with the Project.
El Dorado Irrigation District	Flume 45 Critical Water System and Infrastructure Protection Project	2026-2027	The project would remove approximately 1,140 linear feet of an existing wooden flume (i.e., Flume 45), which is highly susceptible to damage from wildfire and other natural hazards and replace it with a more durable ignition resistant concrete conveyance structure (i.e., U shaped concrete canal) (EID 2025).	Flume 45 project has significant unavoidable impacts related to historic resources (e.g., adverse effects to a historic rock wall). Construction-related impacts if construction occurs concurrently with the Project.
El Dorado Irrigation District	Flume 48 Utility and Infrastructure Replacement Project	2027-2028	The project would replace approximately 448 linear feet of an existing wooden flume (i.e., Flume 48), which is highly susceptible to damage from wildfire and other natural hazards, with a more durable ignition resistant concrete conveyance structure (i.e., cast-in-place or precast concrete flume) (EID 2024c).	Flume 48 project has significant unavoidable impacts related to historic resources (e.g., adverse effects to a historic rock wall). Construction-related impacts if construction occurs concurrently with the Project.
El Dorado Irrigation District	El Dorado Hills Water Treatment Plant Improvements	2027-2029	This program consists of long-term capital improvements identified in the El Dorado Hills Water Treatment Plant (EDHWTP) Master Plan prepared as part of the Water Treatment Plant Asset Management Plan. The project replaces and/or upgrades all major treatment plant processes with some limited added capacity with the ability to expand the WTP plant capacity to 24 million gallons per day. (See also EID 2024d.)	Construction of these improvements may cause indirect operational impacts to EID reservoirs. Such as, decreases in El Dorado Irrigation District (EID) reservoir storage (e.g., Jenkinson Lake) to help meet water demands in EID's service area if construction requires extended outages of the EDHWTP.

Lead Agency	Project Name	Date of Construction or Implementation	Project Description	Potential Cumulative Impacts
El Dorado Irrigation District	Silver Lake Dam Replacement Project	2027-2028	The District proposes to replace the Silver Lake Dam located near Kirkwood, CA, to comply with applicable dam safety requirements of the California Division of Safety of Dams and the Federal Energy Regulatory Commission. The primary benefit of the project is to provide safe and reliable operation of the Dam and Reservoir. The replacement Dam and appurtenances would be constructed at the location of the existing Dam and surrounding areas. (See also EID 2024e.)	Construction of this project may cause indirect operational impacts to EID reservoirs and associated hydrologic impacts. Such as, decreased reservoir storage (i.e., Silver Lake) and instream flow reductions in tributaries to the South Fork American River during construction.
El Dorado Irrigation District	El Dorado Canal Fuel Break Project	2025-2026	The District proposes to implement hazardous fuels treatments to protect four wood-constructed flumes that are part of the El Dorado Canal, which provides one-third of the District's potable drinking water supplies. The District is proposing to utilize a combination of hand treatments, mechanical mastication, and chipping equipment to reduce the hazardous fuels and establish a 600-foot fuel break, up to 300 feet on each side of the canal, on the extremely steep slopes and rugged terrain of the project area. (See also USDA Forest Service 2025a.)	Fuel treatments will occur in areas where Project related construction may occur. Construction-related impacts if vegetation treatments occur concurrently with the Project.
U.S. Forest Service	Eldorado National Forest Caldor Fire Restoration Project	2025-2045	Fuels reduction treatments, creation of a strategic fuel break network, reforestation (up to 76,000 acres), watershed restoration, and abatement of hazard trees in the Caldor Fire burn area. (See also USDA Forest Service 2025b.)	Construction-related impacts if restoration activities occur concurrently with the Project.
Diversion-Related Projects				
El Dorado Irrigation District	Temporary Reservoir Reoperation Water Transfer	Annually depending on hydrologic conditions	This project involves the transfer of water held under water rights by EID to federal and/or state water contractors south of the Delta. The sources of water to be transferred include up to 800 acre-feet (AF) from Weber Reservoir and a combined total of up to 7,200 AF from Caples and Silver lakes. EID would make water available through re-operation of these reservoirs to release water otherwise planned to be consumed by EID customers and/or stored within the EID network of reservoirs. Releases of stored water would occur during the transfer period typically from July through November. (See also EID 2024f.)	Potential effects to instream flows in the South Fork American River and Folsom Reservoir operation. Reservoir releases associated with the transfer may result in minor increases in instream flows in the South Fork American River and its tributaries during the transfer period July – November. Additional instream flows would result in minor increases to Folsom Reservoir inflow and releases to the Lower American River as transfer water is conveyed to the Delta.

Lead Agency	Project Name	Date of Construction or Implementation	Project Description	Potential Cumulative Impacts
El Dorado Irrigation District	Five-year Conserved Water Transfer	Annually from 2024 – 2028 depending on operations of Main Pipeline	This project involves the transfer of up to 740 AF annually of EID's conserved water to state or federal water contractor(s) south of the Delta. The source of water available for transfer is EID's pre-1914 direct diversion water right from the South Fork American River. The water made available for transfer is water that was previously lost through evaporation and seepage from the earthen and unlined Upper Main Ditch and that is now conserved through a new piped conveyance (Main Pipeline). (See EID 2024g.)	No changes to instream flow in the South Fork American River. EID's conserved water currently remains in the South Fork American River or is utilized for hydropower generation at the El Dorado Powerhouse and returned to the South Fork American River where it flows to Folsom Reservoir. Potential minor increases to instream flows downstream of Folsom Reservoir as conserved water is released to the Lower American River as transfer water is conveyed to the Delta.
El Dorado County Water Agency	El Dorado Water Reliability Project	Unknown	The El Dorado Water Reliability Project proposes to secure the partial assignment of surface water rights (State Filed Applications 5644 and 5645) of up to 40,000 acre-feet per year from the upper American River and its tributaries. The surface water would be stored and diverted at the existing Sacramento Municipal Utility District (SMUD) Upper American River Project facilities and delivered to two locations: SMUD's White Rock Powerhouse Penstock and the El Dorado County area of Folsom Reservoir, where the South Fork American River meets the upper reach of the reservoir. (See El Dorado County Water Agency 2024.)	Additional diversions from the South Fork American River and potential effects to SMUD's operations. There is insufficient detail available regarding how this project would be operated, such as the water purveyor(s) and infrastructure necessary for the exercise of the proposed water right, to make an informed assessment of potential cumulative impacts.
El Dorado County Water Agency	Central Valley Project Water Service Contract ("Fazio water")	Unknown	The project consists of a water supply contract for the El Dorado County Water Agency under which the Bureau of Reclamation would provide up to 15,000 acre-feet per year from Folsom Reservoir. The Agency's provisional plans are to divide this water equally between El Dorado Irrigation District and Georgetown Divide Public Utility District. (Refer to Reclamation 2009 and 2019.)	Additional diversions from Folsom Reservoir.
U.S. Fish and Wildlife and National Marine Fisheries Service	Consultation on the Coordinated Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP)	2024	The Bureau of Reclamation and California Department of Water Resources completed consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service under the Endangered Species Act for the long-term operation of the Central Valley Project and State Water Project. (Refer to Reclamation 2024.)	Project affects the long-term operation of the Central Valley Project and State Water Project, including Folsom Reservoir operations and the Lower American River flows.

