B.F. Sisk Dam Raise and Reservoir Expansion Project Environmental Impact Report/ Supplemental Environmental Impact Statement

DRAFT

Estimated Lead Agency Total Costs Associated with Developing and Producing this EIR/SEIS is $1,348,000

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BUREAU OF RECLAMATION

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY

August 2020

Mission Statements

The mission of the Department of the Interior is to conserve and manage the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provide scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honor the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of the San Luis & Delta-Mendota Water Authority is to operate the Delta-Mendota Canal and related facilities reliably and cost-effectively, and to support member agencies in restoring and protecting adequate, affordable water supplies for agricultural, municipal and industrial, and environmental uses.

B.F. Sisk Dam Raise and Reservoir Expansion Project
Draft Environmental Impact Report/Supplemental Environmental Impact Statement

Lead Agencies: San Luis & Delta-Mendota Water Authority (SLDMWA) and the United States Department of the Interior, Bureau of Reclamation (Reclamation)

Cooperating Agencies and Responsible Agencies: California Department of Transportation (Caltrans)

The project is located in the following counties in California: Contra Costa, Fresno, Imperial, Kern, Kings, Los Angeles, Merced, Orange, Riverside, San Benito, San Bernardino, San Diego, San Joaquin, San Luis Obispo, Santa Clara, Stanislaus and Ventura Counties

State Clearing House Number: 2009091004

ABSTRACT

The Draft EIR/SEIS evaluates increasing storage capacity in San Luis Reservoir to provide greater water supply reliability for South-of-Delta Central Valley Project (CVP) and State Water Project (SWP) water contractors. Increased capacity within San Luis Reservoir would only be used to help meet existing demands and would not serve any new demands in the South-of-Delta CVP and SWP service areas. In addition to the No Project/No Action Alternative, this EIR/SEIS evaluates a 1) a Non-Structural Alternative under which operational modifications in San Luis Reservoir would be used to provide operation flexibility; and (2) a Dam Raise Alternative under which B.F Sisk Dam would be raised an additional 10 feet above the 12-foot embankment raise under development by the B.F. Sisk Dam SOD Modification Project.

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Executive Summary

ES.1 Purpose of this Environmental Impact Report/Supplemental Environmental Impact Statement

The San Luis & Delta-Mendota Water Authority (SLDMWA) and the United States Department of the Interior, Bureau of Reclamation (Reclamation) are completing the B.F. Sisk Dam Raise and Reservoir Expansion Project Feasibility Study to evaluate alternatives to increase operational flexibility and improve water supply reliability for South-of-Delta Central Valley Project (CVP) and State Water Project (SWP). SLDMWA and Reclamation are also completing this joint Environmental Impact Report/Supplemental Environmental Impact Statement (EIR/SEIS) to evaluate the environmental impacts of these alternatives under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). SLDMWA is the Lead Agency pursuant to CEQA and Reclamation is the Lead Agency pursuant to NEPA. This report refers to SLDMWA and Reclamation jointly as the Lead Agencies. California Department of Transportation (Caltrans) is serving as a responsible agency pursuant to CEQA and as a cooperating agency pursuant to NEPA.

The EIR/SEIS evaluates increasing storage capacity in San Luis Reservoir to provide greater operational flexibility and water supply reliability for South-of-Delta CVP and SWP water contractors. As an alternative to increasing storage capacity, this EIR/SEIS also evaluates reserving a portion of the CVP share of San Luis Reservoir to provide dry year reliability for South-of-Delta CVP contractors. Increased capacity and reserved supply within San Luis Reservoir would only be used to help meet existing demands and would not serve any new demands in the South-of-Delta CVP and SWP service areas. Reclamation is evaluating this project as a connected action to the B. F. Sisk Dam Safety of Dams (SOD) Modification Project to create additional project benefits by increasing storage within San Luis Reservoir. Reclamation and California Department of Water Resources (DWR) evaluated environmental impacts of the B.F. Sisk Dam SOD Modification Project in 2019 and the EIS/EIR is available here: https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281. As a connected action this EIR/SEIS uses the baseline evaluation presented in the B.F. Sisk Dam SOD Modification Project EIS/EIR and considers the incremental impacts of action alternatives presented herein.

ES.2 Project Background and History

B.F. Sisk Dam was constructed to create the offstream San Luis Reservoir, which provides supplemental storage capacity for the CVP and SWP. Currently, San Luis Reservoir provides 2,027,840 acre-feet of water storage for the CVP and SWP. The water stored in the reservoir is managed for federal (approximately 45%) and state (approximately 55%) uses as part of the CVP and SWP, respectively. Typically, during the winter and early spring, water conveyed from the Sacramento-San Joaquin River Delta (Delta) by the Delta-Mendota Canal (DMC) (a CVP facility)

and California Aqueduct (a SWP facility) is lifted from O'Neill Forebay into San Luis Reservoir for storage using the pump-turbines in Gianelli Pumping-Generating Plant. Later in the year, when CVP and SWP demand increases, water is released from San Luis Reservoir through O'Neill Forebay and conveyed via the DMC or the San Luis Canal (a joint-use CVP and SWP facility) and California Aqueduct for use by water contractors (Reclamation 2019). As water is released back through Gianelli Pumping-Generating Plant, the plant generates hydropower, which is used to offset the energy demand of the project operations. Water is also diverted from the west side of San Luis Reservoir at the Pacheco Pumping Plant to supply water to two CVP contractors, the Santa Clara Valley Water District (Valley Water), and the San Benito County Water District (Reclamation 2019). In addition to storing and supplying water, San Luis Reservoir provides recreation opportunities.

The B.F. Sisk Dam SOD Modification Project is a federal project that has the potential to influence water supply conditions in San Luis Reservoir. In 2006, Reclamation completed a risk analysis of B.F. Sisk Dam that concluded there is justification to take action to reduce risk to the downstream public from a potential severe earthquake (Reclamation 2006). Consequently, Reclamation, in coordination with the California Department of Water Resources (DWR), completed the B.F. Sisk Dam SOD Modification Project EIS/EIR in December 2019[1]. The Crest Raise Alternative, one of the alternatives evaluated in the study that would reduce the dam safety risk, was selected to be implemented. Raising the crest elevation 12 feet would increase the distance between the water surface and the dam crest (freeboard) to prevent reservoir overtopping and failure in the event of dam deformation from a seismic event.

ES.3 Project Purpose and Need/Project Objectives

ES.3.1 Project Purpose and Need

As a potential funding source for the Proposed Action under the Water Infrastructure Improvements for the Nation (WIIN) Act, and in accordance with the amended Safety of Dams Act, Reclamation's preliminary purpose and need is to evaluate the feasibility report and determine if SLDMWA's request to increase water storage supply provides an additional benefit in conjunction with the current B.F. Sisk Dam SOD Modification Project, is consistent with Reclamation Law, can support a Secretary of Interior's finding of feasibility, has federal benefits pursuant to the WIIN Act, and can be accomplished without negatively impacting the B.F. Sisk Dam SOD Modification Project.

ES.3.2 Project Objectives

Hydrologic variability and regulatory requirements in the Delta continue to restrict the amount of water that Reclamation and DWR can pump. These limitations cause water supply reliability concerns for CVP and SWP contractors that receive water supplies through Delta conveyance. Regulatory changes, project operations, and overall growth in surface water demand are expected to increase reliance on San Luis Reservoir supplies in the future. These conditions all contribute to a need for actions to improve water supply reliability and operational flexibility south of the Delta.

[1] The B.F. Sisk Dam SOD Modification Project Final EIS/EIR is available for review at the following hyperlink: https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281

SLDMWA has developed additional objectives to optimize the water supply benefits of San Luis Reservoir while reducing additional risks to South-of-Delta contractors by:

- Increasing long-term reliability and quantity of yearly allocations to South-of-Delta contractors dependent on San Luis Reservoir.
- Increasing the certainty of access to supplies stored by South-of-Delta contractors in San Luis Reservoir in subsequent water years.

ES.3.3 Project Opportunities

ES.3.1.1 Operational Flexibility

Operational flexibility allows water agencies to manage water supplies efficiently by increasing supply and storage management options. Implementing the B. F. Sisk Dam Raise and Reservoir Expansion Project would provide increased storage options to CVP contractors to store non-Project water.

ES.3.1.2 Water Supply Reliability

In years when CVP contractors choose to conserve portions of their allocation for use in a subsequent dry year, those contractors can choose to leave that unused supply in San Luis Reservoir as carried-over water. The contractors, in storing this carried-over supply in San Luis Reservoir, take on a risk of potentially losing it if San Luis Reservoir fills the next year and that supply is "spilled" (converted to CVP supplies for following year's allocation). The CVP contractors also store their supplemental supply (non-Project water) such as transfer water or conserved water into a subsequent year. The contractors also risk losing this water if San Luis Reservoir fills. Implementing the B.F. Sisk Dam Raise and Reservoir Expansion Project could increase storage capacity and reduce the likelihood of carried-over supply and other water being lost to CVP contractors. Additionally, Reclamation could also capture more project water if excess flows become available.

ES.4 Study Area

The study area for this EIR/SEIS (Figure ES-1) includes San Luis Reservoir where construction impacts under the action alternatives would occur. The study area also includes the Delta, all South-of-Delta CVP and SWP contractors' service areas and related water infrastructure including the California Aqueduct, DMC, and San Luis Canal due to the operational impacts of the action alternatives.

ES.5 Alternatives Evaluated in this EIR/SEIS

ES.5.1 Alternative 1: No Project/No Action Alternative

Both CEQA Guidelines (Section 15126.6) and NEPA regulations (40 Code of Federal Regulations 1502.14(d)) require the evaluation of a No Project Alternative or No Action, which presents the reasonably foreseeable future condition in the absence of the proposed project. Additionally, CEQA Guidelines (Section 15125(a)(1)) also require a comparison to a baseline reflecting existing conditions. This EIR uses the baseline evaluation presented in the B.F. Sisk Dam SOD Modification Project EIS/EIR (Reclamation 2019), which remains a current and accurate representation of existing conditions. In this EIR/SEIS Alternative 1, the No Project/No Action Alternative, reflects

the implementation of the crest raise actions evaluated in the B.F. Sisk Dam SOD Modification Project EIS/EIR. The Crest raise action includes increasing the dam crest by 12 feet to reduce safety concerns for the downstream public by reducing the likelihood of overtopping if slumping were to occur during a seismic event (Reclamation 2019). The No Project/No Action Alternative was analyzed consistent with existing regulatory requirements, including the Reinitiation of Consultation on the Coordinated Long-Term Operations of CVP and SWP (ROC on LTO) Record of Decision (ROD) and the 2018 Addendum to the Coordinated Operation Agreement CVP/SWP and implementation of the B.F. Sisk Dam SOD Modification Project.

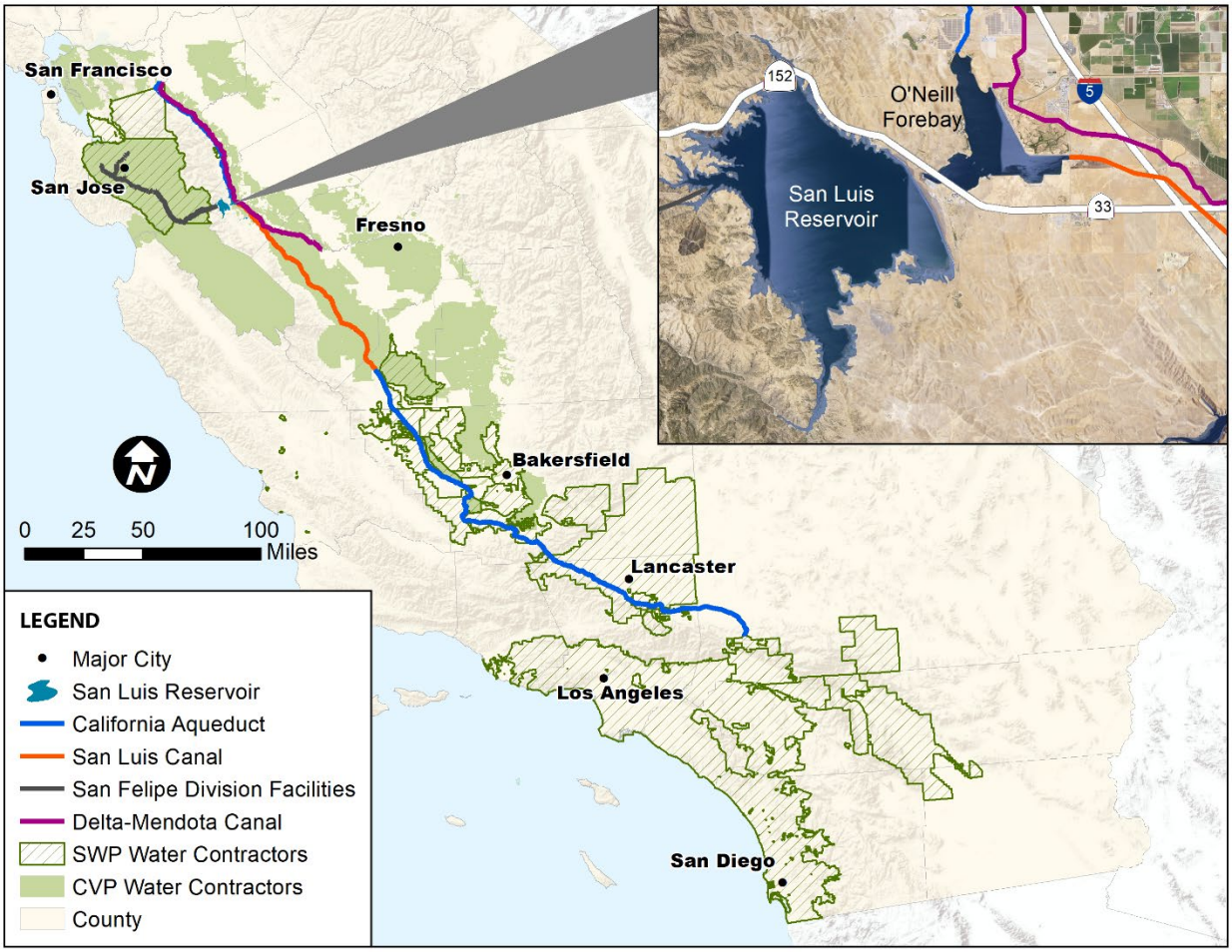


Figure ES-1. B.F. Sisk Dam Raise and Reservoir Expansion Project Study Area

ES.5.2 Alternative 2: Non-Structural Alternative

Under Alternative 2, the Non-Structural Alternative, operational measures would be used to contribute to the purpose and need/project objective. Under the Non-Structural Alternative, Reclamation would change its annual allocation process to reserve up to 310 thousand acre-feet (TAF) of stored CVP supply in San Luis Reservoir at the end of wetter[2] years. This water would be

[2] Wetter years under Alternative 2 are defined as years with South-of Delta CVP allocations of 55% or higher. These allocations usually correlate with Wet or Above Normal year types.

reserved in San Luis Reservoir for allocation in subsequent drier years to South-of-Delta CVP contractors. In these drier years, the 310 TAF in reserved supply would be allocated to South-of-Delta CVP water contractors, consistent with the CVP's current allocation of water supply stored in San Luis Reservoir. Under this new operational configuration allocated water supply not used by CVP contractors would not be carried over for use in a subsequent year. The Non-Structural Alternative would not require any additional construction or maintenance actions.

Alternative 2 is an action connected to the approved B.F. Sisk Dam SOD Modification Project included under Alternative 1. Therefore, the analysis of effects completed for Alternative 2 in this EIR/SEIS considers the additional operational impacts of implementing Alternative 2.

ES.5.3 Alternative 3: Dam Raise Alternative (Proposed Action)

Alternative 3, the Dam Raise Alternative, would place additional fill material on the dam embankment to raise the dam crest an additional 10 feet above the 12-foot embankment raise under development by the B.F. Sisk Dam SOD Modification Project. The 10-foot embankment raise would support an increase in reservoir storage capacity of 130 TAF. Under this alternative, there are three sub-alternatives that evaluate different operational configurations of this expanded storage capacity.

Alternative 3 is an action connected to the approved B.F. Sisk Dam SOD Modification Project included under Alternative 1. The analysis of effects completed for Alternative 3 in this EIR/SEIS considers the incremental impacts of raising the dam an additional 10 feet above the B.F. Sisk Dam SOD Modification Project.

ES.6 Impact Summary

This section summarizes environmental impacts identified for the No Project/No Action Alternative and action alternatives. These environmental impacts and mitigation measures are listed in Table ES-1 and described in further detail in Chapter 4 of the EIR/SEIS. Areas of controversy and issues to be resolved (CEQA Guidelines Section 15123) are discussed in Chapter 6 of the EIR/SEIS.

Table ES-1 consolidates and discloses the significance determinations made pursuant to CEQA throughout this EIR/SEIS. NEPA requires an environmental document to consider the context and intensity of effects caused by, or result from, a project. These factors pursuant to NEPA have been considered for determining significance in this document. The impacts listed in Table ES-1 are NEPA impacts as well as CEQA impacts, but they are judged for significance only under CEQA.

ES.6.1 Alternative 1 – No Project/ No Action Alternative

Alternative 1 would complete construction actions previously analyzed in the B. F. Sisk Dam SOD Modification Project. These impacts were analyzed in the B.F. Sisk Dam SOD Modification Project Final EIS/EIR, jointly prepared by Reclamation and DWR in August 2019 (Reclamation and DWR 2019). The construction has the potential to result in significant effects on air quality, greenhouse

gas (GHG) emissions, visual resources, noise and vibration, recreation, and cultural resources. The following potentially significant impacts have been identified:

(1) Impacts on air quality due to construction actions under Alternative 1 would generate nitrogen oxides (NOx) emissions that exceed significance thresholds. Implementation of mitigation measures required under the B.F. Sisk Dam SOD Modification Project, including use of Tier 4 construction equipment, reduction of exhaust emissions from on-road trucks, and implementing best available mitigation measures for the construction phase would reduce impacts to less than significant.

(2) Construction activities would generate maximum project and annual emissions of GHGs that exceed significance thresholds resulting in a significant impact. Implementation of a mitigation measure required under the B.F. Sisk Dam SOD Modification Project that requires purchasing carbon offsets prior to the start of construction would reduce impacts to less than significant.

(3) The scenic vistas and the scenic character of the areas around San Luis Reservoir would be impacted by construction equipment required under Alternative 1. Construction lighting to support nighttime work would add a more substantial visual distraction, resulting in a significant impact. Implementation of a mitigation measure required under the B.F. Sisk Dam SOD Modification Project, to reduce light and glare would reduce visual impacts to a less than significant level.

(4) Noise levels at sensitive receptors would exceed significance criterion due to construction activities, including blasting under Alternative 1. In addition, construction-related traffic along Basalt Road would increase by a large percentage. Implementation of mitigation measures, required under the B.F. Sisk Dam SOD Modification Project, including development of a Noise Control Plan, blasting plan, and performing a preconstruction noise survey would reduce noise impacts but would not be sufficient to reduce these impacts to less than significant. Noise impacts would be significant and unavoidable under Alternative 1.

(5) The temporary closure of boat launches, trails (including American with Disabilities Act (ADA) compliant trails), and other recreation facilities (including ADA and Regulatory Compliance (RC) compliant campsites, fish cleaning stations, public storage rooms, public showers) at San Luis Reservoir, which would reduce recreation opportunities during construction resulting in a significant impact to recreation. Implementation of Mitigation Measure REC-1 required under B.F. Sisk Dam SOD Modification Project would reduce the severity of this impact to less than significant.

(6) There would be direct and indirect impacts to known historic properties, historical resources, and other cultural resources under Alternative 1. Implementation of a mitigation measure required under the B.F. Sisk Dam SOD Modification Project that would include execution of a formal agreement document to govern National Historic Preservation Act (NHPA) Section 106 compliance and resolve adverse effects to cultural resources would reduce impacts to a less than significant level.

ES.6.2 Alternative 2 – Non-Structural Alternative

Alternative 2 would be implemented as a connected action to Alternative 1 and would require only operational modifications, consistent with all environmental requirements pertaining to Delta operations, including the 2019 Biological Opinions for CVP and SWP operations as well as any future biological opinions or requirements. To provide dry year water supply reliability, Reclamation would reserve water during wetter years for delivery in dry years. This would reduce available space

in San Luis Reservoir during wetter years and result in a reduction to Delta exports during these years type. No construction or maintenance actions are required. The operational changes have the potential to impact resources. Resources of concern under Alternative 2 are water quality, water supply, and aquatics. The following impacts have been identified:

(1) Under Alternative 2, average annual South-of-Delta CVP agricultural deliveries are expected to decrease resulting in a significant impact to water supply. The reduction in water supply deliveries would not be able to be replaced reliably from other sources, such as groundwater pumping, water transfers, or new surface storage. As such, water supply impacts for South-of-Delta CVP water contractors remain significant and unavoidable.

(2) Operational changes proposed under Alternative 2 would result in increases to Old and Middle River flows which are expected to be beneficial to fish as a result of more retained water within the rivers, and somewhat reduced entrainment risk due to less flow moving towards the conveyance facilities. Overall impacts to aquatic resources under Alternative 2 would be less than significant.

ES.6.3 Alternative 3 – Dam Raise Alternative

Alternative 3 would be implemented as a connected action to Alternative 1 and would complete major construction actions at San Luis Reservoir to raise the B.F. Sisk Dam embankment an additional 10 feet above the 12-foot dam raise analyzed and approved in connection with the B.F. Sis Dam SOD Modification Project to increase storage capacity in the reservoir. The construction has the potential to result in significant effects on water quality, paleontological resources, air quality, GHG emissions, visual resources, noise, traffic conditions, hazards, terrestrial resources, and cultural resources. The following potentially significant impacts have been identified:

(1) Impacts on water quality due to construction actions under Alternative 3 would be similar to those identified under the B.F. Sisk Dam SOD Modification Project. Construction actions would generate impacts on surface water quality resulting both from the disturbance of soils in construction and staging areas and the associated potential for increases in erosion, along with subsurface construction activity in San Luis Reservoir and potential for increases in turbidity from reservoir floor disturbance. Environmental commitments identified in the B.F. Sisk Dam SOD Modification Project include erosion control actions.

(2) Construction-related earth moving activities could encounter previously undetected paleontological resources in areas of poor surface visibility around San Luis Reservoir where detection may have been impeded, and in areas that have not been subject to prior investigation. Mitigation Measure GEO-1 required under the Proposed Action, includes monitoring of earth moving activities by a qualified paleontologist, would reduce these potential impacts to a less than significant level.

(3) Construction activities would also result in air quality and greenhouse gas emissions with the potential to exceed significance thresholds. Implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, and AQ-4, required under the Proposed Action, include use of renewable diesel or biodiesel powered construction equipment and the purchase of carbon offsets, and would reduce greenhouse gas emissions to a less than significant level. Short-term construction related air quality impacts would be significant and unavoidable.

(4) Modifications to the study area's visual setting during the construction of Alternative 3 through the introduction of construction equipment and the disturbance of areas where construction is underway could impact visual resource experiences for visitors to the San Luis Recreation Area

and viewers passing by the reservoir on nearby State Route (SR) 152. These impacts on visual setting would be mitigated, through implementation of Mitigation Measures VIS-1 and VIS-2, required under the Proposed Project, to less than significant levels through the shielding of construction lighting used during nighttime construction, the strategic use of locations out of sight of major nearby viewing points including SR 152 for spoils storage and disposal, and design requirements for new infrastructure in the viewshed to minimize any new visual contrast or distraction they could generate.

(5) Noise generated under Alternative 3 would result in a temporary construction-related significant and unavoidable impact, by temporarily increasing the noise level on local roads.

(6) The use of area roadways by trucks and construction workers accessing the construction areas at San Luis Reservoir could cause temporary impacts to traffic safety on those roadways. This impact would be mitigated with implementation of Mitigation Measure TR-1, required under the Proposed Project, to a less than significant level with the installation of signage along impacted roadways warning motorists of slow-moving construction traffic and lane closures, and the use of traffic controls like flaggers or temporary traffic signals where construction equipment will be entering roadways. For the section of SR 152 where it crosses over Cottonwood Creek, the lane closures during construction and the added construction-related trips would result in a significant unavoidable impact on level of service (LOS) during construction and result in a significant unavoidable short-term impact on traffic flow.

(7) Roadway improvements and the use of mechanical construction equipment would have a significant impact on hazards within the study area and State Responsibility Area, but with implementation of Mitigation Measures HAZ-1 and TR-1 required under the Proposed Project, this impact would be less than significant.

(7) Construction activities have the potential for significant impacts on sensitive terrestrial habitats including wetland and riparian vegetation communities, terrestrial wildlife, nesting birds, and special status plant species. Mitigation Measures TERR-1 through TERR-16, required under the Proposed Project including preconstruction surveys, establishment of buffers, construction monitoring, and compensatory mitigation where impacts could not be avoided, which would substantially reduce these potential impacts to a less than significant level.

(8) Impacts to known historic properties, historical resources, and other cultural resources associated with Alternative 3 would be significant. CEQA Mitigation Measures CR-1, CR-2, and CR-3, required under the Proposed Project, which include avoidance of known resources, training of construction personnel on the cultural sensitivity of the area, monitoring for the inadvertent discovery of new resources by qualified personnel, and continued coordination with culturally associated Native American tribes, would be implemented to avoid or reduce significant impacts. Under Section 106 of the NHPA, adverse effects to historic properties would be resolved (i.e., avoided, minimized, or mitigated) through the completion of the Section 106 process and the execution of an amendment to the agreement document developed for Alternative 1.

(9) Significant recreation impacts due to increased surface inundation would occur under Alternative 3. Mitigation Measures REC-1 and REC-2, required under the Proposed Project, include expansion of boat launches at the San Luis Creek Use Areas and movement of portions of the Lone Oak Trail upslope, which would reduce recreation impacts to a less than significant level.

ES.7 Environmentally Superior Alternative

CEQA Guidelines require an EIR to identify an environmentally superior alternative. However, the environmentally superior alternative does not need to be adopted as the preferred alternative for implementation. The identification of the preferred alternative is independent of the identification of the environmentally superior alternative, although the identification of both will be based on the information presented in this draft EIR/SEIS.

This draft EIR/SEIS provides a substantive portion of the environmental information for SLDMWA to determine the environmentally superior alternative. In this draft EIR/SEIS, SLDMWA has identified the subalternatives under Alternative 3 that provide additional refuge water supply benefits as the environmentally superior alternative. SLDMWA will consider feedback during the public review phase of the draft EIR/SEIS on the environmental benefits and impacts of each alternative when developing the final EIR/SEIS and ROD.

Reclamation has not yet identified an environmentally preferable alternative for the Project. Pursuant to 40 CFR 1505.2(b), Reclamation will decide on the environmentally preferable alternative based on analysis in the EIR/SEIS, consultation and coordination with interdisciplinary team members, and public input

Table ES-1. Impact Summary

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
4.1 Water Quality					
Cause a violation of existing water quality standards or waste discharge requirements.	Evaluation of how the alternatives could potentially generate violations of water quality standards or waste discharge requirements during construction or operation of new facilities.	1	LTS	--	Section 4.1.3
		2	LTS	None	Section 4.1.4
		3	LTS	None	Section 4.1.5
Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site or provide substantial additional sources of polluted runoff.	Evaluation of how construction or operation of the alternatives could alter the existing drainage pattern and create or contribute runoff water when compared to No Project/No Action Alternative conditions.	1	LTS	--	Section 4.1.3
		2	NI	None	Section 4.1.4
		3	LTS	None	Section 4.1.5
In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.	Evaluation the risk of how construction or operation of the alternatives could release pollutants due to project inundation in flood hazard, tsunami, or seiche zones.	1	NI	--	Section 4.1.3
		2	NI	None	Section 4.1.4
		3	NI		Section 4.1.5
Conflict with or obstruct implementation of a water quality control plan.	Evaluation of whether construction or operation of the alternatives could conflict with or obstruct water quality control plan objectives.	1	LTS	--	Section 4.1.3
		2	LTS	None	Section 4.1.4
		3	LTS	None	Section 4.1.5
4.2 Surface Water Supply					
Construction impacts on water supply would be considered significant if the alternative would substantially reduce the annual supply of water available to CVP, SWP, refuges, or other water users during construction.	Evaluation of how construction of the alternatives could change CVP and SWP water supply deliveries.	1	NI	--	Section 4.2.3
		2	NI	None	Section 4.2.4
		3	NI	None	Section 4.2.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Operational impacts on water supply would be considered significant if the alternative would substantially reduce the annual supply of water available to CVP, SWP, refuges, or other water users during the long-term operation of the alternative.	Evaluation of how operation of the alternatives could change CVP and SWP water supply deliveries.	1	NI	--	Section 4.2.3
		2	CVP Only Storage: South-of-Delta SWP - LTS South-of-Delta CVP - SU	None	Section 4.2.4
		3	CVP Only Storage: South-of-Delta SWP - LTS South-of-Delta CVP - B	None	Section 4.2.5
			CVP/SWP Split Storage: South-of-Delta SWP - LTS South-of-Delta CVP - B	None	Section 4.2.5
			Investor-Directed Storage: South-of-Delta SWP - LTS South-of-Delta CVP - B	None	Section 4.2.5
4.3 Air Quality					
Conflict with or obstruct implementation of the applicable air quality plan	Estimates of potential emissions from the short-term construction generated and long-term operations and maintenance of the alternatives were developed and compared to significance thresholds established by the respective air district where the alternative would be implemented.	1	S, LTS	AQ-1, AQ-2. AQ-3[1]	Section 4.3.3
		2	NI	None	Section 4.3.4
		3	S, SU	AQ-1[2], AQ-2[2], AQ-3, AQ-4	Section 4.35 Appendix F

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Expose sensitive receptors to substantial pollutant concentrations	Each alternative's potential to generate toxic air contaminants (TACs) was measured and then evaluated considering the distance to the nearest sensitive receptor.	1	LTS	--	Section 4.3.3
		2	NI	None	Section 4.3.4
		3	LTS	None	Section 4.3.5 Appendix F
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	Each alternative's potential to generate emissions, including objectionable odors, was measured and then evaluated considering the distance to the nearest sensitive receptor.	1	LTS	--	Section 4.3.3
		2	NI	None	Section 4.3.4
		3	NI	None	Section 4.3.5 Appendix F
Cause temporary and short-term construction-related emissions of criteria pollutants or precursors that would exceed the general conformity *de minimis* thresholds.	For NEPA purposes, estimates of potential emissions from the short-term construction of the alternatives were developed and compared to the general conformity de minimis threshold.	1	NI	--	Section 4.3.3
		2	NI	None	Section 4.3.4
		3	General Conformity Determination Required	None	Section 4.3.5 Appendix F
4.4 Greenhouse Gases					
Generate greenhouse gas emissions, either directly or indirectly, that could have a significant impact on the environment.	Estimates of potential emissions from the short-term construction generated and long-term operations and maintenance of the alternatives were developed and compared to project thresholds established by DWR.	1	S, LTS	GHG-1[1]	Section 4.4.3
		2	NI	None	Section 4.4.4
		3	S, LTS	AQ-1[2], AQ-2[2], GHG-1, GHG-2	Section 4.4.5 Appendix F
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Comparison of all proposed alternative emissions estimates against applicable plans, policies, or regulations adopted to reduce greenhouse gas emissions.	1	S, LTS	--	Section 4.4.3
		2	NI	None	Section 4.4.4
		3	S, LTS	AQ-1[2], AQ-2[2], GHG-1, GHG-2	Section 4.4.5 Appendix F
4.5 Visual Resources					
Have a substantial adverse effect on a scenic vista).	Evaluation of the degree to which construction activities and long-term placement of new infrastructure could detract from viewing experience at scenic vistas.	1	S, LTS	VIS-1[1]	Section 4.5.3
		2	LTS	None	Section 4.5.4
		3	LTS	None	Section 4.5.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Substantially damage scenic resources within a State scenic highway corridor.	Evaluation of the degree to which construction activities and long-term placement of new infrastructure could detract from viewing experience along scenic highway corridors.	1	S, LTS	VIS-1[1]	Section 4.5.3
		2	LTS	None	Section 4.5.4
		3	S, LTS	VIS-2	Section 4.5.5
Substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable regulations governing scenic quality.	Evaluation of the degree to which construction activities and long-term placement of new infrastructure could degrade the existing visual character or quality of the site and its surroundings.	1	S, LTS	VIS-1[1]	Section 4.5.3
		2	LTS	None	Section 4.5.4
		3	LTS	None	Section 4.5.5
Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.	Evaluation of the degree to which construction activities and long-term placement of new infrastructure could introduce new light or glare sources.	1	S, LTS	VIS-1[1]	Section 4.5.3
		2	LTS	None	Section 4.5.4
		3	S, LTS	VIS-1	Section 4.5.5
4.6 Noise and Vibration					
Expose sensitive receptors to noise levels in excess of standards established in the local general plan or noise ordinance.	Comparison of predicted noise levels during construction and operation of the alternatives to established general plan and noise ordinance standards and to existing noise levels in the study area.	1	S, SU	NOI-1, NOI-2, NOI-3[1]	Section 4.6.3
		2	NI	None	Section 4.6.4
		3- Dam Raise	S, SU	None	Section 4.6.5
		3- SR 152 Modifications	LTS	None	Section 4.6.5
		3- Operation	NI	None	Section 4.6.5
Expose sensitive receptors to excessive ground-borne vibration or ground-borne noise.	Evaluation of predicted ground-borne vibration levels during construction and operation of the alternatives at the nearest sensitive receptors (significance threshold of 0.3 inches/second).	1	LTS	--	Section 4.6.3
		2	NI	None	Section 4.6.4
		3- Dam Raise	LTS	None	Section 4.6.5
		3- SR 152 Modifications	LTS	None	Section 4.6.5
		3- Operation	NI	None	Section 4.6.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	Comparison of predicted noise levels during construction of the alternatives to existing noise levels in the study area.	1	S, SU	NOI-1, NOI-2, NOI-3[1]	Section 4.6.3
		2	NI	None	Section 4.6.4
		3- Dam Raise	S, SU	None	Section 4.6.5
		3- SR 152 Modifications	LTS	None	Section 4.6.5
		3- Operation	NI	None	Section 4.6.5
Operational sources 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 could expose people residing or working in the study area to excessive noise levels.	Consideration of the alternative's location in relationship to an airport and its consistency with that airport's land use plans.	1	LTS	--	Section 4.6.3
		2	NI	None	Section 4.6.4
		3- Dam Raise	LTS	None	Section 4.6.5
		3- SR 152 Modifications	NI	None	Section 4.6.5
		3- Operation	NI	None	Section 4.6.5
4.7 Traffic and Transportation					
Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities	Evaluation of whether construction or operation of the alternative would generate traffic that would conflict with any goals or objectives of a program, plan, ordinance or policy addressing the circulation system.	1	LTS	--	Section 4.7.3
		2	LTS	None	Section 4.7.4
		3	LTS	None	Section 4.7.5
Cause a substantial increase in traffic in relation to the existing traffic load and capacity of the street system	Comparison of the alternative's contribution to local traffic conditions during and after construction based on level of service (LOS) changes.	1	LTS	--	Section 4.7.3
		2	LTS	None	Section 4.7.4
		3	S, SU	None	Section 4.7.5
Substantially increase traffic hazards due to a geometric design feature or incompatible uses.	Consideration of the alternative's potential to alter the transportation network that would increase traffic hazards.	1	LTS	TR-1[1]	Section 4.7.3
		2	LTS	None	Section 4.7.4
		3	S, LTS	TR-1	Section 4.7.5
Result in inadequate emergency access.	Evaluation of whether construction activities could impede emergency response vehicle access on site or along study area roadways.	1	LTS	TR-1[1]	Section 4.7.3
		2	LTS	None	Section 4.7.4
		3	S, LTS	TR-1	Section 4.7.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
4.8 Hazards and Hazardous Materials					
During construction activities, the transport, use or disposal of hazardous materials could increase the risk of exposure from hazardous materials to the public and construction workers.	Evaluation of the of the types of waste materials generated by the alternatives onsite, the transportation routes to any disposal sites and the need for interaction with or generation of hazardous materials as a part of operation and maintenance of the alternatives.	1	LTS	None	Section 4.8.3
		2	NI	None	Section 4.8.4
		3	LTS	None	Section 4.8.5
During construction activities, there is potential to encounter contaminated soil and/or groundwater, which could result in an accidental release of hazardous materials and pose a threat to the public and the environment.	Evaluation of the degree to which construction activities could occur on or near an active remediation site and whether implementation of the alternative would interfere with that site.	1	S, LTS	HAZ-1[1]	Section 4.8.3
		2	NI	None	Section 4.8.4
		3	LTS	None	Section 4.845
Construction activities at San Luis Reservoir could conflict with seaplane maneuvers on San Luis Reservoir and operations at the San Luis Reservoir Seaplane Base, resulting in safety hazards for pilots and people working and residing in the area.	Evaluation of the degree to which construction activities could temporarily reduce the use of some portions of San Luis Reservoir from use by the seaplane base and whether pilots would be aware of the temporary closures.	1	S, LTS	HAZ-2, HAZ-3 [1]	Section 4.8.3
		2	NI	None	Section 4.8.4
		3	LTS	None	Section 4.8.5
During construction activities use of Basalt Road and SR 152 for site access could temporarily interfere with an emergency response plan or emergency evacuation plan for the State Responsibility Area.	An evaluation of the degree to which construction site access via SR 152 could interfere with emergency response and evacuation uses on SR 152.	1	LTS	TR-1 [1]	Section 4.8.3
		2	NI	None	Section 4.8.4
		3	S, LTS	TR-1	Section 4.8.5
The use of mechanical equipment during construction could increase the risk of wildfire within the vicinity of the study area.	An evaluation of the degree to which mechanical equipment would be used during construction activities in wildfire risk areas around San Luis Reservoir based on the location of the alternative in relation to State Responsibility Areas or lands classified as very high fire hazard severity zones.	1	LTS	HAZ-4 [1]	Section 4.8.3
		2	NI	None	Section 4.8.4
		3	S, LTS	HAZ-1[4]	Section 4.8.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
4.9 Aquatic Resources					
Have a substantial adverse effect, either directly or through habitat modifications, on any aquatic species identified as an endangered, threatened, candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS), or USFWS.	Evaluate how construction of new infrastructure or later through operation of the alternatives could potentially impact any aquatic species identified as a candidate, sensitive, or special status species through direct effects or through habitat modification.	1	NI	None	Section 4.9.3
		2	LTS	None	Section 4.9.4
		3	LTS	None	Section 4.9.5
Interfere substantially with the movement of any native resident or migratory fish.	Evaluate how implementation of the alternatives could impact the movement of native resident or migratory fish.	1	NI	None	Section 4.9.3
		2	LTS	None	Section 4.9.4
		3	LTS	None	Section 4.9.5
4.10 Terrestrial Resources					
Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as an endangered, threatened, candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW, NMFS, or USFWS.	Evaluate how construction of new infrastructure or later through operation of the alternatives could potentially impact any species identified as a candidate, sensitive, or special status species through direct effects or through habitat modification.	1	S, LTS	TERR-1 through TERR-16 [1]	Section 4.10.3
		2	NI	None	Section 4.10.4
		3	Construction - S, LTS Operation - NI	TERR-1,2,3,8,10,11,12,14; TERR-15: Species-specific mitigation measures; TERR-4,5,6,7,9 and 13[2]	Section 4.10.5
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 CDFW, NMFS, or USFWS.	Evaluate how implementation of the alternative through the placement of equipment or development of new infrastructure during construction or through changes in water flow or availability during operation, could impact any riparian habitat or other sensitive natural community.	1	S, LTS	TERR-16 [1]	Section 4.10.3
		2	NI	None	Section 4.10.4
		3	Construction - S, LTS Operation - NI	TERR-16: Jurisdictional wetlands or waters, and streambeds and streambank mitigation	Section 4.10.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Have a substantial adverse effect on federally or state protected wetlands (including, but not limited to, marsh, vernal pool, coast, etc.) through direct removal, filling, hydrological interruption, or other means.	Evaluate how implementation of the alternative could through the placement of equipment or development of new infrastructure during construction or over the long term with operations could impact any federally or state protected wetlands.	1	S, LTS	TERR-16 [1]	Section 4.10.3
		2	NI	None	Section 4.10.4
		3	Construction - S, LTS Operation - NI	TERR-16: Jurisdictional wetlands or waters, and streambeds and streambank mitigation	Section 4.10.5
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.	Evaluate how implementation of the alternative could impact wildlife corridors or interfere with a wildlife species use of or a wildlife corridor.	1	LTS	--	Section 4.10.3
		2	NI	None	Section 4.10.4
		3	Construction – S, LTS Operation – S, LTS	None	Section 4.10.5
Conflict with any local policies or ordinances protecting biological resources, or adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or State conservation plan.	Evaluate how implementation of the alternative could conflict with policies or ordinances protecting terrestrial resources such as a tree preservation policy or ordinance, HCPs or Natural Community Conservation Plan.	1	NI	--	Section 4.10.3
		2	NI	None	Section 4.10.4
		3	S, LTS	TERR-1,2,3,8,10,11,12,14; TERR-15: Species-specific mitigation measures; TERR-16: Jurisdictional wetlands or waters, and streambeds and streambank mitigation TERR-4,5,6,7,9 and 13[2]	Section 4.10.5
4.11 Recreation					
Project construction could substantially reduce recreational use trails.	Evaluation of the degree to which construction activities and long-term placement of new infrastructure could reduce recreational trail use with consideration of the capacity of other trails available within the San Luis State Recreation Area (SRA) to offset this effect.	1	LTS	--	Section 4.11.3
		2	NI	None	Section 4.11.4
		3	LTS	None	Section 4.11.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Project construction could result in temporary closure to recreation facilities, resulting in a substantial loss of recreation opportunities.	Evaluation of the degree to which construction activities and long-term placement of new infrastructure could reduce recreation opportunities through the closure of available recreation facilities within the San Luis SRA.	1	S, LTS	REC-1 [1]	Section 4.11.3
		2	NI	None	Section 4.11.4
		3	S, SU	REC-1 [1]	Section 4.11.5
Project construction could displace visitors and substantially contribute to overcrowded conditions at other local and regional recreation sites.	Evaluation of the average visitor numbers at facilities that would have reduced access or closures due to project construction compared to user rates and any unused capacity at other regional facilities.	1	LTS	--	Section 4.11.3
		2	NI	None	Section 4.11.4
		3	LTS	None	Section 4.11.5
Operational changes to water levels in recreational water bodies could affect recreational uses.	Evaluation of the degree to which operational changes could affect recreational uses at the reservoir, such as reduced boating access and trail closure through the review of CalSim II model results for San Luis Reservoir storage and elevation changes.	1	LTS	--	Section 4.11.3
		2	NI	None	Section 4.11.4
		3	S, LTS	REC-1, REC-2	Section 4.11.5
4.12 Cultural Resources					
Project construction and operation could result in adverse effects to historic properties and/or substantial adverse changes to historical resources, unique archaeological resources, or tribal cultural resources or result in the disturbance of human remains.	Evaluation of how implementation of the alternative would adversely affect or change known or previously undiscovered significant cultural resources.	1	S, LTS	CR-1 [1]	Section 4.12.3
		2	NI	--	Section 4.12.4
		3	S, SU	CR-1, CR-2, CR-3	Section 4.12.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
4.13 Geology, Seismicity, and Soils					
Construction activities could directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death, through rupture of a known earthquake fault; strong seismic ground shaking; seismic-related ground failure; and landslides.	Evaluation of the degree to which the proposed location of construction activities could influence earthquake activity such as the rupture of any known active faults through the review of fault mapping, seismic risk data, liquefaction risk, and landslide mapping data.	1	LTS	--	Section 4.13.3
		2	NI	None	Section 4.13.4
		3	LTS	None	Section 4.13.5
Construction activities on unstable soils could result in the risk of loss, injury, or death as a result of liquefaction or landslides.	Evaluation of the degree to which the proposed location of construction activities could expose workers to the risk of loss, injury, or death in the case of an earthquake or strong ground movement through review of available unstable soil mapping data.	1	LTS	--	Section 4.13.3
		2	NI	None	Section 4.13.4
		3	LTS	None	Section 4.13.5
Construction activities could take place on expansive soils creating a substantial risk to life or property.	Evaluation of the degree to which construction activities would result in changes in moisture content through review of available expansive soil mapping data.	1	LTS	--	Section 4.13.3
		2	NI	None	Section 4.13.4
		3	LTS	None	Section 4.13.5
Maintenance activities during operations could expose people or structures to adverse effects related to the rupture of a known earthquake fault.	Evaluation of the degree to which people or structures would be exposed to adverse effects related to a seismic event during onsite operations through the review of fault mapping data.	1	B	None	Section 4.13.3
		2	NI	None	Section 4.13.4
		3	B	None	Section 4.13.5
Operations could result in long term impacts to geology, soils, or mineral resources.	Evaluation of the degree to which operations could affect the availability of a known mineral resource of value to the region or State, or cause the loss of a locally important resource recovery site through review of available geology, soils, or mineral resources mapping data.	1	NI	--	Section 4.13.3
		2	NI	None	Section 4.13.4
		3	NI	None	Section 4.13.5

Potential Impact	Assessment Methodology	Alt	Significance Determination (W/O Mitigation, W Mitigation)[3]	Mitigation	Evaluation Support
Construction activities could result in the loss of availability of a known mineral resource of regional or local importance.	Evaluation of the degree to which construction activities could remove a known mineral resource of regional or local importance through review of available mineral resources mapping data.	1	LTS	--	Section 4.13.3
		2	LTS	None	Section 4.13.4
		3	LTS	None	Section 4.13.5
Construction activities could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Evaluation of the potential for construction activities to impact known or previously undiscovered paleontological resources or unique geologic features through the review of literature and previously completed survey reports to determine the potential for impacts to known resources and estimate the potential for impacts to previously undiscovered resources.	2	NI	None	Section 4.13.4
		3	S, LTS	GEO-1	Section 4.13.5
4.14 Public Utilities, Services, and Power					
Construction activities would generate solid waste, the disposal of which could exceed the capacity of landfills designated to accommodate the project's solid waste disposal needs.	Evaluation of each alternative's potential to generate solid waste and compare those numbers against the remaining capacity at the local landfill.	1	LTS	--	Section 4.5.3
		2	LTS	None	Section 4.5.4
		3	LTS	None	Section 4.5.5
Adverse impacts associated with the use and/or depletion of local or regional energy supplies.	Evaluation of each alternative's potential power demands on the local power supply and compare those demands against the capacity of local medium voltage distribution lines.	1	LTS	--	Section 4.5.3
		2	LTS	None	Section 4.5.4
		3	LTS	None	Section 4.5.5

Notes: [1] Indicates Mitigation Measures implemented under the B.F. Sisk Dam SOD Modification Project. Table 2-1 provides a summary of each mitigation measure and Section B.1.1.1 in Appendix B includes full mitigation measure descriptions.

[2] Indicates measures carried forward from the B.F. Sisk Dam SOD Modification Project and implemented under Alternative 3. Description of measures provided in Section 4.15.

[3] Column 4 presents significance determinations without implementation of proposed Mitigation Measure and significance determination with implementation of proposed Mitigation Measure. For example. Conflict with or obstruct implementation of the applicable air quality plan under Alternative 1 is presented as S, LTS. Therefore, Alternative 1 would cause significant impacts that would mitigate with the implementation of AQ1, AQ-2 and AQ-3. With the implementation of the Mitigation Measures, this impact would be less than significant.

Key: B – Beneficial; CDFW – California Department of Fish and Wildlife; CRHR – California Register of Historical Resources; CVP – Central Valley Project; LTS – Less than Significant; NI – No Impact; NRHP – National Register of Historic Places; S – Significant; SWP – State Water Project; SU – Significant Unavoidable

Chapter 1 Introduction

The San Luis & Delta-Mendota Water Authority (SLDMWA) and the United States Department of the Interior, Bureau of Reclamation (Reclamation) are completing the B.F. Sisk Dam Raise and Reservoir Expansion Project Feasibility Study to evaluate alternatives to increase operational flexibility and improve water supply reliability for the Central Valley Project (CVP) and State Water Project (SWP). SLDMWA and Reclamation are also completing this joint Environmental Impact Report/Supplemental Environmental Impact Statement (EIR/SEIS) to evaluate the environmental impacts of these alternatives under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). SLDMWA is the Lead Agency pursuant to CEQA and Reclamation is the Lead Agency pursuant to NEPA. This report refers to SLDMWA and Reclamation jointly as the Lead Agencies. California Department of Transportation (Caltrans) is serving as a responsible agency pursuant to CEQA and as a cooperating agency pursuant to NEPA.

The EIR/SEIS evaluates increasing storage capacity in San Luis Reservoir to provide greater operational flexibility and water supply reliability for South-of-Delta CVP and SWP water contractors. As an alternative to increasing storage capacity, this EIR/SEIS also evaluates reserving a portion of the CVP share of San Luis Reservoir to provide dry year reliability for South-of-Delta CVP contractors. Increased capacity or reserved supply within San Luis Reservoir would only be used to help meet existing demands and would not serve any new demands in the South-of-Delta CVP and SWP service areas. Reclamation is evaluating this project as a connected action to the B. F. Sisk Dam Safety of Dams (SOD) Modification Project to create additional project benefits by increasing storage within San Luis Reservoir. Reclamation and California Department of Water Resources (DWR) evaluated environmental impacts of the B.F. Sisk Dam SOD Modification Project in 2019 and the EIS/EIR is available here: https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281. As a connected action this EIR/SEIS relies on the baseline evaluation presented in the B.F. Sisk Dam SOD Modification Project EIS/EIR and considers the incremental impacts of action alternatives presented herein.

1.1 Project Background and History

B.F. Sisk Dam was constructed to create the offstream San Luis Reservoir, which provides supplemental storage capacity for the CVP and SWP. Currently, San Luis Reservoir provides 2,027,840 acre-feet (AF) of water storage for the CVP and SWP. The water stored in the reservoir is managed for federal (approximately 45%) and state (approximately 55%) uses as part of the CVP and SWP, respectively. Typically, during the winter and early spring, water conveyed from the Delta in the Delta-Mendota Canal (DMC) (a CVP facility) and California Aqueduct (a SWP facility) is lifted from O'Neill Forebay into San Luis Reservoir for storage using the pump-turbines in Gianelli Pumping-Generating Plant (see Figure 1-1). Later in the year typically late spring and summer months, when CVP and SWP demand increases, water is released from San Luis Reservoir through O'Neill Forebay and conveyed via the DMC or the San Luis Canal (a joint-use CVP and SWP facility) and California Aqueduct for use by water contractors (Reclamation 2019). As water is

released back through Gianelli Pumping-Generating Plant, the plant generates hydropower, which is used to offset the energy demand of the project operations. Water is also diverted from the west side of San Luis Reservoir at the Pacheco Pumping Plant to supply water to two CVP contractors, the Santa Clara District (Valley Water), and the San Benito County Water District (Reclamation 2019). In addition to storing and supplying water, San Luis Reservoir provides recreation opportunities.

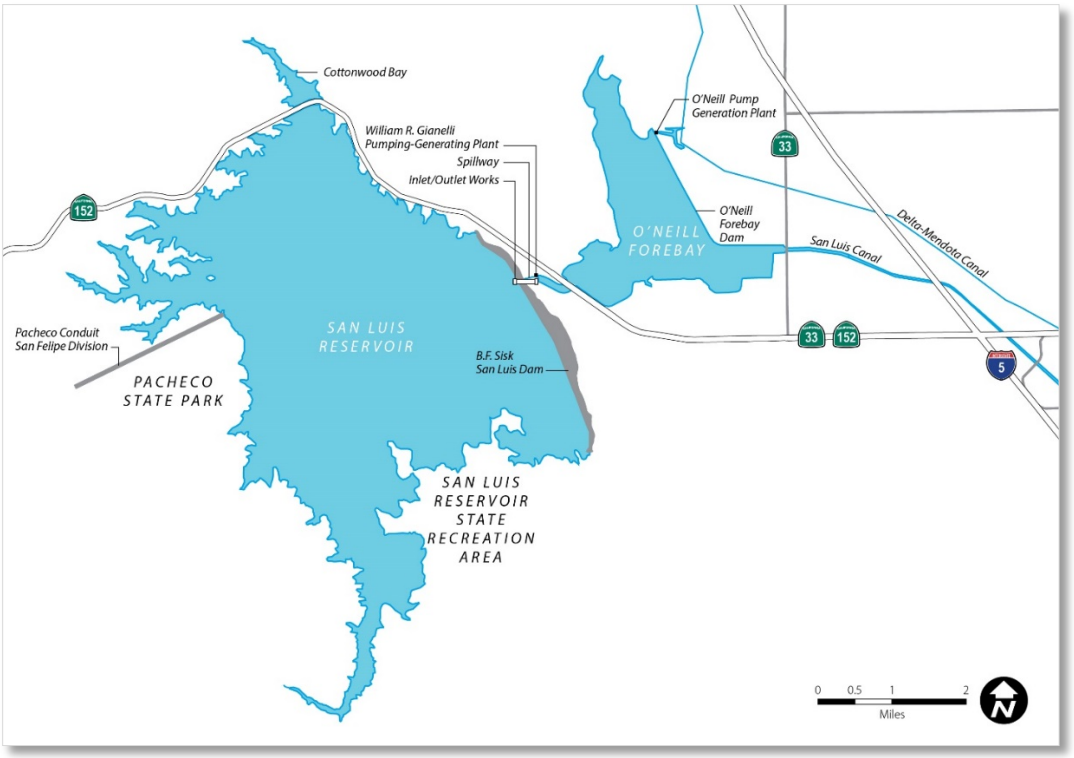


Figure 1-1. San Luis Reservoir and Associated Facilities

The B.F. Sisk Dam SOD Modification Project is a federal project that, if not completed, has the potential to influence water supply conditions in San Luis Reservoir. In 2006, Reclamation completed a risk analysis of B.F. Sisk Dam that concluded there is justification to take action to reduce risk to the downstream public from a potential severe earthquake (Reclamation 2006). Consequently, Reclamation, in coordination with DWR, completed the B. F. Sisk Dam SOD Modification Project Final EIS/EIRin December 2019[3]. The Crest Raise Alternative, one of the alternatives evaluated in the study that would reduce the dam safety risk, was selected to be implemented. Raising the crest elevation 12 feet would increase the distance between the water surface and the dam crest (freeboard) to prevent reservoir overtopping and failure in the event of dam deformation from a seismic event. The Crest Raise Alternative does not provide for any additional storage. In December 2019, Reclamation signed a Record of Decision detailing the agency's decision to implement the Crest Raise Alternative.

The Reclamation Safety of Dams Act of November 2, 1978 (SOD Act) (43 U.S.C. §506 et seq.), was amended by P.L. 114-113 to include authority for Reclamation to develop additional project benefits

[3] The B.F. Sisk Dam SOD Modification Project Final EIS/EIR is available for review at the following hyperlink: https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281

in conjunction with a B.F. Sisk Dam SOD Modification Project. Pursuant to Section 5.B. of the SOD Act, as amended, Reclamation must determine that additional project benefits are necessary and in the interest of the United States prior to developing any additional project benefits, consistent with Reclamation law. Furthermore, it must be determined that the development of additional project benefits will not negatively impact the B.F. Sisk Dam SOD Modification Project.

As a connected action to the B.F. Sisk Dam SOD Modification Project, Reclamation and SLDMWA seek to evaluate an increase in storage capacity of San Luis Reservoir. The increased storage capacity could be achieved by implementation of Proposed Action by an additional 10-foot raise of the B.F. Sisk Dam embankment across the entire dam crest above the level proposed for dam safety purposes. This additional 10 feet of dam embankment could add approximately 130,000 AF of water storage to San Luis Reservoir. SLDMWA, in coordination with Reclamation, is conducting a feasibility study to evaluate the Proposed Action and a potential cost-share in accordance with the Reclamation SOD Act and the Water Infrastructure Improvements for the Nation (WIIN) Act (P.L. 114-322) §4007.

1.2 Project Purpose and Need/Project Objectives

1.2.1 Project Purpose and Need

As a potential funding source for the Proposed Action under the WIIN Act, and in accordance with the amended SOD Act, Reclamation's preliminary purpose and need is to evaluate the feasibility report and determine if SLDMWA's request to increase water storage supply provides an additional benefit in conjunction with the current B.F. Sisk Dam SOD Modification Project, is consistent with Reclamation Law, can support a Secretary of Interior's finding of feasibility, has federal benefits pursuant to the WIIN Act, and can be accomplished without negatively impacting the B.F. Sisk Dam SOD Modification Project.

1.2.2 Project Objectives

Hydrologic variability and regulatory requirements in the Delta continue to restrict the amount of water that Reclamation and DWR can pump. These limitations cause water supply reliability concerns for CVP and SWP contractors that receive water supplies through Delta conveyance. Regulatory changes, project operations, and overall growth in surface water demand are expected to increase reliance on San Luis Reservoir supplies in the future. These conditions all contribute to a need for actions to improve water supply reliability and operational flexibility south of the Delta.

SLDMWA has developed additional objectives to optimize the water supply benefits of San Luis Reservoir while reducing additional risks to South-of-Delta water contractors by:

- Increasing long-term reliability and quantity of yearly allocations to South-of-Delta contractors dependent on San Luis Reservoir.
- Increasing the certainty of access to supplies stored by South-of-Delta contractors in San Luis Reservoir in subsequent water years.

1.2.3 Project Opportunities

1.2.3.1 Operational Flexibility

Operational flexibility allows water agencies to manage water supplies efficiently by increasing supply and storage management options. Implementing the B. F. Sisk Dam Raise and Reservoir Expansion Project would provide increased storage options to CVP contractors to store non-Project water.

1.2.3.2 Water Supply Reliability

In years when CVP contractors choose to conserve portions of their allocation for use in a subsequent dry year, those contractors can choose to leave that unused supply in San Luis Reservoir as carried-over water. The contractors, in storing this carried-over supply in San Luis Reservoir, take on a risk of potentially losing it if San Luis Reservoir fills the next year and that supply is "spilled" (converted to CVP supplies for following year's allocation). The CVP contractors also store their supplemental supply (non-Project water) such as transfer water or conserved water into a subsequent year. The contractors also risk losing this water if San Luis Reservoir fills. Implementing the B.F. Sisk Dam Raise and Reservoir Expansion Project could increase storage capacity and reduce the likelihood of carried-over supply and other water being lost to CVP contractors. Additionally, Reclamation could also capture more project water if excess flows become available.

1.3 Public Involvement

1.3.1 Public Scoping

The purpose of public scoping is to obtain feedback from agencies, the public, and other interested parties on significant issues associated with a project. This information helps guide an agency's environmental review of a project. Reclamation and SLDMWA considered scoping comments received both as part of the alternatives formulation process and to support the evaluation of potential environmental effects.

Additionally, the Notice of Preparation (NOP) was circulated for a 30-day public comment period beginning on May 14, 2020 and ending on June 14, 2020. Written comments on the proposed content and scope of the EIR received in response to SLDMWA's NOP were also reviewed and incorporated as appropriate in the draft EIR/SEIS. All comments received during the scoping period are included in Appendix Q, Public Scoping Report.

The NEPA process begins with publication of a Notice of Intent (NOI), stating the Reclamation's intent to prepare an EIS for the Project. The NOI was published in the *Federal Register* (FR) on May 14, 2020 to coincide with release of the NOP.

A public scoping meeting was held by SLDMWA on May 26, 2020 to inform interested parties about the proposed project and to solicit agency and public input on the scope and content of the EIR. Given the Coronavirus disease pandemic and the associated precautions and procedures being followed throughout California, the public scoping meeting was conducted online utilizing a web-based tool that allowed presentation of the project and public participation through the online chat function. Four people attended the meeting and no public comments were received during the online public scoping meeting.

Chapter 2 Proposed Action and Description of Alternatives

2.1 Alternative Formulation

CEQA and NEPA require an EIR and EIS, respectively, to identify a reasonable range of alternatives and provide guidance on the identification and screening of such alternatives. Both NEPA and CEQA include provisions that alternatives reasonably meet the purpose and need/project objectives and be potentially feasible. A supplemental EIS is to be developed using the same process and format as an original EIS, except that scoping is not required (23 CFR 771.130(d)).

SLDMWA and Reclamation followed a structured, documented process to identify and screen alternatives for inclusion in the EIR/SEIS under development for the B.F. Sisk Dam Raise and Reservoir Expansion Project. Appendix A describes this process and the alternatives considered in more detail.

SLDMWA and Reclamation started the process by identifying the project objectives (operational flexibility and water supply reliability)/purpose and need. SLDMWA and its member agencies reviewed the project objectives and previous studies in their initial effort to develop conceptual alternatives. This process identified an initial list of 16 measures that could, in part, contribute to the project objectives/purpose and need. The three criteria developed to evaluate each measure include the ability of the measure to address the objective of the project; the reliability and quantity of annual allocations and increasing the certainty of access to supplies for South-of-Delta contractors, as well as the cost effectiveness of the measure; and the acceptability of the environmental impacts. Measures were scored qualitatively for each of the three screening criteria. The metrics used were:

- The measure fully addressed the screening criteria
- The measure partially addressed the screening criteria
- The measure did not address the screening criteria

Measures that scored highest moved forward to be incorporated into the alternatives. These measures, and their performance, are documented in the Alternatives Development Report (see Appendix A). The measures remaining after the initial screening were combined into one action alternative that was selected to move forward for analysis (in addition to the No Project/No Action Alternative).

The B.F. Sisk Dam, San Luis Reservoir, and associated infrastructure are existing facilities and crest raise actions from the B.F. Sisk Dam SOD Modification Project have been analyzed under NEPA and CEQA and approved for implementation. As such, the purpose of this EIR/SEIS is to focus on analysis and mitigation of those potential effects on the environment resulting from an additional 10-foot dam raise (Proposed Action). The nature and scope of the alternatives to the Proposed Action to be studied is governed by the rule of reason, which means that an environmental

document need only discuss those alternatives necessary to permit a reasoned choice in light of environmental considerations. The scope of alternatives comprising a reasonable range will vary depending on the nature of the project under review, the project's impacts, relevant agency policies, and other material facts. In some situations, no potentially feasible alternatives may be available that would achieve most project objectives (e.g., *Mount Shasta Bioregional Ecology Center v. County of Siskiyou* (2012) 210 Cal.App.4th 184.) The reviewing agencies have the discretion to determine, based on the nature of the project and its circumstances, and how many alternatives will constitute a reasonable range.

2.2 Proposed Alternatives

2.2.1 Alternative 1: No Project/No Action Alternative

Both CEQA Guidelines (Section 15126.6) and NEPA regulations (40 Code of Federal Regulations [CFR] 1502.14(d)) require the evaluation of a No Project Alternative/No Action Alternative, which presents the reasonably foreseeable future conditions in the absence of the proposed project. The purpose of the No Project/No Action Alternative is to allow decision-makers to compare the impacts of approving the project to the impacts of not approving the project. Under CEQA, existing conditions (conditions at the time of issuance of the NOP) serve as the baseline to determine potential impacts of the alternatives. This differs from NEPA, where the No Action Alternative serves as the baseline to which the action alternative is compared to determine potential impacts. This EIR uses the baseline evaluation presented in the B.F. Sisk Dam SOD Modification Project EIS/EIR (Reclamation 2019), which remains a current and accurate representation of existing conditions.

In this EIR/SEIS Alternative, the No Project/No Action Alternative reflects the implementation of the crest raise actions per the B.F. Sisk Dam SOD Modification Project Record of Decision (ROD). The crest raise action, as detailed in the B.F. Sisk Dam SOD Modification Project EIS/EIR, includes increasing the dam crest by 12 feet to reduce safety concerns for the downstream public by reducing the likelihood of overtopping if slumping were to occur during a seismic event (Reclamation 2019). The EIS/EIR assumes construction would start in 2020 and last between 8 to 12 years. The crest raise action evaluated in the B. F. Sisk Dam SOD Modification Project EIS/EIR would not result in an increase in inundation, construction actions evaluated in the EIS/EIR is expected to result in ground disturbance area of approximately 3,905 acres (includes the crest of the dam, the entire downstream slope of the dam, borrow areas, haul routes, site access, and potential construction use areas). As discussed in the B.F. Sisk Dam SOD Modification Project ROD, the crest raise action includes implementation of several mitigation measures to reduce environmental impacts. These mitigation measures are evaluated as project actions under the No Project/No Action Alternative analysis in this EIR/SEIS.

The No Project/No Action Alternative was analyzed consistent with existing regulatory requirements, including the Reinitiation of Consultation on the Coordinated Long-Term Operations of CVP and SWP (ROC on LTO) ROD and the 2018 Addendum to the Coordinated Operation Agreement CVP/SWP) and implementation of the B.F. Sisk Dam SOD Modification Project.

2.2.2 Alternative 2: Non-Structural Alternative

Under Alternative 2, the Non-Structural Alternative, operational measures would be used to contribute to the purpose and need/project objective[4]. Alternative 2 would rely on a change in the current approach for annual CVP water supply allocations. San Luis Reservoir maximum capacity is 2,027,840 AF with a federal share of 966 thousand acre-feet (TAF) and state share of 1,062 TAF. The annual allocation of CVP supplies is managed by Reclamation. Reclamation develops the annual allocation to fully utilize stored CVP supply in the reservoir to meet CVP contractors' contracts and the requirements of other authorized purposes such as CVPIA refuge water supplies. Under the Non-Structural Alternative, Reclamation would change its annual allocation process to reserve up to 310 TAF of stored CVP supply in San Luis Reservoir at the end of wetter years[5]. This water would be reserved in San Luis Reservoir for allocation in subsequent drier years to South-of-Delta CVP contractors. In these drier years, the 310 TAF in reserved supply would be allocated to M&I South-of-Delta CVP contractors, consistent with the CVP's current allocation of water supply stored in San Luis Reservoir. Under this new operational configuration allocated water supply not used by CVP contractors could not be carried over for use in a subsequent year.

This change in San Luis Reservoir operations to increase water supply available in dry and critical years would adversely impact average water supply deliveries to CVP and SWP contractors. This alternative would not completely meet the project objectives/purpose and needs of the Proposed Action. However, Alternative 2 is analyzed in this EIR/SEIS as a nonstructural alternative that would partially meet the water supply reliability objective. The Non-Structural Alternative would not require any additional construction or maintenance actions.

Alternative 2 is an action connected to the approved B.F. Sisk Dam SOD Modification Project included under Alternative 1. Therefore, the analysis of effects completed for Alternative 2 in this EIR/SEIS considers the additional operational impacts of implementing Alternative 2.

2.2.3 Alternative 3: Dam Raise Alternative (Proposed Action)

Alternative 3, the Dam Raise Alternative, would be completed by placing additional fill material on the dam embankment to raise the dam crest an additional 10 feet above the 12-foot embankment raise under development by the B.F. Sisk Dam SOD Modification Project. The 10-foot embankment raise would support an increase in reservoir storage capacity of 130 TAF. The 10-foot increase in San Luis Reservoir's maximum surface elevation would inundate 445 acres of new land around the shore of the reservoir when the reservoir is full. The newly inundated lands are public lands and would not require additional land acquisitions. Under this alternative, there are three subalternatives that evaluate different operational configurations of this expanded storage capacity (see Section 2.2.2.2 for details). The subalternatives cover varying assignment and use of the increased storage space, as described in more detail below.

Alternative 3 is an action connected to the approved B.F. Sisk Dam SOD Modification Project included under Alternative 1. Therefore, the analysis of effects completed for Alternative 3 in this

[4] *The Directive and Standard – Developing Additional Project Benefits in Conjunction with a Safety of Dams Modification Project* (Reclamation 2016) established requirements for developing additional project benefits in conjunction with a SOD modification project. This directive and standard included the requirement for the evaluation of "a non-structural alternative that meets the needs and objectives of the additional benefits of the additional benefits project"

[5] Wetter years under Alternative 2 are defined as years with South-of Delta CVP allocations of 55% or higher. These allocations usually correlate with Wet or Above Normal year types.

EIR/SEIS considers the incremental impacts of raising the dam an additional 10 feet above the approved B.F. Sisk Dam SOD Modification Project.

2.2.3.1 Elements Common to all Subalternatives

Project Facilities. All the subalternatives under the Dam Raise Alternative would include modifications to the following project facilities:

B.F. Sisk Dam Embankment and Reservoir Facilities In addition to the increase in dam embankment elevation, all subalternatives would include (1) installation of downstream stability berms and crack filters and (2) raising the existing outlet works intake towers, access bridge, and spillway intake by 10 feet.

The existing saddle dike, known as the East Dike, approximately 1,300 feet north of the main embankment, would be modified by adding a downstream filter. With increased reservoir surface elevations, modifications would be made to Dinosaur Point Boat Launch and Goosehead Point Boat Launch (Basalt Use Area) to increase the ramps' operating elevation by 10 feet.

State Route (SR) 152 Facilities. The increase in storage levels will require modifications to a section of SR 152 where it crosses over Cottonwood Bay (see Figure 2-2). The current maximum water level at San Luis Reservoir is 544 feet. Under all Alternative 3 subalternatives, the maximum water level would increase 10 feet. The current elevation of the SR 152 road surface near Cottonwood Creek crossing ranges in elevation from 555 to 558 feet and up. With the lowest point of SR 152 approximately 1 foot above the proposed maximum water storage level, it is assumed that modifications will be needed to protect the roadway from wave action. The SR 152 embankment between milepost MER R5.239 and MER R5.806 would be modified to allow adequate freeboard to protect against wave action. The feasibility-level design used as the basis for this document evaluated two design options for the SR 152 modification. The first configuration's design includes raising the embankment by 11 feet in response to raise in maximum water level from the dam raise actions. Additionally, the configuration will include flattening the side slopes from 2:1 to a 3:1 slope to increase seismic stability of the embankment. The second configuration's design includes installing wave barrier walls without raising the embankment. This EIR/SEIS evaluates effects potentially generated from implementation of the first configuration, given its larger construction footprint, longer potential construction schedule, and larger potential environmental impacts. In addition to the embankment modification at Cottonwood Bay, the embankment at milepost MER R6.295 would require the placement of downslope fill to prevent inundation of the roadway when the enlarged reservoir is filled to capacity.

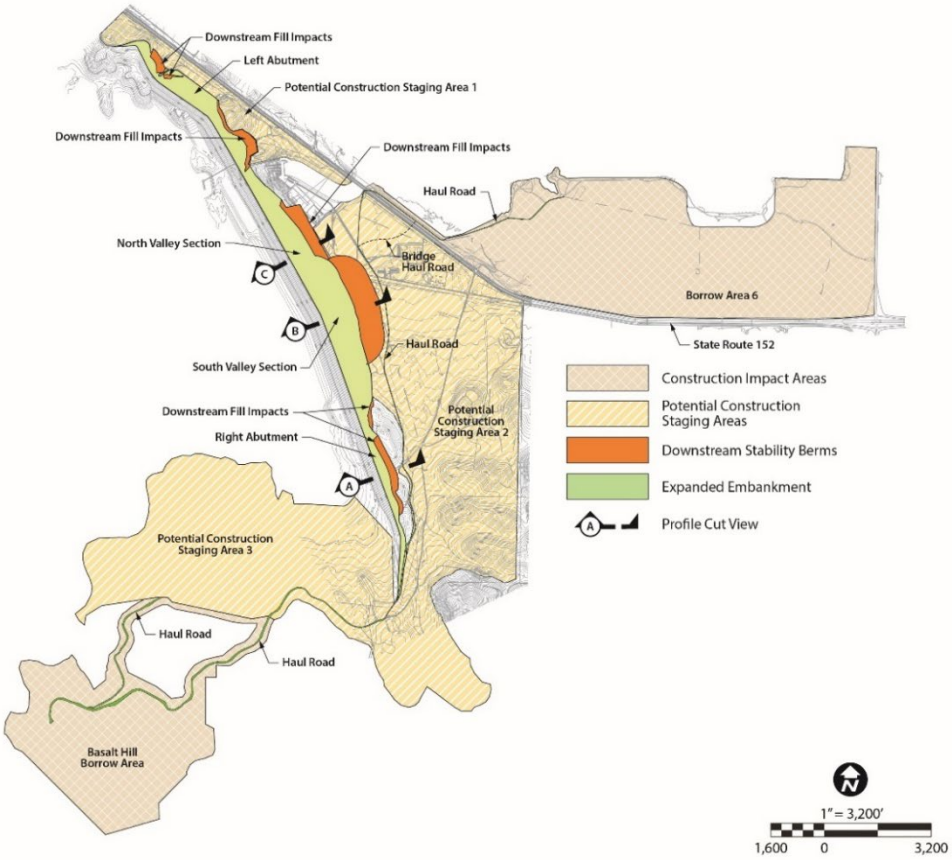


Figure 2-1. Dam Raise Facilities, Construction, and Staging Areas

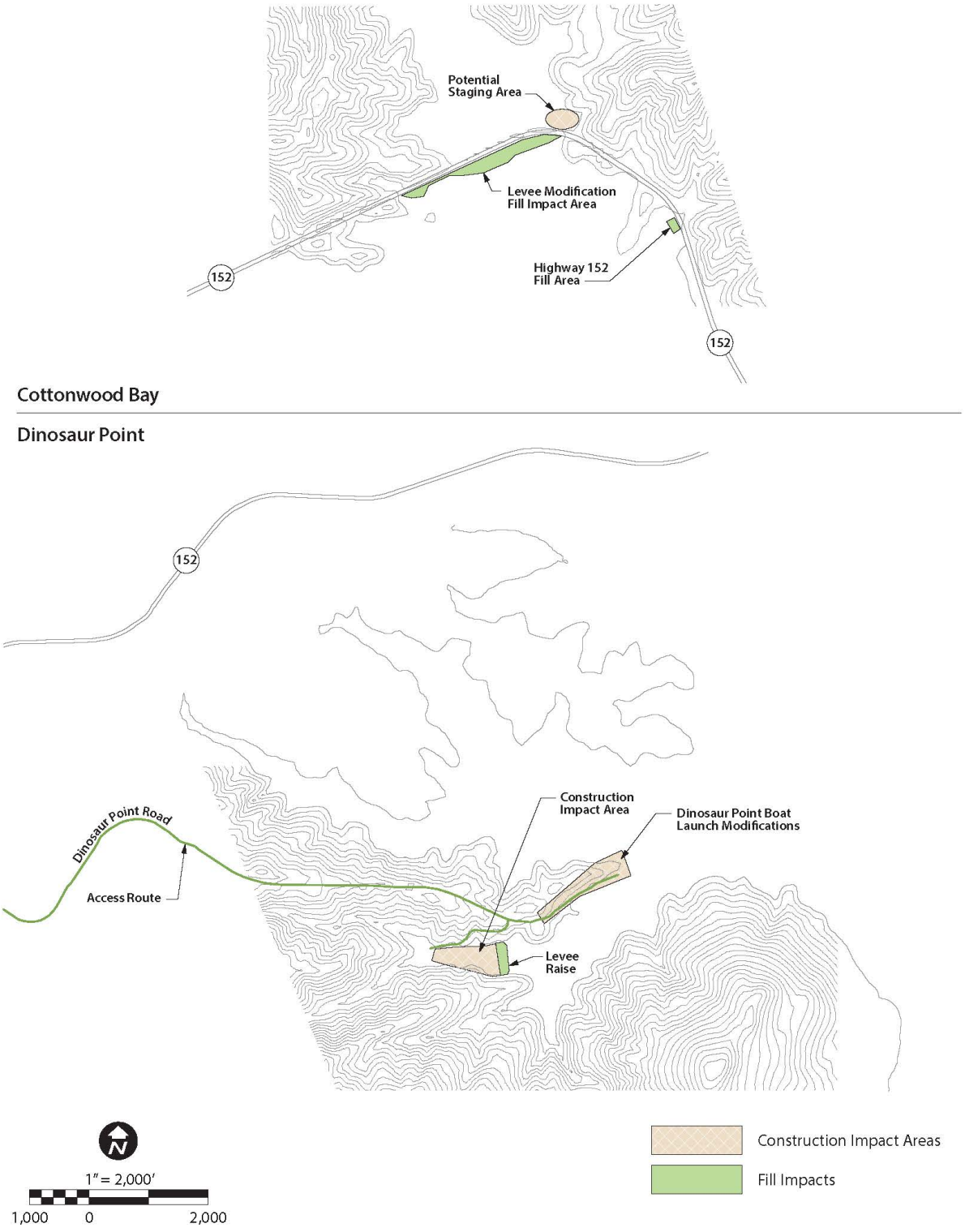


Figure 2-2. State Route 152 and Dinosaur Point Facilities and Construction Areas

Construction of Dam Raise. Construction of the additional 10-foot embankment and associated modifications would initiate during final stages of the construction of the B.F. Sisk Dam SOD Modification Project. Construction of the dam raise action is scheduled to start in September 2025 and completed in 8 years. Preconstruction and design activities will begin in 2022.

The downstream stability berms would be constructed by first excavating the existing liquefiable and soft foundation soils. The rock blanket or slope protection would be removed to the top elevation of the embankment and stockpiled downstream of the toe. The existing toe drain then would be removed by excavation. After completion of the excavation, the existing filters/drains located at the downstream toe would be reestablished and a new toe drain seepage collection system would be installed, similar to the one currently in place. Stronger material then would be placed as backfill and compacted. At 480 feet, a two-stage downstream crack filter would be constructed. Above an elevation of 550 feet, the raised crest would be developed by simultaneously placing riprap and bedding, core, a two-stage chimney filter, and the downstream shell. An estimated 15 million cubic yard of fill materials for the new enlarged dam embankment would be sourced from two borrow sites—Basalt Hill and Borrow Area 6—and stockpiled downstream of the toe and in Borrow Area 6. It is estimated that approximately 1 million cubic yards of material would need to be sourced from commercial sources in the area. After fill placement is completed, road base and paving of the dam crest complete the overlay raise.

Items in the staging areas would include trailers, equipment, and stockpiled materials. Construction staging and stockpile areas would include the area south of Gianelli Pumping-Generating Plant off Basalt Road, the area north of Gianelli Pumping-Generating Plant off Gonzaga Road, and Dinosaur Point. The access route to the two main staging areas would be SR 152 to Basalt Road. Up to 240 large deliveries or waste material transports off-site per day could be expected, along with the transport and disposal of material to local landfills and the regular commuting of construction personnel.

Aside from areas dedicated to construction staging and transportation, all remaining available space at the areas next to B.F. Sisk Dam would be needed for stockpiling materials. These areas around the dam would be used as a staging area for the full duration of construction. These areas would be returned to preconstruction condition after the project is completed. Equipment used to construct the alternative are in table below, the equipment listed below would be in addition to that utilized in the No Action Alternative:

3 Excavators	4 Bulldozers	5 Cranes/Lifts	5 Compactors
1 Grader	2 Scrapers	13 Dump trucks	5 Water Trucks
4 Flatbed Trucks	2 Wheel Trenchers	1 Barge	2 Concrete Pumpers
2 Concrete Saw Cutters	5 Loaders (2 small, 3 large)		

Recreational activities would be suspended for safety reasons for the full duration of construction at Basalt Use Area and Medeiros Use Area and during active construction at Dinosaur Point Use Area (approximately 1 year). Recreational use for boating would be suspended for the full year that both Basalt Use Area and Dinosaur Point Use Area are closed, and it would be limited to areas of the reservoir away from B.F. Sisk Dam for the full construction schedule and other sections of the reservoir near active construction during that work. The closed Basalt Campground would be used as a temporary camping/housing area for construction workers.

Final design of the dam raise would include the development of a construction schedule that times the completion work in the direct path of potential flood flows or on infrastructure specifically designed to direct flood flows to occur in periods of the year when rain is unlikely and reservoir levels are lower. In addition, the contractor would be required to develop a health and safety plan (HASP) that includes a response plan to flood forecasts that would require the suspension of construction activities and the movement of construction equipment to higher ground.

During the period of construction (2025 through 2032), it is anticipated that 130 workers would be on-site during the day shift and 87 workers on-site during the night shift. This is in addition to the number of worker evaluated under the B.F. Sisk Dam SOD Modification Project EIS/EIR. Postconstruction maintenance activities would not increase the frequency of maintenance workers being on-site compared to existing maintenance activities at B.F. Sisk Dam.

The construction work would be performed 24 hours per day, 7 days per week, 12 months per year, but work would not occur on certain holidays as required by federal law. The 24-hour workday would consist of two 10-hour work shifts, with a half hour for lunch each shift, plus a 3-hour maintenance period. Blasting operations at Basalt Hill would be limited to between 6:00 a.m. and 6:00 p.m. The overall duration of construction (daily, weekly and annually) evaluated in this EIR/SEIS would not extend beyond the period evaluated in the B.F. Sisk Dam SOD Modification Project EIS/EIR. Table below summarizes the construction action included under Alternative 1 and Alternative 3:

	Alternative 1[1]	**Alternative 3[2]**
Construction Schedule	8 to 12 years starting in 2021 ending in 2032; 24 hours per day	8 years starting in 2025 ending in 2032; 24 hours per day
Construction Workers	46 - day shift; 30 - night shift	Dam Raise Action: 130 - day shift; 87 - night shift SR 152 Modification: 130 - day shift; 20 - night shift
Daily Construction Deliveries	59	240

Notes:
[1] The No Project/No Action Alternative (Alternative 1) includes implementation of the B.F. Sisk Safety of Dams Modification Project
[2] Construction workers and deliveries identified for the Dam Raise Alternative (Alternative 3) are additive above the numbers reported for Alternative 1

Construction of State Route 152 Modification. Construction of the SR 152 modification would be completed within the construction window identified in the of the B.F. Sisk Dam SOD Modification Project EIS/EIR and the dam raise construction activities described above. SR 152 modification would include raising the embankment by 11 feet and slope protection of the East Overlook Parking Area located approximately half a mile southeast from the SR 152 site. The SR 152 modification construction is scheduled to last for 18–24 months, starting in summer 2027.

Construction of the SR 152 modification would be sequenced to occur in eight steps: (1) rough excavation and site grading; (2) mobilization and assembly of the barge system to move material from the borrow sites to the construction site and the conveyor system to move material from the San Luis Reservoir side to the Cottonwood Bay side; (3) stockpiling rip rap and fill material on San Luis Reservoir and Cottonwood Bay side; (4) placement of riprap on both sides slopes in wet; (5) placement of additional filter material and riprap on both side slopes in dry; (6) placement of backfill and riprap armor to raise the embankment height on the San Luis Reservoir side; (7) placement of backfill and riprap armor to raise embankment height on the Cottonwood Bay side; (8) construction of the new roadway pavement.

Construction of the steps 1 through 5 can occur without lane closures along SR 152. During construction of steps 6 through 8, traffic would be reduced to two-way traffic using two of the existing four lanes along SR 152. Traffic reductions from lane closure would occur for approximately 8–12 months during the scheduled period of construction.

Items in the staging areas would include trailers, equipment, and stockpiled materials. Construction staging would primarily occur along the embankment slopes and on the Cottonwood Bay side off SR 152. Construction on the Cottonwood Bay side of SR 152 would occur in the dry by dewatering a portion of the bay. Dewatering of the Cottonwood Bay would be facilitated by plugging the 24- and 66-inch existing submerged pipes and installing a cofferdam. An estimated 1.1 million cubic yard of fill materials for SR 152 embankment modification would be sourced from two on-site borrow sites—Basalt Hill and Borrow Area 6—and stockpiled on the embankment slopes and roadway. Stockpiling of materials could result in minor changes to drainage patterns during the period of construction. Large deliveries or waste material transports off-site per day could be expected, along with the transport and disposal of material to local landfills and the regular commuting of construction personnel. Approximately 87,000 cubic yards of waste is expected to be generated from removal of existing riprap and filter material at the site. Roadway pavement material would be sourced from a local asphalt plant.

Aside from areas dedicated to construction staging and transportation, all remaining available space along the embankment slopes would be needed for stockpiling materials. These areas around SR 152 would be used as a staging area for the full duration of construction. These areas would be returned to preconstruction condition after the project is completed. Equipment used to construct the alternative is included in table below:

27 Cranes	4 Pavers	9 Tractors/Loaders/Backhoes	18 Plate Compactors
8 Crawler Tractors	9 Rollers	9 Dump Truck	1 Rollers
8 Excavators	5 Rough Terrain Forklifts	2 Flatbed Truck	1 Pumps
4 Graders	5 Rubber Tired Loaders	7 Haul Truck	2 Welders
5 Off-Highway Trucks	1 Skid Steer Loaders	2 Concrete/Industrial Saws	7 Generators
9 Water Truck	16 Barges (8 aggregate, 4 conveyor, 4 crane)		

Recreational activities would be suspended for safety reasons for the full duration of construction schedule at Basalt Point. Recreational use for boating on the reservoir would be supported through the use of the boat launch at Dinosaur Point but would be limited to areas away from B.F. Sisk Dam and SR 152 for the full construction schedule.

Final design of the SR 152 embankment modifications will include the development of a construction schedule that times the completion work in the direct path of potential flood flows or on infrastructure specifically designed to direct flood flows to occur in periods of the year when rain is unlikely and reservoir levels are lower. In addition, the contractor would be required to develop a HASP as an environmental commitment that includes a response plan to flood forecasts that would require the suspension of construction activities and the movement of construction equipment to higher ground.

Construction is expected to last approximately 18–24 months from summer 2027. The construction duration is based on approximately 75–130 workers on-site. Work would be performed from 6:00 a.m. to 6:00 p.m., 7 days per week, 12 months per year. A smaller crew of 10–20 people would

be active at the site performing equipment maintenance, repair activities, crushing operations at Basalt Hill, and borrow operations in Borrow Area 6 from 6:00 p.m. to 6:00 a.m.

2.2.3.2 Operation of Dam Raise Alternative

SLDMWA and its member agencies, Reclamation, and DWR coordinated on the identification of several operational configurations of the Dam Raise Alternative. Those subalternatives have been further configured as "bookends" to capture the range of stakeholder-requested configurations and cover the high- and low-end of potential environmental effects. These effects include potential growth-inducing impacts from increases in municipal and industrial (M&I) water supply reliability and potential environmental impacts to aquatic resources in the Delta resulting from changes in water deliveries conveyed through the Delta.

CVP-Only Storage Subalternative. The additional storage in San Luis Reservoir would be Reclamation-owned CVP storage and would be operated consistent with current CVP operations. The new reservoir capacity would be used to store CVP Project water, carried-over water,[6] and non-Project water.[7] The maximum quantity of carried-over water would be the same as recent operations under the current rescheduling guidelines. Based on a review of historical rescheduling quantities and the most recent annual rescheduling guidelines (Reclamation 2020), an upper quantity of 180 TAF was used to estimate the aggregate total of rescheduled water in high-allocation water years. As an operational bookend, this upper limit was allocated 98% to agricultural and 2% to M&I South-of-Delta CVP water contractors.

Storage priority will follow current rescheduling guidelines with carried-over water and non-Project water being subject to spill consistent with current operating criteria.

CVP/SWP Split Storage Subalternative. The additional storage would be split between CVP and SWP consistent with the current 45% CVP and 55% SWP split of the overall reservoir storage The additional storage would follow current operating criteria and the storage priority will follow the current rescheduling guidelines.

Investor-Directed Storage Subalternative. Under this subalternative's four operational configurations, the use of the proposed storage (expanded capacity) would be primarily investor-directed. Remaining expanded capacity not in use by the investors, at any given time, would be available to Reclamation to store CVP Project water.