Lead Agency	Project Name	Date of Construction or Implementation	Project Description	Potential Cumulative Impacts
Placer County Water Agency (PCWA)	PCWA American River Water Rights Time Extension Project	Unknown	The primary purpose of the project is to extend PCWA's existing Water Rights Permits 13856 and 13858 through the year 2043 to allow PCWA additional time to put water allocated under these permits to full beneficial use. (See also PCWA 2008.)	Additional diversions from the American River watershed
State Water Resources Control Board	Upper American River Healthy Rivers and Landscapes Program	Planning Phase	The purpose of the Healthy Rivers and Landscapes (HRL) Program, previously referred to as Voluntary Agreements and Agreements to Support Healthy Rivers and Landscapes, is to improve the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) ecosystem by creating a comprehensive program of habitat enhancement projects coupled with more water for fish and wildlife, managed in a collaborative, science-based manner (Adapted from Association of California Water Agencies website). Upper American River water purveyors (*i.e.*, Placer County Water Agency, El Dorado Irrigation District, Foresthill Public Utility District, and Georgetown Divide Public Utility District) are developing a potential framework for providing supplemental releases from storage that would benefit the American River and Bay-Delta. (See also California Natural Resources Agency 2024.)	Potential impacts to reservoir storage and stream flows, including District reservoirs and the American River watershed
El Dorado Irrigation District	Folsom Lake Intake and Pump Station Project	Completed in 2022	The project included construction and operation of a temperature control device (TCD) for EID's intake facilities to preserve the cold-water pool in Folsom Lake to help enhance downstream habitat for anadromous fish species. It also included replacement of existing pumps, installation of raw water infrastructure and improvement of the intake system's appurtenant facilities. (See also EID 2019.)	Operation of the TCD allows the District to selectively withdraw water from different elevations in Folsom Lake, which helps minimize the amount of cold water that is diverted to help improve Reclamation's ability to manage water temperatures in the Lower American River for salmonids.

District = El Dorado Irrigation District; EID = El Dorado Irrigation District; WTP = water treatment plant

6.4 RESOURCE-SPECIFIC CUMULATIVE ANALYSIS

The analysis presented in Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures," identifies multiple less-than-significant and potentially significant impacts that could potentially occur with implementation of the Project. Each of these impacts is discussed further in this section because these impacts might act in a cumulative manner to create a significant cumulative impact.

6.4.1 AESTHETIC RESOURCES

As described in Section 4.1, "Aesthetics," Project operations would result in less-than-significant impacts to scenic vistas, scenic resources, visual character, and light and glare. Minor hydrologic changes in stream flow in the South Fork watershed and in water levels within some reservoirs would be within the same range as current conditions. Construction impacts on aesthetic resources were found to be less than significant. Minor alterations to the viewsheds would be temporary in nature and would not damage scenic resources within a designated scenic highway (*e.g.*, construction activities along the El Dorado Canal would not be visible or only momentarily visible to drivers along U.S. 50). Areas affected by construction would be restored following completion of construction.

The projects in the cumulative list (Table 6-2) all result in no impact, less-than-significant impacts, or less-than-significant impacts with mitigation on aesthetic resources, and there is no significant cumulative impact. While there is a minor potential for the Project to affect sensitive aesthetic resources, the cumulative impact that will result from the combination of the Project's incremental impact and the effects of the other projects is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.2 AGRICULTURAL AND FORESTRY RESOURCES

As described in Section 4.2, "Agriculture and Forestry Resources," Project operations would result in no impact on agricultural lands and forestry resources. Project operations would not result in changes in the physical environment that would cause conversion of farmland to non-agricultural uses. Project operations would involve only minor hydrologic changes within waterways and reservoirs and these minor hydrologic effects would not result in other changes in the physical environment that would affect forest land, timberland, or timberland zoned Timber Production or cause conversion of forest land to non-forest uses. Construction impacts on forest land were found to be less than significant (and there was no impact on agricultural lands). Anticipated construction activities include vegetation and tree removal in the vicinity of the existing water conveyance facilities. However, the removal of trees for construction activities would be minor relative to the surrounding forested landscape and would not result in the loss of forest land or conversion of forest land to non-forest use.