Investors could store allocated CVP, project water carried-over water, and non-Project water in the expanded storage. Investors could forgo delivery of their allocated CVP Project water for delivery in subsequent year(s). This unused CVP Project water would be carried over to subsequent year(s) and continue to be stored in San Luis Reservoir until investor requests delivery of the water without the

[6] Carried-over water refers to Rescheduled Water. Rescheduled Water is defined as allocated CVP water carried over to subsequent water year(s) by the water contractor pursuant to Reclamation's then-current Rescheduling Guidelines. The water contractors, in storing this carried-over supply in San Luis Reservoir, take on a risk of potentially losing it if San Luis Reservoir fills the next year and that supply is "spilled" (converted to CVP supplies for following year's allocation).

[7] Non-Project water includes transfer water acquired by existing South-of-Delta CVP contractors or other non-Project water currently stored in San Luis Reservoir such as conserved water. The water contractors can store non-Project water in San Luis Reservoir under a Warren Act Contract. Similar to carried-over water, the contractors take on a risk of potentially losing non-Project water if San Luis Reservoir fills the next year and that supply is "spilled" (converted to CVP supplies for following year's allocation).

risk of "spill". Carried-over water in the expanded capacity would be subject to evaporation at the same rate as CVP Project water stored in San Luis Reservoir. Investors would have first priority in storing carried-over water and non-Project water in the expanded storage without the risk of "spill."

Configuration A – The upper target quantity of carried-over water in San Luis Reservoir would be 180 TAF. The delivery of the carried-over water and CVP Project water was allocated proportionally among the SLDMWA investor group at 78% to agriculture, 7% to M&I, and 15% federal refuge water contractors.

Configuration B – The upper target quantity of carried-over water in San Luis Reservoir would be 180 TAF. The delivery of the carried-over water and CVP Project water was allocated proportionally among the SLDMWA investor group at 90% to M&I and 10% to agriculture water contractors.

Configuration C – The upper target quantity of carried over water in San Luis Reservoir would be 310 TAF. The delivery of the carried-over water and CVP Project water was allocated proportionally among the SLDMWA investor group at 78% to agriculture, 7% to M&I, and 15% federal refuge water contractors.

Configuration D – The upper target quantity of carried over water in San Luis Reservoir would be 310 TAF. The delivery of the carried-over water and CVP Project water was allocated proportionally among the SLDMWA investor group at 90% to M&I and 10% to agriculture water contractors.

2.3 Mitigation Measures Implemented Under the B.F. Sisk Dam SOD Modification Project

Several mitigation measures are included under the No Project/No Action Alternative that have been adopted as part of the approved B.F. Sisk Dam SOD Modification Project. Table 2-1 provides a summary of the mitigation measure and three environmental commitments under Alternative 1 and a summary of the measures and environmental commitments that will be carried forward under Alternative 3 (Proposed Action). Full mitigation measure and environmental commitment descriptions are provided in Section 4.15 and Appendix B.

Table 2-1. Mitigation Measures to Avoid Environmental Impacts Associated with B.F. Sisk Dam SOD Modification Project

Mitigation Measure	Summary	Measures Under Alternative 1 Carried Forward Under Alternative 3
AQ-1	Reduce emissions from off-road construction equipment by using Tier 4 construction equipment	Carried forward as AQ-1 (See Section 4.15 for full measure description)
AQ-2	Reduce exhaust emissions from on-road trucks	Carried forward as AQ-2 (see Section 4.15 for full measure description)
AQ-3	Implement best available mitigation measures for construction phase	

Mitigation Measure	Summary	Measures Under Alternative 1 Carried Forward Under Alternative 3
GHG-1	Require the purchase of carbon offsets prior to starting construction activities	Carried forward as GHG-2 (see Section 4.15 for full measure description)
VIS-1	Implement measures to reduce light and glare	
NOI-1	Develop a noise control plan (NCP) prior to the start of any construction activities to address increased noise levels	
NOI-2	Prepare a blasting plan	
NOI-3	Perform a preconstruction noise survey across the study area to establish background noise levels	
TR-1	Prepare a temporary traffic control plan	
HAZ-1	Coordinate with the California Department of Parks and Recreation (CDPR) and the Central Valley Regional Water Quality Control Board (RWQCB) to review existing monitoring data of the San Luis Reservoir State Recreation Area (SRA) Leaking Underground Storage Tank Cleanup Site	
HAZ-2	Include in construction contracts requirements to prepare the construction safety plan in coordination with seaplane base personal to coordinate construction activities	
HAZ-3	Notify the San Luis Seaplane Base administrator when a Notice to Airmen is required to be issued	
HAZ-4	Use of spark arrestors on all construction equipment	Carried forward as HAZ-1 (see Section 4.15 for full measure description)
TERR-1	Perform surveys of the study area for special status plant and special status natural communities	
TERR-2	Prior to construction, perform elderberry shrub and suitable elderberry habitat surveys	
TERR-3	Implement measures before and during construction for special status amphibians	
TERR-4	Conduct western pond turtle surveys within creeks and ponded areas affected by the project.	Carried forward as TERR-4 (see Section 4.15 for full measure description)
TERR-5	Conduct San Joaquin whipsnake surveys and relocation prior to construction activities	Carried forward as TERR-5 (see Section 4.15 for full measure description)
TERR-6	Conduct, using a qualified biologist, nesting bird surveys and supervise avoidance of nests during construction	Carried forward as TERR-6 (see Section 4.15 for full measure description)
TERR-7	Conduct surveys for active Swainson's hawk nests in and around all potential nest trees	Carried forward as TERR-7 (see Section 4.15 for full measure description)
TERR-8	Implement measures to address impacts on nesting eagles in the San Luis Reservoir vicinity	
TERR-9	Conduct burrowing owl surveys, prior to construction, in areas supporting potentially suitable habitat	Carried forward as TERR-9 (see Section 4.15 for full measure description)

Mitigation Measure	Summary	Measures Under Alternative 1 Carried Forward Under Alternative 3
TERR-10	Perform surveys for tricolored blackbirds in areas supporting potentially suitable habitat	
TERR-11	Perform preconstruction surveys for special status bat species and create no-disturbance buffers around active bat roosting sites	Carried forward as TERR-11 (see Section 4.15 for full measure description)
TERR-12	Implement measures to address impacts to the San Joaquin kit fox (SJKF)	
TERR-13	Implement measures to address impacts to the American badger	Carried forward as TERR-13 (see Section 4.15 for full measure description)
TERR-14	Implement measures to address impacts to vernal pool fairy shrimp and vernal pool tadpole shrimp	
TERR-15	Implement contractor environmental awareness training and site protection measures	Carried forward as TERR-15 (see Section 4.15 for full measure description)
TERR-16 (TERR-16a and TERR-16b)	Mitigation measures for special status communities, including jurisdictional wetlands or waters and streambeds and banks regulated by the California Department of Fish and Wildlife (CDFW), RWQCB, and United States Army Corps of Engineers (USACE), and native grassland	TERR-16b carried forward as TERR-16 4.15 for full measure description)
REC-1	Closure of Basalt Campground and other recreational facilities due to construction activities will be replaced at a 1:1 ratio. It will include six American with Disabilities Act (ADA) accessible campsites (with site amenities) and Recreational Vehicle (RV) accommodations. The boat launch at the San Luis Creek and Dinosaur Point use areas would be expanded by addition of a launch lane and a boarding float at each area. In addition, a fish cleaning station, public storage lockers, and shower facilities would be developed at San Luis Creek Use Area	
CR-1	Implement a formal agreement document to govern National Historic Preservation Act (NHPA) Section 106 compliance and resolve any adverse effects/significant impacts to cultural resources	
Environmental Commitment-Water Quality	Comply with the State General Permit and the specified best management practices (BMPs) within, including the preparation and implementation of a stormwater pollution prevention plan (SWPPP) and a rain event action plan	Carried forward as a water quality environmental commitment (see Appendix B for full commitment description)
Environmental Commitment-Air Quality	Implement dust control measures during the construction phase	
Environmental Commitment-Terrestrial Resources	Avoid and minimize the fill of wetlands and other waters and develop a wetland mitigation and monitoring plan and weed control plan. In addition, implement suitable measures to avoid impact nesting raptors.	

Source: Reclamation 2019

2.4 Environmentally Superior Alternative

CEQA Guidelines require an EIR to identify an environmentally superior alternative. However, the environmentally superior alternative does not need to be adopted as the preferred alternative for implementation. The identification of the preferred alternative is independent of the identification of the environmentally superior alternative, although the identification of both will be based on the information presented in this draft EIR/SEIS.

This draft EIR/SEIS provides a substantive portion of the environmental information for SLDMWA to determine the environmentally superior alternative. In this draft EIR/SEIS, SLDMWA has identified the subalternatives under Alternative 3 that provide additional refuge water supply benefits as the environmentally superior alternative. SLDMWA will consider feedback during the public review phase of the draft EIR/SEIS on the environmental benefits and impacts of each alternative when developing the final EIR/SEIS and ROD.

Reclamation has not yet identified an environmentally preferable alternative for the Project. Pursuant to 40 CFR 1505.2(b), Reclamation will decide on the environmentally preferable alternative based on analysis in the EIR/SEIS, consultation and coordination with interdisciplinary team members, and public input.

Chapter 3 Affected Environment / Environmental Setting

This chapter presents an overview of the affected environment for the draft EIR/SEIS. Table 3-7 and Appendix C present the federal, state, and local laws, regulations, policies, and plans that are relevant and applicable to the affected environment, study area, and analysis of impacts. The study area for this EIR/SEIS (Figure 3-1) includes San Luis Reservoir and its related water infrastructure; the Cities of Los Banos, Gustine, Gilroy, and Hollister, California; Merced, Santa Clara, and San Benito Counties, California; the Delta; and South-of-Delta CVP and SWP contractors' service areas. This baseline conditions presented in this chapter is the same baseline presented and evaluated in the B.F. Sisk Dam SOD Modification Project EIS/EIR (Reclamation 2019) [8]. This information remains a current and accurate representation of existing conditions. The environmental settings for regional and local and resources of broader geographic reach are detailed in this chapter.

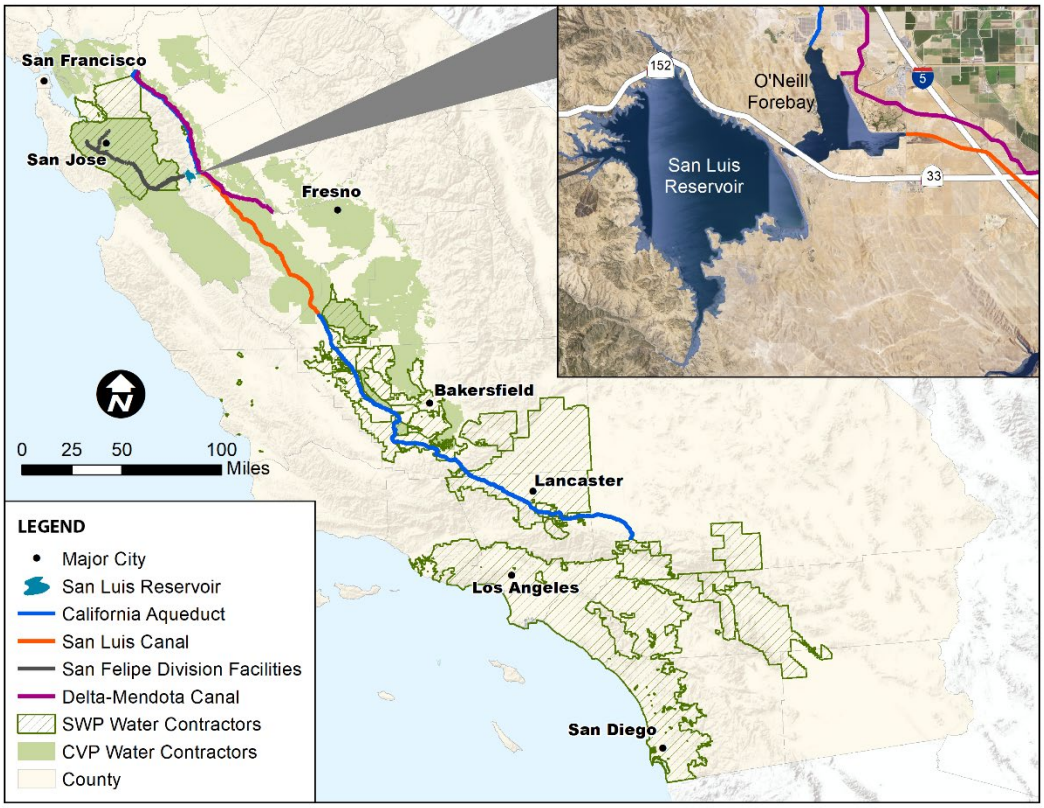


Figure 3-1. Project Study Area

[8] *B.F. Sisk Safety of Dams Modification Project Final Environmental Impact Statement and Environmental Impact Report* is available for review at https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281

3.1 San Luis Reservoir

San Luis Reservoir is an offstream storage reservoir in Merced County. Reclamation owns and jointly operates San Luis Reservoir with DWR to provide seasonal storage for CVP and SWP. San Luis Reservoir receives water from both the DMC and the California Aqueduct, which enables CVP and SWP operators to pump water into the reservoir during the wet season (October through March) and release water into the conveyance facilities during the dry season (April through September) when demands are higher. Deliveries from San Luis Reservoir also flow west, through the Pacheco Pumping Plant and Conduit, to the CVP's San Felipe Division. CVP contractors that receive water from San Luis Reservoir include the Delta, San Luis Unit of the West San Joaquin and San Felipe Divisions.,

San Luis Reservoir and the surrounding area tend to be windy and are characterized by wet, cool winters and warm, dry summers. During the summer months, when water levels are low (below 300 TAF), water quality in San Luis Reservoir deteriorates because of higher warmer temperatures, wind-induced nutrient mixing, and algal blooms near the reservoir surface. Historical algae count data collected at Pacheco Pumping Plant indicate greatest algae cell counts during mid- to late summer months, peaking in some years above 70,000 algae cell counts. Dissolved oxygen (DO) levels are often lowest in the late summer and fall following excessive algae growth. Nitrate levels drop beginning in late spring, as algae begins to form and depletes nitrate levels through late fall.

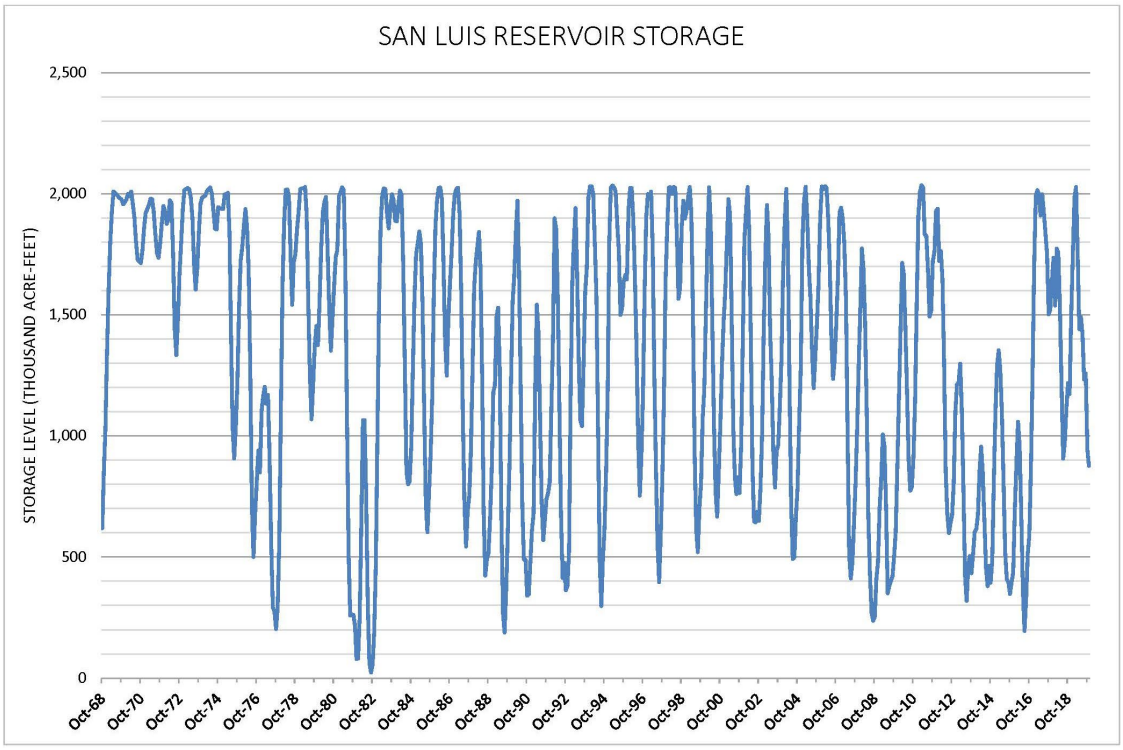
Figure 3-2 shows monthly storage in San Luis Reservoir from 1968 through 2019. Storage is highly variable throughout the year as the reservoir refills in the fall and winter months and releases water in spring and summer to meet CVP and SWP demands. In most years, the storage level in San Luis Reservoir has remained above 300 TAF. When storage levels drop below 300 TAF in storage, an elevation of 369 feet, known as "low point" conditions, algal blooms occurring during the summer can enter the lower intake of Pacheco Pumping Plant and deliveries of water supplies to the San Felipe Division contractors can be adversely affected. Deliveries to the San Felipe Division may be severely or completely interrupted when storage levels are drawn down such that there is insufficient hydraulic head to effectively operate Pacheco Pumping Plant. As Figure 3-2 shows, San Luis Reservoir was drawn down in 1981 and 1982 to a storage level of 79 TAF to facilitate repairs. During the drought periods of 1976 to 1977, 1988 to 1992, and 2007 to 2008, the reservoir was drawn down to below 300 TAF. San Luis Reservoir also fell below 300 TAF in summer 2016 (DWR California Data Exchange Center [CDEC] 2019).

In addition, San Luis Reservoir and O'Neill Forebay were designated in 2010 on the California 303(d) List for mercury impairment. Potential sources of the impairment are listed as unknown. Appendix D provides detailed information about constituents of concern listed in the Clean Water Act (CWA) and beneficial uses of California waters defined in the California Water Code. Appendix D also discusses water quality in the Delta and general water quality characteristics of reservoirs. Water quality samples are routinely collected through automated monitoring of O'Neill Forebay at Gianelli Pumping-Generating Plant. Electrical conductivity (EC), DO, and dissolved nitrate data from this sampling location are presented in Appendix D.

San Luis Reservoir is in the Panoche-San Luis Reservoir watershed, part of the San Joaquin River Basin. San Luis Reservoir is drained by San Luis Creek, a tributary to the San Joaquin River. Natural runoff is captured by canals, reservoirs, and pumping facilities and directed into a complex network

of water supply infrastructure for SWP and CVP beneficial uses (Reclamation and CDPR 2013). There is no current streamflow monitoring at any of these inlets into the reservoir.

Three pumping plants are utilized as part of the San Luis Reservoir: O'Neill Pumping-Generating Plant, Gianelli Pumping-Generating Plant, and Pacheco Pumping Plant. The O'Neill Pumping-Generating Plant is located on a channel that conveys water between DMC and the O'Neill Forebay (see Figure 1-1). This pumping-generating plant is owned by Reclamation. This plant generates power when water is released from the O'Neill Reservoir to DMC and serves as a pump to convey water from DMC to O'Neill Forebay.



Source: DWR CDEC 2019

Figure 3-2. Monthly Storage in San Luis Reservoir from 1968 to 2019

Gianelli Pumping-Generating Plant is located along the western boundary of the O'Neill Forebay at the San Luis Dam (see Figure 1-1). This pump-generating plant is owned by the Reclamation but is operated as a joint federal-state facility that is shared by the CVP and SWP. The plant generates energy when water is conveyed from San Luis Reservoir into O'Neill Forebay for continued conveyance to the DMC and San Luis Canal. The plant is operated in pumping mode when water is moved from O'Neill Forebay to San Luis Reservoir for storage until heavier water demands develop. The generated power is used to offset CVP and SWP pumping loads. The powerplant can generate up to 424 megawatts, with the CVP share of the total capacity being 202 megawatts. This facility is operated and maintained by DWR under an operation and maintenance agreement with Reclamation.

The San Luis Reservoir State Recreation Area (SRA) spans approximately 27,000 acres and includes major facilities such as the San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir and several other federal and state-owned lands and facilities (Reclamation and CDPR 2013). The San

Luis Reservoir SRA Resource Management Plan (RMP)/General Plan (GP) defines distinct geographic divisions, or management zones, within the SRA based on physical, social, and management characteristics (Reclamation and CDPR 2013). The management zones include the Administrative and Operations Zone (for staff, operations, and maintenance activities), Front Country Zone (for most visitor facilities, camping, and concessions), and Backcountry Zone (for less intensive recreation and with limited camping and trails).

The San Luis Reservoir SRA contains five use areas (areas designated as major public recreational facilities)—Basalt, Dinosaur Point, Los Banos Creek, Medeiros, and San Luis Creek—and one minor use area for off-highway vehicle use. Appendix L exhibits the different use areas within the SRA. Two additional areas are designated for wildlife; both allow for hunting and primitive hiking, along with nature study activities. The primary activities at each use area vary, but collectively, the San Luis Reservoir SRA provides opportunities for boating, swimming, windsurfing, camping, and fishing (Reclamation and CDPR 2013). Boating and other water sports such as jet skiing and windsurfing are allowed from sunrise to sunset on San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir (CDPR 2011). There are boat ramps at all five use areas; however, the boat ramp at the Medeiros Use Area is closed because of safety concerns (Reclamation and CDPR 2013). The San Luis Reservoir SRA also provides over 540 campsites for visitor use. The San Luis Reservoir SRA consists of two developed campgrounds at the Basalt and San Luis Creek Use Areas, and undeveloped campgrounds at the Medeiros and Los Banos Creek Use Areas.

Pacheco State Park lies directly west of the San Luis Reservoir SRA. The park is only partially open to the public for day-use recreation such as hiking and bicycling. The Pacheco State Park offers an approximately 25-mile-long trail system, including 15 designated trails. The remainder of the park is used for equestrian activities and cattle grazing and a wind turbine farm that generates clean energy for 3,500 homes. The only campground facilities available at Pacheco State Park consist of primitive horse campgrounds; however, tent camping is available for corporate events and is permitted upon request (CDPR 2020; CDPR 2006).

The area surrounding San Luis Reservoir is dominated by agricultural land uses and publicly owned parkland and wildlife areas, which are relatively quiet. Motorboats and vehicle traffic on SR 152 are the main source of noise near San Luis Reservoir. Motorboats are the main source of noise at O'Neill Forebay. Several campgrounds and day-use picnic areas, including San Luis Creek Use Area, are present along the shores of the reservoir and forebay and are near areas where construction activities would take place.

The residences nearest potential construction sites at San Luis Reservoir include a subdivision off SR 152 and a residence on Harper Lane. Figures G-1 and G-2 in Appendix G show these noise-sensitive land uses around San Luis Reservoir for the dam raise action and the SR 152 modifications. At these sensitive receptors, the estimated noise level is a day-night average level (L_{dn}) of 40 A-weighted decibels (dBA), based on the United States Environmental Protection Agency (EPA) *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA 1974).

Visual sensitivity and judgments of visual quality and viewer response depend on several conditions and tend to be subjective in nature. Overall, the area around San Luis Reservoir offers open, scenic vistas of undeveloped land and open water. These scenic qualities are enhanced by the surrounding undeveloped landscape consisting of "open grassland, expansive vistas of the rolling terrain and the

adjacent Diablo range" (Reclamation and CDPR 2013). San Luis Reservoir is considered to provide unusual, unique, or outstanding scenic quality, and O'Neill Forebay has elements that provide both unusual and unique quality and an ordinary or common scenic quality. Of the major viewer groups at the reservoir and reservoir facilities, recreationists at the reservoir have high visual sensitivity. SR 152 is a state-designated scenic highway within Merced County, from the Santa Clara County line to the junction with Interstate 5. Views from this route can be considered similar to San Luis SRA.

San Luis Reservoir and O'Neill Forebay are near the boundary of the Great Valley (San Joaquin Valley portion) and the Coast Ranges geomorphic provinces (California Geological Survey [CGS] 2002). As mapped by the county, the eastern portion of San Luis Reservoir (including O'Neill Forebay) is in a low-potential landslide zone, while the western portion of the reservoir is in a medium-potential landslide zone (Merced County 2013). Surface soil texture surrounding San Luis Reservoir is generally characterized as silt loam on the eastern portion and loam and sandy loam on the western portion (USDA Natural Resources Conservation Service [NRCS] 2019a). The silt loam soils have moderate erodibility, while the sandy loam soils have a high erodibility (USDA NRCS 2019b). Shrink-swell potential surrounding San Luis Reservoir can be characterized as low to moderate (USDA NRCS 2019c). Figures N-2 and N-3 in Appendix N show the arrangement of major soils and the shrink-swell potential in the area.

San Luis Reservoir is in a seismically active area and is close to several faults and fault systems. The Ortigalita fault passes under the reservoir in two locations: one along the western shore of the reservoir crossing over Lone Oak Bay to the east and one along Cottonwood Bay, close to the eastern shore of the reservoir on the eastern side of Basalt Hill (Reclamation and CDPR 2013; USGS 2020). The statewide map of aggregate availability shows the location of aggregate mines in Merced County; however, none are located near San Luis Reservoir. The general location of the mines is southwest of Los Banos on the east side of I-5 (Clinkenbeard and Gius 2018). The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (California DOC, DOGGR) identified one dry hole well near the eastern edge of O'Neill Forebay near the connection to the California Aqueduct. This well was abandoned in 1937 (California DOC, DOGGR 2010). There is one active mine near San Luis Reservoir and three mines located near the Los Banos SRA (California DOC, Office of Mine Reclamation 2016).

San Luis Reservoir is not located within 2 miles of a public or private land-based airport. The closest airport is Los Banos Municipal Airport located approximately 13 miles away. However, the San Luis Reservoir Seaplane Base, owned by CDPR, allows water landings of planes on the reservoir. Approximately 25 aircraft operations per year take place at the reservoir. No overnight mooring of seaplanes is allowed, and landing must be at least 500 feet from shore. Notices to Airmen are provided as needed from the seaplane base (Airport-Data 2017). The San Luis Reservoir SRA is surrounded by wildlands and the potential for a wildfire in this area does exist, which could affect neighboring urbanized areas of Santa Nella, California. Much of the area surrounding San Luis Reservoir SRA is designated within a moderate- or high-fire severity zone and is within the State Responsibility Area, which is protected by the California Department of Forestry and Fire Protection. The Merced County Fire Department provides primary response services to urban fires in unincorporated Merced County Local Responsibility Areas (Merced County 2013). The closest school to the San Luis Reservoir SRA is Romero Elementary School on West Luis Road in Santa Nella, approximately 1.5 miles east of O'Neill Forebay (Gustine Unified School District 2017).

One active hazardous materials site was discovered within the San Luis Reservoir SRA consisting of soil and groundwater contamination from a leaking underground storage tank (LUST) containing gasoline. The status of the site is open, and remediation of soil and groundwater occurred under the supervision of Merced County until September 2009. RWQCB has issued a request to the California Department of General Services to continue with monitoring and the installation of additional monitoring wells to assess the extent of soil and groundwater contamination still present (RWQCB 2016). Three open hazardous materials sites are near the San Luis Reservoir SRA. The Anderson's Pea Soup LUST cleanup site on SR 33 is contaminated with diesel and gasoline, and the Anderson's Pea Soup site is open with verification monitoring. Santa Nella Parcel 41, formerly known as Central Valley Pipelines, is located on Santa Nella Road. Santa Nella Parcel 41 is open and currently under remediation for crude oil contamination. The Forebay Chevron site is located on Gonzaga Road and is open, with a completed site assessment. Emergency evacuation routes within the study area include I-5, SR 33, and SR 152. See Appendix I for further description of existing conditions.

Figure H-1 in Appendix H shows the road network surrounding the proposed work sites near San Luis Reservoir. Table 3-1 provides the existing (2016) operating conditions of highway segments located near the project site. Table 3-2 summarizes the daily traffic along the three local access routes. At a junction, a highway segment is divided into an upstream section and a downstream section and will have two different annual average daily traffic volumes (AADT) values. To be conservative, the higher value was used for analysis.

Table 3-1. Existing Highway Operations – San Luis Reservoir Area

Highway	Junction	Jurisdiction	Lanes	Road Type	2016 AADT[1]	Highest LOS
I-5	SR 152	Merced County	4	Rural Freeway	32,000	B
US 101	SR 152 North Junction	Santa Clara County	6	Rural Freeway	110,000	D[2]
SR 152	SR 156 Junction	Santa Clara County	4	Rural Freeway	39,500	B[2]
SR 152	I-5	Merced County	4	Rural Freeway	30,700	B
SR 152	SR 33	Merced County	4	Rural Freeway	29,100	B
SR 33	I-5 West Junction	Merced County	2	Rural Non-Freeway Isolated Stops	14,200	F

[1] *Source: Caltrans 2017*; [2] *Source: Santa Clara County 2016*
AADT – annual average daily traffic volumes, LOS – level of service

Table 3-2. Existing Local Roadway Operations – San Luis Reservoir Area

Parameter	Fifield Road/ Dinosaur Point Road	Basalt Road
Road Type	Rural Non-Freeway Isolated Stops	Rural Non-Freeway Isolated Stops
Number of Lanes	2	2
Average Maximum Daily Trips	137	191
Level of Service	B	B

Source: Reclamation and CDPR 2013

Within Merced County, there are two active solid waste disposal-landfill facilities owned by Merced County and operated by the Merced County Association of Governments Regional Waste Management Authority. The Merced County Department of Public Works Solid Waste Division is under contract to operate the Highway 59 Landfill (HWY 59 Landfill), which serves the eastern end of the county, and the Billy Wright Landfill, which serves the western end of the county. The HWY 59 Landfill and the Billy Wright Landfill are defined as Class III landfills and accept mixed municipal solid waste. The HWY 59 Landfill also accepts green materials, wood waste, tires, and other hazardous materials, while the Billy Wright Landfill accepts construction/demolition waste (California Department of Resources, Recycling, and Recovery [CalRecycle] 2017a and 2017b). The HWY 59 Landfill is projected to have a remaining capacity of 28,025,334 cubic yards (CalRecycle 2017a). The Billy Wright Landfill has a remaining capacity of 11,370,000 cubic yards (CalRecycle 2017b).

3.2 Sacramento-San Joaquin River Delta

San Luis Reservoir provides offstream storage, with most water supplied to the reservoir by water conveyed through the Delta. Water quality in the Delta region is governed, in part, by Delta hydrodynamics, which are highly complex. The principal factors affecting Delta hydrodynamic conditions are (1) river inflows from the San Joaquin and Sacramento River systems, (2) daily tidal inflows and outflows through San Francisco Bay, and (3) pumping from the south Delta through the Harvey O. Banks Pumping Plant (Banks Pumping Plant), C.W. "Bill" Jones Pumping Plant (Jones Pumping Plant), and other smaller diversions throughout the Delta. Delta hydrodynamic conditions are primarily measured using the parameters of Sacramento and San Joaquin River flows, Delta outflow, Delta inflow, Old and Middle River flows, and Delta conveyance. The transition area between saline waters and fresh water, frequently referred to as the low salinity zone (LSZ),[9] is typically located within Suisun Bay. Western Delta changes in the location of the LSZ are commonly measured by the position of X2, which is controlled by parameters such as daily tidal flows, Delta inflow, and Delta conveyance. Aquatic organisms have different salinity tolerances and preferences, and as such, changes in the position of the LSZ and X2 are commonly used to characterize likely changes in species distribution and other ecological responses. The location of X2 is an indicator of the extent of saltwater intrusion into the Delta and thus is used to indicate changes to salinity concentrations within the Delta.

The existing water quality constituents of concern in the Delta can be categorized broadly as metals; pesticides; nutrient enrichment and associated eutrophication; constituents associated with suspended sediments; and turbidity, salinity, bromide, and organic carbon. The relative concentrations of these constituents over time is closely related to hydrodynamic conditions, including the position of X2. Other physical parameters, including pH and temperature, can interact with water quality constituents of concern to increase or decrease their effects on aquatic organisms and other beneficial uses.

3.2.1 South-of-Delta CVP Contractors and Facilities

Reclamation operates the CVP, which diverts water through the Delta via Jones Pumping Plant at the southern end of the Delta and lifts the water into the DMC. The SLDMWA operates and

[9] The LSZ often is referenced by X2, which is the distance upstream (in kilometers) from the Golden Gate Bridge, where tidally averaged salinity is equal to 2 parts per thousand. X2 primarily is determined by Delta outflow (Kimmerer 2004).

maintains the Jones Pumping Plant and the DMC under an operation and maintenance agreement with Reclamation. This canal delivers water to CVP contractors and exchange contractors on the San Joaquin River and to water rights contractors on the Mendota Pool. CVP water is conveyed to the O'Neill Forebay and San Luis Reservoir for deliveries to CVP contractors through the San Luis Canal. Water from San Luis Reservoir also is conveyed through the Pacheco Tunnel to CVP contractors in Santa Clara and San Benito Counties (Reclamation 2019a).

SLDMWA member agencies hold contracts for approximately 3 million acre-feet (MAF) of CVP water annually. Approximately 2.5 MAF of the water is used to irrigate 1.2 million acres of agricultural lands in the Central Valley and Santa Clara and San Benito Counties, while 150 to 250 TAF is used for M&I purposes and 250 to 300 TAF is used for environmental purposes, including wildlife habitat management in the San Joaquin Valley (SLDMWA 2020).

In the past, Reclamation has made significant cutbacks to water deliveries for many CVP contractors in periods of drought. In addition, State Water Board Decision 1641 and the Central Valley Project Improvement Act (CVPIA) have impacted CVP deliveries. Because of groundwater regulation under the Sustainable Groundwater Management Act in the SLDMWA service area, groundwater supplies are more limited than in the past. This has further reduced water supplies available and increased the need for additional surface supplies to SLDMWA agencies.

In 2014 and 2015, critical water years, South-of-Delta CVP allocations were 0% for agricultural contractors and 25%, or approximately 42 TAF, for M&I contractors (Reclamation 2020a). In 2019, a wet water year, South-of-Delta CVP allocations were revised to 75%, or approximately 1.5 MAF, for agricultural contractors and 100%, or approximately 138 TAF, for M&I contractors in June 2019 (Reclamation 2020a). Most recently, in February 2020, South-of-Delta CVP agricultural water service contractors received an initial allocation of 15% of contracted supplies, and South-of Delta M&I contractors initially received a 65% allocation (Reclamation 2020b). In May 2020, South-of-Delta CVP agricultural water service contractors' allocation was increased to 20% of contracted supplies, and South-of Delta M&I contractors' allocation was increased to 70% (Reclamation 2020b). In addition, Reclamation determined 2020 to be a Shasta noncritical year for exchange contractors and refuges (Reclamation 2020c). See Appendix E for more information on South-of-Delta CVP contractors and facilities.

3.2.2 South-of-Delta SWP Contractors and Facilities

DWR operates the SWP, which diverts water from the Delta through the Banks Pumping Plant into Bethany Reservoir. The California Aqueduct, which is 444 miles long, delivers water from Bethany Reservoir south to the Central Valley and Southern California and flows south for 60 miles to O'Neill Forebay at San Luis Reservoir (DWR 2018). At O'Neill Forebay, the California Aqueduct becomes the San Luis Canal, which is managed jointly by Reclamation and DWR and serves both CVP and SWP. The San Luis Canal is federally built and extends 103 miles from O'Neil Forebay southeast to just past Kettleman City, California (Reclamation 2019a). At this point, the canal becomes the California Aqueduct again, an SWP facility that delivers water over the Tehachapi Mountains to Southern California.

The SWP delivers water to 29 public water agencies in northern, central, and southern California that hold long-term contracts for surface water deliveries. The agencies deliver water for both urban use and agricultural use, representing over 25 million municipal water contractors and 750,000 acres

of irrigated farmland. Five of the agencies use SWP water primarily for agricultural use, and the remaining 24 use SWP water primarily for municipal use.

Water supplies for the agencies include SWP water, groundwater, local surface water, and for some agencies, other surface supplies. Some agencies have recycled or purified water sources and desalination. The agencies collectively have received deliveries ranging from approximately 1.4 MAF in dry water years to approximately 4 MAF in wet years.

Similar to South-of-Delta CVP deliveries, SWP water deliveries conveyed through the Delta and the corresponding South-of-Delta deliveries vary from year to year and have generally decreased over time. Implementation of the State Water Board Decision 1641, and CVPIA resulted in substantial changes in South-of-Delta SWP deliveries (DWR 2018). See Appendix E for more information on the South-of-Delta SWP contractors and facilities.

3.3 Air Quality and Greenhouse Gases

3.3.1 Air Quality

San Luis Reservoir is in Merced County, which is within the San Joaquin Valley Air Basin (SJVAB). The valley is bordered on the west by the Coast Range, on the east by the Sierra Nevada Mountains, and on the south by the Tehachapi Mountains. The region is highly susceptible to pollutant accumulation over time because of the mountains that surround the valley. Marine air flows toward the east through gaps in the Coast Range at the Golden Gate Strait and Carquinez Strait.

Low wind speeds contribute to high concentrations of air pollutants in the winter. During the summer, winds typically originate from the north end of the basin and flow in a south-southeast direction though the valley. These conditions contribute to persistent summer inversions that prevent the vertical dispersion of air pollutants. Summertime inversions occur when a layer of cool marine air is trapped below a mass of warmer air above.

The federal Clean Air Act requires states to classify air basins (or portions thereof) as either attainment or nonattainment with respect to criteria air pollutants, based on whether the National Ambient Air Quality Standards (NAAQS) have been achieved and to prepare air quality plans containing emission reduction strategies for those areas designated as nonattainment. Table 3-3 shows the attainment status for the SJVAB.

Table 3-3. Attainment Status for SJVAB (Merced County)

Pollutant	National Standards[1,2,3]	California Standards[1,2]
Ozone (O_3)	Nonattainment, extreme [4]	Nonattainment
Carbon monoxide (CO)	Attainment	Unclassified
Nitrogen dioxide (NO_2)	Attainment	Attainment
Sulfur dioxide (SO_2)	Attainment	Attainment
Inhalable Particulate Matter (PM_{10})	Maintenance	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment [5]	Nonattainment
Lead (Pb)	Attainment	Attainment

Source: California Air Resources Board (CARB) 2018; EPA 2020; 40 CFR 81.305.

[1] Nonattainment means that the area does not meet the ambient air quality standard for that pollutant.

[2] Attainment means that the area meets the ambient air quality standard for that pollutant.
[3] Maintenance means that the area has recently met the standard and must continue to provide EPA with information showing that it is maintaining the standard before the area can qualify for redesignation as attainment.
[4] The San Joaquin Valley, which includes Merced County, was designated as a nonattainment area for the 2015 O_3 NAAQS on August 3, 2018 (83 FR 25776).
[5] Classified as moderate nonattainment for the 2012 annual primary NAAQS and serious nonattainment for the 2006 24-hour NAAQS.

Sensitive receptors are locations where segments of the population susceptible to poor air quality, including children, elderly, and people with preexisting health problems, may reside or inhabit. Examples of sensitive receptors include residences, schools and school yards, parks and playgrounds, daycare centers, nursing homes, and medical facilities. Table 3-4 summarizes the closest sensitive receptors to the center of construction for the dam raise action and SR 152 modifications. Figures 1 and 2 in Appendix G1 show the sensitive receptor locations in relation to the project area.

Table 3-4. Air Quality and Noise Sensitive Receptors in the Study Area

Sensitive Receptors	Distance from Center of Construction (feet)
Dam Raise	
San Luis Creek Use Area	5,600
Subdivision off SR 152	8,250
Residence on Harper Lane	16,400
SR 152 Modification	
Romero Visitor Center	12,400
San Joaquin Valley National Cemetery	14,450
Residence on Dinosaur Point Road	25,300

Table 3-5 summarizes the health effects associated with criteria air pollutants. EPA set NAAQS and the local air districts set CEQA significance thresholds to reduce these health risks to acceptable levels. See Appendix F for more information on sensitive receptors in the study area.

Table 3-5. Criteria Pollutants and Their Effects on Health

Pollutant	Characteristics	Health Effects	Major Sources
O_3	Highly reactive photochemical pollutant created by the action of sunshine on O_3 precursors	• Cough and chest tightness pain upon taking a deep breath • Worsening of wheezing and other asthma symptoms • Reduced lung function • Increased hospitalizations for respiratory causes	Pollutants emitted from vehicles, factories, and other industrial sources; fossil fuels combustion; consumer products; and evaporation of paints
NO_2	Reactive, oxidizing gas formed during combustion	• Respiratory symptoms • Episodes of respiratory illness • Impaired lung function	High-temperature combustion processes, such as those occurring in trucks, cars, and power plants

Pollutant	Characteristics	Health Effects	Major Sources
SO_2	Colorless gas with pungent odor	• Wheezing, shortness of breath, and chest tightness • Pulmonary symptoms and disease • Decreased pulmonary function • Increased risk of mortality	Sulfur-containing fuel burned by locomotives, ships, and off-road diesel equipment, or industrial sources like petroleum refining and metal processing
CO	Highly toxic odorless, colorless gas; formed by the incomplete combustion of fuels	• Impairment of oxygen transport in the bloodstream • Aggravation of cardiovascular disease • Fatigue, headache, and dizziness	Carbon-containing fuels like gasoline or wood
PM_{10} and $PM_{2.5}$	Small particles measuring 10 microns or less are termed PM_{10} (fine particles less than 2.5 microns are termed $PM_{2.5}$); solid and liquid particles of dust, soot, aerosols, smoke, ash, and pollen and other matter that is small enough to remain suspended in the air for a long period	• Increased risk of hospitalization for lung and heart-related respiratory illness • Increased risk of premature deaths • Reduced lung function • Increased respiratory symptoms and illness	Burning fuels like gasoline, oil, and diesel or wood ($PM_{2.5}$) and windblown dust (PM_{10})
Pb	Soft resilient metal	• Impaired blood formation and nerve conduction • Fatigue, anxiety, short-term memory loss, depression, weakness in extremities, and learning disabilities in children • Cancer	Various industrial activities

3.3.2 Greenhouse Gas Emissions

Greenhouse gases (GHGs)—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons—are emitted from human activities and natural systems into the atmosphere and trap heat that would otherwise be released into space. Thermal radiation absorbed by GHGs is reradiated in all directions, including back toward the Earth's surface. This results in an increase of the Earth's surface temperatures above what they would be without the presence of GHGs, which are persistent and remain in the atmosphere for long periods. GHGs differ from criteria pollutants in that GHG emissions do not cause direct adverse human health effects. Rather, the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans.

Scientific research shows that global GHG emissions from human activities have grown since preindustrial times, with an increase of 78% between 1970 and 2010 (Intergovernmental Panel on Climate Change 2014). Atmospheric concentrations of carbon dioxide equivalent (CO_2e) reached 407.8 parts per million (ppm) in 2018, up from 405.5 ppm in 2017 and 403.3 ppm in 2016, far exceeding the natural range over the last 800,000 years as measured in ice core samples (World

Meteorological Organization 2019). Most anthropogenic CO_2 emissions are attributed to the burning of fossil fuels for electricity, heat, and transportation and land use changes such as deforestation (EPA 2019).

If left unchecked, by the end of the century CO_2 concentrations could reach levels three times higher than preindustrial times, leading to climate change that threatens public health, the economy, and the environment. Efforts are underway globally to both mitigate GHG emissions to reduce further climate change and to adapt to the unavoidable changes in climate that will result from past and future GHG emissions. However, recent studies show that global GHG emissions continue to rise (Melillo 2014).