The projects in the cumulative list (Table 6-2) all result in no impact or less-than-significant impacts on forestry resources, and there is no significant cumulative impact. Three of these projects include construction at or near the El Dorado Canal, *i.e.,* the El Dorado Canal Fuel Break Project (construction scheduled for 2025 – 2026), the Flume 45 Critical Water System and Infrastructure Protection Project (2026 – 2027), and the Flume 48 Utility and Infrastructure Replacement Project (2027 – 2028). One project includes construction activities throughout the County over the next two decades, *i.e.,* the Caldor Fire Restoration Project (2025 – 2045). While there is a minor

potential for the Project to affect forestry resources, Project improvements are not expected to cause ground disturbance in the same areas and/or have concurrent construction. For these reasons, the cumulative impact that will result from the combination of the Project's incremental impact and the effects of the other projects is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.3 AIR QUALITY

By its very nature, air pollution is largely a cumulative impact. The non-attainment status of regional pollutants is a result of past and present development within the Mountain Counties Air Basin and surrounding regions, and this regional impact is cumulative rather than being attributable to any one source. The portion of El Dorado County within which Project construction would occur is designated non-attainment for ozone under federal and state standards, for particulate matter of diameter equal to or less than 2.5 micrometers ($PM_{2.5}$) under federal standards, and for particulate matter of diameter equal to or less than 10 micrometers (PM_{10}) under state standards. In addition, the El Dorado County Air Quality Management District (AQMD) has established thresholds for reactive organic gases (ROG) and oxides of nitrogen (NO_X), emissions of air pollutants and precursors above which would contribute to the regional degradation of ambient air quality within the region. Numerical thresholds for construction- and operation-related emissions of criteria air pollutants and precursors are the basis for determining whether a project's discrete emissions would result in a regional contribution (i.e., significant) to the baseline nonattainment status of the air basin.

As described in Section 4.3, "Air Quality," Project operations would not conflict with or obstruct implementation of the applicable air quality plan, operations would not result in a cumulatively considerable net increase of any criteria pollutants, and operations would not expose sensitive receptors to substantial pollutant concentrations or odors. Operational and maintenance activities, such as equipment use or vehicle trips for maintenance work, are expected to remain similar to existing conditions and would not include new emissions sources.

The Project's construction impacts on sensitive receptors were found to be less than significant with mitigation. Although the Project's emissions sources would not occur in proximity to sensitive receptors and would not expose sensitive receptors to substantial pollutant concentrations, there is the potential for ultramafic rock/serpentine to be discovered during grading or excavation, with the potential to expose people to asbestos dust. Therefore, mitigation measures are incorporated to reduce potential impacts to less than significant with mitigation.

With respect to construction emissions, the best available evidence indicates Project emissions would be below applicable thresholds. Furthermore, because construction emissions are temporary, it is reasonable to assume the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standards. However, a definitive determination of significance is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Cumulative Mitigation Measures: No mitigation measures required regarding operational impacts. Potential construction-related impacts and mitigation measures to be determined after project-level environmental analysis.

Cumulatively Considerable Impact: No impact from Project operations. Construction-related impacts unlikely but to be determined after project-level environmental analysis.

6.4.4 BIOLOGICAL RESOURCES

As described in Section 4.4, "Biological Resources," Project operations would result in less-than-significant impacts on sensitive biological resources (*i.e.,* special-status plant and wildlife species, including special-status salmonids, riparian habitat or other sensitive natural communities, wetlands, migratory corridors, and nursery sites) and it would not conflict with policies protecting biological resources or habitat conservation plans. Construction impacts on sensitive biological resources associated with infrastructure improvements to the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake were found to be less than significant with mitigation (*e.g.,* implementation of preconstruction surveys and avoidance and minimization measures).

The projects in the cumulative list (Table 6-2), except for the long-term operation of the Central Valley Project (CVP) and State Water Project (SWP), all result in less-than-significant impacts or less-than-significant impacts with mitigation on biological resources. While there is a minor potential for the Project to have a minor cumulative effect on sensitive biological resources, the Project would not contribute to any significant and unavoidable impacts during construction and Project operational effects on flow and water temperature are minimal in the context of existing conditions which already includes CVP and SWP operations. Thus, the Project's incremental contribution to cumulative impacts on sensitive biological resources would not be cumulatively considerable.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.5 CULTURAL RESOURCES

As described in Section 4.4, "Cultural Resources," the Project would not result in operations-related impacts on cultural and historical resources because Project operations would not include new development that would involve ground disturbance. Construction impacts on cultural and historical resources were found to be less than significant with mitigation. Potential impacts resulting from inadvertent damage or destruction of unknown cultural resources or historical resources during construction would be reduced to less-than-significant through inventory, avoidance and protection, worker awareness training, and measures for inadvertent discovery of cultural resources.

The projects in the cumulative list (Table 6-2), with the exception of the Flume 45 Critical Water System and Infrastructure Protection Project and the Flume 48 Utility and Infrastructure Replacement Project, all result in no impact or less-than-significant impacts with mitigation on cultural and historical resources. The Flume 45 Critical Water System and Infrastructure Protection Project and the Flume 48 Utility and Infrastructure Replacement Project would both affect segments of historic rock walls located along the El Dorado Canal.

Three of the projects on the cumulative list include construction at or near the El Dorado Canal, *i.e.,* the El Dorado Canal Fuel Break Project (construction scheduled for 2025 – 2026), the Flume 45 Critical Water System and Infrastructure Protection Project (2026 – 2027), and the Flume 48 Utility and Infrastructure Replacement Project (2027 – 2028). One project includes construction activities throughout the County over the next two decades, *i.e.,* the Caldor Fire Restoration Project (2025 – 2045). While there is a minor potential for the Project to have a cumulative effect on cultural and historical resources, Project improvements are not expected to cause ground disturbance in the same areas and/or have concurrent construction. Thus, the cumulative impact that will result from the combination of the Project's incremental impact and the effects of the other projects is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.6 ENERGY

As described in Section 4.6, "Energy," Project operations would result in less than significant impacts on energy resources. Although Project operations would affect hydroelectric energy generation, these operations would not preclude utilities from procuring renewable energy and meeting Renewables Portfolio Standard (RPS) milestone requirements. Construction impacts on energy resources were found to be less than significant with mitigation. Construction activities would consume energy in the form of diesel and gasoline fuels to power construction-related equipment and on-road vehicles. However, the increased energy use would be limited because the work would be temporary and would not require a substantial long-term use of energy. Furthermore, Project construction activities are required to implement energy-efficient practices during construction, such as maintaining and properly tuning all construction equipment in accordance with the manufacturer's specifications and minimizing the idling time of construction equipment and vehicles and are required to comply with energy related regulations.

The projects in the cumulative list (Table 6-2) all result in less-than-significant impacts on energy, and there is no significant cumulative impact. While there is a minor potential for the Project to affect energy resources, the Project would not contribute to any significant and unavoidable impacts because construction would be temporary, and energy efficient practices would be implemented. For these reasons, the cumulative impact of the Project and the effects of the other projects on energy is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.7 GEOLOGY AND SOILS

As described in Section 4.7, "Geology and Soils," Project operations would result in no impact on geology and soils because there would only be minor hydrologic changes associated with Project operations and these changes would not result in substantial soil erosion or the loss of topsoil, nor would minor hydrologic changes directly or indirectly destroy a unique paleontological resource, site, or unique geologic feature. Construction impacts on geology and soil resources were found to be less-than-significant with mitigation. Geotechnical studies will be performed to determine the presence or extent of expansive soils and if soil conditions could become unstable due

to construction. The design and engineering of proposed improvements would consider recommendations regarding landslides, lateral spreading, subsidence, liquefaction, or collapse during or after construction. Implementation of approved best management practices (BMPs) and the preparation and implementation of a water pollution control plan (WPCP) or stormwater pollution prevention plan (SWPPP) would minimize and substantially avoid soil erosion from active construction areas. In addition, Project mitigation measures would reduce the Project's construction-related impacts on unique paleontological resources to a less-than-significant level because construction workers would be alerted to the possibility of encountering paleontological resources and, in the event that resources were discovered, fossil specimens would be recovered and recorded and would undergo appropriate curation.

The projects in the cumulative list (Table 6-2) all result in no impact, less-than-significant impacts, or less-than-significant impacts with mitigation on geology and soils, and there is no significant cumulative impact. While there is a minor potential for the Project to affect these resources, the Project would not contribute to any cumulative impacts because construction-related ground disturbance is unlikely to occur at the same time and/or in the same location as proposed by the construction-related projects in the cumulative list. For these reasons, the cumulative impact of the Project and the effects of the other projects on geology and soils is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.8 GREENHOUSE GAS EMISSIONS

Because greenhouse gases (GHGs) have long atmospheric lifetimes and mix globally in the atmosphere and given the nature of environmental consequences from GHGs and global climate change (i.e., impacts of GHG emissions occur long after emissions are generated and can affect climate change globally, far from the source of emissions), impacts of GHG emissions are evaluated on a cumulative basis.

As described in Section 4.8, "Greenhouse Gas Emissions," Project operations would result in less than cumulatively considerable impacts on GHG emissions. Project operations can change total annual hydroelectric generation at regional hydroelectric facilities. Assuming that lost electricity generation was compensated by the existing mix of renewable and nonrenewable energy resources, some critically dry years could result in a potential increase of more than 1,100 metric tons of carbon dioxide-equivalents (MT CO_2e). However, over time as utilities increase their renewable and zero-carbon resources to meet RPS requirements, the utilities' general mix would have more renewable energy resources which would result in less GHG emissions. Pursuant to Senate Bill (SB) 100, by 2045, utilities will be required to supply 100 percent of electric retail sales to end-use customers from renewable energy and zero-carbon resources. Therefore, under the future baseline (2045 conditions), although there would be a reduction in hydroelectric generation resulting from the Project operations, it would not result in an increase in reliance on fossil fuels, as utilities would be required to have sufficient renewable energy sources in order to meet RPS. Therefore, under the future baseline (2045 conditions), Project operations would not result in an increase in GHG emissions. Project operations would also not preclude utilities from procuring renewable energy and meeting RPS milestone requirements.

With respect to construction emissions, although the best available evidence from comparable past projects indicates that potential construction-related GHG emissions impacts associated with the Project would likely be less than significant with implementation of mitigation measures, this impact conclusion is still speculative given

the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known.

Cumulative Mitigation Measures: No mitigation measures required regarding operational impacts. Potential construction-related impacts and mitigation measures to be determined after project-level environmental analysis.

Cumulatively Considerable Impact: No impact from Project operations. Construction-related impacts unlikely but to be determined after project-level environmental analysis.

6.4.9 HAZARDS AND HAZARDOUS MATERIALS

As described in Section 4.9, "Hazards and Hazardous Materials," Project operations would result in no impact on hazards and hazardous materials. Project operations would not increase the transport, use, or disposal of hazardous materials compared to existing operations, operations would not increase vehicle trips compared to existing operations or impair the implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan, nor would operations involve activities that contribute to increased fire risk. Construction impacts on hazards and hazardous materials were found to be less-than-significant with mitigation. Project mitigation measures would reduce potential hazards to the public and the environment during the routine transport, use, or disposal of hazardous materials; implementation of a traffic control plan would include coordination with and notification of residents, emergency response agencies, and school districts affected by lane and road closures to ensure delays are minimized, detours are noticed, and that emergency access remains possible at all times; and implementation of a Fire Safety Plan would reduce wildfire risks associated with construction activities by requiring measures to prevent fire and providing procedures for responding to a fire.

The projects in the cumulative list (Table 6-2) all result in no impact, less-than-significant impacts, or less-than-significant impacts with mitigation on hazards and hazardous materials, and there is no significant cumulative impact. While there is a minor potential for the Project to affect hazardous materials, the Project would not contribute to any cumulative impacts because all other projects would also be required to adhere to appropriate federal, State, and local standards for transport and use of hazardous materials and for fire and safety. For these reasons, the cumulative impact of the Project and the effects of the other projects on hazards and hazardous materials is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.10 HYDROLOGY AND WATER QUALITY

As described in 4.10, "Hydrology and Water Quality," Project operations would result in less-than-significant impacts on hydrology and water quality. Fluctuations in streamflow and water levels in reservoirs with Project operations would be within the same range as current fluctuations. In addition, potential operational effects on water temperature in the Lower American River would be minor. Construction impacts on hydrology and water quality were found to be less than significant with mitigation (*e.g.,* with construction-phase BMPs and avoidance and minimization measures).