3.4 Cultural Resources in Study Area

The cultural resources area of analysis is centered on the area of potential effect (APE) for the alternatives considered in this EIR/SEIS, or the area within which cultural resources may be directly or indirectly impacted by project activities. The Alternative 1 APE includes the total footprint for the B.F. Sisk Dam SOD Modification Project, which was examined by Reclamation and DWR in a 2019 EIS/EIR. It spans 3,914 acres and incorporates the B.F. Sisk Dam, Basalt Hill Borrow Area, Borrow Area 6, three construction staging areas, upstream and downstream stability berms or fill impact areas, expanded embankment areas, and haul roads. The Alternative 3 APE encompasses the reservoirs, conveyance systems, and distribution systems associated with CVP water supply allocations, including San Luis Reservoir. The Alternative 3 APE includes the total footprint for the San Luis Low Point Improvement Project (SLLPIP) Reservoir Expansion Alternative, which was analyzed by Reclamation and Valley Water in a 2019 draft EIS/EIR. It spans 5,022 acres and incorporates all areas within the Alternative 1 APE and the San Luis Reservoir shoreline and Cottonwood Bay shoreline and embankment. The area of analysis for Alternative 1 consists of a 0.25-mile buffer surrounding the APE; for Alternative 2, it encompasses the infrastructure and service areas associated with the CVP; and for Alternative 3 it consists of a 0.5-mile buffer surrounding the APE.

Federal laws, policies, and regulations applicable to the project include NEPA, NHPA, Native American Graves Protection and Repatriation Act (NAGPRA), and regulations published by the Advisory Council on Historic Preservation and the National Park Service. Relevant state laws, policies, and regulations include CEQA and California Office of Historic Preservation guidelines. Regional or local policies and regulations may be found in the affected county general plans. Laws, policies, and regulations are described in Appendix C.

Information on cultural resources within the area of analysis for each alternative was collected through archival and record searches, examination of current literature, analysis of buried cultural resource sensitivity, and cultural resource inventory surveys. This information is detailed in the nonconfidential draft cultural resources technical report (Pacific Legacy 2020) in Appendix M.

3.4.1 Cultural Context

Construction actions under Alternatives 1 and 3 are centered in the western Central Valley region, which was inhabited by Native Americans beginning at least 10,000 years ago. The Northern Valley Yokuts, the major native group that would have been encountered by early Euro-Americans, left behind a rich material culture evident in archaeological sites throughout the region. The Northern

Valley Yokuts were followed by Spanish, Mexican, and American explorers, missionaries, soldiers, and settlers who transformed the landscape. The prehistoric, ethnographic, and historic period cultural history of the region is discussed in Appendix M and provides context for the cultural resources discussed below.

3.4.2 Archival and Record Searches and Cultural Resource Inventory Surveys

Archival and record searches of known cultural resource locations and prior cultural resource studies were carried out at the Central California Information Center of the California Historical Resources Information System (CHRIS) for Alternatives 1 and 3 in 2012, 2016, and 2020. Pedestrian inventory surveys within the APE for Alternatives 1 and 3 were conducted between 2012 and 2020. Using a survey interval of no more than 12–15 meters, the APE for these alternatives was fully examined, and all previously recorded and newly discovered cultural resources were documented as appropriate. An architectural field survey and evaluation of the B.F. Sisk Dam and its associated features was conducted by JRP Historical Consulting, LLC (JRP) in 2018. Archival and record search and inventory survey results for the project alternatives are summarized below and are in Appendix M.

3.4.2.1 Alternative 1 – No Project/No Action Alternative

Archival and record searches revealed that 38 prior cultural resource studies have been carried out within the Alternative 1 area of analysis and that 29 of those studies overlapped the APE. Thirteen cultural resources have been recorded within the Alternative 1 area of analysis, including five resources within the APE. Resources within the APE included two prehistoric sites (CA-MER-14, CA-MER-437) and three historic period resources (CA-MER-451H, CA-MER-521H, B.F. Sisk Dam). Two have been evaluated for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR): (1) B.F. Sisk Dam/San Luis Reservoir Historic District, which was recommended eligible for listing in the NRHP and CRHR in 2018 (JRP 2018), and (2) CA-MER-521H, a historic period livestock watering locale that was determined not eligible for listing in the NRHP with concurrence from the State Historic Preservation Officer (SHPO) (Polanco 2018).

The Alternative 1 APE spans 3,914 acres and encompasses construction impact and staging areas, upstream and downstream stability berms or fill impact areas, expanded embankment areas, and haul roads. Approximately 3,443 acres were subject to an intensive pedestrian inventory survey, while 471 acres could not be examined because of inundation or unsafe terrain. Wave action and recreational activities visibly impacted much of the potential construction staging area just west of the dam. Other areas, such as the potential construction staging area east of the dam and the Basalt Hill Borrow Area, had been disturbed by prior dam and facility construction activities.

During inventory surveys conducted between 2012 and 2020, two of the five cultural resources previously recorded within the Alternative 1 APE were found to be destroyed or noncultural. One was originally recorded within the footprint of the B.F. Sisk Dam and was presumed destroyed (CA-MER-14), while another was found to be a natural feature (CA-MER-437). Three known resources that were relocated included the remnants of a historic period ranch complex (CA-MER-451H), the historic period livestock watering locale noted above (CA-MER-521H), and key elements of the B.F. Sisk Dam/San Luis Reservoir Historic District. Thirteen historic period archaeological sites or built environment resources and six isolated finds were newly recorded during the inventory surveys. The historic period archaeological sites or built environment resources included six road segments (CA-MER-491H, CA-MER-493H, CA-MER-494H, CA-MER-495H, CA-MER-513H, PL-Sisk-01); the

Basalt Hill Quarry (CA-MER-509H), which was used during dam construction; an industrial resource used for riprap separation (CA-MER-492H) that was connected via conveyer belt to the Basalt Hill Quarry; a concrete equipment pad (CA-MER-510H); a corral and water tank (CA-MER-511H); a helicopter pad located near the dam (CA-MER-512H); a ditch segment (CA-MER-514H); and a series of survey markers and monitoring wells associated with dam maintenance and construction (CA-MER-520H). A historic period well head (P-24-002166), metal can (P-24-002167), and concrete foundation (P-24-002172) were recorded as isolated finds, along with one isolated prehistoric core (P-24-001990), one biface fragment (P-24-001991), and one displaced cupule boulder (PL-Sisk-02).

Roughly 3,120 acres within the Alternative 1 APE were examined prior to the release of the 2019 final EIS/EIR for the B.F. Sisk Dam SOD Modification Project, while 323 acres were subject to an inventory survey in 2020 in support of the current project. The historic period ranch complex (CA-MER-451H), historic period road and conveyor belt alignment associated with the Basalt Hill Quarry (CA-MER-509H), historic period road (PL-Sisk-01), and an isolated prehistoric cupule boulder (PL-Sisk-02) were recorded in 2020 and were not included in the inventory of cultural resources presented in the 2019 final EIS/EIR for the B.F. Sisk Dam SOD Modification Project. As of April 2020, all traversable areas within the Alternative 1 APE have been subject to pedestrian inventory survey.

3.4.2.2 Alternative 2 – Non-Structural Alternative

Alternative 2 would rely on operational measures to meet project objectives, specifically changes in current CVP water supply allocations. Up to 310 TAF of stored CVP supply would be reserved in San Luis Reservoir at the end of wetter years and then allocated in subsequent drier years to South-of-Delta CVP contractors. Modeling results for Alternative 2 indicate that these changes in water allocation would result in reservoir elevations similar to those under normal operations and are not expected to newly inundate or expose cultural resources or result in increased erosion to cultural resources along the reservoir's margins (see Appendix D). Because the alternative involves no physical impacts to cultural resources, no archival and records searches or pedestrian inventory surveys were carried out within the Alternative 2 APE. Instead, cultural resources associated with the APE were considered on a programmatic level only using archival and current literature pertinent to the San Luis Reservoir vicinity and CVP service areas.

3.4.2.3 Alternative 3 – B.F. Sisk Dam Raise Alternative

Archival and record searches revealed that 52 prior cultural resource studies have been carried out within the Alternative 3 area of analysis and that 33 of those studies overlapped the APE. Fifty-one cultural resources were previously recorded within the Alternative 3 area of analysis, including 19 within the APE. Fifteen of those 19 resources are prehistoric archaeological sites (CA-MER-14, CA-MER-15, CA-MER-20, CA-MER-21, CA-MER-22, CA-MER-23, CA-MER-27, CA-MER-28, CA-MER-29, CA-MER-41, CA-MER-82, CA-MER-130, CA-MER-136, CA-MER-137, CA-MER-437), one is a prehistoric archaeological district (P-24-000489/San Luis Gonzaga Archaeological District), and three are historic period resources (CA-MER-451H, CA-MER-521H, B.F. Sisk Dam). Two of the previously recorded prehistoric sites (CA-MER-130, CA-MER-136) and the prehistoric district (P-24-000489/San Luis Gonzaga Archaeological District) are listed in the NRHP and CRHR. B.F. Sisk Dam/San Luis Reservoir Historic District was recommended eligible for listing in the NRHP and CRHR (JRP 2018), and CA-MER-521H was determined not eligible for listing in the NRHP.

The Alternative 3 APE spans 5,022 acres and includes all areas encompassed by Alternative 1 and SR 152 modification areas, Pacheco Pumping Plant berm raise area, Dinosaur Point and Goosehead Point Boat Launches, and expanded shorelines of San Luis Reservoir and Cottonwood Bay where they would be newly inundated under the alternative. Approximately 4,454 acres were subject to an intensive pedestrian inventory survey between 2012 and 2020, while 568 acres could not be examined because of inundation or unsafe terrain. Erosion and agricultural activities have impacted much of the Cottonwood Bay shoreline, while most of the San Luis Reservoir shoreline has been affected by wave action and recreational activity. Areas closer to the dam encompassed by Alternatives 1 and 3 have been disturbed by dam and facility construction and maintenance.

Ten of the 19 resources previously recorded in the Alternative 3 APE were not relocated. These included seven prehistoric archaeological sites originally noted along the San Luis Reservoir shoreline (CA-MER-20, CA-MER-21, CA-MER-22, CA-MER-23, CA-MER-27, CA-MER-29, CA-MER-41) that may have been misplotted when originally recorded, destroyed or obscured by natural processes, or subject to modern disturbance; one prehistoric site (CA-MER-14) presumed destroyed by dam construction; one that was found to be a natural feature (CA-MER-437); and one arbitrarily defined prehistoric district (P-24-000489/San Luis Gonzaga Archaeological District) with no physical markers in the APE. Eleven previously recorded cultural resources were relocated within the APE during inventory surveys, including seven prehistoric sites (CA-MER-15, CA-MER-28, CA-MER-82, CA-MER-83, CA-MER-130, CA-MER-136, CA-MER-137), most with midden, lithics, and groundstone; one historic period water tank and trough (CA-MER-521H); one historic period ranch complex (CA-MER-451H); one historic period road (CA-MER-477H); and key features of the B.F. Sisk Dam/San Luis Reservoir Historic District. Two of these known resources (CA-MER-83 and CA-MER-477H) were originally plotted outside of the APE but were noted within it during inventory surveys.

Thirty-two resources were first documented in the Alternative 3 APE during inventory surveys conducted between 2012 and 2020. These included a series of historic period transmission poles with debris scatter (CA-MER-484H); two industrial sites (CA-MER-492H, CA-MER-509H) associated with construction of the B.F. Sisk Dam; eight historic period road segments (CA-MER-489H, CA-MER-491H, CA-MER-493H, CA-MER-494H, CA-MER-495H, CA-MER-513H, CA-MER-519H, PL-Sisk-01); a concrete equipment pad (CA-MER-510H); a corral and water tank (CA-MER-511H); a helicopter pad (CA-MER-512H); a ditch segment (CA-MER-514H); three earthen dams with impound ponds (CA-MER-515H, CA-MER-516H, CA-MER-518H); two prehistoric middens, one with lithics and groundstone (CA-MER-517) and the other with fire-affected rock (PL-Sisk-05); a series of survey markers and monitoring wells (CA-MER-520H) associated with the B.F. Sisk Dam; and the Cottonwood embankment (PL-Sisk-04), which is a feature of San Luis Reservoir and wider B.F. Sisk Dam/San Luis Reservoir Historic District. A historic period well head (P-24-002166), metal can (P-24-002167), concrete foundation (P-24-002172), two watering troughs (P-24-002169 and P-24-002170), and a bottle (P-24-002171) were recorded as isolated finds, along with one isolated prehistoric core (P-24-001990), one biface fragment (P-24-001991), one cobble and flake (P-24-002168), and one displaced cupule boulder (PL-Sisk-02).

Roughly 4,099 acres within the Alternative 3 APE were examined ahead of the 2019 draft SLLPIP EIS/EIR (Reclamation and Valley Water 2019), while 355 acres were subject to an inventory survey in 2020 for the current project. A historic period road and conveyor belt alignment associated with the Basalt Hill Quarry (CA-MER-509H), an embankment (PL-Sisk-04) associated with Cottonwood Bay and the B.F. Sisk Dam/San Luis Reservoir Historic District, a historic period ranch complex

(CA-MER-451H), a prehistoric midden site (PL-Sisk-05), a historic period road (PL-Sisk-01), and an isolated prehistoric cupule boulder (PL-Sisk-02) were recorded in 2020 and were not included in an inventory of cultural resources presented in the 2019 SLLPIP draft EIS/EIR. As of April 2020, all traversable areas within the Alternative 3 APE have been subject to pedestrian inventory surveys (see Appendix M).

3.4.3 Tribal Cultural Resources

No Native American resources were identified by the Native American Heritage Commission through searches of the Sacred Lands Inventory as it encompasses the APE for Alternatives 1 and 3. No tribal cultural resources, as defined under Public Resources Code (PRC) Section 21074, have been reported within the APE for Alternatives 1 and 3. SLDMWA is pursuing formal consultation with Native American tribes consistent with Assembly Bill 52 (Chapter 532, Statutes of 2014). Reclamation cultural resources staff will conduct tribal consultation under NHPA Section 106 as part of the project.

3.5 Paleontological Resources in Study Area

Paleontological resources include fossilized remains and the geologic context in which they occur, providing information about the history of life on earth (City of San Jose 2011). Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined using a qualitative measurement of fossil data, including rock type, history of the geologic unit in producing significant fossils, and fossil localities that are recorded from that geologic unit. In areas of high sensitivity, full-time monitoring by a professionally trained paleontologist is recommended during any type of ground disturbance (City and County of San Francisco 2005).

The western side shoreline of San Luis Reservoir lies within the Franciscan Formation, from the Jurassic or Cretaceous Period 80–200 million years ago (Reclamation and CDPR 2013). This formation consists of a thick assemblage of sedimentary, igneous, and metamorphic rocks and has been ranked at low sensitivity because of the general lack of recorded vertebrate fossils (City and County of San Francisco 2005). The Panoche Formation makes up most of the eastern shore of San Luis Reservoir, from the late Cretaceous Period about 65 million years ago (Reclamation and CDPR 2013). The Panoche Formation consists of shale and thinly bedded sandstone approximately 25,000 feet thick and has been ranked as moderately sensitive because of the discovery of noteworthy invertebrate marine fossils (California High Speed Rail Authority and United States Department of Transportation Federal Railroad Administration 2004).

3.6 Fisheries Resources in Study Area

The area of analysis for fisheries resources includes the area around San Luis Reservoir that is federally owned and leased to the CDPR. San Luis Reservoir is a large and intensively managed reservoir that contains warm water fishes. San Luis Reservoir is an artificial environment and does not support a naturally evolved aquatic community. Although a few native species may be present, most fish species in the reservoir have either been directly introduced or transported into the reservoir via the California Aqueduct, and DMC.

The Delta region includes the Delta, which comprises channels of the Sacramento and San Joaquin Rivers, including from about the I-Street Bridge in Sacramento on the Sacramento River and Vernalis on the San Joaquin River, west to Martinez, including Suisun Bay and the Suisun Marsh. The Delta is tidally influenced and is the diversion point for CVP and SWP. The Delta comprises tidal river channels and sloughs and many constructed features. More than 120 fish species rely on the Delta and San Francisco Bay as important areas to complete one or more life stages. Channels and sloughs of the Delta and Suisun Bay provide important migration and rearing habitats for anadromous salmonids, delta smelt, longfin smelt, and splittail.

There are state and federal listed species and critical habitats within the study area. See Appendix J1 for details on special status fish species present in San Luis Reservoir and the Delta region.

3.7 Terrestrial Resources in Study Area

3.7.1 Natural Communities

Dominant natural communities were examined within the terrestrial area of analysis, which includes areas on the edge of San Luis Reservoir that would be inundated by the 10-foot increase in water crest level; within the footprint for construction improvements at Dinosaur Point, SR 152 at Cottonwood Bay; and at B.F. Sisk Dam. Such communities include valley foothill riparian, coast live oak woodland, chaparral/scrub, annual grassland, purple needlegrass grassland, freshwater emergent wetland, seasonal wetland, agricultural, and urban/disturbed (Table 1) (Reclamation and CDPR 2013; Reclamation 2018; Environmental Science Associates [ESA] 2018; ESA 2020) (see Figure 9-1 in Appendix K1 [ESA 2018 Biological Survey Report] and Figure 3-1 in Appendix K2 [ESA 2020 Biological Survey Report]). See Appendices K-1 and K-2 for a description of common natural communities, sensitive natural communities, and wildlife in the area of analysis.

Table 3-6. Habitats in the Project Area (Acres)

Habitat Type	Alternative 1 Project Area	Alternative 3 Project Area	Alternative 1 + 3 Project Area
Fresh Emergent Wetland	24	1.0	25
Seasonal Wetland/Seep	17	0.0	17
Intermittent/Ephemeral drainage	5	4.0	9
Lacustrine (Reservoir)	523	13	536
Purple Needlegrass Grassland	2	4.0	6
Annual Grassland	2,559	337	2,896
Scrub/Chaparral	189	4	193
Valley Foothill Riparian	34	0.4	34
Blue Oak Woodland	0	55	55
Urban	610	26	636
Total	3,963	444	4,407

3.7.1.1 Common Natural Communities

Common natural communities in the study area include annual grassland, chaparral/scrub, and disturbed areas. Annual grassland is the dominant natural community in the San Luis Reservoir area.

It is dominated by introduced grasses and forbs, with occasional patches of native grasses. Chaparral/scrub communities occur in small patches, principally west of San Luis Reservoir.

3.7.1.2 Sensitive Natural Communities

Sensitive natural communities in the area of analysis include oak woodland, valley foothill riparian, freshwater emergent wetland, and seasonal wetlands. Oak woodlands occur within the area around San Luis Reservoir but not within the vicinity of the dam where construction activities would occur. Patches of valley foothill riparian habitat were noted in major draws on the margin of San Luis Reservoir. Freshwater emergent wetland occurs along drainages, at several small seeps, and within the few ponds around San Luis Reservoir. Seasonal wetlands occur within grasslands near San Luis Reservoir, including short-lived pools that may pond water long enough to support listed crustaceans.

3.7.1.3 Wildlife

The annual grassland, oak woodland, chaparral/scrub, lacustrine areas (open water), and wetlands support a variety of common wildlife species. Grassland and woodland habitats and lacustrine habitat support many species of migratory birds and raptors. A variety of amphibians, reptiles, birds, and mammals also inhabit grassland and woodland and scrub habitats that provide cover for these types of wildlife. Riparian woodlands, though less common, support numerous common wildlife species, including amphibians and nesting migratory birds (Appendices K-1 and K-2).

3.7.2 Special Status Species

Special status species are protected pursuant to federal or state endangered species laws or have been designated as species of concern by the CDFW. CEQA Guidelines Section 15380(b) defines rare, endangered, or threatened species that are not included in any listing, and species recognized under these terms are collectively referred to as "special status species." Appendices K-1 and K-2 describe the database searches and surveys conducted to determine which special status species have potential to occur in the area of analysis and the findings of biological surveys in 2018 and 2020.

3.7.2.1 Invertebrates

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) has potential to occur near San Luis Reservoir. Biological surveys identified at least 35 elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs, which are the beetle's host plant. These shrubs occur within an 0.87-acre area that is primarily south of the reservoir outside of the project footprint (see Figure 3-1 in Appendix K1) (ESA 2018). Valley elderberry longhorn beetle was observed in 1987, about 6 miles from the reservoir (CDFW 2020). Small areas of suitable habitat for vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardi*) were found within grassland below B.F. Sisk Dam (ESA 2018), and species presence is presumed within these features. However, these aquatic features would be avoided by the project and are outside of the inundation area

3.7.2.2 Amphibians and Reptiles

For California tiger salamander (*Ambystoma californiense*), there are three California Natural Diversity Database (CNDDB) records over 2.5 and 4 miles from San Luis Reservoir. Critical habitat is designated for California tiger salamander approximately 1 mile southeast of San Luis Reservoir and approximately 2.5 miles from Basalt Hill (see Figure 3-10 in Appendix K2) (USFWS 2018). Suitable habitat is present in grasslands surrounding the reservoir.

There are several CNDDB occurrences documented for California red-legged frog (CRLF) (*Rana draytonii*) located generally west of San Luis Reservoir. Critical habitat is designated west of the western boundary of San Luis Reservoir (see Figure 3-10 in Appendix K2). In addition, ESA (2018) identified a CRLF breeding population at the Willow Spring pond, approximately 0.3 miles south of San Luis Reservoir (see Figure 5-1 in Appendix K1); though within the project site, this location is on the fringe of the designated borrow area—Basalt Hill. CRLF intermittently use San Luis Creek on the southwestern portion of the reservoir during drawdown conditions (ESA 2020), with populations identified or suspected in several ponds just outside of the area of analysis.

Numerous aquatic features were identified via aerial imagery within 1 mile of San Luis Reservoir. While access was limited, several of these were verified as breeding ponds or as providing breeding potential (see Figure 3-9 in Appendix K2).

Based upon the field review of San Luis Creek, foothill yellow-legged frog (*Rana boylii*) is considered unlikely in the area of analysis. San Joaquin whipsnake (*Masticophis flagellum ruddocki*) has potential to occur in grasslands in the area of analysis. Other California species of special concern identified in Appendices K-1 and K-2 have the potential to occur in the study area.

3.7.2.3 Birds

Foraging habitat for numerous birds occurs in the area of analysis, which includes terrestrial areas and San Luis Reservoir. Such species include bald eagle (*Haliaeetus leucocephalus*), California condor (*Gymnogyps californianus*), golden eagle (*Aquila chrysaetos*), Swainson's hawk (*Buteo swainsoni*), American white pelican (*Pelecanus americanus*), and common raven (*Corvus corax*), among many others (see Appendix K2, Attachment D). Breeding and foraging habitat for tricolored blackbird (*Agelaius tricolor*) and white-tailed kite (*Elanus leucrus*) have potential to occur in the area of analysis. The California species of special concern identified in Appendices K1 and K2 may have potential to occur in the study area.

3.7.2.4 Mammals

The endangered San Joaquin kit fox (SJKF) (*Vulpes macrotis mutica*) and the California species of special concern, American badger (*Taxidea taxus*), have potential to occur in the area of analysis. Three observations of SJKF were made in 2005 between San Luis Reservoir and Los Banos Creek Reservoir. A habitat evaluation for SJKF in 2010 found one known den (based on tracks) and 194 potential SJKF dens within the B.F. Sisk Dam SOD Modification Project boundary, which is similar to the current area of analysis (Reclamation 2010). The most recent kit fox detections within a 5-mile radius are from 2018 at the Wright Solar Park, approximately 3.7 miles southeast of the project (USFWS 2019). Badgers are known to occur in grasslands surrounding San Luis Reservoir, including within the study area (ESA 2018). The mountain lion (*Puma concolor*) became a state candidate species in April 2020 and may use portions of the project area as foraging and dispersal habitat. Although not a special status species, tule elk (*Cervus canadensis nannodes*) occur throughout the study area, mostly in association with grassland habitat (ESA 2018, 2020).

3.7.2.5 Plants

The B.F. Sisk Dam SOD Modification Project EIS/EIR (Reclamation 2019) identified 32 special status plant species with at least a moderate potential to occur within the dam construction area (Reclamation 2019). Reconnaissance-level botanical surveys by ESA (2020) considered that five of these species have moderate or greater potential to occur within the project area. The species are described and assessed for occurrence potential in the B.F. Sisk Dam SOD Modification Project

EIS/EIR (Reclamation 2019) and in Section 3.3.1, "Special Status Plants" in Appendices K-1 and K-2. Rare plant surveys have not been conducted within the area of analysis; thus, potential to occur is based on analysis of habitat suitability, range, and database occurrences. Rare plant surveys will be conducted to characterize botanical resources in the project area.

3.8 Regulatory Setting

Table 3-7 lists the federal, state, regional, and local laws, regulations, policies, and plans that are relevant and applicable to the affected environment, area of analysis, and analysis of impacts. The alternatives would not have any inconsistencies with applicable local and regional plans.

Table 3-7. Federal, State, and Local Laws, Regulations, and Plans

Laws, Regulations, and Plans	Applicable Resources	Full Description
Federal		
Advisory Council on Historic Preservation Section 106 Consultation	Cultural	C.1.1
Bald and Golden Eagle Protection Act	Terrestrial	C.1.2
Central Valley Project Improvement Act	Water Supply	C.1.3
Clean Air Act	Air Quality	C.1.4
Clean Water Act	Water Quality; Fisheries; Terrestrial	C.1.5
Earthquake Hazard Reduction Act of 1977	Geology, Seismicity, and Soils	C.1.6
Executive Order (EO) 11990, Protection of Wetlands	Water Quality; Terrestrial	C.1.7
EO 13783, Promoting Energy Independence and Economic Growth	GHG	C.1.8
Endangered Species Act	Water Supply; Fisheries; Terrestrial	C.1.9
Fish and Wildlife Coordination Act	Fisheries; Terrestrial; Recreation	C.1.10
Magnuson-Stevens Fishery Conservation and Management Act	Fisheries	C.1.11
Migratory Bird Treaty Act	Terrestrial	C.1.12
National Historic Preservation Act	Cultural	C.1.13
Principles and Requirements for Federal Investments in Water Resources	GHG	C.1.14
Resource Conservation and Recovery Act	Hazards and Hazardous Materials	C.1.15
San Luis Act (Public Law 86-488)	All	C.1.16
Safe Drinking Water Act	Water Quality	C.1.17
US DOI, Reclamation NEPA Handbook	GHG	C.1.18
US DOI, Reclamation Safety of Dams Act	Hazards and Hazardous Materials	C.1.19
US DOI, Climate Change Adaptation Plan	GHG	C.1.20
US DOI Plan for a Coordinated, Science-based Response to Climate Change Impacts on Our Land, Water, and Wildlife Resources	GHG	C.1.21
US DOI Secretarial Order No. 3360	GHG	C.1.23
Water Project Recreation Act	Recreation	C.1.24
State		
Alquist-Priolo Earthquake Fault Zoning Act	Geology, Seismicity, and Soils	C.2.1
California Building Code	Geology, Seismicity, and Soils; Noise and Vibration	C.2.2
California Clean Air Act	Air Quality	C.2.3

Laws, Regulations, and Plans	Applicable Resources	Full Description
CDFW Species Designations	Fisheries	C.2.4
California Department of Transportation Guide for the Preparation of Traffic Impact Studies	Traffic and Transportation	C.2.5
DWR Division of Safety of Dams	Hazards and Hazardous Materials	C.2.6
DWR Non-Project Water Acceptance Criteria	Water Quality	C.2.7
California Endangered Species Act	Fisheries; Terrestrial	C.2.8
Cal EPA Unified Program	Hazards and Hazardous Materials	C.2.9
CEQA Guidelines	GHG	C.2.10
California EO S-3-05	GHG	C.2.11
California EO B-30-15 and Senate Bill 32	GHG	C.2.12
California Fish and Game Code Section 1600, Streambed Alterations	Terrestrial	C.2.13
California Fish and Game Code Sections 3500-3705, Migratory Bird Protection	Terrestrial	C.2.14
California Global Warming Solutions Act of 2006 (AB 32)	GHG	C.2.15
California Natural Resources Agency	Cultural	C.2.16
California Occupational Safety and Health Administration Standards	Hazards and Hazardous Materials	C.2.17
California Office of Historic Preservation	Cultural	C.2.18
California Porter-Cologne Water Quality Control Act	Water Quality	C.2.19
California State Parks Guidelines	Recreation	C.2.20
California Water Code Section 13240, Regional Water Quality Control Plan	Water Quality	C.2.21
California Water Code, Water Rights	Water Supply	C.2.22
Hazardous Waste Control Act	Hazards and Hazardous Materials	C.2.23
Pacheco State Park General Plan	Recreation	C.2.24
Noise Element Guidelines	Noise and Vibration	C.2.25
San Luis Reservoir State Recreation Area Resource Management Plan/ General Plan	Recreation	C.2.26
Seismic Hazards Mapping Act	Geology, Seismicity, and Soils	C.2.27
State Scenic Highways	Visual	C.2.28
State Water Resources Control Board and the California Department of Toxic Substances Control Hazardous Waste Management	Hazards and Hazardous Materials	C.2.29
Surface Mining and Reclamation Act of 1975	Geology, Seismicity, and Soils	C.2.30
Local/ Regional		
Guide to Building Permits and Inspections in Merced County (Unincorporated Areas)	Noise and Vibration	C.3.1
Merced County Code	Noise and Vibration	C.3.2
Merced County General Plan	Water Quality; Geology, Seismicity, and Soils; Visual; Noise and Vibration; Fisheries; Terrestrial; Recreation; Cultural	C.3.3
Merced County Office of Environmental Services	Hazards and Hazardous Materials	C.3.4
SJVAPCD Air Quality Management Plans	Air Quality	C.3.5
SJVAPCD Programs	Air Quality	C.3.6
Santa Clara County General Plan	Recreation	C.3.7

Chapter 4 Environmental Consequences/ Environmental Impacts

This chapter presents the analysis of impacts associated with implementation of each alternative. The subsection begins with an explanation of the assessment method(s) used to identify and address potential impacts and then presents the basis and criteria for determining whether the potential impacts are significant (under CEQA) and whether mitigation of the impact is warranted. Impacts are determined relative to the baseline of existing conditions (for CEQA) and the No Action Alternative (for NEPA). This EIR uses the baseline evaluation presented in the B.F. Sisk Dam SOD Modification Project EIS/EIR (Reclamation 2019) [10], which remains a current and accurate representation of existing conditions. Because the B.F. Sisk Dam SOD Modification Project (12-foot embankment raise) has been approved and the structural alternative (Alternative 3) proposes an additional 10-foot embankment raise, the effects analysis presented below uses the No Project/No Action Alternative (Alternative 1) as the basis for comparison of the approved project to the Proposed Action and action alternatives for CEQA and NEPA. Resource areas with potentially significant impacts based on the B.F. Sisk Dam SOD Modification Project EIS/EIR and areas of known controversy based on scoping are discussed in this chapter. For each resource area, significance criteria were developed consistent with the CEQA Guidelines and used to assess the significance level of the impacts under CEQA. A NEPA environmental document must, in accordance with NEPA guidance (40 CFR 1508.27), consider the context and intensity of the effects that would be caused by, or result from, a project. These factors were considered when developing the significance criteria under which each resource was evaluated to develop impact conclusions. Thus, although determinations of significance are for CEQA purposes only, the significance of the action is described with respect to the context and intensity, pursuant to NEPA.

The impact discussion is concluded with a CEQA significance determination that indicates if there is no impact to a resource area, or if the impact to a resource area is beneficial, less than significant, or significant. For those impacts that would be significant, the Lead Agencies identified feasible mitigation measures, if they exist, to reduce the magnitude of the impact. Impacts for each resource are summarized in this chapter, with detailed analysis in appendices. An effects analysis table containing a summary of the significance criteria, assessment methodology, significance determination, mitigation measures, and the location of the evaluation support is provided in Executive Summary.

Alternative 2 and Alternative 3 are actions connected to the B.F. Sisk Dam SOD Modification Project evaluated under Alternative 1. Therefore, the incremental impacts of implementing the action alternatives are evaluated in this section. Construction related impacts under Alternative 3 consider only the impacts of raising the dam an additional 10 feet.

[10] *B.F. Sisk Safety of Dams Modification Project Final Environmental Impact Statement and Environmental Impact Report* is available for review at https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281

4.1 Water Quality

4.1.1 Assessment Methods

Water quality monitoring data and computer modeling were used to aid in evaluating potential impacts. Temporary construction impacts were evaluated qualitatively based on anticipated construction practices, materials, locations, and duration of construction and related activities. Long-term operational effects were evaluated using results from computer modeling tools; specifically, CalSim II was used to estimate changes in reservoir storage and streamflow within the area of analysis. Water quality analysis of the Delta was performed using outputs from the CalSim II model. Appendix D describes the changes to water quality under the action alternatives and includes the detailed modeling results and interpretation of those results.

4.1.2 Significance Criteria

Impacts would be significant if they resulted in one or more of the following conditions or situations: (1) violate existing water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality; (2) 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 that would (a) result in substantial erosion or siltation on- or off-site or (b) create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; (3) conflict with or obstruct implementation of a water quality control plan; or (4) result in substantial effects on water quality-related beneficial uses.

San Luis Reservoir is not located within a flood hazard, tsunami, or seiche zone. Therefore, risk of pollutants due to project inundation within a flood hazard, tsunami, or seiche zone does not exist and has not been evaluated under each alternative.

4.1.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would be scheduled for completion during times in the water year that San Luis Reservoir is typically drawn down to lower levels to avoid any changes to South-of-Delta CVP and SWP operations. The additional embankment height would maintain the current water surface elevation level of 544 feet and would not result in water surface elevation dropping below 369 feet that could result in "low point" conditions. change operations of San Luis Reservoir. **There would be no change to operations of San Luis Reservoir and would result in no impact.**

During construction, the exposure of bare soils, soil and material stockpiles, and presence of fuels, lubricants and solid and liquid wastes could cause short-term water quality impacts to the reservoir if not managed properly. Therefore, construction-related activities have the potential to degrade water quality, create additional sources of polluted runoff, and conflict with a water quality control plan. Soil disturbance at surface areas used for construction staging and excavated material storage and disposal locations could result in localized surface erosion, minor changes in drainage patterns, and changes in erosion rates. Construction activities would require permits under CWA Sections 404, 402, and 401. Preparation of a stormwater pollution prevention plan (SWPPP) would be required by the RWQCB under the Construction General Permit (Section 402 permit). The RWQCB administers Section 401 and either issues or denies water quality certifications depending upon

whether the proposed discharge of fill material complies with applicable state and federal laws. CWA Section 404 requires USACE to issue individual and general permits when discharge of dredged or fill material into wetlands and waters of the United States occurs. As described in Table 2-1 and Appendix B, an environmental commitment proposed under the B.F. Sisk Dam SOD Modification Project would be implemented to significantly decrease erosion rates and delivery of sediments and any other resident pollutants to surface waters during construction and following construction prior to and after the reestablishment of vegetation at construction sites. **This impact would be less than significant.**

4.1.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no changes to Delta water quality resulting from changes in Delta outflows compared to the No Project/No Action Alternative. To provide dry year water supply reliability, Reclamation would reserve water during wetter years for delivery in dry years. This would reduce available space in San Luis Reservoir during wetter years and result in a reduction to Delta exports during these years type. As shown in Table 12 and Table 20 in Appendix D, this would be an insubstantial (less than 1%) change on average compared to the No Project/No Action Alternative conditions and is not expected to have a measurable impact on water quality conditions in the Delta. Alternative 2 would be operated consistent with all environmental requirements pertaining to Delta operations, including the 2019 biological opinions for CVP and SWP operations and any future biological opinions or requirements. **This impact would be less than significant.**

Alternative 2 would generate increased storage levels in San Luis Reservoir (see Table 30 and Table 31 in Appendix D) through the storage of reserved water to be used in drier years. Higher reservoir storage levels would not change the water's quality or temperature. Alternative 2 would not change the water surface elevation of San Luis Reservoir. **There would be no impact.**

4.1.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.1.5.1 Construction of Dam Raise

Construction of Alternative 3 would take place in the same location, with the same equipment, and during the same construction period as the B.F. Sisk Dam SOD Modification Project but would require additional fill materials. The B.F. Sisk Dam SOD Modification Project was required to obtain a NPDES permit and submit a NOI, with DWR and Reclamation as the applicants. As such, the B.F. Sisk Dam Raise and Reservoir Expansion Project must obtain a separate NPDES permit as the project would not be covered under the permit obtained for the B.F. Sisk Dam SOD Modification Project. Effects to water quality surrounding the dam and the introduction of construction equipment would be similar to Alternative 1. Construction of Alternative 3 would include the same environmental commitments based on the increased material quantities needed for the dam raise. **Therefore, this impact would be less than significant.**

4.1.5.2 SR 152 Modifications

During construction of modifications to SR 152 between milepost MER R5.239 and MER R5.806, the exposure of bare soils, soil and material stockpiles, and the presence of fuels, lubricants and solid and liquid wastes could cause short-term water quality impacts to the reservoir if not managed properly. Therefore, construction-related activities have the potential to degrade water quality, create

additional sources of polluted runoff, and conflict with a water quality control plan. Soil disturbance at surface areas used for construction staging and excavated material storage and disposal locations could result in localized surface erosion, minor changes in drainage patterns and changes in erosion rates. Preparation of a SWPPP would be required by the RWQCB under the Construction General Permit. Additionally, environmental commitments, BMPs, monitoring, and other construction controls would be implemented to protect water quality as described in Section 4.15. **This impact would be less than significant.**

4.1.5.3 Operation of Alternative 3

Under all configurations of Alternative 3, on average, there are negligible changes to Delta water quality resulting from changes in Delta outflows compared to the No Project/No Action Alternative. Tables 6 through 11 in Appendix D summarize X2 results that modeled potential changes in salinity. Average annual changes to X2 would be less than 100 meters under all configurations.

South-of-Delta conveyance is expected to increase during wet and above-normal year types, as increased San Luis Reservoir storage will require greater conveyance to fill the reservoir, resulting in decreases in Delta outflows. Tables 14 through 21 in Appendix D summarize the change in South-of-Delta conveyance under all configurations. Tables 24 through 29 in Appendix D summarize the change in Delta outflows under all configurations. Conveyance under the operation of the CVP Only Storage subalternative is expected to increase by an average of approximately 25 TAF annually and Delta outflow is expected to decrease by an average of approximately 576 cubic feet per second (cfs) annually under all water year types. Operation of the CVP/SWP Split Storage subalternative would increase conveyance by an average of approximately 24 TAF annually under all water year types and Delta outflow would decrease up to 603 cfs annually and increase up to 125 cfs annually in certain water year types. Operation of the Investor-Directed Storage Configurations A and B would increase conveyance by an average of approximately 39 TAF annually under all water year types and Delta outflow would be the same as the operation of the CVP Only Storage subalternative. Operation of the Investor-Directed Storage Configurations C and D would increase conveyance by an average of approximately 14 TAF annually under all water year types and Delta outflow would be the same as the operation of the CVP Only Storage subalternative. While there would be changes to Delta conveyance and outflows, the modeling results indicate insubstantial changes under all Alternative 3 configurations and would result in a less than 1% change compared to Alternative 1. In addition, Alternative 3 would be operated consistent with all environmental requirements pertaining to Delta operations, including the 2019 biological opinions for CVP and SWP operations and any future biological opinions or requirements. **This impact would be less than significant.**

All Alternative 3 configurations would generate increased storage levels in San Luis Reservoir (see Tables 32 through 39 in Appendix D). Higher reservoir storage levels would not change the water quality or temperature. **There would be no impact.**

Alternative 3 would increase water surface elevation of San Luis Reservoir, as shown in Appendix D, Section D.6.5. Following construction, storage in the new expanded reservoir footprint is anticipated to result in the loss of primarily grassland vegetation as detailed in Section 4.14.6. Following the loss of this vegetation in the first water year where the new capacity is exercised, this new section of reservoir floor would interact with the water stored in the reservoir in the same fashion as the current reservoir floor. **Therefore, there would be no impact on water quality in San Luis Reservoir from the long-term operation under all subalternatives.**

4.2 Surface Water Supply

4.2.1 Assessment Methods

This chapter estimates the potential water supply effects using the CalSim II model. Appendix E describes the changes to water supply associated with the action alternatives and includes the detailed modeling results and interpretation of those results.

The CalSim II model's monthly simulation of an actual daily (or even hourly) operation of the CVP and SWP results in several limitations in use of model results. Model results must be used in a comparative manner to reduce effects of use of monthly and other assumptions that are indicative of real-time operations but do not specifically match real-time observations. CalSim II model output is based upon a monthly time step. CalSim II model output includes minor fluctuations of up to 5% due to model assumptions and approaches. Therefore, if quantitative changes between a specific alternative and the No Action Alternative are 5% or less, conditions under the specific alternative would be considered similar to conditions under the No Action Alternative.

4.2.2 Significance Criteria

Impacts on water supply would be considered significant if the alternative would substantially reduce the annual supply of water available to CVP, SWP, refuges, or other water users. Impacts to fisheries from water supply changes is addressed in Section 4.9, "Aquatic Resources".

4.2.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, the construction phases of the B.F. Sisk Dam SOD Modification Project requiring lower reservoir levels would be scheduled for completion during times in the water year that San Luis Reservoir is typically drawn down to lower levels to avoid any impact on storage capacity and water supply. Deliveries to CVP, SWP, refuges, and other water users from San Luis Reservoir would be unimpeded, with no limits on the drawdown and refill. Operation of the B.F. Sisk Dam SOD Modification Project would not change CVP, SWP, or refuge deliveries and would not change storage in San Luis Reservoir. **There would be no impact to surface water supply under Alternative 1.**

4.2.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, water supply reserved in wetter water years by Reclamation for delivery to South-of Delta CVP contractors in drier years could potentially be diverted for delivery to the Exchange Contractors in critical water year types.

Under Alternative 2, average annual South-of-Delta CVP agricultural deliveries are expected to decrease up to 86 TAF under certain water year types, as shown in Tables 5 and 6 in Appendix E. Average annual South-of-Delta CVP M&I deliveries are expected to decrease up to 2 TAF under certain water year types, as shown in Tables 7 and 8 in Appendix E. Changes to average annual South-of-Delta SWP deliveries under Alternative 2 are expected to be minimal, as shown in Tables 9 and 10 in Appendix E. **This would be a significant water supply impact for South-of-Delta CVP water contractors in the long term.** The reduction in water supply deliveries could not be replaced reliably from other sources, such as groundwater pumping, water transfers, or new surface storage. Groundwater banking was evaluated and rejected as infeasible given the lack of availability

of capacity in existing groundwater banks to replace this decrease in deliveries, along with those banks' recovery rates that limit the return of back groundwater to between 50% and 80% of the stored supply (Reclamation 2016). The potential use of surface water transfers to offset these decreased deliveries would be infeasible given their dependence on the availability of willing sellers and available conveyance capacity at the time the water supply they would be replacing is needed—in perpetuity. While transfers could potentially offset some of this lost supply, South-of-Delta CVP contractors are using water transfers to meet unmet demand under existing conditions, and it is unlikely that in the future, with these existing unmet demands, that transfers could offset the decrease in deliveries generated by the operation of Alternative 2 and meaningfully reduce this significant impact.

Development of new surface water storage at a different location to offset the reduced deliveries would likely generate numerous significant environmental impacts and require extensive time to implement, similar to the groundwater bank development option, and has been determined to be infeasible. Water conservation measures were considered to replace the reduced deliveries, yet water districts already have successfully applied these measures. Water conservation is included in water management plans and water rebate programs have been initiated. In addition, Assembly Bill 1668 and Senate Bill 606, signed into law in 2018, enacted new standards for indoor and outdoor water use efficiency requirements. With these measures already in place, additional measures have been determined to be infeasible to implement.