The projects in the cumulative list (Table 6-2), with the exception of the long-term operation of the CVP and SWP, all result in less-than-significant impacts or less-than-significant impacts with mitigation on hydrology and water quality. While there is a minor potential for the Project to have a cumulative effect on flow and water temperature, the Project would not contribute to any significant and unavoidable impacts during construction and Project operational effects on flow and temperature are minimal in the context of existing conditions which already includes CVP and SWP operations. Thus, the Project's incremental contribution to cumulative impacts on hydrology and water quality would not be cumulatively considerable.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.11 LAND USE AND PLANNING

As described in Section 4.11, "Land Use and Planning," Project operations would result in no impact related to land use and planning, as operations would not divide an established community, not require a change in zoning, nor conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Fluctuations in water levels within the South Fork American River and in reservoirs with Project operations would be within the same range as current fluctuations. Construction impacts related to land use and planning were also found to result in no impact, as the improved facilities would generally be constructed in the same location as the existing facilities. Because the Project will have no impact on land use and planning, it would not have a cumulatively considerable contribution to a significant cumulative impact.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.12 MINERAL RESOURCES

As described in Section 4.12, "Mineral Resources," Project operations would result in no impact related to mineral resources, as the Project's increase in water supply reliability would not involve activities, such as ground disturbance or new development, that would affect the availability of mineral resources. Fluctuations in water levels within the South Fork American River and in reservoirs with Project operations would be within the same range as current fluctuations. Construction impacts related to mineral resources were also found to result in no impact, as construction would not be located in a designated regionally important area of known mineral resources. Because the Project will have no impact on mineral resources, it would not have a cumulatively considerable contribution to a significant cumulative impact.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.13 NOISE

As described in Section 4.13, "Noise," Project operations would result in no impact on noise because the Project's water diversion and conveyance would not cause an increase in ambient noise levels as compared to existing conditions. Construction impacts from noise and vibration were found to be less than significant with mitigation.

Although an increase in construction-related traffic could contribute to increased noise along roadways and construction equipment in the project area and could generate groundbourne vibration or noise, mitigation measures would ensure that construction activities would be consistent with El Dorado County noise policies and would not generate a substantial increase in ambient noise levels within the vicinity of the Project construction alignment and access routes are not.

The projects in the cumulative list (Table 6-2) all result in no impact or less-than significant-impacts on noise, and there is no significant cumulative impact. While there is a minor potential for the Project to affect noise, the Project would not contribute to any significant and unavoidable noise impacts because construction would be temporary and because mitigation measures for noise and vibration would be incorporated into the Project construction. For these reasons, the cumulative impact of the Project and the effects of the other projects on noise is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.14 POPULATION AND HOUSING

As described in Section 4.14, "Population and Housing," Project operations would result in no impact related to population and housing, as the Project's increase in water supply reliability would not induce substantial population growth, either directly or indirectly, and no existing housing would be affected. Fluctuations in water levels within the South Fork American River and in reservoirs with Project operations would be within the same range as current fluctuations. Construction impacts related to population and housing were also found to result in no impact, as construction would prevent any impact on water supplies and would not induce substantial population growth. Because the Project will have no impact on population and housing, it would not have a cumulatively considerable contribution to a significant cumulative impact.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.15 PUBLIC SERVICES

As described in Section 4.15, "Public Services," Project operations would result in no impact on public services because no additional public services beyond existing levels would be required during operations. Construction impacts on public services were found to be less-than-significant with mitigation. Construction activities, which would involve the presence of workers and the use of equipment that could be sources of ignition, would increase fire risk, which in the event of a wildfire incident would increase demand for fire protection services. However, implementation of a Fire Safety Plan would reduce wildfire risks associated with construction activities by requiring measures to prevent fire and providing procedures for responding to a fire.

The projects in the cumulative list (Table 6-2) which all result in no impact, less-than-significant impacts, or less-than-significant impacts with mitigation on public services, and there is no significant cumulative impact. While there is a minor potential for the Project to affect public services, the Project would not contribute to any cumulative impacts because construction would be temporary, and all other projects would also be required to

adhere to appropriate federal, State, and local standards for fire and safety. For these reasons, the cumulative impact of the Project and the effects of the other projects on public services is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.16 RECREATION

As described in Section 4.16, "Recreation," Project operations would result in less-than-significant impacts on recreational resources. Project-related changes in reservoir elevations would not affect the ability of recreationists to participate in land-based activities such as picnicking, hiking, biking, horseback riding, and camping. Project-related changes in streamflow would not change the ability of recreationists to participate in land-based uses along the river such as camping, picnicking, bicycling, and walking. Project-related changes to boatable days would not substantially change whitewater boating opportunities on affected runs.

Construction impacts on recreational resources were found to be less than significant with mitigation. Potential loss of recreation use at the Hazel Creek campgrounds would be minimized as construction would occur when the campgrounds are closed. In addition, though there may still be noise impacts near the day use area and potential temporary access delays or detours on roads around Jenkinson Lake while construction activities were occurring, these effects would occur when there were less visitors present at the lake (in the spring and fall) and therefore Project construction would not affect a substantial number of people.

Although whitewater boating opportunities can be limited and dependent on conditions, the projects in the cumulative list (Table 6-2) all result in no impact or less-than-significant impacts on recreation, and there is only minor potential for the Project to affect recreational resources. The Project would not contribute to any cumulative impacts because construction would be temporary and the other projects in the cumulative list are not expected to have construction impacts in the same area at the same time. Thus, the Project's incremental contribution to cumulative impacts on recreational resources would not be cumulatively considerable, and no mitigation would be necessary.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.17 TRANSPORTATION AND TRAFFIC

As described in Section 4.17, "Transportation and Traffic," Project operations would result in no impact on transportation and traffic. Because the operational phase of the Project would not increase vehicle trips, it would not increase vehicle miles traveled (VMT), nor affect circulation systems, nor or conflict with a program, plan, ordinance or policy addressing the circulation system. Construction impacts were found to be less-than-significant with mitigation with respect to potential conflicts with programs, plans, ordinances or policies addressing the circulation system – implementation of a traffic control plan would minimize motorist delay due to construction activities. However, a Project-specific evaluation of construction-related VMT could not be conducted due to lack of project-level details regarding infrastructure improvements. An analysis of three comparable projects was used to illustrate that projects of similar size and scope to the proposed Project would not generate significant VMT.

The projects in the cumulative list (Table 6-2) all result in no impact, less-than-significant impacts, or less-than-significant impacts with mitigation to transportation and traffic. Three of these projects include construction at or near the El Dorado Canal, *i.e.,* the El Dorado Canal Fuel Break Project (construction scheduled for 2025 – 2026), the Flume 45 Critical Water System and Infrastructure Protection Project (2026 – 2027), and the Flume 48 Utility and Infrastructure Replacement Project (2027 – 2028). One project includes construction activities throughout the County over the next two decades, *i.e.,* the Caldor Fire Restoration Project (2025 – 2045). Construction of these projects within adjacent areas of El Dorado Canal is unlikely to occur at the same time as Project construction.

Although the best available evidence indicates impacts on transportation and traffic would be less than significant even without mitigation, a definitive determination of significance is still speculative given the lack of project-level details regarding the infrastructure improvements associated with the proposed Project. Therefore, the District is electing to defer the determination of significance to the subsequent project-level environmental analysis once sufficient design details are known. Although the Project's incremental contribution to cumulative impacts on transportation and traffic is not expected to be cumulatively considerable, a definitive determination is also deferred until sufficient Project-level design details are known.

Cumulative Mitigation Measures: No mitigation measures required regarding operational impacts. Potential construction-related impacts and mitigation measures to be determined after project-level environmental analysis.

Cumulatively Considerable Impact: No impact from Project operations. Construction-related impacts unlikely but to be determined after project-level environmental analysis.

6.4.18 TRIBAL CULTURAL RESOURCES

As described in Section 4.18, "Tribal Cultural Resources," Project operations would result in no impact on tribal cultural resources because the operations would not involve ground disturbance or other activities that would cause a substantial adverse change in the significance of a tribal cultural resource. Construction impacts on tribal cultural resources were found to be less-than-significant with mitigation. The potential for substantial adverse changes during construction would be reduced to a less-than-significant level through the performance of procedures for the discovery of previously undocumented significant tribal cultural resources, requirements for notification of the appropriate agencies, and the requirement to provide an opportunity for the most likely descendant to make recommendations should human remains be of Native American origin.

The projects in the cumulative list (Table 6-2) all result in no impact or less-than-significant impacts with mitigation on tribal cultural resources. Three of these projects include construction at or near the El Dorado Canal, *i.e.,* the El Dorado Canal Fuel Break Project (construction scheduled for 2025 – 2026), the Flume 45 Critical Water System and Infrastructure Protection Project (2026 – 2027), and the Flume 48 Utility and Infrastructure Replacement Project (2027 – 2028). One project includes construction activities throughout the County over the next two decades, *i.e.,* the Caldor Fire Restoration Project (2025 – 2045). While there is a minor potential for the Project to affect tribal cultural resources, Project improvements are not expected to cause ground disturbance in the same areas and/or have concurrent construction. Thus, the Project's incremental contribution to cumulative impacts on cultural and historical resources would not be cumulatively considerable, and no mitigation would be necessary.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.19 UTILITIES AND SERVICE SYSTEMS

As described in Section 4.19, "Utilities and Service Systems," Project operations would result in no impact because the Project would not involve operational changes that would affect these resources. Project operations would also result in no impacts related to utilities and service systems as Project operations would not require or result in the relocation or construction of new or expanded utilities and generate solid waste, and it would have a beneficial effect on the availability of water supplies. Project construction would not include new development that would require or result in the relocation or construction of new or expanded wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities.

The projects in the cumulative list (Table 6-2) all result in no impact or less-than-significant impacts on utilities and service systems, and there is no significant cumulative impact. While there is a minor potential for the Project to affect these resources, the cumulative impact of the Project and the effects of the other projects is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

6.4.20 WILDFIRE

As described in Section 4.20, "Wildfire," Project operations would result in no impact related to wildfire as Project operations would not involve activities, such as construction, that would alter the local or regional transportation network, exacerbate wildfire risks, or expose people or structures to significant risks. Potential construction impacts related to increased traffic, wildfire risk from potential ignition sources onsite during construction, postfire slope instability, runoff or drainage changes would be reduced to less-than-significant through a traffic control plan, fire safety plan, and BMPs to manage soil erosion and stormwater runoff.

Although wildlife risk can be high within the project area in general, depending on conditions, the projects in the cumulative list (Table 6-2) all result in no impacts or less-than-significant impacts with mitigation on wildfire and there is only minor potential for the Project to affect this resource. Construction would be temporary and all projects would be required to adhere to appropriate federal, State, and local standards for fire and safety. For these reasons, the cumulative impact of the Project and the effects of the other projects on wildfire is not significant.

Cumulative Mitigation Measures: None required

Cumulatively Considerable Impact: No

7 OTHER CEQA REQUIREMENTS

In addition to the resource categories evaluated in Chapter 5, CEQA requires an evaluation of additional topics. This section describes potential growth inducing impacts, significant and unavoidable impacts, and significant irreversible environmental changes relative to the Project. Cumulative impacts are addressed in Chapter 6.

7.1 GROWTH-INDUCING IMPACTS

CEQA (CEQA Guidelines, Section 15126.2[d]) requires an examination of the direct and indirect impacts of the proposed project, including the potential of the project to induce growth leading to changes in land use patterns and population densities and related impacts on environmental resources. Specifically, CEQA states that the EIR shall:

> *[d]iscuss ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects that would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring the construction of new facilities that could cause significant environmental effects. Also discuss characteristics of some projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project has the potential to induce growth both directly and indirectly. Direct growth-inducement would result if a project involved construction of new housing. Indirect growth-inducement would result, for instance, if implementing a project resulted in any of the following:

- substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises);
- a construction effort with substantial short-term employment opportunities that indirectly stimulates the need for additional housing and services to support the new temporary employment demand; or,
- removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area) or adding development adjacent to undeveloped land.

Growth-inducement itself is not an environmental effect, but it may lead to foreseeable environmental effects. These environmental effects may include increased demand on other community and public services and infrastructure, increased traffic and noise, degradation of air or water quality, degradation or loss of plant or animal habitats, or conversion of agricultural and open space land to urban uses.