Given the environmental and technological limits on other potential options to offset this impact, no feasible mitigation (CEQA 21061.1) has been identified to reduce these impacts to a less than significant level. **Therefore, the water supply impact for South-of-Delta CVP water contractors remains significant and unavoidable.**

4.2.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.2.5.1 Construction of Dam Raise

Construction requiring lower reservoir levels under Alternative 3 would occur in the same schedule as Alternative 1, during times in the water year that San Luis Reservoir is typically drawn down to avoid any impact on storage capacity and water supply. Therefore, there would be no change to CVP, SWP, or refuge deliveries and impacts to deliveries during construction of the dam raise would be the same as Alternative 1. **There would be no impact to surface water supply.**

4.2.5.2 SR 152 Modifications

To accommodate the increased reservoir surface-level operations, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet. Similar to the dam raise construction, construction of the SR 152 modifications requiring lower reservoir levels would be scheduled for completion during times in the water year that San Luis Reservoir is typically drawn down to lower levels to avoid any adverse impact on storage capacity and water supply. **Therefore, there would be no impact to surface water supply.**

4.2.5.3 Operation of Alternative 3

As described in Chapter 2 and detailed in Appendix B, Alternative 3 includes several operational configurations of the Dam Raise Alternative. These subalternatives differ in their assignment of the expanded storage capacity in an expanded reservoir and in their approach to storing that water. The

configurations under Alternative 3 are not forecasted to generate measurable changes to water surface elevations in upstream reservoirs (Shasta, Folsom, Oroville, and Trinity Reservoirs), as shown in Appendix D.

As discussed in detail below, under all configurations of Alternative 3, average annual South-of-Delta CVP M&I deliveries are expected to increase in certain water year types. The alternative would deliver additional M&I supply partially reducing San Felipe Division unmet demand during low point events, when San Luis Reservoir storage levels drop below 300 TAF in storage.

Operation of CVP Only Storage Average annual South-of-Delta CVP agricultural deliveries are expected to increase up to 63 TAF in certain water year types, as shown in Tables 12 and 13 in Appendix E. Average annual South-of-Delta CVP M&I deliveries are expected to increase up to 3 TAF in certain water year types, as shown in Tables 24 and 25 in Appendix E. Increased CVP supplies would be available during wetter years when surplus water is available in the Delta and San Luis Reservoir would have filled in the No Project/No Action Alternative. Changes to South-of-Delta CVP refuge deliveries are expected to be minimal, with an average annual increase of approximately 1 TAF. **Therefore, operating Alternative 3 under the CVP Only Storage subalternative would have a beneficial effect on South-of-Delta CVP contractors.**

Under this subalternative, there would be a slight reduction in Table A SWP deliveries, an average of 12 TAF or less than 1% of total annual deliveries, as summarized in Tables 40 and 41 in Appendix E. CalSim II relies on assumptions and approaches that contribute to minor fluctuations of up to 5% and projected changes of less than 5% are not identified as an adverse or beneficial water supply effect. CALSIM II modeling and other analyses show there will be no significant adverse effects on the SWP during construction and operation of this subalternative. Given the importance of effective coordinated operations of the CVP and SWP, the existence and/or extent of any SWP water supply reduction from the subalternative will be reassessed prior to construction, during construction, and at the time that any new regulatory requirement or permit issued for the subalternative, affect SWP operations. SLDMWA, through these reassessments and ongoing coordination of operations between Reclamation and DWR, shall confirm at these intervals that any SWP water supply reduction resulting from the subalternative's construction or operation is less than significant. Any adaptive management measures or restrictions imposed on SLDMWA, Reclamation, or the CVP through permits or other regulatory approvals issued for the subalternative's operations will be coordinated with DWR consistent with the rights and obligations of and between Reclamation and DWR agreed to in other independent agreements. **Therefore, operating Alternative 3 under the CVP Only Storage subalternative would have a less than significant impact on South-of-Delta SWP contractors.**

Operation of CVP/SWP Split Storage Average annual South-of-Delta CVP agricultural deliveries are expected to increase up to 35 TAF under certain water year types, as shown in Tables 14 and 15 in Appendix E. Average annual South-of-Delta CVP M&I deliveries are expected to increase up to 2 TAF under certain water year types, as shown in Tables 26 and 27 in Appendix E. Increased CVP supplies would be available during wetter years when surplus water is available in the Delta and San Luis Reservoir would have filled in the No Project/No Action Alternative. Changes to South-of-Delta CVP refuge deliveries are expected to be minimal, with an average annual increase of approximately 1 TAF. **Therefore, operating Alternative 3 under the CVP/SWP Split Storage subalternative would have a beneficial effect on South-of-Delta CVP contractors.**

Under this subalternative, there would be an increase in Table A SWP deliveries, an average of 9 TAF annually or less than 1% of total annual deliveries, as summarized in Tables 43 and 44 in Appendix E. As previously stated, CalSim II relies on assumption and approaches that contribute to minor fluctuations of up to 5% and projected changes of less than 5% are not identified as an adverse or beneficial water supply effect. In addition, this subalternative would reduce potential surplus water supply (Article 21) deliveries to SWP contractors as CVP deliveries increase. **Therefore, operating Alternative 3 under the CVP/SWP Split Storage subalternative would have a less than significant impact on South-of-Delta SWP contractors.**

Operation of Investor-Directed Storage Under the Investor-Directed Storage, subalternatives A and C average annual South-of-Delta CVP agricultural deliveries are expected to increase up to 74 TAF and 27 TAF in wet water year types and by 19 TAF and 21 TAF in dry water year types, as shown in Tables 16 and 20 in Appendix E. Average annual South-of-Delta CVP M&I deliveries are expected to increase slightly as indicated in Tables 28 and 32 in Appendix E. Average annual South-of-Delta refuge deliveries are expected to increase up to 14 TAF and 5 TAF in wet water year types and by 4 TAF in dry water year types, as shown in Tables 36 and 38 in Appendix E. Under the Investor-Directed Storage, subalternatives B and D average annual South-of-Delta CVP agricultural deliveries are expected to increase slightly as indicated in Tables 18 and 22 in Appendix E. Average annual South-of-Delta CVP M&I deliveries are expected to increase up to 77 TAF and 29 TAF in wet year types and by 33 TAF and 35 TAF in dry water year types, as shown in Tables 30 and 34 in Appendix E. South-of-Delta CVP refuge deliveries would not change. **Therefore, operating Alternative 3 under the Investor-Directed Storage subalternatives would have a beneficial effect on South-of-Delta CVP contractors.**

Under the Investor-Directed Storage subalternatives, there would be a slight reduction in Table A SWP deliveries, an average of 12 TAF or less than 1% of total deliveries, as summarized in Tables 46 and 47 in Appendix E. CalSim II relies on assumptions and approaches that contribute to minor fluctuations of up to 5%, and projected changes of less than 5% are not identified as an adverse or beneficial water supply effect. CALSIM II modeling and other analyses show there will be no significant adverse effects on the SWP during construction and operation of these subalternatives. Given the importance of effective coordinated operations of the CVP and SWP, the existence and/or extent of any SWP water supply reduction from the Investor-Directed Storage subalternatives will be reassessed prior to construction, during construction, and at the time that any new regulatory requirement or permit issued for the subalternatives, affect SWP operations. SLDMWA, through these reassessments and ongoing coordination of operations between Reclamation and DWR, shall confirm at these intervals that any SWP water supply reduction resulting from the subalternatives' construction or operation is less than significant. Any adaptive management measures or restrictions imposed on SLDMWA, Reclamation, or the CVP through permits or other regulatory approvals issued for the subalternatives' operations will be coordinated with DWR consistent with the rights and obligations of and between Reclamation and DWR agreed to in other independent agreements.. **Therefore, operating Alternative 3 under the Investor-Directed Storage subalternatives would have a less than significant impact on South-of-Delta SWP contractors.**

4.3 Air Quality

4.3.1 Assessment Methods

This section describes the assessment methods used to analyze potential air quality effects of the alternatives, including the No Project/No Action Alternative. Construction-related emissions were estimated using the following sources: OFFROAD2017 web database (CARB 2017a), EMFAC2017 web database (CARB 2017b), California Emission Inventory and Reporting System particulate matter speciation profiles (CARB 2016), paved road dust emission factors (EPA 2011), and CalEEMod User's Guide, (California Air Pollution Control Officers Association 2017). Appendix F2 provides detailed information on the emission calculations for off-road construction equipment exhaust; on-road haul/vendor truck and construction worker commuting exhaust; fugitive dust emissions from unpaved road material handling, grading, and bulldozing; and marine exhaust emissions from dredging activities.

4.3.2 Significance Criteria

Impacts on air quality would be considered significant if the proposed project or alternatives (1) would conflict with or obstruct implementation of the applicable air quality plan; (2) would 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; (3) would expose sensitive receptors to substantial pollutant concentrations; or (4) would result in other emissions, such as those leading to objectionable odors, adversely affecting a substantial number of people. The quantitative significance criteria developed by the local air districts and the general conformity de minimis thresholds were developed to determine compliance with the first two significance criteria. This project is subject to the general conformity regulations because it involves a federal agency (Reclamation) and is in a nonattainment or maintenance area. The second criterion for cumulative impacts is addressed in Chapter 5, "Cumulative Effects" and is not discussed further in this chapter.

San Joaquin Valley Air Pollution Control District (SJVAPCD) (2015) published CEQA Guidelines to assist Lead Agencies with uniform procedures for addressing air quality impacts in environmental documentation. Impacts on air quality would be significant if implementing an alternative would cause the thresholds shown in the CEQA guidance documents to be exceeded; if these thresholds are exceeded, conflicts with applicable air quality plans and contributions to air quality standard violations for applicable pollutants can be assumed.

4.3.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, the construction equipment associated with constructing the B.F. Sisk Dam SOD Modification Project would generate nitrogen oxides (NOx) emissions that exceed the SJVAPCD's significance threshold. Emissions of other pollutants that would occur as vehicle exhaust or fugitive dust would be less than significant. Implementation of AQ-1, AQ-2, and AQ-3 and the Air Quality Environmental Commitment required under the B.F. Sisk Dam SOD Modification Project, described in Table 2-1 and Appendix B, would manage these significant impacts, reducing them to **less than significant.**

Construction of B.F. Sisk Dam SOD Modification Project has the potential to emit toxic air contaminants (TACs) in exhaust emissions, such as diesel particulate matter (DPM);[11] however, construction impacts will be temporary. Pollutant concentrations are expected to drop 80% approximately 1,000 feet from a distribution center and 70% 500 feet from a major freeway (CARB 2005). The closest sensitive receptor, the subdivision off SR 152, is approximately 8,250 feet away. Therefore, the exposure of DPM to sensitive receptors is expected to be minimal because of the distance from the construction activities. Because there will be no long-term exposures to any TACs, the impact to sensitive receptors would be insubstantial and **would have a less than significant impact on sensitive receptors.**

The use of diesel equipment during construction may generate near-field odors that are considered to be a nuisance. Because of the distance to sensitive receptors (the nearest receptor is over 1 mile away), odors from diesel exhaust would not affect a substantial number of people. **Odors from the proposed construction of Alternative 1 would have a less than significant impact on air quality.**

Following completion of the B.F. Sisk Dam SOD Modification Project, operation of San Luis Reservoir would continue, consistent with the existing configuration, and there would be no change in storage capacity at the reservoir. Because the reservoir's operation would not change, there would be no change in air emissions from existing conditions. **Therefore, there would be no impact in the potential to cause long-term operational emissions of criteria pollutants or precursors that would exceed the SJVAPCD's significance thresholds.**

4.3.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, no new construction or maintenance actions in the study area would be implemented by the B.F. Sisk Dam Raise and Reservoir Expansion Project. Alternative 2 only includes operational changes to Reclamation's annual allocation process. **Alternative 2 would result in no impacts to air quality.**

4.3.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.3.5.1 Construction of Dam Raise and SR 152 Modifications

Construction-related emissions in the SJVAPCD were estimated for off-road construction equipment, on-road haul trucks and delivery vehicles, and construction worker commuting. Table 4-1 summarizes the annual construction-related emissions. The closest sensitive receptors to dam raise construction activities would be 8,250 feet away, while the closest receptor to SR 152 modification construction would be 5,600 feet away. Because no long-term TAC emissions (including DPM) would occur, the impact to sensitive receptors would be insubstantial. Additionally, because of the short installation period and distance to sensitive receptors, odors from diesel exhaust would not affect a substantial number of people. **As shown in Table 4-1, VOC, NOx, CO, PM_{10}, and $PM_{2.5}$ emissions would exceed the SJVAPCD's significance thresholds, while VOC, NOx, and PM_{10} emissions would exceed the general conformity de minimis thresholds.** Implementation

[11] DPM is listed by Office of Environmental Health Hazard Assessment as a carcinogen and has a noncancer chronic reference exposure level. DPM does not contribute to acute health hazards.

of Mitigation Measures AQ-1, AQ-2, AQ-3, and AQ-4, described in Section 4.15, would be used to reduce VOC, CO, and $PM_{2.5}$ emissions to less than significant; however, VOC, NOx, CO, and PM_{10} emissions would remain significant and unavoidable. Tier 4 emission standards are the strictest emission standards for off-road engines and model year 2015 has the most stringent emission requirements for on-road engines. Given the scale of earthmoving activities proposed under this alternative, no additional technically feasible mitigation could be identified to reduce this impact to a less than significant level while not substantially slowing the construction schedule. A public outreach and communication plan detailed in Mitigation Measure TR-1 will be instituted to inform the public of fugitive dust exposure during excessive wind events. Table 4-1 summarizes the maximum annual emissions that would occur with mitigation.

Table 4-1. Unmitigated and Mitigated Construction Emissions from the Dam Raise

Alternative	VOCs, tpy	NOx, tpy	CO, tpy	SO_2, tpy	PM_{10}, tpy	$PM_{2.5}$, tpy
Dam Raise	**8**	**88**	61	<1	**740**	**78**
SR 152 Modifications	**15**	**232**	78	<1	10	9
Total Emissions	**23**	**320**	**140**	1	**751**	**87**
SJVAPCD Significance Thresholds	10	10	100	27	15	15
General Conformity De Minimis Thresholds	10	10	n/a	100	100	100
Mitigated Alternative 3 (Dam Raise and SR 152 Modifications)	**13**	**67**	**126**	1	**43**	7

Values in **bold** indicate that the SJVAPCD significance threshold or the general conformity de minimis threshold was exceeded.
CO – carbon monoxide; NOx – nitrogen oxides; PM_{10} – inhalable particulate matter; $PM_{2.5}$ – fine particulate matter; SJVAPCD – San Joaquin Valley Air Pollution Control District; SO_2 – sulfur dioxide; tpy – tons per year; VOCs – volatile organic compounds

Health impacts from O_3 precursor emissions would, in general, lead to the increased health risks described in Chapter 3 within the affected air basin. For relatively small projects such as Alternative 3, attempts to model regional O_3 concentration impacts and resulting health impacts pre and postmitigation would not be practical or produce meaningful information. O_3 is a regional air pollutant and O_3 formation rates are a function of complex physical factors such as topography, VOC and NOx concentration ratios, meteorology, and sunlight exposure. Pre and postmitigation exceedances of SJVAPCD mass emission thresholds for PM_{10} and $PM_{2.5}$ would, in general, lead to increased health risks within the affected air basin, as described in Chapter 3. Sensitive receptors that could be affected by mass emissions of PM_{10} and $PM_{2.5}$ are identified in Appendix G1. Exposure would occur during construction but would be variable based on the types of equipment being used. The closest sensitive receptor (San Luis Creek Use Area) is over 1 mile from the center of construction, so any impacts from fugitive dust from a large construction area would be insubstantial. Therefore, it was not practical or meaningful to model ambient PM_{10} and $PM_{2.5}$ concentrations premitigation and postmitigation. However, because the area is prone to extended periods of high winds, traffic on SR 152 could be exposed to increased fugitive dust emissions, but health impacts could be negligible because of the limited transient exposure. **VOC, CO, and $PM_{2.5}$ air quality impacts would be significant premitigation but less than significant with implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, and AQ-4, VOC, NOx, CO, and PM_{10} emissions would be significant and unavoidable. Because mitigated NOx emissions would be more than the general conformity de minimis thresholds, a general conformity**

determination would need to be developed for this alternative if it is Reclamation's preferred alternative in the final EIR/SEIS.

General conformity requires that all reasonably foreseeable[12] direct and indirect emissions[13] be considered together for comparison to the de minimis thresholds. As an action connected to the B.F. Sisk Dam SOD Modification Project, if a conformity evaluation is completed for the Dam Raise Alternative, it will need to consider the emissions of both actions.

4.3.5.2 Operation of Alternative 3

The increased capacity generated by a reservoir enlargement would result in additional pumping into the reservoir and associated increases in electricity consumption, but no local criteria pollutant emissions would occur. Regional emissions could occur at nearby powerplants to accommodate the increased electricity use, but because the plants would only operate within permitted limits, there would be no net increase in criteria pollutant emissions. No other operational changes would occur that would increase criteria pollutant emissions. **Air quality impacts from operation of the enlarged reservoir would be less than significant.**

4.4 Greenhouse Gases

4.4.1 Assessment Methods

GHG emissions were estimated using the same methods discussed in Section 4.3, with notable differences detailed in Appendix F1.

4.4.2 Significance Criteria

Impacts on GHG emissions would be considered significant if the proposed project or alternatives (1) would generate GHG emissions, either directly or indirectly, that may have a significant impact on environment or (2) would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the GHG emissions.

4.4.2.1 DWR Climate Action Plan

GHG emissions evaluation was completed consistent with DWR's *Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan* (GGERP), summarized in Appendix F1. Consistent with these requirements, a GGERP Consistency Determination Checklist for each alternative documenting if the project has met each required element is in Appendix F3.

4.4.2.2 DWR Extraordinary Construction Project Determination

If construction activities are to be performed by outside contractors, then the project must be evaluated against the following Extraordinary Construction Project Thresholds established by DWR:

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[12] In the preamble to the General Conformity Rule, EPA explained, among other things, "[T]iering could cause the segmentation of projects for conformity analysis, which might provide an overall inaccurate estimate of emissions. The segmentation of projects for conformity analyses when emissions are reasonably foreseeable is not permitted by this rule." (58 FR 63240).

[13] Direct emissions are those that occur as a direct result of the action and occur at the same time and place as the action. Indirect emissions are those that occur at a later time or distance from the place where the action takes place but may be reasonably anticipated as a consequence of the proposed action.

- Total Construction Emissions of 25,000 metric tons CO_2e ($MTCO_2e$)
- Maximum Annual Construction Emissions of 12,500 $MTCO_2e$

If the project exceeds either of these thresholds, then the construction emissions from the project must be analyzed and, if necessary, mitigated on a project-specific basis. Even if a project exceeds the Extraordinary Construction Project thresholds, only the construction activity emissions need to be analyzed on a project-specific basis. However, projects can still rely on the analysis in the GGERP for operations, maintenance, and business activity emissions, provided they meet other consistency requirements.

4.4.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction activities under the B.F. Sisk Dam SOD Modification Project would generate maximum project and annual emissions that exceed the significance thresholds of 25,000 $MTCO_2e$ per project and 12,500 $MTCO_2e$ per year. **The potential for construction to generate GHG emissions, either directly or indirectly, would have a significant impact on the environment and would conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions, resulting in a significant impact.** Implementation of Mitigation Measure GHG-1 required under the B.F. Sisk Dam SOD Modifications Project, described in Table 2-1 and Appendix B, would reduce impacts to less than significant. **As such, impacts associated with construction and operation would be reduced to less than significant, and proposed construction and operation of the B.F. Sisk Dam SOD Modification Project would not conflict with plans, policies, or regulations after implementation of the mitigation measure, resulting in a less than significant impact on GHG emissions.**

4.4.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, no new construction or maintenance actions in the study area would be implemented by the B.F. Sisk Dam Raise and Reservoir Expansion Project. Alternative 2 only includes operational changes to Reclamation's annual allocation process. **Therefore, there would be no short- or long-term impacts on GHG emissions.**

4.4.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.4.5.1 Construction of Dam Raise and SR 152 Modifications

Table 4-2 summarizes the annual construction-related emissions for this alternative. Because construction-related GHG emissions exceed the quantitative significance thresholds, they would conflict with GHG reduction plans and policies such as the 2017 scoping plan, Assembly Bill 32, Senate Bill 32, and Executive Order S-3-05. **The construction and operation of the dam raise and SR 152 modifications would generate GHG emissions that would have significant GHG impact and conflict with GHG reduction plans and policies.** Implementation of Mitigation Measures AQ-1, AQ-2, GHG-1, and GHG-2, described in Section 4.15, would reduce the impacts' severity. **With the implementation of Mitigation Measures AQ-1, AQ-2, GHG-1, and GHG-2, construction and operation of the dam raise and SR 152 modifications would have less than significant impact on GHG emissions and GHG reduction plan and policy conflicts with mitigation.**

Table 4-2. Unmitigated Construction Emissions

Project Component	Total CO_2e (MT per project)	Maximum Annual CO_2e (MT per year)
Construction of Dam Raise	243,433	31,153
SR 152 Modifications	32,493	32,493
Total	**275,926**	**63,646**
Significance Threshold	25,000	12,500
Significant?	Yes	Yes

Values in **bold** exceed the significance criteria.
CO_2e – carbon dioxide equivalent; MT – metric tons

4.4.5.2 Operation of Alternative 3

Additional pumping at Gianelli Pumping-Generating Plant and Pacheco Pumping Plant would increase GHG emissions by 4,971 $MTCO_2e$ per year. An increase in head at San Luis Reservoir would increase pumping requirements at the Dos Amigos Pumping Plant, which would increase GHG emissions. As described in Section 4.10, "Terrestrial Resources," changes in land cover would occur from project implementation, which would result in 7,691 $MTCO_2$ that would not be accumulated over the vegetation's lifetime. Impacts associated with construction and operation of the dam raise would exceed the significance criterion. **GHG impacts from operation of the enlarged reservoir would be significant; however, after implementation of Mitigation Measure GHG-2, operational impacts of Alternative 3 would be reduced to less than significant.**

4.5 Visual Resources

4.5.1 Assessment Methods

Assessment of visual resources was accomplished through the consideration of how modifications proposed under each alternative could affect scenic vistas and the scenic character in the study area. Reservoirs are generally areas where landforms, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality or ordinary or common scenic quality. These landscapes have positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance when their water surface elevations are near or at their maximum. As discussed in Chapter 3, the area around San Luis Reservoir offers open scenic vistas of undeveloped land and open water. This evaluation assesses the degree of public importance placed on landscapes viewed from travelways (linear concentrations of public-viewing, including highways, trails, and waterways) and use areas (spots that receive concentrated public-viewing use).

4.5.2 Significance Criteria

Impacts on visual resources would be considered significant if the project (1) would have a substantial permanent or temporary adverse effect on a scenic vista; (2) would substantially damage scenic resources including trees, rock outcroppings, and historic buildings within a state scenic highway corridor; (3) would substantially degrade the existing visual character or quality of public views of the site and its surroundings in nonurbanized areas and would conflict with applicable zoning and other regulations governing scenic quality in urbanized areas; or (4) would create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

4.5.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would affect the area around the dam and recreational facilities that surround the dam, impacting the scenic vistas and the scenic character. However, the panoramic nature of background views from distant static viewing locations and the speed of motorists passing the site from adjacent roadways reduce the overall impact generated by construction activities. The introduction of construction lighting to support nighttime work would add a more substantial visual distraction to the landscape with new stationary lighting sources at staging areas and on the dam embankment. The use of lighting during the construction would have a significant impact on scenic vistas and visual character in the study area. Implementation of Mitigation Measure VIS-1 required under the B.F. Sisk Dam SOD Modification Project, described in Table 2-1 and Appendix B, would reduce the severity of this impact to less than significant. There would be no changes to existing reservoir operations in the study area. **This alternative would result in less than significant impacts to visual resources.**

4.5.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no new construction or changes to existing structures in the study area, only operational changes to the annual allocation process to reserve up to 310 TAF of stored CVP supply in San Luis Reservoir at the end of wetter years for allocation in drier years. Impacts to visual resources are determined to be less than significant because of the lack of effects that changes in conveyance would have on the existing landscape character, although the conveyance that follows could be visible from adjacent land, vantage points, and roadways in the study area. **Therefore, impacts to visual resources from operational activities under Alternative 2 would be less than significant.**

4.5.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.5.5.1 Construction of Dam Raise

Construction of Alternative 3 would occur on the same schedule as Alternative 1. Therefore, effects to scenic vistas and the scenic character surrounding the dam, and the introduction of construction lighting to support nighttime work would be same as Alternative 1. Construction of Alternative 3 would include the same mitigation measures and environmental commitments and take place in the same location and during the same construction period of the B.F. Sisk Dam SOD Modification Project. **Therefore, this impact would be less than significant.**

4.5.5.2 SR 152 Modifications

To accommodate the increased reservoir surface-level operations, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet. The introduction of construction equipment and vehicles and the introduction of disturbed earth along SR 152 could introduce new visual distraction to views from SR 152. However, the scale of the surrounding uninterrupted reservoir vistas and hillslope backdrop, coupled with the speed that those motorists would be traveling and short exposure to the construction area, limit the magnitude of any impact on viewers' scenic experience. The introduction of construction lighting to support nighttime work would add a more substantial visual distraction to the landscape with new temporary lighting sources. **The use of lighting during construction and the roadway improvements would have a significant**

impact on scenic resources within a designated state scenic highway, but with implementation of Mitigation Measures VIS-1 and VIS-2, discussed in Section 4.15, this impact would be less than significant.

4.5.5.3 Operation of Alternative 3

Alternative 3 would generate increased storage levels in San Luis Reservoir (see Water Supply Appendix E). The 10-foot increase in San Luis Reservoir's maximum surface elevation would inundate 445 acres of new land around the shore of the reservoir when the reservoir is full. Given the large scale of the existing San Luis Reservoir footprint, this increased footprint would be insubstantial and would not change the existing visual character of the reservoir by covering existing vegetation (see Appendix K2 for detailed discussion of the impacts on vegetation due to the increased seasonal inundation at the reservoir). In addition, the annual operation approach would remain unchanged under all subalternatives, with annual reservoir drawdown and refill targets unchanged. Therefore, there would be little change to the visual experience of viewers from the Visitor Center, watercraft on the reservoir, and shoreline areas (from a distance) around the reservoir. Similarly, while the elevated segment of SR 152 (at Cottonwood Bay) could provide motorists a greater view of the reservoir, the magnitude of this beneficial impact is diminished when coupled with the additional crest raise and would result in a negligible change to the travelers' scenic experience. **This impact would be less than significant.**

4.6 Noise

4.6.1 Assessment Methods

Activities with the potential for generating short-term, temporary increases in noise levels include construction activities and construction-related traffic. Long-term noise impacts could occur from operation of new facilities. Appendix G1 presents a framework for understanding noise and vibration levels, a detailed description of the existing environment, study area figures, and details on the methods and results of the noise modeling conducted.

4.6.2 Significance Criteria

Impacts on noise would be considered significant if the project would result in (1) generation of a substantial temporary or permanent increase in ambient noise levels near the project that exceed standards established in the local general plan or noise ordinance or applicable standards of other agencies;[14] (2) generation of excessive ground-borne vibration or ground-borne noise levels (significance threshold of 0.3 inches per second [in./sec] of peak particle velocity [PPV]);[15] (3) substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or (4) exposure of excessive noise to people residing or working in the study area for a project located near a private airstrip or with an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport.

[14] The applicable local standard is detailed in Appendix C: Section C.3.2 Merced County Code

[15] To assess the potential for structural damage associated with vibration, the vibratory ground motion near the affected structure is measured in terms of PPV in the vertical and horizontal directions, typically in units of in./sec. The PPV is defined as the maximum instantaneous peak of the vibration signal. Caltrans estimates that frequent generation of vibration at levels exceeding 0.3 in./sec can damage older residential structures and cause annoyance to humans (Caltrans 2013b).

The Merced County Code (see Section C.3.2 in Appendix C) sets sound level limitations that no sound source should exceed the background sound level at the receiving property line by 10 dBA or more during daytime hours (7:00 a.m. to 10:00 p.m.) and by 5 dBA or more during nighttime hours (10:00 p.m. to 7:00 a.m.). However, the county's ordinance exempts construction activities during daytime hours between 7 a.m. and 6 p.m. Therefore, noise levels would be significant if they exceed the background sound level by 5 dBA or more during nighttime hours.

4.6.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

The PPV for constructing the B.F. Sisk Dam SOD Modification Project would not exceed the significance threshold of 0.3 in./sec (see Table 9 in Appendix G1). No long-term project operations would occur that could generate vibrations or ground-borne noise or otherwise expose persons to such impacts. **Ground-borne vibration impacts associated with construction of Alternative 1 would be less than significant.**

Because of the approximately 25 aircraft operations per year that take place at San Luis Reservoir (Airport-Data 2013), implementation of Alternative 1 would not change the frequency or intensity of use of the existing seaplane base and there would be no new permanent residents near the reservoir that would be affected by the plane noise. Because of the limited aircraft operations and the size of the reservoir, construction workers on-site would not be exposed to excessive noise levels. **Noise impacts associated with operating Alternative 1 within an airport land use plan would be less than significant.**

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project and the associated blasting activities would affect sensitive receptors around the dam. Noise levels at San Luis Creek Use Area and the subdivision off SR 152 would exceed the daytime significance criterion of a 10 dBA increase and the nighttime significance criteria of a 5 dBA increase (see Table 8 in Appendix G1). Construction noise would have a significant impact. Implementation of Mitigation Measures NOI-1, NOI-2, and NOI-3 required under the B.F. Sisk Dam SOD Modification Project described in Table 2-1 and Appendix B, would reduce the severity of impacts; however, these actions would not provide a noise level reduction necessary at the San Luis Creek Use Area to avoid a significant impact under this significance criterion.

Given the proximity of San Luis Creek Use Area and the subdivision off SR 152 to the construction area and the magnitude of the widely dispersed construction activity proposed, no additional mitigation to reduce these impacts has been identified. In addition, traffic along Basalt Road due to construction vehicles and workers would increase by a sizable percentage and substantially increase the equivalent noise level on this road by more than 10 dBA, representing a doubling of noise levels experienced at the San Luis Creek Use Area and the subdivision off SR 152, which is a significant impact. Implementation of mitigation measures would manage noise impacts but would not reduce it to less than significant levels. Given large construction areas and the long travel distances, conventional methods to reduce noise sources, like constructing barriers, would not be feasible and would not provide a substantial reduction in noise levels. Given the social and environmental limits on implementing other potential options to offset this impact, no feasible additional mitigation (per CEQA Section 21061.1) has been identified to further reduce these impacts to a less than significant level. **This alternative would result in significant and unavoidable noise impacts.**

4.6.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no new construction, changes to existing structures, or maintenance actions in the study area implemented by the B.F. Sisk Dam Raise and Reservoir Expansion Project, only operational changes. Ambient noise levels under Alternative 2 would be the same as noise conditions experienced under the No Action Alternative. **Alternative 2 would result in no impact to noise.**

4.6.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.6.5.1 Construction of Dam Raise

The PPV for dam raise construction activities would not exceed the significance threshold of 0.3 in./sec (see Table 11 in Appendix G1 and Appendix G2 for detailed calculations). No long-term project operations would occur that could generate vibrations or ground-borne noise or otherwise expose persons to such impacts. **Therefore, ground-borne vibration impacts associated with construction of Alternative 3 would be less than significant.**

As mentioned under Alternative 1, approximately 25 aircraft operations per year take place at San Luis Reservoir (Airport-Data 2013). Implementation of construction of the dam raise under Alternative 3 would not change the frequency or intensity of use of the existing seaplane base and there would be no new permanent residents near the reservoir that would be affected by the plane noise. Because of the limited aircraft operations and the size of the reservoir, construction workers on-site would not be exposed to excessive noise levels. Construction impacts on ambient noise levels generated by construction of the dam raise would not result in permanent increases in ambient noise levels. **Noise impacts associated with operating Alternative 3 within an airport land use plan would be less than significant.**

Construction activities under Alternative 3, except for blasting, would be performed 24 hours per day. Blasting operations at Basalt Hill would be limited to the hours between 6:00 a.m. and 6:00 p.m. Construction actions associated with the dam raise would not increase noise levels at sensitive receptors above 102 dBA (daytime) and 88 dBA (nighttime) already experienced under the No Project/No Action Alternative (see Table 10 in Appendix G1).

Construction-related traffic noise sources would include construction worker vehicles, visitor vehicles, material delivery trucks, and material off-hauling trucks. According to the traffic analysis, the volume of construction-related traffic generated by these sources would be low in relation to existing traffic volumes. Because of the logarithmic nature of noise, a doubling of traffic would result in a 3 dBA increase in noise levels, which would be barely perceptible to the human ear. Traffic would need to be increased at least three times for increased noise to be readily perceived (5 dBA) and at least nine times to double the noise levels (10 dBA). No Project/ No Action traffic levels (2027) on the local road (Basalt Road) are projected at 468 cars per day. Even though traffic would be distributed throughout the day, traffic would increase along Basalt Road by a sizable percentage for the dam raise action and would substantially increase the equivalent noise level on this road by more than 10 dBA, representing a doubling of noise levels and a significant impact (see Table 15 in Appendix G1 and Appendix G2 for detailed calculations). **Noise impacts would be significant because of construction-related traffic increases.** Conventional methods to reduce

noise sources, like constructing barriers, would not be feasible due to large construction area and large travel distances between the construction sites and would not provide a substantial reduction in traffic noise levels. **As such, construction noise levels under the Dam Raise Alternative would be significant and unavoidable.**

4.6.5.2 SR 152 Modifications

The PPV for each construction phase of the SR 152 modification activities would not exceed the significance threshold of 0.3 in./sec (see Table 14 in Appendix G1); detailed calculations are provided in Appendix G2. No long-term effects related to the SR 152 modifications would occur that could generate vibrations or ground-borne noise or otherwise expose persons to such impacts. Construction impacts on ambient noise levels generated by the SR 152 modifications would not result in permanent increases in ambient noise levels. Noise impacts associated with operating this alternative within an airport land use plan would be less than significant. **Vibration impacts and noise impacts related to airports would be less than significant.**

Construction activities for the SR 152 modifications would be performed 10 hours per day, 5 days per week for 18 months. There would be no blasting at the construction work sites for the SR 152 modifications. Daytime construction actions would not cause noise levels at the sensitive receptors to exceed the 10 dBA increase threshold (see Tables 12 and 13 in Appendix G1 and Appendix G2 for detailed calculations). Construction actions associated with SR 152 modifications would not increase noise levels at sensitive receptors above 102 dBA (daytime) and 88 dBA (nighttime) already experienced under the No Project/No Action Alternative (see Tables 13 and 14 in Appendix G1). Construction traffic noise associated with hauling and worker trips for the SR 152 modifications would cause a slight increase in traffic noise at Basalt Road but would not produce traffic noise levels that constitute a significant impact (see Table 16 in Appendix G1). **Noise impacts related to SR 152 modifications under Alternative 3 would be less than significant.**

4.6.5.3 Operation of Alternative 3

Operations of San Luis Reservoir under Alternative 3 would not result in noise impacts in excess of current operational noise levels. **Alternative 3 would result in no long-term operational noise impacts.**

4.7 Traffic and Transportation

4.7.1 Assessment Methods

For each project alternative, anticipated short-term construction-related and long-term operations-related trip generation were identified. These additional trips were assigned to roadways located near the service area (the San Luis Reservoir region) to determine traffic operations and level of service (LOS) under various project alternatives. LOS was determined to be an acceptable impact criteria for this analysis. The project is not subject to vehicle miles traveled (VMT) analysis because it is not increasing the capacity of any transportation facility and therefore no demand-inducing effect is expected.

Appendix H provides detailed information about traffic flow assessment methods, trip generation, and roadway operations under the action alternatives. LOS thresholds for various jurisdictions shown in Appendix H were used to identify traffic impacts. For roadways within Merced County,

LOS value was determined using criteria for different types of roadways provided in Appendix H. Freeway segments were evaluated using the LOS criteria provided in Appendix H.

Traffic safety effects were analyzed by identifying potentially hazardous areas (areas where slow-moving traffic would need to merge with fast-moving traffic) or roads/intersections that were not designed to adequately handle the proposed construction traffic. Safety hazards include blind corners or turnouts and sharp turns or areas where slow construction traffic might conflict with high roadway speed limits. Any potential routes where increases in construction traffic would conflict with existing public transit routes and their operations were analyzed. Construction and operations effects were analyzed to identify conditions that could result in inadequate emergency access.

4.7.2 Significance Criteria

Impacts related to traffic and transportation would be considered significant if they result in one or more of the following conditions or situations: (1) conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities; (2) increase traffic substantially in relation to the existing traffic load and capacity of the street system; (3) substantially increase hazards due to a geometric design feature or incompatible uses; or (4) result in inadequate emergency access. The significance criteria apply to all transportation systems that could be affected by the project.

4.7.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, there would be no changes to existing operations in the study area as a result of the B.F. Sisk Dam SOD Modification Project. Construction of the B.F. Sisk Dam SOD Modification Project would cause temporary increases in traffic with the presence of construction equipment and increased construction personnel vehicle trips. **However, this would not result in any roadway LOS degradation.**

Construction activities associated with the B.F. Sisk Dam SOD Modification Project could increase traffic hazards due to a design feature or incompatible uses or could affect emergency access by limiting or slowing emergency vehicle access to the reservoir and dam. Some areas identified as hazardous include the junctions of Basalt Road and SR 152 and the junction of the Romero Visitor Center access road and SR 152. Temporary traffic signals will be installed at these two intersections for use during the 8- to 10-year construction schedule. In addition, Mitigation Measure TR-1 required under the B.F. Sisk Dam SOD Modification Project (described in Table 2-1 and Appendix B) includes construction management actions that will be submitted to Caltrans for review and approval as part of a traffic control plan to be included in the construction contract. **With implementation of this mitigation measure, this alternative would result in less than significant impacts to traffic and transportation.**

4.7.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-structural Alternative

Under Alternative 2, there would be no construction or changes to existing operations in the study area. Therefore, there would be no short- or long-term impacts to traffic and transportation from these construction and operation activities. **This impact would be less than significant.**

4.7.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.7.5.1 Construction of Dam Raise and SR 152 Modifications

Construction of Alternative 3 would include the same mitigation measures taking place in the same location and during the same construction period as B.F. Sisk Dam SOD Modification Project under Alternative 1. Under Alternative 3, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet to accommodate the increased reservoir surface-level operations. The effects identified from implementation of the dam raise and SR 152 modifications actions under Alternative 3 are additive above those necessary for the B.F. Sisk Dam SOD Modification Project.

Construction-related traffic under Alternative 3 would not conflict with the goals and objectives of any applicable programs, plans, ordinances, or policies that establish roadway performance standards and would not result in a substantial increase in traffic in relation to the existing traffic load and roadway capacity.

Trip generation and roadway operations during construction of the Alternative 3 dam raise and SR 152 modifications are presented in Appendix H. For daily operations, the added construction-related trips would not change the LOS at any study roadway segments except for the section of SR 152 where it crosses over Cottonwood Creek. For peak hour operations, the added construction-related trips would either not change the LOS or change the LOS without exceeding the LOS threshold at any study roadway segments or intersections except for the section of SR 152 where it crosses over Cottonwood Creek. For the section of SR 152 where it crosses over Cottonwood Creek, lane closures during construction and added construction-related trips would result in a significant unavoidable impact on LOS during construction. **Therefore, construction of the Alternative 3 dam raise and SR 152 modifications would have a significant unavoidable short-term impact on traffic flow.**

During operations of Alternative 3, roadway operations would remain similar to those under No Project/No Action Alternative conditions. No long-term additional trips would be associated with Alternative 3 operations. **Alternative 3 operations of would have no long-term impact on traffic flow.**

Construction equipment and construction worker vehicle trips would increase hazards at dangerous intersections, including Fifield Road near SR 152, Gonzaga Road, Basalt Road, and Dinosaur Point Road. For safety reasons, Reclamation, DWR, and CDPR personnel must always be able to access areas around the reservoir and dam, and construction traffic has the potential to limit or slow this emergency access. To reduce the potential for adverse traffic safety interactions between this construction truck and worker traffic and other vehicle traffic, temporary traffic signals would be installed at the junctions of SR 152 with Basalt Road and the Romero Visitor Center access road for use during the construction period. **Construction of Alternative 3 would increase the potential for traffic hazards at intersections and potentially conflict with emergency vehicles, resulting in a significant impact.** Developing a site-specific HASP, installing caution signs, implementing dust control measures, and implementing construction traffic management actions included in **Mitigation Measure TR-1, described in Section 4.15, would reduce the severity of this impact to less than significant.**

The design of the SR 152 modifications would be consistent with all relevant sections of the Caltrans *Highway Design Manual*, particularly for roadway curve radius and embankment slope. **This will ensure that Alternative 3 operations, including SR 152 modifications, would have no long-term impact on traffic safety**.

4.8 Hazards and Hazardous Materials

4.8.1 Assessment Methods

In general, the evaluation used to analyze potential hazards and hazardous materials effects of the alternatives is qualitative, focusing on two types of impacts associated with hazards and hazardous materials: (1) the potential to encounter hazardous materials including contaminated soil or groundwater at existing active hazardous materials sites near proposed construction and (2) accidental release of hazardous materials during construction and operations, including accidental release of hazardous materials (e.g., fuels, oils) during transportation to and from sites related to construction and operations. Short-term impacts during construction and long-term impacts of operations are analyzed.

The locations of existing hazardous materials sites in relation to proposed construction areas and operating facilities were considered when determining the potential for encountering contaminated soil or groundwater that could result in a release of hazardous materials and a potential threat to public health and safety.

Potential construction activity impacts to San Luis seaplane operations at San Luis Reservoir are analyzed. The proximity of proposed facilities and construction work areas to wildlands was considered in the analysis for the risk of wildland fires. Emergency evacuation plans for the various state and local emergency management jurisdictions were researched to determine if the project would conflict with emergency evacuation procedures and construction controls, and mitigation measures were identified where necessary.

No schools are within 0.25 miles of proposed construction activities. CEQA Guidelines 15186 states that 0.25 miles is the threshold for the proximity of school to construction sites to warrant further impact analysis. Therefore, no further analysis of potential hazards associated with construction and operations near schools is conducted.

4.8.2 Significance Criteria

Impacts on hazards and hazardous materials would be considered significant if the project (1) would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; (2) would create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; (3) would be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and as a result would create a significant hazard to the public or the environment; (4) would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or (5) would expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

The significance criteria described herein apply to areas where hazards exist and where hazardous materials could be released and cause safety risks to the public, construction workers, or employees operating facilities.

4.8.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would remove asbestos-wrapped corrugated metal pipe from existing toe drains and transport it to an off-site waste management facility using the Uniform Hazardous Waste Manifest consistent with EPA regulations under the Resource Conservation and Recovery Act of 1976. The California Department of Toxic Substances Control (DTSC) classifies asbestos as hazardous waste if it is friable (DTSC 2003). However, asbestos in pipeline coatings is never in a friable state and when a pipeline is cut and removed from the ground, the coating is only minimally disturbed (Howell 2011). In addition, instances of concentrated exposure are unlikely with the use of a respirator as prescribed standard safety equipment by workers handling asbestos-wrapped pipe and given the pipelines locations outdoors. **Therefore, Alternative 1 would have a less than significant impact related to hazards and hazardous materials resulting from the use and transport of hazardous materials during construction.**

An active remediation site is located within the area of a proposed construction staging site and approximately 830 feet from proposed permanent downstream fill impacts for dam construction. A hazard to the public or the environment would be created if contaminated soil or groundwater was encountered and released during construction and released to the environment. **However, implementation of the Mitigation Measures HAZ-1, HAZ-2, and HAZ-3 required under the B.F. Sisk Dam SOD Modification Project (described in Table 2-1 and Appendix B) would reduce the severity of this impact to less than significant**. Similarly, the severity of potential impacts to pilots, the general public, and workers within the study area that could occur if pilots are unaware of the temporary base closures **would be reduced to less than significant through implementation of the mitigation measures described in Chapter 2**.

Construction activities for the B.F. Sisk Dam SOD Modification Project would require the use of SR 152 and Basalt Road. SR 152 is the main access route into the San Luis Reservoir SRA from both the east and west and would be the main evacuation route from the park in case of an emergency. As a result, the use of SR 152 and Basalt Road for construction site access could temporarily conflict with emergency response and evacuation plans for the San Luis Reservoir SRA. **However, implementation of the mitigation measures would reduce the severity of this impact to less than significant.**

Construction activities would include the use of mechanical equipment from which sparks could be generated during operation and cause a wildfire. As the San Luis Reservoir area was determined to be at moderate or high risk for wildfire, this could be a significant impact. **However, with the implementation of Mitigation Measure HAZ-4 proposed under the B.F. Sisk Dam SOD Modification Project (described in Table 2-1 and Appendix B), the increased risk of wildfire during construction activities would be less than significant. Overall, this alternative would have a less than significant impact related to hazards and hazardous materials.**

4.8.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no new construction or changes to existing structures in the study area implemented by the B.F. Sisk Dam Raise and Reservoir Expansion Project, only operational changes to the annual allocation process to reserve up to 310 TAF of stored CVP supply in San Luis Reservoir at the end of wetter years for allocation in drier years. Impacts to hazards and hazardous materials were not analyzed because operational changes would not result in the disturbance of land. **Therefore, there would be no impacts to hazards and hazardous materials.**

4.8.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.8.5.1 Construction of Dam Raise

Construction of Alternative 3 would take place in the same location, occur during the same construction period and include the same mitigation measures and environmental commitments as Alternative 1 (B.F. Sisk Dam SOD Modification Project). Therefore, the potential to encounter contaminated soil or groundwater, conflict with seaplane maneuvers, temporarily conflict with emergency response or emergency evacuation, and increase wildfire risk would be same as Alternative 1. The blasting plan, contaminated soil/groundwater remediation plan, and construction safety plan developed for the B.F. Sisk Dam SOD Modification Project would be amended to cover the additional blasting operations and construction equipment required under Alternative 3. Plan amendments would require submitting formal requests to the governing entity. For example, a request for changes to blasting plans would be made to EPA. **Therefore, this impact would be less than significant.**

4.8.5.2 SR 152 Modifications

To accommodate the increased reservoir surface-level operations, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet. Some hazardous materials (motor oil, gasoline, diesel fuel, solvents, degreasers) would be used on-site during construction and operation of the SR 152 modifications. Development of a SWPPP would be required by the RWQCB under the Construction General Permit. Additionally, mitigation measures, general safety measures, and BMPs, as described in Section 4.15, would be implemented when transporting, storing, or using hazardous materials and would describe actions to prevent a release of hazardous materials and procedures in case of an accidental spill or release of hazardous materials.

This segment of SR 152 was last modified between 1982 and 1992, and gasoline and other fuels contained lead as an additive until the mid-1980s. Therefore, construction activities associated with the highway modifications have the potential to release aerially deposited lead (ADL) that may have accumulated in the soils along SR-152 (DTSC 2016). Consistent with the Caltrans and DTSC Soil Management Agreement for ADL-Contaminated Soils, a preliminary site investigation would be conducted to determine the lead concentration in the soils, and dependent on the findings, actions would be taken to properly dispose of or reuse the soils. Typically, soils with lead concentrations between 80 and 320 ppm (or 80 to 320 mg/kg) may be reused without restriction and soils with concentrations above 320 ppm would be considered hazardous materials and subject to full regulations regarding disposal (DTSC 2016).

SR 152 modifications could include the removal or reuse of highway railing wood posts. The wood posts, typically preserved with hazardous chemicals, would be considered treated wood waste (TWW) and subject to handling and disposal requirements established by DTSC. If encountered, construction workers would comply with DTSC alternative management standards for TWW, which could include disposal at hazardous waste landfills or specified nonhazardous waste landfills to ensure safe handling and disposal of TWW. **Impacts related to hazardous materials during construction of the SR 152 modifications would be less than significant.**

The introduction of construction equipment and vehicles could introduce new potential temporary inference with an emergency response plan or emergency evacuation plan for the State Responsibility Area and could increase wildfire risk. Roadway improvements and the use of mechanical construction equipment would have a significant impact on hazards within the study area and State Responsibility Area, but with implementation of Mitigation Measures HAZ-1 (required under the B.F. Sisk Dam SOD Modification Project as Mitigation Measure HAZ-4) and TR-1, described in Section 4.15, **this impact would be less than significant**.

4.8.5.3 Operation of Alternative 3

All operational subalternatives under Alternative 3 would generate increased water surface elevations in San Luis Reservoir by up to 12.8 feet, inundating 445 acres of new land around the shore of the reservoir when the reservoir is full, based on the CalSIM II results (see Appendix E for CalSIM II modeling results). Operations are not forecasted to reduce the water elevations in the reservoir and would not result in the reduction of available space for seaplane landing. **Therefore, Alternative 3 operations would not limit the area available for seaplane landing resulting in safety hazards for pilots and the public, and this impact would be less than significant.**

San Luis Reservoir is located within a State Responsibility Area, classified as moderate or high fire hazard severity. All operational subalternatives under Alternative 3 would not substantially impair or interfere with the goals and plan elements of the Merced County *Emergency Operations Plan Basic Plan* (Merced County 2017) or the CAL FIRE *Strategic Plan 2019* (CalFire 2019). The reservoir expansion would not alter the landscape or require the installation of infrastructure that would exacerbate wildfire risk. There would be no increase in exposure of people or structures to significant wildfire-related risk as a result of Alternative 3. **This impact would be less than significant.**

4.9 Aquatic Resources

4.9.1 Assessment Methods

Project-related aquatic resources impacts would fall into two categories: (1) short-term construction-related impacts and (2) long-term operations-related impacts. Short-term construction activities would cause the temporary degradation of fish habitat from disturbance and increased sedimentation and release of and exposure to construction-related contaminants and have been evaluated qualitatively in this section. Operational impacts would be triggered by changes in hydrology associated with changes in facilities operations. This analysis has been was performed using outputs from the CalSim II model.

4.9.1.1 Operational Impacts to Delta Fishes

Hydrologic conditions in the Delta were analyzed using CalSim II to assess operational effects of the alternatives on fisheries resources and aquatic habitats in the Delta. Hydrologic indicators for habitat

quality in the Delta used in this analysis include Sacramento River flow, Delta outflow, location of X2, Old and Middle River flows, and Delta conveyance (see Appendix J2 for details on the analysis).

4.9.2 Significance Criteria

Impacts of an alternative on fisheries and aquatic ecosystems would be significant if project implementation (1) would 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 CDFW, USFWS, or NMFS or 2) would interfere substantially with the movement of any native resident or migratory fish or aquatic-dependent species or with established native resident or migratory corridors, or impede the use of native nursery sites. For Sacramento River flow, Delta outflow, and Old and Middle River flows, a negative change of 5% in predicted flows was used as a threshold for a notable change in hydrologic conditions due to the potential negative impacts to fish species as flows decrease. A value of 5% was chosen because it was considered to exceed the predictive model error (noise). For Delta conveyance, a positive change of 5% in predicted flows was used as the threshold for notable change due to the potential negative impacts to fish species due to increased conveyance. For X2, a change in X2 location greater than 1 kilometer (km) was used as the threshold for notable change. In addition to these thresholds, notable changes were evaluated to determine whether they affected Delta fish species substantially, depending on the conditions under which these changes occurred.

4.9.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under the No Project/No Action Alternative, crest raise actions from the B.F. Sisk Dam SOD Modification Project would be implemented and could result in temporary impacts on aquatic habitats for fish species in San Luis Reservoir from clearing, grading, equipment staging, and other ground-disturbing activities. However, no special status fish species are present in San Luis Reservoir, and San Luis Reservoir does not provide migratory habitat to any fish species. There would be no changes to CVP and SWP operations because of this alternative. **Therefore, Alternative 1 would have no impact on special status fish species and their habitats or the movement of any resident or migratory fish species.**

4.9.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no construction in the study area. Modeled operational changes implemented under Alternative 2 indicate that there would be no changes to the Sacramento River flow or to the location of X2 compared to the No Project/No Action Alternative, while Delta outflow would change by less than 5% for all months of all water year types (see Appendix J2 for detailed results). Delta conveyance increased by less than 1% in April of dry water years and either remained the same or decreased for Alternative 2 versus the No Project/No Action Alternative for the remaining months and water year types (see Appendix J2 for detailed results). A decrease in conveyance is expected to be slightly beneficial for fish as a result of more water being available for both fish and their food resources. Similarly, modeled differences in Old and Middle River flows were positive, indicating less negative Old and Middle River flows under Alternative 2 versus the No Project/No Action Alternative. Therefore, increases to Old and Middle River flows are expected to be beneficial to fish as a result of more retained water within the rivers and somewhat reduced entrainment risk due to less flow moving toward the conveyance facilities. **Therefore, the impacts**

of operations on special status fish species and their habitats or the movement of fish species would be less than significant.

4.9.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.9.5.1 Construction of Dam Raise

Construction of Alternative 3 would occur in the same study area as Alternative 1 (B.F. Sisk Dam SOD Modification Project). Therefore, effects on special status fish species and their habitats would be the same as under Alternative 1. **Therefore, construction impacts of Alternative 3 would have no impact on special status fish species and their habitats or the movement of any resident or migratory fish species.**

4.9.5.2 SR 152 Modifications

To accommodate the increased reservoir surface-level operations, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet. Because no listed or other special status fish species are present within San Luis Reservoir, **the SR 152 modifications would have no impact on listed or other special status fish species and their habitats or the movement of any resident or migratory fish species.**

4.9.5.3 Operation of Alternative 3

Alternative 3 includes three operational subalternatives (see Chapter 2 for details on alternatives). The primary subalternatives include CVP Only Storage, CVP/SWP Split Storage, and Investor-Directed Storage. The Investor-Directed Storage subalternative comprises four operational configurations (see Chapter 2 for details on operational configurations and water delivery scenarios). Below is a high-level summary of the analysis of operational impacts on special status fish species (see Appendix J2 for detailed results). The configurations under Alternative 3 are not forecasted to generate measurable changes to water storage in upstream reservoirs (Shasta, Folsom, Oroville, and Trinity Reservoirs) and therefore would not impact fish species upstream of San Luis Reservoir.

CVP Only Storage For CVP Only Storage subalternative, the modeled location of X2 for Alternative 3 differs less than 1 km compared to the No Project/No Action Alternative across all months and water years. For Sacramento River flow, Delta outflow, and water deliveries conveyed through the Delta, modeled flows differ less than 5% compared to the No Project/No Action Alternative across all months and water years. Modeled Old and Middle River flow only differs more than 5% compared to the No Project/No Action Alternative during wet and above-normal water year types from February through April. However, Old and Middle River flow during these months have values well below (less negative) than the −5,000 cfs threshold believed to have deleterious effects to listed fish species. **Therefore, the impacts of operations on special status fish species and their habitats or the movement of fish species would be less than significant.**

CVP/SWP Split Storage For CVP /SWP Split Storage subalternative, the modeled location of X2 differs less than 1 km compared to the No Project/No Action Alternative across all months and water years. For Sacramento River flow, Delta outflow, and water deliveries conveyed through the Delta, modeled flows differ less than 5% compared to the No Project/No Action Alternative across all months and water years. Modeled Old and Middle River flow only differs greater than 5% compared to the No Project/No Action Alternative during wet and above-normal water year types from February through April. However, Old and Middle River flow during these months have

values well below (less negative) than the −5,000 cfs threshold believed to have deleterious effects to special status listed fish species. **Therefore, the impacts of operations on special status fish species and their habitats or the movement of fish species would be less than significant.**

Investor-Directed Storage For Investor-Directed Storage subalternative, the modeled location of X2 differs less than 1 km compared to the No Project/No Action Alternative across all months and water years. For Sacramento River flow and Delta outflow, modeled flows differ less than 5% from the No Project/No Action Alternative across all months and water years. For water deliveries conveyed through the Delta, modeled flows differ slightly more than 5% (5.60%) during wet water year types during March and April compared to the No Project/No Action Alternative. Modeled Old and Middle River flow only differ greater than 5% compared to the No Project/No Action Alternative during wet and above-normal water year types from February through April. However, Old and Middle River flow during these months have values well below (less negative) than the −5,000 cfs threshold believed to have deleterious effects to special status listed fish species. **Therefore, the impacts of operations on special status fish species and their habitats or the movement of fish species would be less than significant.**

4.10 Terrestrial Resources

4.10.1 Assessment Methods

Impacts to biological resources would fall into two categories: (1) short-term construction-related impacts and (2) long-term operations-related impacts. Short-term construction activities would cause the temporary degradation of habitat from construction actions and staging. Operational impacts would be triggered by increased inundation associated with changes in facility operations. The analysis in this section is based on multiple survey reports, including the report from a biological resources survey conducted in September 2018 and May 2020, database output, and habitat assessments provided in Appendix K1 and Appendix K2 respectively.

4.10.2 Significance Criteria

Impacts on terrestrial biological resources would be considered significant if the project (1) would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as an endangered, threatened, candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS; (2) would have a substantial adverse effect on any riparian habitat or other sensitive (or special status) natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS; (3) would have a substantial adverse effect on state or federally protected wetlands (e.g., vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means; (4) would 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 would impede the use of native wildlife nursery sites; or (5) would conflict with any local policies or ordinances protecting biological resources or adopted HCP, NCCP, or other approved local, regional, or state conservation plan.

4.10.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would remove or adversely affect natural habitats around the dam, near Basalt Quarry, and at the San Luis Reservoir

SRA near the Medeiros Day Use Area. Construction and materials borrowing would have a significant impact on sensitive biological resources, including special status plant and wildlife species, wetlands and sensitive natural communities including wetlands, and wildlife movement corridors. Under Alternative 1, construction activities would permanently remove 358 acres of upland and aquatic habitat and temporarily disturb 3,084 acres (Appendix K1) (ESA 2018; Reclamation 2019), which include permanent impacts to approximately 3.4 acres of freshwater emergent wetland and 1.5 acres of seasonal wetland from the expansion of the dam footprint. Additional habitat would be temporarily impacted in the borrow and staging areas (Table 4-3).

Table 4-3. Habitat Impacts Associated with Alternative 1 Construction

Habitat Type	Temporary Impact (Acres)	Permanent Impact (Acres)
Annual Grassland	2,473	86
Valley Foothill Riparian	34	0
Scrub/Chaparral	182	7.3
Urban	354	256
Lacustrine (Reservoir)	520	3.0
Fresh Emergent Wetland	21	3.4
Seasonal Wetland	15	1.5
Ephemeral drainage	4.6	>0.1
Purple needlegrass grassland	1.0	0.5
Total (excludes lacustrine)	3,084	358

Source: Reclamation 2019

> – greater than

Construction could result in associated loss of habitat or direct or indirect harm to several special status wildlife species, including vernal pool fairy shrimp, valley elderberry longhorn beetle, CRLF, California tiger salamander, western pond turtle, coast horned lizard, San Joaquin whipsnake, special status bats, SJKF, and American badger (see Appendix K1) (Reclamation 2019). Common and special status bird nesting activities that could be directly impacted during construction are loggerhead shrike, California horned lark, tricolored blackbird, Swainson's hawk, golden eagle, and bald eagle, among other birds. Potential effects to golden eagle and Swainson's hawk include the loss of foraging habitat. Rare plant surveys remain underway, with no special status plants known from the study area. Limited impacts to nonlisted special status plant species could occur under Alternative 1. Potentially significant impacts to the above-described resources would be reduced to less than significant through the implementation of Mitigation Measures TERR-1 through TERR-16 required under the B.F. Sisk Dam SOD Modification Project (described in Table 2-1 and Appendix B). **Under the No Project/No Action Alternative, planned construction would have less than significant impacts to terrestrial plants and wildlife, sensitive natural communities, protected wetlands, and wildlife movement. Project construction would have no impact to policies protecting biological resources or approved HCPs or NCCPs.**

4.10.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-structural Alternative

Under Alternative 2, there would be no construction in the study area. **Therefore, there would be no short- or long-term impacts to terrestrial biological resources from these construction and operation activities. This alternative would result in no impact to biological resources.**

4.10.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.10.5.1 Construction of Dam Raise

Construction of the dam raise under Alternative 3 would occur within the same project footprint and schedule as described for the B.F. Sisk Dam SOD Modification Project under Alternative 1 and would include the mitigation measures identified in Chapter 2. The B.F. Sisk Dam SOD Modification Project EIS/EIR concluded that the permanent removal of potential SJKF habitat that could support SJKF is considered a significant impact. Actions at the dam under Alternative 3 would occur entirely within the Alternative 1 disturbed footprint but would have higher intensity of impacts in comparison to Alternative 1. It is expected that all sensitive biological resources would be absent prior to starting the Alternative 3 work at the dam. The active construction area would be free of special status species, wetlands and sensitive natural communities, and nursery sites and would be devoid of habitat for many terrestrial wildlife species. For this reason, effects to common, special status, and USFWS- and CDFW-regulated biological resources at the dam, Basalt Quarry, and San Luis Reservoir SRA would be the same as described for Alternative 1, as analyzed in the B.F. Sisk Dam SOD Modification Project EIS/EIR. **Therefore, this impact would be less than significant.**

Primary scientific literature considers the SJKF movement pathway across B.F. Sisk Dam as the last remaining north-south movement pathway for this species in the Santa Nella Area (e.g., Constable et al. 2009). Under this alternative, the pathway would be unavailable during the 8-year dam construction period. With the dam raise, the added fill could further reduce conditions for wildlife movement; specifically, for SJKF, tule elk, American badger, and mountain lion. Similarly, construction activities at SR 152 at Cottonwood Bay could further decrease a limited wildlife dispersal corridor that exists next to the immediate roadway. **These impacts to wildlife movement, especially to SJKF, would be significant.** Mitigation Measure TERR-12 requires inclusion of SJKF movement design requirements at B.F. Sisk Dam and SR 152 at Cottonwood Bay, which would reduce this impact. These considerations would also include an earthen wildlife movement bridge over the dam spillway to facilitate north-south SJKF dispersal and other wildlife movement and the inclusion of SJKF movement design requirements at SR 152 such as a broad, unrocked shoulder at the top of the causeway that allows wildlife movement away from roadside areas. **With the implementation of mitigation measures, impacts to SJKF would be less than significant.**

4.10.5.2 SR 152 and Dinosaur Point Modifications

To accommodate the increased reservoir surface-level operations, the SR 152 section at Cottonwood Bay would be elevated by 10 feet, with downslope modifications to a section of the roadway east of Cottonwood Bay, and the Dinosaur Point boat ramp facilities would be relocated upslope, as described in Chapter 2. The modifications to SR 152 at Cottonwood Bay would extend laterally into seasonally flooded lacustrine habitat in San Luis Reservoir and outside of wildlife refuge boundaries,

with no associated effects on sensitive plant or wildlife species within flooded portions of the reservoir.

SR 152 road modifications would result in 23.4 acres of permanent impacts to annual grassland, 0.6 acres of blue oak woodlands, and 9.5 acres of urban habitat and facility improvements at Dinosaur Point would affect approximately 6.3 acres of annual grassland, 0.3 acres of blue oak woodland habitat, and 8.8 acres of urban habitat. These impacts to vegetation communities under Alternative 3 are shown in Table 4-4 and Appendix K2.

Impacts to land cover types, including sensitive natural communities, special status plants, and aquatic resources, could occur as a result of construction in these areas. Approximately 8.9 acres of sensitive land cover types would be permanently impacted in work and staging areas, including 1 acre of freshwater emergent wetland, 0.04 acres of seep, 4 acres of intermittent and ephemeral channel, and 4 acres of native grassland habitat (Table 4.10-2). **Impacts to sensitive natural communities, aquatic resources (e.g., wetlands and other jurisdictional waters), and special status plant species at SR 152 and Dinosaur Point would be significant.**

Mitigation Measure TERR-1 (described in Section 4.15) would protect natural communities by surveying work areas, avoiding impacts where possible, and providing compensatory mitigation for unavoidable impacts and TERR-16 would identify sensitive vegetation communities, including jurisdictional wetlands or waters through focused surveys and mapping. Mitigation Measures TERR-1 and TERR-16 (described in Section 4.15) would compensate for the loss of special status plant species or sensitive natural communities through focused botanical surveys for special status plants, flagging and avoiding identified rare plant populations, minimizing the removal of sensitive natural communities and other areas that could support special status plants, revegetation of sensitive natural communities, and, where avoidance is not possible, plant collection and propagation and compensatory mitigation combined with monitoring to ensure the success of newly established plants. **With the implementation of mitigation measures, impacts to sensitive natural communities, aquatic resources (e.g., wetlands and other jurisdictional waters), and special status plant species would be less than significant.**

Table 4-4. Habitat Impacts Associated with Alternative 3

Habitat Type	San Luis Reservoir Expansion Impact (Acres)		
	Alt 3 Construction Impact (SR 152+Dinosaur Point)	Alt 3 Inundation Impact	Total Impact
Terrestrial Habitats			
Annual Grasslands	6.3+23.4 (**29.7**)	307.2	336.9
Purple Needlegrass	0	4.0	4.0
Blue Oak Woodland	0.3+0.6 (**0.9**)	54.3	55.2
California Sycamore Woodland	0	0.4	0.4
California Sagebrush Scrub	0	4.2	4.2
Urban	8.8+9.5 (**18.3**)	7.9	26.2
Terrestrial Subtotal	**48.9**	**378.0**	**426.9**
Aquatic Habitats			
Pond	0	0	0
Intermittent Channel	0	3.2	3.2
Ephemeral Channel	0	0.8	0.8
Fresh Water Emergent	0	1.0	1.0
Seep	0	<0.1	<0.1
Lacustrine	0	12.8	12.8
Aquatic Subtotal	**0**	**17.8**	**17.8**
Totals	**48.9**	**395.7**	**444.5**

[1] GIS calculations may not reflect exact acreage of study area due to rounding.
Bold text indicates totals and subtotals.

SR 152 improvements would require using materials excavated from Basalt Hill Borrow Area and Borrow Area 6, and construction would require equipment and materials staging and equipment access. Work activities at Dinosaur Point would require equipment access and use. Each activity could directly affect special status species that occur within the study area. Construction at SR 152 and at Dinosaur Point will occur in low to moderate quality grassland and scrub habitat that could support several special status wildlife species: San Joaquin whipsnake, SJKF, and American badger (Appendix K1). As presented in the USFWS (2019) biological opinion for the B.F. Sisk Dam SOD Modification Project the loss or degradation of annual grassland, valley foothill riparian, and blue oak woodland habitat could impact SJKF breeding, foraging, sheltering, and dispersal throughout the 8 year project duration by causing SJKF to avoid the area. Under Alternative 3, construction effects would occur to approximately 30.6 acres of annual grassland and blue oak woodland habitat at SR 152 and Dinosaur Point, as shown in Table 4-4. This would result in the potential minor impact to SJKF dispersal in the area during construction. However, SJKF dispersal routes are generally recognized to the east of the reservoir and along the dam face and do not include the SR 152 or Dinosaur Point construction areas (Constable et al. 2009). The SR 152 area is mostly rocked with large riprap, and SJKF movement passages are limited to the immediate highway shoulder. The Dinosaur Point area is in a semideveloped area on a peninsula that juts into San Luis Reservoir. However, the project would result in the loss of potential SJKF movement habitat. **These impacts would be significant.** By incorporating Mitigation Measures TERR-4, TERR-5, TERR-13, and TERR-15, described in Section 4.15, impacts on San Joaquin whipsnake, western pond turtle, and American badger would be substantially reduced through a combination of worker training,

preconstruction surveys, and passively or actively relocating animals in coordination with CDFW. Protection measures for SJKF and their habitat would be provided as described in Mitigation Measure TERR-12, which provides preconstruction surveys and avoidance buffers consistent with USFWS (1999) guidance and SJKF movement design requirements at SR 152 and an earthen wildlife movement bridge over the dam spillway to facilitate species movement, and TERR-15 (contractor awareness training). **By incorporating these mitigation measures, impacts on San Joaquin whipsnake, western pond turtle, American badger and SJKF would be less than significant.**

Construction in areas north of SR 152 could directly impact CRLF and California tiger salamander and their habitat (Appendix K2). These species are not expected at the Dinosaur Point construction areas because of the lack of local breeding sites. If found within the work area, CRLF and California tiger salamander could be relocated in coordination with wildlife agencies. In addition, the western side of San Luis Reservoir from Cottonwood Bay to Portuguese Creek Area is considered critical habitat for CRLF (see Appendix K2, Figure 3-10). Approximately 207.8 acres of the project area are within critical habitat, of which 177.2 acres support primary constituent elements for CRLF (30.6 acres within the construction footprint and 158.9 acres within the inundation footprint). Approximately 6.6 acres of critical habitat for this species with annual grassland and blue oak woodland cover types would be impacted during construction at the Dinosaur Point Boat Launch.[16] The SR 152 construction area is not within designated critical habitat for CRLF. **These impacts would be significant.** Mitigation would be provided for impacts to these species and their habitat. Compensatory mitigation will be needed for impacts to CRLF critical habitat. Mitigation Measure TERR-3 (described in Section 4.15) describes preconstruction survey methods, biological monitoring, and other compliance measures for these species and compensation for the permanent loss of habitat, and Mitigation Measure TERR-15 provides worker awareness training and site protection. **With the implementation of mitigation measures, impacts to special status amphibians would be less than significant.**

Migratory and special status nesting birds may be found in grassland, scrub, and nearby woodland and riparian habitat in the study area. Roosting bats could occur in trees within the study area. Such birds and bats could be harmed or disturbed during construction. **These impacts would be significant.** Mitigation Measures TERR-6, TERR-7, TERR-8, TERR-9, and TERR-10 (described in Section 4.15) protect special status and migratory nesting birds such as bald and golden eagles, burrowing owls, and tricolored blackbirds through surveys and avoidance with buffers that are appropriate to the species. Mitigation Measure TERR-11 (described in Section 4.15) protects roosting bats through surveys and avoidance and humane exclusion, if needed, prior to construction. Mitigation Measure TERR-15 includes worker awareness training and site protection. **With implementation of mitigation measures, impacts on migratory and special status nesting birds, and roosting bats would be less than significant.**

Wildlife nursery sites would remain mostly unchanged. No HCPs or local plans and policies cover San Luis Reservoir. The construction of Alternative 3 would comply with the policies established in the San Luis Reservoir SRA RMP/GP EIS/EIR (Reclamation and CDPR 2013). **Therefore, there would be no impact.**

[16] This figure does not include 8.8 acres of existing paved and developed surfaces at Dinosaur Point.

4.10.5.3 Operation of Alternative 3

Based on the vegetation mapping conducted for Alternative 3 in 2020, the 10-foot increase in San Luis Reservoir's maximum surface elevation would seasonally inundate approximately 445.0 acres of new land, including common and sensitive natural communities, around the reservoir's shore when full (see Appendix K2 for details). Additionally, affected sensitive natural communities include aquatic resources (e.g., wetlands, other jurisdictional waters) (Table 4-4) and special status plant species. **Impacts to these resources would be significant.** As described for the Alternative 3 construction, implementation of Mitigation Measure TERR-1, which characterizes the distribution of special status plants and natural communities in the project area and provides compensatory mitigation for unavoidable impacts to wetlands and other jurisdictional waters, and TERR-16, which compensates for the loss of special status plant species and sensitive natural communities through focused botanical surveys, flagging, and avoidance of identified rare plant populations, minimizing the removal of sensitive natural communities and other areas that could support special status plants, revegetation of sensitive natural communities, and where avoidance is not possible, plant collection and propagation, and compensatory mitigation combined with monitoring to ensure the success of newly established plants. **With the implementation of mitigation measures, impacts to sensitive natural communities, aquatic resources (e.g., wetlands, other jurisdictional waters), and special status plant species would be less than significant.**

The continued intermittent use of San Luis Creek in the reservoir footprint by CRLF and potentially California tiger salamander during drawdown conditions is expected to continue during operations under Alternative 3. The use of potential breeding ponds by these species outside of the area of analysis will not be impacted by operations, although one potential California tiger salamander and CRLF breeding pond (identified as Pond 44 in Appendix K2) measuring approximately 0.09 acres, would be inundated during operations. No other suitable aquatic breeding habitat for these species would be inundated or otherwise impacted during operations. Upland dispersal habitat of these species within the reservoir footprint would either be permanently lost or would be seasonally unavailable for use (Table 4-4) (ESA 2020).

Reservoir inundation would directly impact movement habitat for SJKF. The USFWS (2019) biological opinion for the B.F. Sisk Dam SOD Modification Project anticipated the loss or degradation of annual grassland, valley foothill riparian, and blue oak woodland habitat as potential effects to SJKF breeding, foraging, sheltering, and dispersal throughout the 8- to 12-year project duration by causing them to avoid the area. Under Alternative 3, effects would occur to approximately 396.5 acres of annual grassland, valley foothill riparian, and blue oak woodland habitat, as shown in Table 4-4. This would result in the potential impact to SJKF dispersal in the area. Two potential SJKF dispersal routes are recognized near San Luis Reservoir: one from the southeast and one from the south, with both routes converging at the dam foot and continuing above the exposed dam spillway (Constable et al. 2009). Under Alternative 3, these routes would not be altered beyond disturbances that would occur under Alternative 1. Based on the SJKF least-cost path analysis for the project region performed by Constable et al. (2009), all identified local least-cost SJKF dispersal routes favor paths that are east of San Luis Reservoir. Based on the 2020 biological surveys, much of the area that would be inundated under Alternative 3 is relatively steep (i.e., greater than 15 degrees), with few to no burrows and therefore of relatively low value for SJKF (ESA 2020) (see Appendix K2). Hence, water level changes would remove a portion of the SJKF movement corridor west of the reservoir. Potential indirect effects to SJKF within the operations footprint could include animal displacement, decreased foraging habitat quality, exposure to predation, and short-term impediments to movement. **These impacts would be significant.** Mitigation would be

provided for operational impacts to CRLF, California tiger salamander, and SJKF and their habitat. Compensation for loss of habitat for these species would be provided as described in Mitigation Measures TERR-3 (Amphibians) and TERR-12 (SJKF). **With implementation of mitigation measures, including providing compensation for habitat impacts, providing replacement breeding sites for CTS and CRLF, and providing movement opportunities in mitigation lands, impacts to California tiger salamander, CRLF, and SJKF associated with operations would be less than significant.**

Other special status wildlife species that could be present within the operations footprint include San Joaquin whipsnake, special status birds, and American badger (Appendix K2). These species are expected to naturally relocate upslope with rising waters, with a permanent reduction in available habitat. **This impact would be less than significant.**

Wildlife movement corridors and nursery sites for wildlife would change seasonally during water drawdown; however, wide-ranging species such as SJKF and American badger are subject to existing obstacles to movement (e.g., roads, waterbodies). SJKF movement is expected generally east of the reservoir, with limited movement opportunities to the west (Constable et al. 2009). Some SJKF use and movement is presumed on lands that would be inundated under Alternative 3. Thus, operation of Alternative 3 could result in the seasonal inability to negotiate these obstacles, including their substantial documented mobility and large home ranges. The incremental effect on increased water levels on reducing SJKF movement at the reservoir edge and where Cottonwood Bay intersects SR 152 would further restrict movement of this species. **With implementation of mitigation measure TERR-12, which provides a land bridge over the dam spillway and wildlife movement design considerations at SR 152, impacts to SJKF movement during operations, this impact would be less than significant.**

No HCPs or local plans and policies cover the project area. The Alternative 3 operations would comply with the policies established in the San Luis Reservoir SRA RMP/GP EIS/EIR (Reclamation and CDPR 2013). **Therefore, there would be no impact on the physical environment resulting from conflicts with local policies or ordinances protecting biological resources or adopted conservation plans.**

4.11 Recreation

4.11.1 Assessment Methods

This analysis assesses impacts to recreation by evaluating closures or access restriction at sites at or near the San Luis Reservoir SRA. There should be no closures or access restrictions to Pacheco State Park.

This analysis also assesses impacts to recreation by evaluating potential impacts to recreation during operation of each project alternative. The operational changes under Alternative 3 have the potential to alter reservoir water levels at San Luis Reservoir. If reservoir operations changed to reduce or increase water levels during summer months, water-based recreation such as boating, fishing, and swimming could be affected. Therefore, this analysis estimates the potential water storage and surface levels and their associated effect on recreation facility availability and quality of project implementation using the project inundation mapping provided in Appendix L. The recreation

facility availability and quality analysis in this section relies on the modeling results and therefore contains a degree of uncertainty.

4.11.2 Significance Criteria

Impacts on recreation would be considered significant if they resulted in one or more of the following conditions or situations: (1) recreational use of trails within the San Luis Reservoir SRA would be substantially reduced as a result of construction; (2) construction activities would substantially reduce access to or close recreation areas; (3) displaced recreation from sites affected by construction would substantially contribute to overcrowding or exceed the facility capacity at other recreation sites; or (4) operational changes to water levels in recreational water bodies would be reduced to an extent that recreational uses would be substantially affected.

4.11.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would affect the area around the dam and recreational facilities that surround the dam, impacting the availability of recreational opportunities in the area. The Basalt and Medeiros Use Areas would be used for construction staging and would be closed for the full construction schedule. The B.F. Sisk Dam SOD Modification Project would cause a temporary reduction in local recreational trail availability, but recreationists would have access to a large network of alternate trails that are readily available at neighboring recreation sites in the SRA and at neighboring state parks. This could result in a less than significant contribution to overcrowded conditions at other local and regional recreation sites during this time. The B.F. Sisk Dam SOD Modification Project would temporarily close boat launches, trails (including American with Disabilities Act (ADA) compliant trails), and other recreational facilities (including ADA and RC compliant campsites, fish cleaning stations, public storage rooms, public showers) at San Luis Reservoir during the full duration of construction, which would reduce recreation opportunities and could displace recreational visitors during construction.

Implementation of Mitigation Measure REC-1 required under the B.F. Sisk Dam SOD Modification Project, described in Table 2-1 and Appendix B, would reduce the severity of this impact to less than significant. There would be no changes to existing reservoir operations under Alternative 1. **Therefore, Alternative 1 would result in less than significant impacts on recreational opportunities.**

4.11.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no new construction or changes to existing structures in the study area implemented by the B.F. Sisk Dam Raise and Reservoir Expansion Project, only operational changes to the annual allocation process. There would be no impacts to the recreational setting or visitor attendance at the San Luis Reservoir SRA because the slight changes in water surface elevation in San Luis Reservoir would result in minimal changes to water-based recreational activities such as boating where the usability of boat ramps would remain unchanged. **Therefore, there would be no impacts to recreation from operational activities under Alternative 2.**

4.11.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.11.5.1 Construction of Dam Raise

Construction of Alternative 3 would occur on the same schedule as Alternative 1. Therefore, effects to recreational facilities or activities surrounding the dam and the temporary closures of the Basalt and Medeiros Use Areas (i.e., loss of camping, picnicking, fishing, hiking at Basalt Campground Trail and Lone Oak Trail, and swimming opportunities) would be same as Alternative 1 and would not extend its impacts. While only a portion (approximately 930 feet [3%]) of the 6-mile round trip along Lone Oak Trail would fall within the construction staging area, the trail begins near Goosehead Point Boat Launch (within the construction staging area) and would be closed to the public during construction. Closure of the Basalt Use Area, Medeiros Use Area and Dinosaur Point Boat Launch to the public during construction of the Dam Raise action and modifications to Dinosaur Point and Goosehead Point Boat Launches could result in increased recreational usage at San Luis Creek Use Area and boat launch located on O'Neill Forebay. To reduce the severity of increased water-based recreational usage at San Luis Creek Use Area and boat launch, Mitigation Measure REC-1 would be implemented. However, with the closure of access to Goosehead Point Boat Launch for the full period of construction and closure of access to Dinosaur Point Boat Launch for approximately 1 year during active construction at the Dinosaur Point Use Area, all boat launch facilities at San Luis Reservoir would be closed for public access. **This would result in a significant impact to recreation**. Due to lack of other boat launch facilities at San Luis Reservoir, no feasible mitigation could be identified to reduce this impact to a less than significant level. **Although impacts would be reduced through implementation of Mitigation Measures REC-1 (see Section 4.15), these impacts would remain significant and unavoidable despite mitigation.**

4.11.5.2 SR 152 Modifications

To accommodate the increased reservoir surface-level operations, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet. Construction activities associated with the SR 152 modifications would not result in the closure of recreation facilities. In addition, with only 10% of construction-related truck trips occurring during peak hours, the truck trips are not anticipated to increase roadway traffic above conditions currently experienced during peak hours in such a way that would require the closure or modification of recreation site access points (see Appendix H for further discussion of roadway operations during construction of SR 152 Modifications). **Therefore, there would be no impact to recreation due to the proposed modifications to SR 152 under Alternative 3.**

4.11.5.3 Operation of Alternative 3

Alternative 3 would generate increased storage levels and water surface elevations in San Luis Reservoir and inundate an additional 445 acres of land around the shore of the reservoir when the reservoir is full. Inundation mapping shown in Appendix L (Figure 7 for Basalt Use Area and Figure 8 for Dinosaur Point Boat Launch) does not show potential impacts to the top of the boat launches. However, since top of the boat launch is less than a mile from inundation under existing conditions i.e. Alternative 1, Alternative 3 includes modifications to Dinosaur Point and Goosehead Point Boat Launches. Additionally, inundation is expected to occur to vehicle parking at Dinosaur Point Boat Launch Parking Lot and Dinosaur Point Parking. Alternative 3 includes modification both parking areas. **Therefore, impacts on recreation due to operations of Alternative 3 would be less than significant.**

When the reservoir is full, it is anticipated that inundation would increase such that the reservoir would expand slightly in size, inundating portions of the Lone Oak Trail (nearly a half mile), requiring temporary trail closure until water levels recede. The trail traverses' loam and clay soil types, which have a low to moderate erodibility. Therefore, after inundation, the trail would remain in good condition and would not require additional maintenance. **Operation of this alternative could cause a significant impact by temporarily closing a trail and reducing recreation opportunities during times when the reservoir is fully inundated.** Implementation of Mitigation Measure REC-2, described in Section 4.15, would relocate the portions of the trail that would be inundated and reduce the long-term impact on Lone Oak Trail to a less than significant impact. **Therefore, operational impacts on trails and recreation facilities associated with Alternative 3 would be less than significant with implementation of Mitigation Measure REC-2.**

The operational alternatives under Alternative 3 are not forecasted to generate measurable changes to water surface elevations in upstream reservoirs (Shasta, Folsom, Oroville, and Trinity Reservoirs). **Therefore, this impact would be less than significant.**

4.12 Cultural Resources

4.12.1 Assessment Methods

NHPA Section 106 requires federal agencies to consider the effects of their undertakings on historic properties or cultural resources listed or eligible for listing in the NRHP and affords the Advisory Council on Historic Preservation an opportunity to comment on such undertakings. Implementing regulations under 36 CFR Part 800 outline steps that must be taken to comply with NHPA Section 106. The criteria for evaluating cultural resources for listing in the NRHP are defined in 36 CFR Part 60.4. A formal determination of NRHP eligibility is made when the state SHPO concurs with an evaluation made by the federal Lead Agency. Alternatively, the evaluation of a historic property could be submitted to the NRHP Keeper for a formal determination of NRHP eligibility.

The analysis of potential impacts to historic properties employs the criteria of adverse effect, which is defined under 36 CFR Part 800.5. Adverse effects can occur when an undertaking alters, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. As outlined under 36 CFR Part 800.6, the resolution of adverse effects to historic properties under NHPA Section 106 requires consultation with appropriate parties to seek ways to avoid, minimize, or mitigate adverse effects and calls for the execution of a formal agreement (Memorandum of Agreement or Programmatic Agreement) with SHPO and other parties to govern implementation of the undertaking.

CEQA requires state and local public agencies to identify potential impacts to historical resources or cultural resources listed or eligible for listing in the CRHR and to determine if those impacts would be significant. CEQA further requires state and local public agencies to identify alternatives and mitigation measures that would substantially reduce or eliminate significant impacts to historical resources. Similar provisions are established for unique archaeological resources under PRC Section 21083.2(b) and for tribal cultural resources under PRC Section 21084.3. Pursuant to PRC Section 21084.1, an impact is considered significant if a project would cause a substantial adverse change in the significance of a historical resource. The criteria for evaluating cultural resources for listing in the CRHR are based on NRHP criteria and are defined in PRC Section 5024.1. A resource is listed in

the CRHR once an eligibility nomination has been reviewed by SHPO and approved by the California State Historical Resources Commission.

4.12.2 Significance Criteria

For the purposes of this draft EIR/SEIS, impacts would be significant if they would result in adverse effects to historic properties listed or eligible for listing in the NRHP; result in substantial adverse changes to historical resources, unique archaeological resources, or tribal cultural resources listed or eligible for listing in the CRHR; or disturb human remains, including those interred outside of formal cemeteries.

4.12.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Archival and record searches and inventory surveys revealed 16 historic period archaeological sites or built environment resources within the Alternative 1 APE. In addition to the B.F. Sisk Dam/San Luis Reservoir Historic District, these included six road segments (CA-MER-491H, CA-MER-493H, CA-MER-494H, CA-MER-495H, CA-MER-513H, PL-Sisk-01); two industrial sites associated with construction of the B.F. Sisk Dam (CA-MER-492H, CA-MER-509H); a historic period ranch complex (CA-MER-451H); a concrete equipment pad (CA-MER-510H); two livestock watering locales (CA-MER-511H, CA-MER-521H); a helicopter pad (CA-MER-512H); a ditch segment (CA-MER-514H); and a series of survey markers and monitoring wells associated with dam construction and maintenance (CA-MER-520H).

Key elements of the B.F. Sisk Dam system have been recommended not eligible for listing in the NRHP or CRHR as individual resources but have been recommended as contributing elements to the B.F. Sisk Dam/San Luis Reservoir Historic District under NRHP Criterion A/CRHR Criterion 1 (JRP 2018). CA-MER-492H and CA-MER-509H (industrial resources used in the construction and development of the B.F. Sisk Dam) have been recommended not eligible for listing in the NRHP or CRHR as individual resources and are regarded as non-contributing elements of the B.F. Sisk Dam/San Luis Reservoir Historic District (JRP 2018). All remaining resources noted above have been recommended not eligible for listing in the NRHP and CRHR (see Appendix M and Pacific Legacy 2019), and the SHPO has concurred with the NRHP recommendations for seven of these resources (CA-MER-510H, CA-MER-511H, CA-MER-512H, CA-MER-513H, CA-MER-514H, CA-MER-520H, CA-MER-521H).

Although all traversable areas within the Alternative 1 APE have been subject to cultural resource inventory surveys, certain areas within the Basalt Hill Borrow Area, near the B.F. Sisk Dam, and along the reservoir shoreline remained inaccessible because of unsafe terrain or inundation. It is assumed that most portions of the Alternative 1 APE that were inaccessible will not be used as staging or stockpiling locations during construction, though some areas (e.g., along the base of the existing dam) will be capped by fill materials, subject to stabilization measures or used as borrow areas (e.g., Basalt Hill Borrow Area). Three historic period road segments (CA-MER-493H, CA-MER-494H, PL-Sisk-01) will be improved under Alternative 1, and the Basalt Hill Quarry (CA-MER-509H) will be reactivated. The northern edge of an industrial resource (CA-MER-492H) associated with the Basalt Hill Quarry and a historic period ranch complex (CA-MER-451H) intersect a potential construction staging area but could be avoided. Three other resources, including a ditch (CA-MER-514H), helicopter pad (CA-MER-512H), and a series of widely distributed survey markers and monitoring wells (CA-MER-520H), overlap potential construction staging areas but would be more difficult to avoid. Five cultural resources within the Basalt Hill Borrow Area or

Borrow Area 6 (CA-MER-494H, CA-MER-509H, CA-MER-510H, CA-MER-511H, CA-MER-521H) would be directly impacted because both areas will be used to supply fill materials for the enlarged dam embankment. Direct impacts will occur to the B.F. Sisk Dam as stability berms are constructed, the dam embankment is enlarged, and the height of the dam is raised; however, construction is not expected to remove, alter, or add elements or features to the B.F. Sisk Dam/San Luis Reservoir Historic District that are incongruent with its current use, appearance, or setting. JRP (2018) recommended that Alternative 1 would not result in adverse effects to the historic district or its contributing elements.