7.1.1 OPERATIONAL IMPACTS (EXISTING INFRASTRUCTURE)

This phase of the Project involves the operation of facilities to divert Permit 21112 water utilizing existing infrastructure (i.e., prior to construction of any improvements necessary to divert up to 156 cfs) with a maximum rate of diversion of up to 120 cfs, with up to 80 cfs conveyed to Jenkinson Lake and up to 40 cfs conveyed to the Reservoir 1 WTP. Current planning documents applicable to the Project include the District's 2020 Urban Water

Management Plan (UWMP; EID 2021) and the 2024 Water and Recycled Water Master Plan (EID 2024), and the County General Plan. The Project would utilize water supplies available under an existing water right, Permit 21112, subject to its terms and conditions regarding rate of diversion, season of diversion, total diversion to storage, place of use, and total consumptive use. Operations with existing infrastructure would also provide the additional place of storage at Jenkinson Lake, which would allow the District to divert Permit 21112 water to storage when water is abundant and then use that stored water to meet demands during summer and fall. Therefore, operations with existing infrastructure would provide an additional point of diversion for the Permit 21112 water supply and add the additional place of storage at Jenkinson Lake, which would increase water supply reliability by maximizing the flexibility to meet current and future demands defined in the District's Urban Water Management Plan. However, this increase in water supply reliability would not induce substantial population growth, either directly or indirectly as there would be no increase in the total amount of water allowed to be diverted or stored under the District's existing water right Permit 21112. Additionally, the Project would only deliver water to areas within the currently authorized place of use for Water Right Permit 21112 and therefore would not result in substantial population growth beyond what has been previously analyzed during the environmental review for the original water right application for Permit 21112. (EID 1999).

Operations with existing infrastructure would not involve new residential or commercial development. Additionally, the Project would not provide individual treated water connections, treatment capacity, or sewer service, nor would it result in improved roads or access to the area. The Project would not provide water for new growth not accounted for in local and community planning/management documents nor remove an existing obstacle to growth. Therefore, the operation of existing infrastructure with the Project would not be growth inducing.

7.1.2 CONSTRUCTION IMPACTS

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. Because detailed information regarding these future infrastructure improvements are not known at this time, a project-level analysis is not possible, and these Project elements are covered at a programmatic level of analysis only. These future improvements would require subsequent project-level environmental review once sufficient design details are known.

The daily workforce during proposed Project construction activities is unknown at this time. However, it is anticipated that the construction labor force is likely to be drawn primarily from the existing pool of qualified construction workers in El Dorado County. According to the most current labor data available from the U.S. Census Bureau 2022 American Community Survey, 8,294 residents in El Dorado County were employed in the construction industry in 2022 (U.S. Census Bureau 2022). Based on the pool of existing residents who are

employed in the construction industry, Project construction is not expected to cause substantial population growth or a substantial increase in housing demand in the region. Furthermore, if construction workers from outside the region are employed during the construction period, the temporary nature of the Project work suggests that it would be unlikely for non-local workers to relocate permanently. Therefore, the proposed Project would not generate sufficient jobs during construction to foster population growth in El Dorado County or nearby communities.

7.1.3 OPERATIONAL IMPACTS (POST CONSTRUCTION)

The post-construction phase of the Project involves operation of facilities to divert Permit 21112 water following construction of the improvements that would allow for a maximum rate of diversion of up to 156 cfs at the El Dorado Diversion Dam. Post-construction operations would also provide the additional place of storage at Jenkinson Lake, which would allow the District to divert Permit 21112 water to storage when water is abundant and then use that stored water to meet demands in the summer and fall. Therefore, post-construction operations would provide a higher rate of diversion for the Permit 21112 water supply and add the additional place of storage at Jenkinson Lake, which would increase water supply reliability by maximizing the flexibility to meet current and future demands. The Project would utilize water supplies available under an existing water right, Permit 21112, subject to its terms and conditions regarding rate of diversion, season of diversion, total diversion to storage, place of use, and total consumptive use. There would be no increase in the total amount of water allowed to be diverted or stored under the District's water right Permit 21112.

Generally, environmental impacts from community population growth and community development are addressed through local and community planning/management documents that allow for strategic planning and smart growth. Current planning documents applicable to the Project include the District's 2020 Urban Water Management Plan (UWMP; EID 2021) and the 2024 Water and Recycled Water Master Plan (EID 2024), and the County General Plan. Any future growth that would utilize water supplied by the Project would be required to comply with and be developed in a manner consistent with these plans, and the impacts of such development have been evaluated in connection with the adoption of those plans. For example, the UWMP already identifies the full 17,000 AFA under Permit 21112 as an available water supply. Thus, the existing 17,000 consumptive right under Permit 21112 is already accounted for as an available supply to meet District demands.

Post-construction operations would not involve new residential or commercial development, nor would it require an increase in permanent employees that could increase housing demand. Additionally, the Project would not provide individual treated water connections, treatment capacity, or sewer service, nor would it result in improved roads or access to the area. The Project would not provide water for new growth not accounted for in local and community planning/management documents nor remove an existing obstacle to growth. Therefore, post-construction operations would not be growth inducing.

7.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines Section 15126.2(d) describes irreversible environmental changes as follows:

> *Uses of nonrenewable resources during the initial and continued phases of a project may be irreversible if it requires a large commitment of such resources or makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also,*

irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

7.2.1 OPERATIONAL IMPACTS (EXISTING INFRASTRUCTURE)

This phase of the Project includes an existing infrastructure operational regime that diverts Permit 21112 water at the El Dorado Diversion Dam utilizing existing facilities with their existing operational capacities (i.e., prior to construction of the improvements necessary to divert at the maximum rate of diversion of 156 cfs currently authorized under Permit 21112). Operation of existing infrastructure also includes water treatment facilities at Reservoir 1 WTP and Reservoir A WTP. Adding an additional authorized upstream point of diversion to Permit 21112 would enable the District to divert water higher in the system and deliver to customers at lower elevations via gravity flow (i.e., no increased pumping). This would allow the District to meet demands throughout the District's service area without excessive use of energy, such as electricity. Therefore, operational impacts would not result in irreversible or irretrievable commitment of resources.