Under Alternative 1, there would be direct and indirect impacts to known historic properties, historical resources, and other cultural resources when compared to existing conditions. Implementation of Mitigation Measure CR-1 required under the B.F. Sisk Dam SOD Modification Project (described in Table 2-1 and Appendix B) would reduce the severity of these impacts to a level that is less than significant. **Under CEQA and NEPA, this alternative would result in less than significant impacts to known historic properties, historical resources, and other cultural resources in the study area.**

4.12.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

No new or expanded facilities are proposed under Alternative 2, and there will be no ground-disturbing activities or changes in physical conditions in the area of analysis. Compared to existing conditions and the No Project/No Action Alternative, there would be no impacts to known historic properties, historical resources, or other cultural resources under Alternative 2.

4.12.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

Alternative 3 is expected to impact cultural resources as a result of dam raise construction activities, modifications to SR 152, and operation of San Luis Reservoir and Cottonwood Bay under increased storage capacities. Each of these impacts is discussed separately below.

4.12.5.1 Construction of Dam Raise

Construction of the dam raise under Alternative 3 would occur within the same project footprint as described for the B.F. Sisk Dam SOD Modification Project under Alternative 1 and would occur over the course of 8 years, beginning in 2025. Cultural resources that overlap the APE for Alternatives 1 and 3 are expected to experience the same type and level of impacts within the same time frame. For instance, three historic period road segments (CA-MER-493H, CA-MER-494H, PL-Sisk-01) will be improved; the Basalt Hill Quarry (CA-MER-509H) will be reactivated; potential construction staging areas affecting five resources (CA-MER-492H, CA-MER-451H, CA-MER-512H, CA-MER-514H, CA-MER-520H) will be used; and the Basalt Hill Borrow Area and Borrow Area 6 will be used to supply further materials for the enlarged dam embankment, potentially affecting five resources (CA-MER-494H, CA-MER-509H, CA-MER-510H, CA-MER-511H, CA-MER-521H).

Construction impacts that would differ under Alternative 3 include increasing the crest elevation of the dam by another 10 feet; raising the berm elevation at Pacheco Pumping Plant by 10 feet; and raising the operating elevation of Dinosaur Point and Goosehead Point Boat Launches by 10 feet. No features would be removed, altered, or added to B.F. Sisk Dam and Pacheco Pumping Plant or

their appurtenant facilities that would be incongruent with their current setting or use, and activities associated with further raising the height of the dam has not yet been analyzed under Section 106. This analysis will occur after the Project has been authorized by Congress. The elevation of the Goosehead Point Boat Launch would impact one historic period road (CA-MER-477H) that has been recommended not eligible for listing in the NRHP and CRHR.

Compared to No Project/No Action Alternative, construction **impacts** to known historic properties, historical resources, or other cultural resources under Alternative 3 **would be significant. Under CEQA and NEPA, these impacts would be reduced to a level that is less than significant through implementation of Mitigation Measures CR-1, CR-2, and CR-3 (see Section 4.15).**

4.12.5.2 SR 152 Modifications

Under Alternative 3, fill material would be added between SR 152 and the reservoir shoreline at PMR6.295 to prevent damage to the roadway and the Cottonwood embankment (PL-Sisk-04), and portion of SR 152 that separates Cottonwood Bay from San Luis Reservoir between PMR5.239 and PMR5.806 would be elevated 10 feet to accommodate an increase in the reservoir's surface elevation. No archaeological resources have been recorded in these areas, and the potential to encounter such resources is extremely low, as each area is composed of imported fill or has been previously disturbed through dam or roadway construction. One known historic period built environment resource, recorded in 2020 as the Cottonwood embankment (PL-Sisk-04), will be impacted by SR 152 modifications. It is recommended as not individually eligible for listing in the NRHP or CRHR but is regarded as an appurtenant feature of San Luis Reservoir, which is considered a key contributor to the NRHP and CRHR eligibility of the B.F. Sisk Dam/San Luis Reservoir Historic District. Similar to the dam raise action, the SR 152 modification actions have not been analyzed under Section 106. This analysis will occur after the Project has been authorized by Congress. The full extents of SR 152 has not been evaluated for listing in the NRHP or CRHR. The current highway alignment within the study area was built between 1963 and 1965 to bypass San Luis Reservoir and was altered between 1982 and 1992 when it was converted from a two-lane to a four-lane highway.

Compared to No Project/No Action Alternative, impacts to known historic properties, historical resources, or other cultural resources from modifications to SR 152 under Alternative 3 would be significant. **Under CEQA and NEPA, these impacts would be reduced to a level that is less than significant through implementation of Mitigation Measures CR-1, CR-2, and CR-3 (see Section 4.15).**

4.12.5.3 Operation of Alternative 3

In addition to construction impacts and modifications to SR 152, implementation of Alternative 3 will result in operational impacts to cultural resources, specifically as maximum water levels are increased in San Luis Reservoir and Cottonwood Bay. Seventeen archaeological sites or historic period built environment resources have been recorded along the San Luis Reservoir and Cottonwood Bay shorelines. These include nine prehistoric sites (CA-MER-15, CA-MER-28, CA-MER-82, CA-MER-83, CA-MER-130, CA-MER-136, CA-MER-137, CA-MER-517, PL-Sisk-05), most with midden, lithics, and groundstone; a series of historic period transmission poles with a debris scatter (CA-MER-484H); three historic period road segments (CA-MER-477H, CA-MER-489H, CA-MER-519H); three earthen dams with impound ponds (CA-MER-515H, CA-MER-516H, CA-MER-518H); and the Cottonwood embankment (PL-Sisk-04) noted above. Of the nine

prehistoric sites that have been recorded along the perimeters of San Luis Reservoir and Cottonwood Bay, one (CA-MER-136) is listed in the NRHP and CRHR; one (CA-MER-130) has been listed in the NRHP and CRHR as a part of the San Luis Gonzaga Archaeological District (P-24-000489); and seven have not been evaluated for listing in the NRHP or CRHR (CA-MER-15, CA-MER-28, CA-MER-82, CA-MER-83, CA-MER-137, CA-MER-517, PL-Sisk-05). These sites would be susceptible to mechanical and biochemical impacts from increased wave action and fluctuating water levels following expansion of San Luis Reservoir and Cottonwood Bay. None of these sites have been previously identified as tribal cultural resources, and none are known to contain human remains. Further research in the form of subsurface testing or consultation could indicate that one or all of these sites meet the definition of a tribal cultural resource per PRC Section 20174.

The historic period transmission pole alignment and debris scatter (CA-MER-484H) located along the San Luis Reservoir shoreline would be susceptible to increased wave action and fluctuating water levels. Based on the nature of their construction, three historic period earthen dams with impound ponds (CA-MER-515H, CA-MER-516H, CA-MER-518H) are unlikely to be impacted. Three historic period road segments (CA-MER-477H, CA-MER-489H, CA-MER-519H) would be fully or partially inundated as the capacity of San Luis Reservoir is increased. Each resource has been recommended not eligible for listing in the NRHP and CRHR (see Appendix M).

Compared to No Project/No Action Alternative, operational impacts to known historic properties, historical resources, or other cultural resources under Alternative 3 would be significant. **Although impacts would be reduced through implementation of Mitigation Measures CR-1, CR-2, and CR-3, these impacts would remain significant and unavoidable despite mitigation under CEQA and NEPA (see Section 4.15).**

4.13 Geology, Seismicity, and Soils

4.13.1 Assessment Methods

The environmental consequences of the proposed alternatives were analyzed qualitatively based on a review of the soil and geologic data in the study area. Analysis of potential impacts focuses on the alternatives' potential to increase the risk of personal injury, loss of life, and damage to property, including project facilities, as a result of geologic conditions in the area of analysis.

4.13.2 Significance Criteria

Impacts on geology, seismicity, and soils would be considered significant if the project (1) would directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death, through rupture of a known earthquake fault; strong seismic ground shaking; seismic-related ground failure; and landslides; (2) would be located on a geologic unit or soil that is unstable or would become unstable as a result of the project and potentially result in an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse; (3) would be located on expansive soil, creating substantial direct or indirect risk to life or property; (4) would result in substantial soil erosion or the loss of topsoil; (5) would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; (6) would result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state; or (7) would 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.

Substantial soil erosion resulting in the loss of topsoil is a potential criterion because it is listed in CEQA Guidelines Appendix G. Soil erosion also is addressed in detail in Section 4.1, "Water Quality" and Section 4.3, "Air Quality." Because of the mitigation measures incorporated into the project, the impacts to soil erosion that are evaluated in detail in Section 4.1, "Water Quality" and Section 4.3, "Air Quality" were minor and less than significant; therefore, loss of topsoil is not addressed further in this section.

4.13.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would affect the area at and around the dam. Several faults run through the San Luis Reservoir area near potential construction activities; however, no historic earthquake activity has been recorded at the faults near the reservoir. Blasting activities previously occurred at Basalt Hill for construction of B.F. Sisk Dam, and no known adverse effects related to the ruptures of a known or previously unknown earthquake fault were observed. If an earthquake or strong ground movement occurred during construction, workers would be exposed to the risk of loss, injury, or death. Construction activities would follow the safety requirements of the Occupational Safety and Health Administration (OSHA) to reduce the potential for harm to construction workers or equipment. Construction activities impacting dam strength, like embankment and foundation excavation, would be scheduled during periods of the year when reservoir storage levels are lower to limit the potential for equipment loss and for dam overtopping and failure that could expose construction workers to injury or death in the case of a seismic event during construction. In addition, **c**onstruction activities would not take place in a high liquefaction hazard area and would occur within a low to medium landslide hazard area. Potential risks to workers from liquefaction and landslides would be reduced by adhering to an emergency response plan and complying with safety measures and federal and state safety regulations. **Therefore, impacts related to unstable soils as a result of liquefaction or landslides would be less than significant.**

Construction activities could take place on expansive soils and have the potential to result in moisture changes in soils. Construction activities that would result in changes to the soil's moisture content would be evaluated during engineering design to accommodate potential soil expansion. **Therefore, impacts on life or property related to expansive soils as a result of a change in moisture content during construction activities would be less than significant.**

The B.F. Sisk Dam SOD Modification Project would be designed to reduce the risks associated with the potential seismic-related ground shaking and ground failure generated by nearby faults without structure failure. **This impact would be beneficial**.

There is one abandoned oil well, two reclaimed mines, and one active mine near San Luis Reservoir. In addition, there is one active mine east of Los Banos Reservoir. Blasting activities at Basalt Hill would generate materials for the rock blanket used as a top layer of the new embankment, resulting in a net loss of mineral resources. Basalt Hill is located on federally owned land and was previously used to generate materials for the development of B.F. Sisk Dam. There is no known demand for these materials. **Given the previous blasting actions that occurred at Basalt Hill and the lack of demand on the mineral resources that could be affected, impacts to the availability of mineral resources would be less than significant.**

Construction activities would not affect the availability of a known mineral resource of value to the region or state or cause the loss of a locally important resource recovery site. **There would be no impacts to mineral resources.**

4.13.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

Under Alternative 2, there would be no construction or changes to existing structures in the study area, only operational changes to the annual allocation process. Impacts to mineral resources were not analyzed because operational changes would not result in the disturbance of land. **There would be no impact on mineral resources under Alternative 2.**

All operational alternatives under Alternative 2 would result in an increase in water surface elevations in San Luis Reservoir of up to 9 feet. Therefore, there would be no additional exposure of soil surrounding the edge of the reservoir, which could increase erosion of the exposed soils. **There would be no long-term impact to geology, soils, mineral, or paleontological resources.**

4.13.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.13.5.1 Construction of Dam Raise

Construction of the dam raise under Alternative 3 would occur in the same schedule and footprint as Alternative 1 and would include the same Mitigation Measures identified in Chapter 2 and follow the same OSHA safety requirements as Alternative 1. As discussed under Alternative 1, several inactive faults run through the proposed construction area. Therefore, effects to people or structures to adverse impacts related to the rupture of a known earthquake fault would be same as Alternative 1. **Therefore, this impact would be less than significant.**

There are no unique geologic features that could be directly or indirectly destroyed during Alternative 3 construction. There is the potential to encounter previously undetected but potentially significant paleontological resources during construction of this alternative. The area surrounding San Luis Reservoir has been ranked as low to moderately sensitive. Therefore, there is a low to moderate probability of encountering previously undetected paleontological resources near known paleontological resources, in areas of poor surface visibility where detection may have been impeded, and in areas that have not been subject to prior investigation. **Impacts would be significant**. Mitigation Measure GEO-1, described in Section 4.15, would ensure earthmoving construction activities would be monitored by a qualified paleontologist and implementation of measures to avoid, record, preserve, or recover unique paleontological resources if encountered. **Implementation of Mitigation Measure GEO-1 would reduce these impacts to a less than significant**.

4.13.5.2 SR 152 Modifications

To accommodate the increased reservoir surface-level operations, a section of SR 152 (at Cottonwood Bay) would be improved and elevated 10 feet. A SWPPP would be implemented to control accelerated erosion and loss of topsoil during and after the construction of highway modifications. Similar to the dam raise construction, construction activities would follow the safety requirements of OSHA to reduce the potential for harm to construction workers or equipment in the event of an earthquake or strong ground movement during construction. Modifications would

not include structures for human habitation and would have no impact on maintenance workers during potential seismic-related ground shaking and ground failure generated by nearby faults. In addition, there are no known mineral resources of value to the region or state or nearby locally important resource recovery sites where construction would occur. **Therefore, there would be no long-term impact to geology, soils, or mineral resources of regional or local importance from these constructed modifications. This impact would be less than significant.**

There is a low to moderate probability of encountering previously undetected paleontological resources in the area. **Therefore, impacts would be less than significant. However, because of the uncertainty of encountering previously undetected paleontological resources in the area, Mitigation Measure GEO-1 would be implemented.**

4.13.5.3 Operation of Alternative 3

Alternative 3 does not propose the construction of structures for human habitation, and therefore operation and maintenance associated with Alternative 3 would not result in increased risks, compared to the No Action Alternative. The crest raise proposed in the B.F. Sisk Dam SOD Modification Project and included in Alternative 1 is designed to reduce the risks associated with the potential seismic-related ground shaking and ground failure generated by nearby faults without structure failure. The additional crest raise under Alternative 3 would be designed to further reduce the current seismic instability of B.F. Sisk Dam, reducing the risk to public safety even more, according to the findings of the geologic investigations and engineering designs developed for the B.F. Sisk Dam SOD Modification Project. **Therefore, with reduced risk of dam failure during a seismic event and increased public and operational safety, this impact would be beneficial.**

All operational alternatives under Alternative 3 would result in an increase in water surface elevations in San Luis Reservoir of up to 12.8 feet. Therefore, there would be no additional exposure of soil surrounding the edge of the reservoir, which could increase erosion of the exposed soils. **There would be no long-term impact to geology, soils, mineral, or paleontological resources.**

4.14 Public Utilities and Power

4.14.1 Assessment Methods

Impacts to public services, utilities, and power resources could occur during construction of the Alternative 3 because of the use of construction equipment. The significance of these impacts is assessed qualitatively. Potential long-term impacts to energy use and power in the area of analysis could result from changes in water supply sources and the operation of water supply facilities. These changes are analyzed based on the energy impact guidance in CEQA Guidelines Appendix F (Association of Environmental Professionals 2016).

4.14.2 Significance Criteria

Impacts related to public utilities, services, and power would be considered significant if operation or construction of the project (1) would 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 (2) would result in adverse effects related to the depletion of local or regional energy supplies.

4.14.3 Environmental Consequences/Environmental Impacts of Alternative 1 – No Project/No Action Alternative

Under Alternative 1, construction of the B.F. Sisk Dam SOD Modification Project would require the transport and disposal of approximately 4,200 cubic yards of construction solid waste during the construction period. The solid waste material would be transported to the closest solid waste landfill, Billy Wright Landfill, which has a reported available capacity of approximately 11,370,000 cubic yards (CalRecycle 2017b). The solid waste generated by Alternative 1 would have a negligible impact on the permitted capacity at landfills within the study area. Construction activities would not cause stress to or lead to the depletion of existing power supplies at the reservoir. Operation of Alternative 1 would not change operations, and electricity use would not change at Pacheco Pumping Plant or at Gianelli Pumping-Generating Plant. **This alternative would result in less than significant impacts to public utilities, services, and power.**

4.14.4 Environmental Consequences/Environmental Impacts of Alternative 2 – Non-Structural Alternative

There would be no construction under Alternative 2, and therefore there would be no generation of solid waste. **There would be no impact to solid waste facilities.** Under Alternative 2, Reclamation would change its annual allocation process to reserve up to 310 TAF of stored CVP supply in San Luis Reservoir at the end of wetter years. Under Alternative 2, average annual South-of-Delta CVP deliveries are expected to decrease. Alternative 2 operations would result in reduced demand on the existing pumps at Gianelli Pumping-Generating Plant due to the storage of reserved water to be used in drier years. **This alternative would result in less than significant impacts to public utilities and power.**

4.14.5 Environmental Consequences/Environmental Impacts of Alternative 3 – B.F. Sisk Dam Raise Alternative

4.14.5.1 Construction of Dam Raise

Construction of Alternative 3 would require the transport and disposal of approximately 455 cubic yards of solid waste. Similar to Alternative 1, impacts to landfill capacity would not exceed remaining capacity at the Billy Wright Landfill or at landfills within the study area. Construction of Alternative 3 would not cause stress to or lead to the depletion of existing power supplies at the reservoir. **Therefore, this impact would be less than significant.**

4.14.5.2 SR 152 Modifications

The construction of the SR 152 modifications would require the transport and disposal of approximately 87,000 cubic yards of solid waste generated by construction of Alternative 3. Similar to Alternative 1, impacts to landfill capacity would not exceed remaining capacity at the Billy Wright Landfill. This solid waste would have a negligible impact on the permitted capacity at landfills within the study area. Construction activities would not cause stress to or lead to the depletion of existing power supplies at the reservoir. The modification would not require the relocation or installation of any new public utilities. **Therefore, this impact would be less than significant.**

4.14.5.3 Operation of Alternative 3

Operation would increase demand on the existing pumps at Gianelli Pumping-Generating Plant by approximately 10% in years when the new reservoir space is filled. Overall, changes in operation of Gianelli Pumping-Generating Plant resulting from the ability to fill an additional 130 TAF in San

Luis Reservoir would result in the need for additional energy supplies. However, this energy could be partially recaptured when water is released back into the forebay. In addition, the projected modeled frequency of this expanded storage capacity being filled to its maximum capacity would occur in 15 out of 82 years, or about 18% of the time. On average, this increase in power demand is projected to be 46,475,000 megawatt-hours per year. The existing 10,600 megawatts of production capacity in the Western Area Power Administration system can meet this increased demand. Additionally, an increase in head at San Luis Reservoir would increase pumping requirements at Dos Amigos Pumping Plant, which would increase power demand. The increased pumping would be necessary to achieve the project objectives. **This impact would be less than significant.**

4.15 Mitigation Measures Proposed under the Proposed Action

The following mitigation measures are being incorporated to avoid or substantially reduce the potentially significant impacts of the project alternatives:

Mitigation Measure AQ-1. Construction contractors will reduce impacts on air quality from construction activities by using construction equipment compliant with the Tier 4 emission standards for off-road diesel engines instead of the fleet average for the SJVAB. Records will be maintained by the construction contractor to demonstrate that actual emissions would not exceed SJVAPCD significance criteria and will be submitted monthly to SLDMWA.

If NOx emissions are forecasted to exceed thresholds based on the monthly recordkeeping logs, then changes will be made so that the threshold is not exceeded. Possible changes that could be made to reduce emissions include changing the project phasing so there are fewer simultaneous operations, reducing the daily number of hours worked per piece of equipment, or using alternative-fueled equipment when feasible.

Mitigation Measure AQ-2. Construction contractors will ensure all haul trucks, vendor trucks, or other vehicles operating on-site with on-road engines meet model year 2015 or better emission standards.

Mitigation Measure AQ-3. Construction contractors will install diesel oxidation catalysts on all off-road construction equipment capable of achieving an 80% reduction in NOx.

Mitigation Measure AQ-4. Construction contractors will be required to pave all unpaved haul and access roads to and from borrow and disposal areas (i.e., Basalt Hill and Borrow Area 6) to reduce fugitive PM_{10} and $PM_{2.5}$ emissions.

Mitigation Measure GHG-1. Construction contractors will use engine electrification (including hybrid equipment) and use renewable diesel or biodiesel, when feasible, for all on- and off-road construction equipment.

Mitigation Measure GHG-2. Construction contractors will purchase carbon offsets before construction activities commence in an amount sufficient to reduce GHG emissions remaining after implementation of Mitigation Measures AQ-1 through AQ-2 and GHG-1 to less-than-significant levels. Only emission offsets consistent with standards used for CARB Compliance Offset Protocols will be used to reduce GHG emissions. These standards ensure that offsets are real, permanent, quantifiable, verifiable, enforceable, and additional (Health and Safety Code Section 38562(d)).

Registries selling approved offsets meeting these standards include the American Carbon Registry, Climate Action Reserve, and Verra (formally the Verified Carbon Standard).

Mitigation Measure VIS-1. To reduce visual intrusion from light sources, the construction contractor will implement measures at the SR 152 construction area to reduce light and glare while meeting minimum safety and security standards. Light reduction measures must include directing lighting downward to prevent spillover onto nearby areas, using lighting fixtures with directional shielding to focus on areas being lit, and implementing a construction requirement that all lighting in areas not under active construction be shut off. To reduce the amount of glare, building finishes will be subdued and earth-toned. On-site mechanical equipment roofing materials and any exposed vents or flashings must be constructed of nonglare finishes that minimize reflectivity.

Mitigation Measure VIS-2. The construction contractor will implement the following measures in the SR 152 construction area: road improvements that comply with planning and design standards for development of official scenic highways, including (1) detailed land and site planning; (2) careful attention to and control of earthmoving and landscaping; and (3) the design and appearance of structures and equipment (California Department of Transportation [Caltrans] 2011).

Mitigation Measure TR-1: Develop a Temporary Traffic Control Plan. The following construction management actions will be documented in a temporary traffic control plan developed by the design contractor as a requirement that will be included in its construction contract. The temporary traffic control plan will be submitted for Caltrans review and approval during the Encroachment Permit process.

Construction contractors will install signage at intersections identified as dangerous per the *California Manual on Uniform Traffic Control Devices* (Caltrans 2014) guidelines warning motorists of slow-moving construction traffic and lane closures. Roadways with signage would include SR 152, Basalt Road, and Romero Visitor Center access road under Alternative 3. SR 152 construction work is scheduled to last for 2 years and would require lane closures. Signage will be posted at these locations 1 month in advance to allow motorists time to plan for delays or alternate routes. A public outreach/communication plan will be developed and implemented prior to start of construction actions.

Construction contractors will implement dust abatement and perform proper construction traffic management actions, including signage warning motorists of construction activity and traffic controls like flaggers or temporary traffic signals where construction equipment will be entering roadways. This will reduce conflicts during periods of high-traffic volume in and around each construction site. The measure will mitigate conflicts with emergency responders entering and existing the area during an emergency.

In addition to the temporary traffic control plan, prior to any construction actions, construction contractors will develop and adhere to a HASP outlining all applicable OSHA requirements and including important traffic safety plans and identification of emergency access routes in and through construction areas that would need to be kept clear at all times during construction. The HASP will include coordination with emergency service personnel to ensure adequate mitigation for all impacts.

Mitigation Measure HAZ-1. Requirements will be added to the construction contracts requiring the use of spark arrestors on all construction equipment. The contract will include requirements for the construction contractor to educate all construction workers about the risk of starting a wildfire

and how to avoid it and who to contact if a wildfire is started. In addition, restrictions will be placed on smoking and campfires for any personnel using Basalt Campground.

Mitigation Measure TERR-1: Special Status Plant Species and Special Status Natural Communities. Surveys of the study area for special status plant species will be conducted by Reclamation and SLDMWA during the identifiable blooming period prior to commencement of work consistent with CFDW's most recent *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). Special status plants include Arcuate bush-mallow (blooms April through September), big-scale balsamroot (blooms March through June), California alkali grass (blooms March through May), chaparral harebell (blooms May through June), Congdon's tarplant (blooms May through October), Hall's bush-mallow (blooms May through September), Hispid bird's beak (blooms June through September), Hospital Canyon larkspur (blooms March through June), Lemmon's jewelflower (blooms February through May), Lime Ridge navarretia (blooms May through June), round-leaved filaree (blooms March through May), shining navarretia (blooms April through July), and spiny-sepaled button-celery (blooms April through June).

A qualified biologist will be present prior to and during construction to ensure avoidance of impacts on special status plant species and special status natural communities, outside the construction footprint, by implementing one or more of the following, as appropriate, per the biologist's recommendation:

- Ensure the boundary of construction is clearly delineated and avoids rare plant populations or natural communities to be protected
- Allow adequate buffers (or as otherwise defined by federal or state take permits, if listed species are identified per permitting and environmental commitments) around identified and rare plant populations or natural communities

For unavoidable impacts to special status plant species from construction and inundation, a restoration and mitigation plan would be prepared to provide plant salvage and relocation consistent with CDFW guidance. If any impacts occur to listed plant species, consultation with United States Fish and Wildlife Service (USFWS) and/or California Department of Fish and Wildlife (CDFW) will be initiated. If deemed necessary based on the type and extent of special-status plant populations affected, compensatory mitigation will entail:

a. Prior to unavoidable and permanent disturbance to a population of a special status plant species, propagules will be collected from the population to be disturbed. This may include seed collection or cuttings, and these propagules will be used to establish a new population on suitable, unoccupied habitat as described above within the San Luis Reservoir watershed. Transplantation may be attempted but will not be used as the primary means of plant salvage and new population creation, as many local rare plant species seeding may provide a better option to establish annual species.
b. Creation of new populations will require identifying suitable locations and researching and determining appropriate and viable propagation or planting techniques for the species. It will require field and literature research to determine the appropriate seed sampling techniques and harvest numbers for acquisition of seeds from existing populations. Success criteria for established plant populations will be based on minimum area (for seeded plants) to provide a

minimum 1:1 establishment area compared to the impacted area or a minimum 1:1 replacement ratio for individual plants based on transplanted individuals.

c. A minimum 5-year monitoring plan with adaptive management will be implemented by Reclamation and SLDMWA to document the success of new plant populations and ensure no net loss. Adequate assurances will be provided to ensure long-term protection and management of lands to promote established rare plant populations.

Mitigation Measure TERR-2: Valley Elderberry Longhorn Beetle. Prior to construction, a qualified biologist will perform preconstruction surveys to identify, map, and protect any elderberry shrubs in the project area. A minimum 165-foot avoidance buffer will be staked around elderberry shrubs that could be affected by construction. Individual plants that occur closer than 165 feet to construction will be surrounded with high-visibility fencing to avoid direct loss of plants, in coordination with USFWS. Consultation with the USFWS through the Section 7 process would be implemented by Reclamation if shrubs cannot be avoided during construction. If shrubs cannot be avoided, removal measures would be implemented and could include transplanting shrubs to a USFWS-approved conservation area, compensating for habitat loss at a ratio ranging from 1:1 to 8:1 depending on the diameter of the impacted elderberry stems and habitat type that they were removed from (riparian or non-riparian), under an Elderberry Mitigation Plan approved by USFWS, or purchasing credits at a USFWS-approved mitigation bank for VELB.

Mitigation Measure TERR-3: Special status Amphibians. Before and during construction:

- The project proponent will submit the name and credentials of a biologist qualified to act as construction monitor to USFWS and CDFW for approval at least 30 days before construction work begins. General minimum qualifications are a 4-year degree in biological sciences and experience in surveying, identifying, and handling California tiger salamanders and CRLFs. The approved biologist will be present at all times during construction.
- The USFWS- and CDFW-approved biologist, under the appropriate federal and state authorities (e.g., permitting and consultation), will survey the work sites 2 weeks before the onset of construction. If California tiger salamanders or CRLFs (or their tadpoles or eggs) are found, the approved biologist will contact USFWS and CDFW to determine whether moving any of these life-stages is appropriate. If USFWS and CDFW approve moving the animals, the biologist will be allowed sufficient time to move CRLFs or California tiger salamanders from the work sites before work begins. The biologist will immediately inform the construction manager that work will be halted, if necessary, to avert avoidable take of listed species. The biologist will use professional judgment to determine whether and when the California tiger salamanders or CRLFs are to be moved. If these species are not identified, construction can proceed at these sites.
- The known location of CRLFs and Willow Spring, the water source for the perennial frog pond near the borrow area, will be avoided during construction, with a buffer of 250 feet to avoid modifying aquatic habitat that supports the frog population, or as otherwise approved by the resource agencies.
- Areas impacted by construction will be monitored during construction to identify, capture, and relocate special status amphibians, if present.
- Areas beneath construction equipment and vehicles will be inspected daily, prior to operation, for presence of special status amphibians under tracks/tires and within machinery.

If special status amphibians are found, a qualified biologist will capture and relocate animals from work sites.

- Appropriate state and federal permits for handling of special status species will be acquired.
- If necessary, a detailed amphibian relocation plan will be prepared at least 3 weeks before the start of groundbreaking and submitted to CDFW and USFWS for review. The purpose of the plan is to standardize amphibian relocation methods and relocation sites.
- A USFWS- and CDFW-approved biologist will be present at the active work sites until special status amphibians have been removed and habitat disturbance has been completed. Thereafter, the construction contractor will designate a person to monitor on-site compliance with all minimization measures. A USFWS- and CDFW-approved biologist will ensure that this individual receives training consistent with USFWS requirements.
- Reclamation and SLDMWA will install frog-exclusion fencing (i.e., silt fences) around all construction areas that are within 100 feet of any identified ponds that provide potential special status amphibian aquatic breeding habitat. During and after rain events, a qualified biologist will monitor work areas for the presence of special status amphibians.
- Reclamation and SLDMWA will provide compensation for permanent and temporary impacts to 1.6 acres of California tiger salamander and CRLF aquatic habitat at Pond 44 under Alternative 3 (see Appendix K2 for location). Compensatory mitigation will be provided for the loss of aquatic breeding sites that will be filled or otherwise directly affected by the project and mitigate any impacts on associated CRLF upland habitat through compensatory mitigation. If possible, compensatory mitigation areas will be located within a California Red-Legged Frog Recovery Area, as identified in the *Recovery Plan for the California Red-Legged Frog (Rana aurora drayonii)* (USFWS 2002).
- The total area, size, and number of CRLF or California tiger salamander mitigation ponds to be created will be based on a comparable loss of breeding habitat at the approximately 1.6-acre Pond 44 (see Appendix K-2 for location) (e.g., a minimum 1:1 replacement ratio;; or as otherwise specified by regulatory agencies) as a result of the project. These ponds will concurrently satisfy wetland mitigation requirements identified in Mitigation Measure TERR-2. To the degree possible, new mitigation ponds that are created for CRLF and California tiger salamander will be hydrologically self-sustaining and will not require a supplemental water supply.

Mitigation Measure TERR-4: Western Pond Turtle. Before construction activities begin, a qualified biologist will conduct western pond turtle surveys within creeks and in other ponded areas affected by the project. Adjacent upland areas will be examined for evidence of nests and individual turtles. The project biologist will be responsible for the survey and for the relocation of pond turtles, if found. Construction will not proceed until reasonable effort has been made to capture and relocate as many western pond turtles as possible to minimize take. However, some individuals will be undetected or enter sites after surveys and would be subject to injury or mortality. If a nest is observed, a biologist with the appropriate permits and prior approval from CDFW will move eggs to a suitable location or facility for incubation and release hatchlings into the creek system the following autumn.

Mitigation Measure TERR-5: San Joaquin Whipsnake. A qualified biologist will conduct San Joaquin whipsnake surveys 2 weeks prior to construction activities within work sites and within 100 feet of disturbance areas. A qualified biologist will relocate any San Joaquin whipsnakes to suitable

habitat outside of areas of disturbance. There is possibility of snakes to move into the work sites after preconstruction surveys have checked the area, and some individuals could be subject to mortality. If San Joaquin whipsnakes are detected in work sites during construction, activities and equipment travel will cease in the immediate area of detection until the snake has left the work site or has been relocated out of the area by a qualified biologist.

Mitigation Measure TERR-6: Nesting Bird Surveys. A qualified biologist will conduct nesting bird surveys prior to construction and supervise avoidance of nests during construction. The generally accepted nesting season extends from February 1 through September 15. If an active nest of a special status bird is found, construction within 300 feet of the nest (500 feet for raptor nests, excluding Swainson's hawk) will be postponed until the nest is no longer active.

Mitigation Measure TERR-7: Swainson's Hawk. Prior to construction, surveys for active Swainson's hawk nests will be conducted in and around all potential nest trees within 0.5 miles of construction areas. If known or active nests are identified through preconstruction surveys or other means, a 0.5-mile no-disturbance buffer will be established around all active nest sites if construction cannot be limited to occur outside the nesting season (February 15 through September 15). Buffer sizes may be reduced if approved by CDFW and active nest sites are monitored during construction by a qualified biologist.

Permanent foraging habitat losses (i.e., grasslands) within 1 mile of active Swainson's hawk nests will be compensated by preserving, in perpetuity, suitable foraging habitat at a ratio of 1:1. This includes permanently disturbed construction sites. CDFW will approve the location and types of habitats preserved.

Mitigation Measure TERR-8: Bald and Golden Eagles and California Condor. The following measures address potential impacts on nesting eagles near San Luis Reservoir. Prior to the construction, an eagle conservation plan will be developed, detailing eagle protection guidelines specific to the San Luis Reservoir construction area. These protections will include preconstruction surveys by a USFWS- and CDFW-approved biologist for golden and bald eagles starting approximately 2 years prior to construction and continuing through the construction period. These surveys will be completed within a 5-mile radius from where impacts from the project occur, including construction areas. Any nesting sites identified during these surveys would be mapped and monitored for up to 10 years, depending on the monitoring specifications identified within the plan. Whenever feasible, construction near recently active nest sites will start outside the active nesting season. The nesting period is between January 15 and August 15 for golden eagles and January 1 and August 15 for bald eagles. If groundbreaking activities begin during the nesting period, a qualified biologist will perform a preconstruction survey 14–30 days prior to each new construction phase to search for eagle nest sites within 2 miles of proposed activities. If active nests are not identified, no further action is required, and construction may proceed. If active nests are identified, the following avoidance guidelines will be implemented:

- For golden and bald eagles, construction contractors will observe CDFW and USFWS avoidance guidelines, which stipulate a minimum 660-foot to 0.5-mile buffer zone depending upon the visibility and severity of the activity (e.g., earthmoving versus blasting) (USFWS 2007). Buffer zones will remain until young have fledged. A qualified biologist will monitor the nest daily for 1 week to determine whether construction activities are disturbing nest behavior. If nest behavior appears normal, then weekly monitoring will continue until the

nest is no longer active. If the nest appears disturbed, the biological monitor will increase the no-work buffer at the monitor's discretion to ensure normal nesting behavior. For activities conducted with agency approval within this buffer zone, a qualified biologist will monitor construction activities and the eagle nest to monitor eagle reactions to activities. If activities are deemed to have a negative effect on nesting eagles, the biologist will immediately inform the construction manager that work should be halted, and USFWS and CDFW will be consulted.

- CDFW and USFWS often allow construction activities that are initiated outside the nesting season to continue without cessation even if raptors such as eagles choose to nest within 500 feet of work activities. Thus, work at the dam construction site may continue if approved by CDFW and USFWS and a qualified biologist monitors the nest site during construction.
- To compensate for the loss of 340.9 acres of grassland foraging habitat for golden eagles and California condors during construction and inundation, grasslands will be enhanced or restored at a minimum ratio of 1:1. Restoration or enhancement of grassland habitat will be conducted under a USFWS- and CDFW-approved restoration/enhancement plan.

Mitigation Measure TERR-9: Burrowing Owl. Prior to construction, surveys for burrowing owls would be conducted in areas supporting potentially suitable habitat. Any occupied burrows will not be disturbed during the breeding season (February 1 through August 31). A minimum 160-foot-wide buffer will be placed around occupied burrows during the nonbreeding season (September 1 through January 31), and a 250-foot-wide buffer will be placed around occupied burrows during the breeding season. Ground-disturbing activities will not occur within the designated buffers.

In advance of construction, a qualified biologist will follow the current CDFW burrowing owl survey guidance to evaluate burrowing owl use. Measures will apply to all construction activities near active nests or within potential burrowing owl nesting habitat to avoid, minimize, or mitigate impacts on burrowing owls.

Breeding season surveys will be performed to determine the presence of burrowing owls for the purposes of inventory, monitoring, avoidance of take, and determining appropriate mitigation. In California, the breeding season begins as early as February 1 and continues through August 31. Under the Burrowing Owl Consortium's multiphase survey methodology, for areas within 500 feet of construction boundaries, a biologist (1) will perform a habitat assessment to identify essential components of burrowing owl habitat, including artificial nest features; (2) will perform intensive burrow surveys in areas identified as providing suitable burrowing owl habitat; and; (3) will perform at least four appropriately-timed breeding season surveys (four survey visits spread evenly [roughly every 3 weeks] during the breeding season's peak, from April 15 to July 15) to document habitat use.

Preconstruction surveys will be used to assess the owl presence before site modification is scheduled to begin. Generally, initial preconstruction surveys should be conducted within 7 days but no more than 30 days prior to ground-disturbing activities. Additional surveys may be required when the initial disturbance is followed by periods of inactivity or the development is phased spatially or temporally over the study area. Up to four or more survey visits performed on separate days may be required to assure with a high degree of certainty that site modification and grading will not take owls. The full extent of the preconstruction survey effort will be described and mapped in detail (e.g., dates, time periods, areas covered, methods employed) in a biological report that will provided for review to CDFW.

In addition to the above survey requirements, the following measures will be implemented to reduce project impacts to burrowing owls:

- Construction exclusion areas (e.g., orange exclusion fence or signage) will be established around occupied burrows, where no disturbance will be allowed. During the nonbreeding season (September 1 through January 31), the exclusion zone will extend at least 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas will extend 250 feet around occupied burrows (or farther if warranted to avoid nest abandonment).
- If work or exclusion areas conflict with owl burrows, passive relocation of on-site owls could be implemented as an alternative, but only during the nonbreeding season and only with CDFW approval. The approach to owl relocation and burrow closure will vary depending on the number of occupied burrows. Passive relocation will be accomplished by installing one-way doors on the entrances of burrows within 160 feet of the study area. The one-way doors will be left in place for 48 hours to ensure the owls have left the burrow. The burrows will then be excavated with a qualified biologist present. Construction will not proceed until the study area is deemed free of owls.
- Unoccupied burrows within the immediate construction area will be excavated using hand tools and then filled to prevent reoccupation. The qualified biologist will be present during construction to continue examination of burrows. If any burrowing owls are discovered during the excavation, the excavation will cease and the owl will be allowed to escape. Excavation would be completed when the biological monitor confirms the burrow is empty.
- Artificial nesting burrows will be provided as a temporary measure when natural burrows are lacking. To compensate for lost nest burrows, artificial burrows will be provided outside the 160-foot buffer zone. The alternate burrows will be monitored daily for 7 days to confirm the owls have moved in and acclimated to the new burrow.

Mitigation Measure TERR-10: Tricolored Blackbird. Prior to construction, appropriately timed surveys for tricolored blackbirds would be conducted in areas supporting potentially suitable habitat within 0.25 miles of construction areas. Habitat within 0.25 miles of tricolored blackbird colonies will be avoided during nesting season, which can begin as early as mid-March and extend through August. If colonies cannot be avoided, CDFW will be consulted to potentially reduce buffer distances with active monitoring during construction by a qualified biologist.

Prior to reservoir inundation, saddle dams will be dismantled within the inundation footprint to reduce tricolored blackbird breeding habitat that may be inadvertently flooded during the breeding season. Advance avian surveys would be performed, as described above, to avoid impacting nesting birds, including tricolored blackbird, during dam demolition.

Mitigation Measure TERR-11: Special Status Bats. Impacts to special status bats will be minimized by performing preconstruction surveys and creating no-disturbance buffers around active bat roosting sites.

Before construction activities (i.e., ground clearing and grading, including tree or shrub removal) within 200 feet of trees or structures that could support special status bats, a qualified bat biologist will survey for special status bats. If no evidence of bat habitat or other bat sign (i.e., direct observation, guano, staining, or strong odors) is observed, no further mitigation will be required.

If evidence of bats is observed, the following measures will be implemented to avoid potential impacts on breeding populations:

- A no-disturbance buffer of 200 feet will be created around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected by the indirect effects of noise and construction disturbances. However, the direct take of individuals will be prohibited.
- Removal of trees showing evidence of active bat activity will occur during the period least likely to affect bats, as determined and monitored by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula and between August 15 and April 15 for maternity roosts). If the exclusion of bats from potential roost sites is necessary to prevent indirect impacts due to construction noise and adjacent human activity, bat exclusion activities (e.g., installation of netting to block roost entrances) will be conducted during these periods. If special status bats are identified in the dam or special allowances must be made to relocate bats, Reclamation and SLDMWA will coordinate the effort in advance with CDFW.

Mitigation Measure TERR-12: San Joaquin Kit Fox (SJKF). SJKF would be affected by construction activities if animals are harmed or killed by equipment, their movement is blocked, or their dens or other habitat is altered or destroyed. Prior to construction, a qualified biologist will conduct surveys to identify potential dens more than 4 inches in diameter. A habitat assessment in 2010 found 195 potential SJKF dens in the San Luis Reservoir work area (Reclamation 2010) (see Appendix I). If dens are located within the proposed work area and cannot be avoided during construction activities, a USFWS- and CDFW-approved biologist will determine if the dens are occupied. If occupied dens are present within the proposed work sites, their disturbance and destruction will be avoided. Exclusion zones will be implemented following the latest USFWS procedures (USFWS 2011).

The proponent will implement SJKF protection measures. The following measures, which are intended to reduce direct and indirect project impacts on SJKF, are derived from the *San Joaquin Kit Fox Survey Protocol for the Northern Range* (USFWS 1999a) and the *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior To or During Ground Disturbance* (USFWS 1999b). The following measures will be implemented for construction areas at San Luis Reservoir:

- Preconstruction surveys will be conducted within 200 feet of work areas to identify potential SJKF dens or other refugia in and surrounding workstations. A qualified biologist will conduct the survey for potential SJKF dens 14–30 days before construction begins. All identified potential dens will be monitored for evidence of SJKF use by placing an inert tracking medium at den entrances and monitoring for at least 3 consecutive nights. If no activity is detected at these den sites, they will be closed following guidance established in the USFWS standardized recommendations (USFWS 1999b).
- If SJKF occupancy is determined at a given site during the preconstruction surveys or during the construction period, the construction manager will be immediately informed that work should be halted within 200 feet of the den and the USFWS will be contacted. Depending on the den type, reasonable and prudent measures to avoid effects to SJKF could include seasonal limitations on project construction at the site (e.g., restricting the construction period to avoid spring-summer pupping season) or establishing a construction exclusion zone

around the identified site or resurveying the den 1 week later to determine species presence or absence.