As discussed in Section 4.9, "Hazards and Hazardous Materials," operations with existing infrastructure would not increase transport, use, or disposal of hazardous materials compared to existing operations. Thus, operation of the Project would not result in accidental release of hazardous materials, which may lead to irreversible damage.

7.2.2 CONSTRUCTION IMPACTS

To divert at the maximum rate of diversion currently authorized under Permit 21112 (i.e., 156 cfs) to Jenkinson Lake, improvements to the El Dorado Canal and the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would be required. Improvements along segments of the El Dorado Canal between the El Dorado Diversion Dam and the Hazel Creek Tunnel inlet would include replacement of wooden flumes, conversion of wooden flumes to concrete u-shaped canal, and/or restoration of canal segments to meet current safety requirements for weight and freeboard. Additionally, installation of a gate to allow the full flow in the El Dorado Canal to be routed into the Hazel Creek Tunnel inlet would be required. Improvements needed to the channel that conveys water from the outfall of the Hazel Creek Tunnel to Jenkinson Lake would include installation of stabilization measures at various locations along the channel between the outlet of the Hazel Creek Tunnel and Jenkinson Lake and installation of appropriately sized culverts and/or bridges at existing channel crossings. Because detailed information regarding these future infrastructure improvements are not known at this time, a project-level analysis is not possible, and these Project elements are covered at a programmatic level of analysis only. These future improvements would require subsequent project-level environmental review once sufficient design details are known.

Future construction related to the Project would consume energy in the form of diesel and gasoline fuels to power construction-related equipment and on-road vehicles for the required infrastructure improvements. Indirect energy use would involve consuming energy to extract raw materials, manufacture items, and transport the goods and people necessary for construction activities. However, the increase would be limited because the Project construction work would be temporary and would not require a substantial long-term use of energy. Nevertheless, construction activities would, as with any construction project, cause irreversible and irretrievable commitments of finite nonrenewable energy resources, such as gasoline and diesel fuel.

The specific infrastructure requirements and related project-level details, such as size and scale of the infrastructure to be constructed, construction schedule, equipment fleet, and construction worker crew estimates

are not yet known. Implementation of mitigation measures described in Section 4.6, "Energy," would ensure that Project construction activities implement energy-efficient practices during construction, such as maintaining and properly tuning all construction equipment in accordance with the manufacturer's specifications and minimizing the idling time of construction equipment and vehicles. These required practices would limit wasteful and unnecessary energy consumption.

Construction of the Project has the potential to result in accidental release of hazardous materials, which may lead to irreversible damage. As discussed in Section 4.9, implementation of mitigation measures would reduce impacts related to hazards for construction workers and the general public because it would require the District and all contractors to comply with federal, state, and local hazardous materials regulations and codes whose purpose is to ensure safe handling and disposal of hazardous materials. Preparation of a Hazardous Materials Release Prevention Plan would further reduce the potential for accidental release of hazardous materials by identifying control measures to prevent the release of hazardous materials, as well as a detailed action plan to respond to an incidental spill. Together, implementation of these three mitigation measures would reduce potential hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment.

7.2.3 Operational Impacts (Post Construction)

The proposed Project would allow an additional upstream point of diversion on the South Fork at the District's existing El Dorado Diversion Dam near Kyburz and an additional place of storage and point of re-diversion storage at Jenkinson Lake. With these proposed modifications, water could be diverted from higher elevations under Permit 21112 and then delivered to customers at lower elevations via gravity flow (i.e., no increased pumping) to meet demands throughout the District's service area without excessive use of energy. Maintenance activities, such as periodic inspections and repairs, at the El Dorado Diversion Dam, El Dorado Canal, Forebay Reservoir, Jenkinson Lake, Hazel Creek Tunnel, Main Pipeline, and other existing facilities would continue to occur as it is currently undertaken. Thus, operational and maintenance related energy consumption associated with the improvements is anticipated to remain similar to existing conditions. Therefore, operational impacts would not result in irreversible or irretrievable commitment of resources.

Post-construction operation of the Project would allow for a maximum rate of diversion of up to 156 cfs following construction of improvements. Post-construction operations would not increase transport, use, or disposal of hazardous materials compared to existing operations. Therefore, the Project would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment. Thus, post-construction operation of the Project would not result in accidental release of hazardous materials, which may lead to irreversible damage.

7.3 SIGNIFICANT AND UNAVOIDABLE IMPACTS

CEQA Section 21100(b)(2)(A) provides that an EIR shall include a detailed statement setting forth "any significant effect on the environment that cannot be avoided if the project is implemented." Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures," provides a detailed analysis of all the potentially significant environmental impacts of the Project, lists feasible mitigation measures that could be implemented to

reduce or avoid the Project's significant impacts, and states whether these mitigation measures would reduce these impacts to less-than-significant levels. As discussed in Chapter 4, all impacts would be mitigated to less-than-significant; therefore, the Project would not result in significant and unavoidable impacts.

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APPENDIX A

Scoping Report

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX B

Modelling Memos

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX B1

Permit 21112 Change Petition Quantitative Assessment Modeling

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX B2

Permit 21112 Change Petition HEC-ResSim Modeling Technical Report

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX B3

Permit 21112 Change Petition CalSim 3 Modeling Technical Report

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX C

Temperature Modelling Report

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX D

Biological Resources

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX D1

Special-status Species Potential to Occur Table

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX D2

Results of Database Searches (CNDDB, CNPS, IPAC, USFS, NMFS)

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX D3

Analysis of the Potential Effects of Water Temperature Changes on Special-Status Salmonids

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX E

GHG/Energy Supporting Data

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX F

Recreation Analysis Supporting Data

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX G

Alternatives Analysis Supporting Data

Appendices are available for download or viewing on the Project website:
http://www.eid.org/Permit21112

APPENDIX G1

Hydrology and Water Quality Alternatives Analysis Supporting Data

Appendices are available for download or viewing on the Project website:
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APPENDIX G2

GHG/Energy Alternatives Analysis Supporting Data

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APPENDIX G3

Recreation Alternatives Analysis Supporting Data

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