- Off-road vehicle and equipment movement will be limited to the project footprint.
- To compensate for permanent impacts to grassland, which provides habitat for SJKF, lands will be acquired and covered by conservation easements or mitigation credits will be purchased at a 2:1 mitigation ratio or other compensation ratios approved by USFWS and CDFW. The location of compensatory lands will provide areas that are important to regional SJKF movement opportunities.
- To compensate for the 8-year loss of the Santa Nella Area SJKF movement corridor during construction and ensure the SJKF movement corridor remains viable following construction, project design will be refined to include elements for SJKF movement at B.F. Sisk Dam and at the SR 152 causeway at Cottonwood Bay. A SJKF habitat connectivity plan describing the following mandatory wildlife movement elements to be refined during a review of the scientific literature base will be prepared and submitted for USFWS review and will be incorporated into the project:
  - Broad (e.g., 80- to 120-foot-wide) earthen bridge over the mid-portion of the B.F. Sisk Dam spillway that connects to annual grasslands on either side of the spillway
  - Retention and improvement of the existing wildlife movement trail at the top of the spillway to ensure the finished pathway that is not rocked (or covered with earthen fill) connects to grasslands on either side of the spillway and is sufficiently wide to facilitate SJKF and large mammal movement
  - Finishing of the upper portion of SR 152 causeway at Cottonwood Bay with earthen materials, such as imported fill over rock, to allow wildlife movement across the causeway away from highway traffic

Mitigation Measure TERR-13: American Badger. Impacts on badgers within annual grasslands and oak woodland at San Luis Reservoir will be minimized through a combination of worker training, preconstruction surveys, and passively or actively relocating animals. Concurrent with other required surveys, during winter and spring months before new project activities, and concurrent with other preconstruction surveys (e.g., SJKF and burrowing owl), a qualified biologist will perform a survey to identify the presence of active or inactive American badger dens. If this species is not found, no further mitigation will be required. If badger dens are identified within the construction footprint during the surveys or afterwards, they will be inspected and closed using the following methodology:

- When unoccupied dens are encountered outside of work areas but within 100 feet of proposed activities, vacated dens will be inspected to ensure they are empty and temporarily covered using plywood sheets or similar materials.
- If badger occupancy is determined at a given site within the work area, work activities at that site should be halted. Depending on the den type, reasonable and prudent measures to avoid harming badgers will be implemented and will include seasonal limitations on project construction near the site (e.g., restricting the construction period to avoid spring-summer pupping season) or establishing a construction exclusion zone around the identified site or resurveying the den at a later time to determine species presence or absence.

- Badgers will be passively relocated using burrow exclusion (e.g., installing one-way doors on burrows) or similar CDFW-approved exclusion methods. In unique situations, it may be necessary to actively relocate badgers (using live traps) to protect individuals from potentially harmful situations. Such relocation would be performed with advance CDFW coordination and concurrence.

Mitigation Measure TERR-14: Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. While project design is planned to avoid fill of seasonal wetlands and pools identified as suitable habitat for vernal pool crustaceans, if any vernal pool fairy shrimp or vernal pool tadpole shrimp habitat will be impacted, in the absence of surveys, species presence will be assumed. Measures to ensure no net loss of habitat may include compensating for impacts at a 2:1 ratio for preservation and at a 1:1 ratio for creation.

Mitigation Measure TERR-15: Construction Contractor Environmental Awareness Training and Site Protection Measures. All construction personnel will attend an environmental education program delivered by a USFWS- and CDFW- approved biologist prior to starting work. The training will include an explanation as how to best avoid the accidental take of special status plants and wildlife. The field meeting will include species identification, life history, descriptions, and habitat requirements. The program will include an explanation of federal and state laws protecting endangered species and avoidance and minimization methods being implemented to protect these species. A qualified biologist will be present on the site at all times during construction.

The construction contractor will provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites will be cleaned of litter before closure each day and placed in wildlife-proof garbage receptacles. Construction personnel will not feed or otherwise attract any wildlife. No pets, excluding service animals, will be allowed on-site or in construction areas.

Nighttime vehicle traffic will be kept to a maximum speed of 15 miles per hour on unpaved roads.

To minimize disturbance to wildlife, temporary and permanent exterior lighting will be installed such that:

- Lamps and reflectors are not visible from beyond the project site
- Reflective glare will be minimized to the extent feasible
- Illumination of the project and its immediate vicinity is minimized
- Lighting will incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated
- All lighting will be of minimum necessary brightness consistent with operational safety and security
- Lights in areas not occupied on a continuous basis (such as maintenance areas) will have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied

Mitigation Measure TERR-16. Mitigation measures for special status communities, including jurisdictional wetlands or waters and streambeds and banks regulated by CDFW, RWQCB, and USACE, and native grassland.

Mitigation Measure TERR-16a. Final project design will avoid and minimize the fill of wetlands and other waters, identified through Section 404 permitting, to the greatest practicable extent.

Prior to construction, a qualified biologist person will delineate the extent of jurisdictional areas to be avoided in the field. Reclamation will designate areas to be avoided as Restricted Areas and protect them using highly visible fencing, rope, or flagging, as appropriate based on site conditions. No construction activities or disturbance will occur within Restricted Areas that are designated to protect wetlands.

Mitigation Measure TERR-16b. Where jurisdictional wetlands and other waters cannot be avoided, to offset temporary and permanent impacts that would occur as a result of the project (see Tables 4-3 and 4-4), restoration and compensatory mitigation to ensure no net loss will be provided as described below.

A wetland mitigation and monitoring plan will be developed in coordination with CDFW, USACE, or RWQCB to detail mitigation and monitoring obligations for temporary and permanent impacts to wetlands and other waters due to construction activities and for other CDFW jurisdictional areas. The plan will quantify the total acreage affected; provide for mitigation, as described below, to wetland or riparian habitat; specify annual success criteria for mitigation sites; specify monitoring and reporting requirements; and prescribe site-specific plans to compensate for wetland losses resulting from the project consistent with the USACE's no net loss policy.

Prior to construction, the aquatic structure of wetland and riparian areas to be disturbed will be photo-documented and measurements of width, length, and depth will be recorded. Recontouring and revegetation of the disturbed portions of jurisdictional areas in areas temporarily affected by construction prior to demobilization by the construction contractor will be completed at the end of project construction. Creek banks will be recontoured to a more stable condition if necessary.

Revegetation will include a palette of species native to the watershed area according to a revegetation plan to be developed by Reclamation and submitted to USACE, CDFW, and RWQCB for approval. Following removal, woody trees habitat acreage would be replanted at a minimum 1:1 ratio, or as determined and agreed upon by the permitting agencies. Interim vegetation or other measures will be implemented as necessary to control erosion in disturbed areas prior to final revegetation.

Wetland and other waters impact in the construction and inundation area will be compensated at a ratio of 2:1 or at a ratio agreed upon by the wetland permitting agencies. Compensatory mitigation will be conducted by creating or restoring wetland and aquatic habitat at an agency-approved location on nearby lands or through purchasing mitigation credits at a USACE- or CDFW-approved mitigation bank (depending on the resource). If mitigation is conducted on- or off-site, a 5-year wetland mitigation and monitoring program for on- and off-site mitigation will be developed. Appropriate performance standards may include a 75% survival rate of restoration plantings; absence of invasive plant species; and a viable, self-sustaining creek or wetland system at the end of 5 years.

A weed control plan for the project to limit the spread of noxious or invasive weeds will be developed. This plan would be consistent with current integrated pest management plans already in practice on lands surrounding the reservoir. Noxious or invasive weeds include those rated as "high" in invasiveness by the California Invasive Plant Council. The plan will include a baseline survey to identify the location and extent of invasive weeds in the study area prior to ground-disturbing

activity, a plan to destroy existing invasive weeds in the construction area prior to initiation of ground-disturbing activity, weed-containment measures while the project is in progress, and monitoring and control of weeds following completion of construction.

Mitigation Measure REC-1. The following measure will be implemented in coordination with CDPR: Boat launch at the San Luis Creek would be expanded by addition of a launch lane and a boarding float before initiation of the Dam Raise construction actions.

Mitigation Measure REC-2. The following measure will be implemented in coordination with CDPR: Sections of the Lone Oak Trail near the San Luis Reservoir shoreline that would be inundated from increased capacity will be moved upslope to avoid the potential for inundation when an enlarged San Luis Reservoir is forecasted to be filled to capacity.

Mitigation Measure CR-1: Complete Cultural Resource Evaluation Efforts. Following congressional authorization but prior to the signing of a ROD to implement the project, an agreement document will be executed. Reclamation will follow implementing regulations for NHPA Section 106 to identify historic properties within the APE for the selected alternative using NRHP criteria (see Appendix M). Reclamation will consult with the SHPO, Native American tribal representatives, and other consulting parties as appropriate. SLDMWA will follow CEQA Guidelines to identify historical resources, unique archaeological resources, or tribal cultural resources within the APE using CRHR criteria and by consulting Native American tribal representatives consistent with Assembly Bill 52. Cultural resource evaluation efforts will be directed by personnel meeting *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (36 CFR Part 61), as appropriate, and specific methodologies used will be determined based on the nature (e.g., archaeological sites versus building or structures), location, and scale of the cultural resource under evaluation. A technical report detailing evaluation efforts will be produced and forwarded to the CHRIS.

Mitigation Measure CR-2: Implement Avoidance or Mitigation Measures. Once evaluation efforts have been completed, measures to avoid, minimize, or mitigate impacts to significant cultural resources will be implemented consistent with NHPA Section 106 (36 CFR Part 800.6), CEQA Guidelines Section 15126.4(b), and PRC Section 21084.3. Significant cultural resources that can be avoided by project activities will be marked for exclusion on project plans or on the ground. Personnel meeting *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (36 CFR Part 61) will monitor project ground-disturbing activities or modifications to the built environment as appropriate to ensure the avoidance of significant cultural resources. Other methods to ensure preservation in place (e.g., capping or incorporation within an open space or permanent easement) will be used as necessary. Where data recovery through excavation is the only feasible form of mitigation, a data recovery plan will be prepared to provide for the recovery of significant information from the resource. For tribal cultural resources, mitigation efforts will be determined in consultation with the culturally affiliated tribe. Mitigation of impacts to significant historic period built environment resources may include detailed recording, production of interpretive materials, or other measures identified in the amended Programmatic Agreement. Studies and reports resulting from avoidance and mitigation measures will be deposited with CHRIS. Human remains, if encountered, will be treated consistent with NAGPRA if discovered on federal lands and PRC Section 21084.4 and California Health and Safety Code Section 7050.5 if encountered on nonfederal lands.

Mitigation Measure CR-3: Implement a Detailed Inadvertent Discovery Plan. Prior to initiating construction of the selected alternative and consistent with NHPA Section 106 and CEQA compliance efforts determined through consultation with the SHPO, Native American tribal representatives, and other consulting parties, a detailed inadvertent discovery plan will be prepared for the project. The plan will be prepared by personnel meeting appropriate *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (36 CFR Part 61) and will outline cultural resource training procedures for construction personnel and the protocols to follow if cultural resources or human remains are discovered during project ground-disturbing activities. In the event of an inadvertent discovery, construction near the find will halt and work will be directed elsewhere while the significance of the find is evaluated. If the discovery is significant, additional measures identified in the plan (e.g., avoidance, capping beneath a layer of sterile soil, data recovery excavations, consultation with the culturally affiliated tribe for suspected tribal cultural sources) will be implemented consistent with NHPA Section 106 (36 CFR Part 800.13), CEQA Guidelines Section 15126.4(b), and PRC Section 21084.3. Human remains, if encountered, will be treated consistent with NAGPRA if discovered on federal lands and PRC Section 21084.4 and California Health and Safety Code Section 7050.5 if encountered on nonfederal lands.

NEPA Only Cultural Mitigation Measures. A reasonable and good faith effort has been made to identify historic properties within the APE for Alternative 3 through archival research and inventory surveys on lands accessible to the Lead Agencies. Additional efforts are needed, however, to evaluate potential historic properties within the APE for Alternative 3 and to assess the effects of the project on those properties. These efforts cannot be completed at this time. If Congress authorizes funding for final design and construction of Alternative 3 identified in the companion feasibility report and in this draft EIR/SEIS, an amendment to the Programmatic Agreement for the B.F. Sisk Dam SOD Modification Project outlining a process for completing evaluation efforts and resolving adverse effects to historic properties will be negotiated with the SHPO to satisfy NHPA Section 106 compliance requirements.

Following congressional authorization to implement the project, Reclamation will complete all remaining historic property evaluation efforts required by the negotiated Programmatic Agreement. Adverse effects to historic properties will be resolved by completing the NHPA Section 106 process, which will satisfy federal Lead Agency requirements with respect to NHPA and NEPA. A process to avoid, minimize, or mitigate adverse effects to historic properties will be formalized in the agreement document per 36 CFR Part 800.6(c).

Mitigation Measure GEO-1: Avoidance and Management of Inadvertent Paleontological Discoveries. A qualified paleontologist will monitor earthmoving construction activities that have the potential to disturb previously undisturbed native sediment. Monitoring will not be conducted in areas where the ground has been previously disturbed, in areas of artificial fill, or in areas where exposed sediment will be buried but not otherwise disturbed. If paleontological remains are discovered during construction, construction will cease or be directed away from the discovery and the potential resource will be evaluated by the paleontologist. The paleontologist will recommend appropriate measures to avoid, record, preserve, or recover the resource if determined to be unique.

Chapter 5 Cumulative Effects

This chapter provides an analysis of cumulative effects of the action alternatives (i.e. Alternative 2 and 3) taken together with other past, present, and reasonably foreseeable probable future projects (or actions) as required by CEQA Guidelines (Section 15130) and NEPA implementing regulations (40 CFR 1508.7). Resource-specific cumulative effects analyses are presented below. SR 152 modifications are a component of Alternative 3 and are being evaluated in parallel with the dam raise effects on natural resources cumulatively. Descriptions of the regulatory requirements, methodology, and cumulative projects considered are presented in Appendix O.

5.1 Cumulative Effects Analysis

5.1.1 Water Quality

Implementation of the Delta Conveyance Project and the *Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary 2018 Update for the Lower San Joaquin River and Southern Delta* (2018 Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta [SWRCB 2018]) could result in long-term changes to Delta region operations and habitat health with the implementation of conservation and restoration measures designed to improve the health of the Delta ecosystem while improving water quality conditions. Under Alternative 2 and Alternative 3, changes in Delta water quality, South-of-Delta conveyance of CVP and SWP water, and Delta outflow would result in an insubstantial (less than 1%) change under the action alternatives compared to No Project/No Action Alternative conditions, and impacts would be insubstantial. **Therefore, the alternatives in combination with other cumulative projects in the Delta region would not result in significant cumulative impacts on water quality.**

The California High-Speed Rail Project would establish new railway and railway tunnels across Pacheco Pass parallel to SR 152 near San Luis Reservoir. Construction of trails, campgrounds, and wells identified in the San Luis SRA RMP/GP would involve earthmoving and construction near the San Luis Reservoir shore. Other construction is projected to occur in Merced County because of projected population growth. **Alternative 2 would not include any construction and would not be cumulatively considerable.** If construction of the California High-Speed Rail Project and the new trails, campgrounds, and wells at the San Luis Reservoir SRA were completed concurrently or over time with Alternative 3, there could be significant cumulative short-term effects associated with potential contaminants from earthmoving activities, causing water quality degradation in nearby water bodies. However, the cumulative projects would be required to implement BMPs and mitigation measures to reduce impacts. **Alternative 3 would implement mitigation measures to reduce its impacts to water quality, and its incremental contribution to significant cumulative water quality impacts would not be cumulatively considerable.**

5.1.2 Surface Water Supply

Water supplies in California are currently constrained by hydrologic and regulatory conditions, and CVP and SWP often cannot deliver full contract supplies. The California Delta Conveyance Project, the 2018 Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta, and the SLLPIP could result in short- and long-term changes in water supply availability. Projected growth

in the area of analysis could result in cumulative impacts and changes in water demand. The California Delta Conveyance Project could change the delivery patterns of CVP and SWP supplies, and population growth could increase water demands. The 2018 Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta could change the availability of water supply south of the Delta. The SLLPIP would improve water supply reliability for Valley Water. Assembly Bill 1668 and Senate Bill 606, signed into law in 2018, enacted new standards for indoor and outdoor water use efficiency requirements. In addition, many county general plan provisions incorporate conservation efforts that would reduce the demand associated with population growth.

As noted in Section 4.1.4, Alternative 2 would significantly impact water supply deliveries to South-of-Delta CVP contractors. **Given the significant cumulative water supply impacts discussed above, the significant reductions in South-of-Delta deliveries under Alternative 2 would be cumulatively considerable.**

All Alternative 3 subalternatives would produce beneficial impacts on water supply reliability within the CVP service area that would help offset potential cumulative water supply reliability effects under the cumulative condition and would help to reduce the significant cumulative water supply effects described above for CVP contractors. **Alternative 3's incremental contribution to significant water supply impacts** would **be beneficial for CVP water** contractors**.**

The Alternative 3 subalternatives would result in small reductions, less than 1% of total deliveries, to SWP contractors. Similar to Alternative 3, the SLLPIP could result in small reductions in SWP deliveries. None of the other cumulative projects would significantly impact SWP deliveries. These reductions under Alternative 3 and the SLLPIP are considered minor fluctuations within the predictive model error (noise) . **Therefore, Alternative 3's incremental contribution to significant cumulative SWP water supply impacts would not be cumulatively considerable.**

5.1.3 Air Quality

Air pollution is largely a cumulative impact because the attainment status of the region is a result of past and present development. Cumulative projects with the most notable potential to contribute to cumulative construction air quality impacts are those that would be under construction at the same time and near the proposed project. There are no construction actions associated Alternative 2. **As such, Alternative 2 would not contribute to effects from cumulative projects.** Increased vehicle exhaust and fugitive dust emissions could be compounded by construction projects in the region, such as Delta Conveyance Project, California High-Speed Rail Project: Merced to Fresno, SLLPIP, San Luis Transmission Project, San Luis Solar Project, Gonzaga Ridge Wind Repowering Project, Pacheco Reservoir Expansion Project, and Los Vaqueros Reservoir Expansion Project. Construction emissions for the cumulative projects presented in Table 5-1 were obtained from publicly available and readily accessible environmental documents. The maximum annual construction emissions from each project were totaled to estimate the maximum emissions that could occur in a given year for each pollutant. Table 5-1 summarizes cumulative emissions in the SJVAB.

Table 5-1. Cumulative Construction Projects Maximum Annual Emissions

Cumulative Development Projects During Construction[1]	VOCs, tpy	NOx, tpy	CO, tpy	SO_2, tpy	PM_{10}, tpy	$PM_{2.5}$, tpy
B.F. Sisk Dam Raise and Reservoir Expansion Project	5	45	73	<1	41	6
Delta Conveyance Project	30	217	<1	1	58	9
San Luis Low Point Improvement Project	6	9	49	<1	41	6
San Luis Transmission Project	4	26	34	n/a	39	7
San Luis Solar Project	<1	5	3	<1	<1	<1
Total from Other Construction Projects Emissions	40	257	86	1	138	22
Total Cumulative Construction Project Emissions	**45**	**302**	**159**	**1**	**180**	**28**

[1] Although construction emissions would occur from the California High-Speed Rail Project, Gonzaga Ridge Wind Repowering Project, Pacheco Reservoir Expansion Project, and Los Vaqueros Project, the necessary data are not readily available online, so emissions are not included in this summary.
CO – carbon monoxide; NOx – nitrogen oxides; PM_{10} – respirable particulate matter; $PM_{2.5}$ – fine particulate matter; SO_2 – sulfur dioxide; tpy – tons per year; VOC – volatile organic compound

As shown in the table, cumulative construction emissions of VOC, NOx, CO, PM_{10}, and $PM_{2.5}$ would exceed the SJVAPCD CEQA significance threshold. Therefore, cumulative construction emissions of these five pollutants would result in a significant and unavoidable cumulative impact. Because the proposed project by itself would be significant and unavoidable for NOx and PM_{10}, the proposed project would cause a cumulatively considerable incremental contribution to the cumulatively significant impact.

Premitigation exceedances of SJVAPCD mass emission thresholds for O_3 precursors, in general, would lead to the increased health risks described in Chapter 3 within the affected air basin. For relatively small projects such as the action alternatives, attempts to model regional O_3 concentration impacts and resulting health impacts pre and postmitigation in recent EIRs (*Norman Y. Mineta San Jose International Airport Master Plan Amendment* and *Inglewood Basketball and Entertainment Center Project Draft EIR*) have concluded that the results to human health impacts were not statistically different than zero; therefore, photochemical modeling for the proposed project would not be practical or produce meaningful information and was not included in the cumulative analysis. **Because construction emissions under Alternative 3 would exceed the significance thresholds before and after mitigation, the temporary incremental contribution to significant cumulative air quality impacts would be cumulatively considerable premitigation and, for NOx and PM_{10}, remain cumulatively considerable postmitigation.** In addition, operation of Alternatives 2 and 3 would not have significant air quality-related impacts and **would not be cumulatively considerable.**

5.1.4 Greenhouse Gas Emissions

No single project can noticeably change the global climate temperature; therefore, when considered in relationship to all past, present, and future development, implementation of the action alternatives could result in a significant cumulative impact. The significance criterion used to assess an alternative's individual significance is sufficient to determine if a project would conflict with an applicable plan, policy, or regulation adopted for reducing GHG emissions for which project-specific thresholds have been set. Therefore, if an alternative would produce GHG emission impacts

that are individually significant, then the alternative's impact would be cumulatively considerable. There are no construction actions or changes to existing operations associated Alternative 2. **As such, Alternative 2 would not contribute to cumulative effects. The incremental contribution to the cumulative GHG effect for construction and operation of Alternative 3 would be significant because the criteria are exceeded (see Section 4.4). However, with implementation of mitigation measures, GHG effects would not be cumulatively considerable postmitigation.**

5.1.5 Visual Resources

The San Luis Transmission Project and the San Luis Solar Project would construct new facilities downstream of B.F. Sisk Dam. Development of the California High-Speed Rail Project would establish new railway and railway tunnels across Pacheco Pass parallel to SR 152 near San Luis Reservoir. Gonzaga Ridge Wind Repowering Project would decommission and remove existing wind turbines and the overhead energy collection system at Gonzaga Ridge Wind Farm to allow for the installation of modern wind turbines. The wind farm is located west of San Luis Reservoir and south of SR 152. SLLPIP would remove the existing dam, develop a new reservoir and associated facilities, and construct a new interchange on SR 152 at the intersection with Kaiser Aetna Road. Construction of these projects would likely require equipment that would be visible from San Luis Reservoir and public roadways (including SR 152) and would generate a temporary degradation of the area's visual character and the quality of scenic vistas.

Alternative 2 would not complete any construction in the study area and would not contribute to effects from these cumulative projects. If construction of the San Luis Transmission Project, San Luis Solar Project, and California High-Speed Rail Project were completed concurrently with Alternative 3, there could be a cumulative short-term impact on visual resources given the introduction of construction equipment, traffic, and lighting. However, implementation of Mitigation Measures VIS-1 and VIS-2 would reduce effects of Alternative 3 to a less than significant level. **Therefore, although Alternative 3 may combine with other projects to create a cumulatively considerable contribution to significant cumulative visual impacts premitigation, this impact would not be cumulatively considerable postmitigation.**

5.1.6 Noise and Vibration

The San Luis Transmission Project, San Luis Solar Project, California High-Speed Rail Project, Gonzaga Ridge Wind Repowering Project, Pacheco Reservoir Expansion Project, and SLLPIP would all require construction actions that would generate noise and vibration in the study area. There are no construction actions associated with Alternative 2. **As such, Alternative 2 would not contribute to effects from these cumulative projects.** The San Luis Transmission Project, San Luis Solar Project, California High-Speed Rail Project, Gonzaga Ridge Wind Repowering Project, Pacheco Reservoir Expansion Project, and SLLPIP would require construction actions that would generate noise and vibration in the study area. Cumulative projects and population growth in the study area could result in cumulative impacts to noise. Construction is projected to occur in Merced County as a result of projected population growth; however, construction is not expected to be near San Luis Reservoir. Construction of the California High-Speed Rail Project, San Luis Transmission Project, and San Luis Solar Project could occur at the same time as Alternative 3. These cumulative projects, along with Alternative 3, would involve a substantial amount of construction equipment and vehicle traffic that would cause an increase in ambient noise levels in the project vicinity. Therefore, the **contribution of Alternative 3 to temporary significant cumulative noise**

impacts during construction would be cumulatively considerable and remain cumulatively considerable.

Operation of Alternatives 2 and 3 would not have significant noise-related impacts and **would not contribute to any cumulative noise impacts.**

5.1.7 Traffic and Transportation

The San Luis Transmission Project, San Luis Solar Project, California High-Speed Rail Project, Gonzaga Ridge Wind Repowering Project, Pacheco Reservoir Expansion Project, and SLLPIP likely generate additional traffic on public roadways, including SR 152, and could generate a temporary degradation of traffic safety and emergency access in the study area. There are no construction actions associated with Alternative 2. **As such, Alternative 2 would not contribute to effects from these cumulative projects.** Construction of these projects could occur at the same time as Alternative 3. These cumulative projects, along with Alternative 3, would involve a substantial amount of construction equipment and vehicle traffic that would cause an increase in traffic levels in the project vicinity. Therefore, the **contribution of Alternative 3 to temporary significant cumulative traffic impacts during construction would be cumulatively considerable and remain cumulatively considerable**.

Operation of **Alternative 3** would not have significant traffic-related impacts and **would not contribute to any cumulative traffic impacts**.

5.1.8 Hazards and Hazardous Materials

The San Luis Reservoir SRA RMP/GP, San Luis Transmission Project, and San Luis Solar Project would require construction activities near the study area that could occur in the same timeframe as the B.F. Sisk Dam Raise and Reservoir Expansion Project. **Alternative 2 would not complete any construction in the study area and would not contribute to effects from these cumulative projects.** Construction activities under these cumulative projects would require construction equipment, which could require the use of motor oil, gasoline, diesel fuel, solvents, and degreasers. However, a SWPPP for all projects would be required by the RWQCB for approval of a General Construction Permit under the National Pollutant Discharge Elimination System (NPDES) Program. The SWPPP would describe safety measures and BMPs to be implemented when transporting, storing, or using hazardous materials.

SR 152 would be the primary access route for truck, light equipment, and construction worker access for all cumulative projects. If the cumulative projects are constructed at the same time as Alternative 3, this construction traffic could conflict with emergency response and evacuation plans for the State Responsibility Area, a potentially significant cumulative effect. Construction of the trails, San Luis Solar Project, or San Luis Transmission Project at a time different than Alternative 3 would eliminate the potential for construction traffic conflict with emergency response and evacuation plans for the State Responsibility Area.

The San Luis Reservoir area was identified as a region at moderate or high risk for wildfire in the *2030 Merced County General Plan Background Report* (Merced County 2013). Construction activity, such as the use of mechanical equipment, could generate sparks and cause a wildfire, a potentially significant cumulative effect.

Overall, the construction of Alternative 3 in combination with these cumulative actions could result in cumulative impacts on hazards and hazardous materials. The implementation of Mitigation Measures HAZ-1 and TR-1 would reduce the effects of Alternative 3 from encountering contaminated soil, increasing wildfire risk, and conflicting with emergency response to a less than significant level. **Therefore, although Alternative 3 may combine with other projects to create a cumulatively considerable contribution to significant cumulative hazards and hazardous materials impacts premitigation, this impact would not be cumulatively considerable postmitigation.**

5.1.9 Aquatic Resources

Under Alternative 2, there would be no construction in the study area. **Therefore, there would be no cumulative impact due to construction activities on special status fish species and their habitats or the movement of any resident or migratory fish species.**

Other projects that could contribute to cumulative impacts on aquatic habitat conditions include the California Delta Conveyance Project, 2018 Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta, Los Vaqueros Reservoir Expansion Project, and San Joaquin River Restoration Program. These projects, if implemented, would influence operations in the Delta at the same time as Alternative 2. However, as indicated in Section 4.9 changes in Delta conditions from the operation of the Alternative 2 would generate small changes in Delta conditions for aquatic resources, providing small adverse and mostly beneficial impacts on special status fish species that are less than significant. **Therefore, the incremental contribution of Alternative 2 operations to significant cumulative effects on special status fish species and their habitats or the movement of any resident or migratory fish species would not be cumulatively considerable.**

The San Luis Transmission Project, San Luis Solar Project, California High-Speed Rail Project, Gonzaga Ridge Wind Repowering Project, Pacheco Reservoir Expansion Project, and SLLPIP would require construction actions in the project study area. These cumulative projects, along with Alternative 3, could result in temporary impacts on aquatic habitats for fish species from clearing, grading, staging of equipment, and other ground-disturbing activities. However, there are no special status fish species present in San Luis Reservoir. San Luis Reservoir does not provide migratory habitat to any fish species. **Therefore, Alternative 3 construction activities would have no cumulative impact on special status fish species and their habitats or the movement of any resident or migratory fish species.**

Other projects that could contribute to cumulative impacts on aquatic habitat conditions include California Delta Conveyance Project, 2018 Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta, Los Vaqueros Reservoir Expansion Project, and San Joaquin River Restoration Program. These projects, if implemented, would influence operations in the Delta at the same time as Alternative 3. However, as indicated in Section 4.9 changes in Delta conditions from the operation of the Alternative 3 subalternatives would generate small changes in Delta conditions for aquatic resources in all but wet and above-normal water year types from February through April but still in those periods be less than levels believed to have deleterious effects to special status fish species. **Therefore, the incremental contribution of Alternative 3 operations to significant cumulative effects on special status fish species and their habitats or the movement of any resident or migratory fish species would not be cumulatively considerable.**

5.1.10 Terrestrial Resources

Under Alternative 2, there would be no construction in the study area. **Therefore, there would be no cumulative impact due to construction activities on special status wildlife species, special status plants, migratory or special status birds, wetland and riparian habitats, or local policies or ordinances protecting biological resources.**

Construction activities for Alternative 3 would result in impacts on wetland and riparian vegetation communities at San Luis Reservoir. Alternatives described for the San Luis Reservoir SRA RMP/GP, California High-Speed Rail Project, San Luis Transmission Project, San Luis Solar Project, and SLLPIP could have impacts on wetland and riparian vegetation communities and could occur at the same time as the dam raise. **Together, these projects and Alternative 3 could result in significant cumulative effects associated with loss or adverse modification of wetland and riparian habitats.** However, Alternative 3 would implement Mitigation Measure TERR-16, which requires avoidance of wetlands whenever practicable, use of fencing to delineate waters of the United States and waters of the state within and adjacent to construction areas that cannot be directly filled, and identification of these areas as sensitive habitat prior to start of construction to prevent unintended trampling of wetland vegetation by construction personnel and equipment. Mitigation Measure TERR-16 further requires that areas disturbed by construction be replanted with native plants to minimize erosion. This mitigation would reduce impacts to previously unidentified sensitive habitats to a less than significant level. **With implementation of Mitigation Measure TERR-16, the incremental contribution to significant cumulative effects on wetland and riparian habitats would not be cumulatively considerable.**

Construction activities for Alternative 3 could result in impacts on special status wildlife, wildlife movement, or wildlife habitat at San Luis Reservoir. Alternatives described for the San Luis Reservoir SRA RMP/GP, California High-Speed Rail Project, San Luis Transmission Project, San Luis Solar Project, and SLLPIP could have impacts on special status wildlife, wildlife movement, or habitat and could occur at the same time as Alternative 3. **Together, these projects and Alternative 3 could result in significant cumulative effects on special status wildlife with potential to occur at San Luis Reservoir.** However, Alternative 3 would implement Mitigation Measures TERR-1 through TERR-5 and TERR-11 through TERR-15 to complete preconstruction wildlife surveys, implement avoidance requirements, train workers, and require species-specific compensatory mitigation measures to address unavoidable impacts to wildlife habitats. Mitigation Measure TERR-12 specifically includes wildlife movement elements that would reduce the incremental degradation of regional wildlife movement opportunities for SJKF, mountain lion, tule elk, American badger, and other wildlife species by improving the condition of the wildlife corridor that crosses B.F. Sisk Dam, providing a new wildlife bridge over the dam spillway, and improving movement opportunities at the SR 152 causeway at Cottonwood Bay. This mitigation would reduce impacts to special status wildlife to a less than significant level. **With implementation of Mitigation Measures TERR-1 through TERR-5 and TERR-11 through TERR-15, the incremental contribution to significant cumulative effects on special status wildlife would not be cumulatively considerable.**

Construction activities for Alternative 3 could result in impacts on migratory birds if construction occurs during nesting season or results in destruction of nesting habitat for migratory birds. Alternatives described for the San Luis Reservoir SRA RMP/GP, California High-Speed Rail Project, San Luis Transmission Project, San Luis Solar Project, and SLLPIP could have impacts on migratory birds or habitat and could occur at the same time as Alternative 3. **Together, these**

projects and Alternative 3 could result in significant cumulative effects on migratory birds at San Luis Reservoir. However, Alternative 3 would implement Mitigation Measures TERR-6 through TERR-10 to avoid or reduce effects to migratory and migratory birds. **Therefore, with implementation of Mitigation Measures TERR-6 through TERR-10, the incremental contribution to significant cumulative effects on migratory and special status birds would not be cumulatively considerable.**

Construction activities for Alternative 3 could result in impacts on special status plants at San Luis Reservoir. Alternatives described for the San Luis Reservoir SRA RMP/GP, California High-Speed Rail Project, San Luis Transmission Project, San Luis Solar Project, and SLLPIP could have impacts on special status plants and could occur at the same time as Alternative 3. **Together, these projects and Alternative 3 could result in significant cumulative effects on special status plants at San Luis Reservoir.** However, the Dam Raise Alternative would implement Mitigation Measure TERR-1, which outlines requirements for special habitat and species surveys, avoidance requirements, and compensatory mitigation requirements to address unavoidable impacts to special status plants. This mitigation would reduce impacts to previously unidentified special status plant species to a less than significant level. **Therefore, with implementation of Mitigation Measure TERR-1, the Alternative 3 incremental contribution to significant cumulative effects on special status plants would not be cumulatively considerable.**

The Merced County general plan includes objectives and policies to preserve and protect biological resources in the county. These include provisions to preserve existing protected lands and increase the overall acreage of protected lands in the county and designation of buffers around and protection of wetlands. **Together, these projects and Alternative 3could generate significant impacts on terrestrial wildlife and vegetation.** Mitigation Measures TERR-1 through TERR-16 are required to reduce these potential impacts to terrestrial wildlife and vegetation, including wetlands, during construction near the San Luis Reservoir shoreline to a less than significant level. **Therefore, with implementation of Mitigation Measures TERR-1 through TERR-16, the incremental contribution to significant cumulative effects by Alternative 3 on local policies or ordinances protecting biological resources would not be cumulatively considerable.**

5.1.11 Recreation

The San Luis Reservoir SRA RMP/GP, San Luis Transmission Project, and San Luis Solar Project would construct new facilities downstream of B.F. Sisk Dam. The San Luis Reservoir SRA RMP/GP includes a park plan, which outlines various alternatives for future park expansion. A project construction timeline is not available; therefore, associated construction actions could take place prior to or concurrently with Alternative 3 construction actions. The San Luis Transmission Project would construct a new transmission line between Tracy and Dos Amigos that would cross O'Neill Forebay and pass adjacent to the Medeiros Use Area. This new transmission line segment would generate short-term construction-related impacts on recreation with the potential development of transmission line supports in the San Luis Reservoir SRA, which could require temporary closures during construction and could potentially, depending on placement, displace existing and planned camping sites. The San Luis Solar Project would develop a new 159-acre solar facility at the western corner of the Medeiros Use Area that would permanently convert land that is currently used informally for recreation and is adjacent to approximately 18 established campsites. If recreation facilities in the Medeiros Use Area are removed by the San Luis Transmission Project and the San Luis Solar Project prior to Alternative 3 construction, fewer facilities would be available to offset visitors unable to use the Basalt Use Area. SLLPIP could operate San Luis Reservoir in a way

that could decreases in reservoir storage levels. **Alternative 2 would not complete any construction in the study area and would not contribute to effects from these cumulative projects. The short-term incremental contribution of Alternative 3 to this significant cumulative effect on recreation opportunities in the area of analysis due to the temporary closure of recreation facilities would be cumulatively considerable if any of the other cumulative projects are completed at the same time. No feasible mitigation has been identified that could reduce the severity of this impact; therefore, it remains cumulatively significant and the contribution of Alternative 3 remains cumulatively considerable. The incremental contribution of Alternative 3 to this significant cumulative effect on trail access in the study area would not be cumulatively considerable.**

Simultaneous closures at multiple use areas could displace visitors to other areas within the San Luis Reservoir SRA or at other local and regional recreation sites. This would be a significant cumulative impact because the displacement could contribute to overcrowding at these other recreation sites. **The short-term incremental contribution of Alternative 3 to this significant cumulative effect on recreation user displacement and overcrowding in the area of analysis due to the temporary closure of recreation facilities would be cumulatively considerable if recreation facility expansions outlined in the park plan are completed at the same time. No feasible mitigation has been identified that could reduce the severity of this impact; therefore, it remains cumulatively significant and the short-term contribution of Alternative 3 remains cumulatively considerable.**

Operational changes under the Alternative 3 subalternatives could raise the average water surface elevation in San Luis Reservoir by up to 12.8 feet and reduce capacity at reservoir boat launches. **Therefore, operational changes proposed in Alternative 3 could result in a short-term incremental contribution to the significant cumulative effect on recreation opportunities in the area of analysis due to the reductions in boat launch capacity would be cumulatively considerable if any of the other cumulative projects are completed at the same time. However, with the implementation of Mitigation Measures REC-2, the severity of the impact would be reduced, and the short-term incremental contribution of operational changes generated by Alternative 3 to this significant cumulative effect on recreation opportunities would not be cumulatively considerable.**

5.1.12 Cultural Resources

The California High-Speed Rail Project, the San Luis Transmission Line Project, the San Luis Solar Project, San Luis Reservoir SRA RMP/GP, Pacheco Reservoir Expansion Project, and SLLPIP have all been identified as cumulative actions that could result in significant impacts to cultural resources. Archival and records search information, geoarchaeological sensitivity studies, and pedestrian inventory surveys were used to assess potential impacts to cultural resources within the project area of analysis in Merced County. **Alternative 2 would not complete any construction in the study area and would not contribute to effects from these cumulative projects.** For Alternative 3, the projects noted above could have a cumulatively significant effect on cultural resources. Impacts under the California High-Speed Rail Project, San Luis Transmission Line Project, San Luis Solar Project, and San Luis Reservoir SRA RMP/GP would be reduced through implementation of mitigation measures associated with each project. Impacts under the Pacheco Reservoir Expansion Project and three alternatives under the SLLPIP, however, are expected to be significant and unavoidable.

The SLLPIP includes three action alternatives that overlap the area of analysis for the current project, and each is expected to have significant unavoidable impacts on cultural resources despite mitigation. The Lower San Felipe Intake and San Luis Reservoir Expansion alternatives are both centered on San Luis Reservoir, while the Pacheco Reservoir Expansion Alternative is centered 6 miles west at Pacheco Reservoir. As examined in a 2019 draft EIS/EIR (Reclamation and Valley Water 2019), the San Luis Reservoir Expansion Alternative is almost identical to Alternative 3 and both are expected to have the same impacts on cultural resources.

The Pacheco Reservoir Expansion Project is identical to the Pacheco Reservoir Expansion Alternative under the SLLPIP and would not be further analyzed or implemented if that alternative is selected. The project would involve increasing the Pacheco Reservoir's capacity from 5.5 TAF to as much as 140 TAF and would have significant construction and operational impacts on cultural resources. At least seven archaeological sites, including four that may be considered tribal cultural resources per PRC Section 20174, would be fully or partially inundated if the project moves forward and at least four archaeological sites may be subject to construction impacts. Despite mitigation, impacts under the Pacheco Reservoir Expansion Project are expected to remain significant and unavoidable.

Impacts to cultural resources from construction activities and SR 152 modifications under Alternative 3 would be reduced through implementation of appropriate mitigation measures, though operational impacts, specifically mechanical and biochemical impacts from increased wave action and fluctuating water levels from expansion of San Luis Reservoir and Cottonwood Bay, are expected to remain significant despite mitigation. The incremental contribution to cumulative effects from Alternative 3 therefore would be cumulatively considerable despite mitigation. **Impacts under Alternative 3 would be reduced through implementation of mitigation measures, though the incremental contribution to cumulative effects from this alternative would remain cumulatively considerable following mitigation**.

5.1.13 Geology, Seismicity, and Soils

The San Luis Transmission Project and the San Luis Solar Project would construct new facilities downstream of B.F. Sisk Dam. The San Luis Transmission Project would construct a new transmission line between Tracy and Dos Amigos that would cross O'Neill Forebay and connect to the San Luis Substation. The San Luis Solar Project would develop a new 159-acre solar facility adjacent to the SR 152 crossing at O'Neill Forebay. Development of the California High-Speed Rail Project would establish new railway and railway tunnels across Pacheco Pass parallel to SR 152 near San Luis Reservoir. Construction of these projects would require earthmoving activities that could expose workers to adverse effects related to earthquake activity and unstable soils. The San Luis Reservoir SRA RMP/GP would construct new trails, campgrounds, and other recreation resources; however, actions identified in the plan would not permit development of structures in Alquist-Priolo fault zones and would not increase the risk related to seismic events. Development and construction in Merced County related to projected population growth in the county would not likely occur near San Luis Reservoir and would not add to potential geology and soil effects related to Alternatives 2 and 3.

Alternative 2 would not complete any construction in the study area and would not contribute to effects from these cumulative projects. Construction activities proposed for Alternative 3 and the identified cumulative projects would not directly influence earthquake activity. In addition, in the event of an earthquake, construction activities would follow the safety

requirements of OSHA to reduce the potential for harm to construction workers or equipment. **Therefore, construction of Alternative 3 in combination with other cumulative projects would not result in a significant cumulative impact on geology, seismicity, or soils.**

Alternative 3 and the cumulative projects identified above do not propose the construction of permanent structures for human habitation and would not increase the frequency of maintenance workers being on-site compared to existing maintenance activities at B.F. Sisk Dam. The B.F. Sisk Dam SOD Modification Project that Alternative 3 is connected to would reduce the risk of dam failure from strong seismic ground shaking and associated ground failure, liquefaction, or landslides that could occur while workers were on-site. The California High-Speed Rail Project would be designed to include safeguards to stop train traffic if seismic activities occur to prevent any accidents caused by impacts to the tracks. The visitor facilities proposed under the San Luis Reservoir SRA RMP/GP would be subject to California building codes that require protection against seismic ground shaking. **Therefore, operation and maintenance of Alternative 3 in combination with other cumulative projects would not result in a significant cumulative impact on geology, seismicity, and soils.**

There is the potential to encounter previously undetected but potentially significant paleontological resources during construction of Alternative 3; however, Mitigation Measure GEO-1 would reduce impacts to less than significant. The cumulative projects would not generate ground-disturbing actions within the same footprint as Alternative 3. While there would be no other cumulative projects with ground-disturbing actions within the same footprint as the alternatives, these cumulative projects could affect similar paleontological resources to Alternative 3. **Therefore, cumulative impacts on paleontological resources would be significant, and Alternative 3's incremental impacts would be cumulatively considerable premitigation but not cumulatively considerable postmitigation.**

5.1.14 Public Utilities and Power

Over time, construction debris from other construction projects and from future growth and development could cause the landfill to reach capacity. **Alternative 2 would not complete any construction in the study area and would not contribute to effects from these cumulative projects.** Alternative 3's contributions to the regional landfills' remaining capacity would be insubstantial relative to their remaining unused capacity. Energy demand associated with construction of the cumulative projects, including Alternative 3, could be met by regional supplies, especially with construction efforts of the alternatives using generators. Operation would increase demand on the existing pumps at Gianelli Pumping-Generating Plant by approximately 10% in years when the new reservoir space is filled. The increased pumping would be necessary to achieve the project objectives. However, this increase in energy use would not result in significant energy impacts or the substantial depletion of local or regional energy supplies. In addition, none of the other cumulative projects in the San Luis Reservoir area would require a significant increase in energy use. **Therefore, Alternative 3 in combination with other cumulative projects would result in less than significant cumulative short- or long-term impacts on public utilities, services, and power.**

5.1.15 Summary of Cumulative Effects

A summary of the cumulative effects identified for Alternative 2 is presented in Table 5-2.

Table 5-2. Cumulative Effects Summary

Significance Criteria	Contribution to Cumulative Condition	Mitigation
Water Quality		
Cause a violation of existing water quality standards or waste discharge requirements.	Not cumulatively considerable contribution to significant cumulative impact.	None
Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site or provide substantial additional sources of polluted runoff.	Not cumulatively considerable contribution to significant cumulative impact	None
In flood hazard, tsunami, or seiche zones, risk release of pollutants because of project inundation.	Not cumulatively considerable contribution to significant cumulative impact	None
Conflict with or obstruct implementation of a water quality control plan.	Not cumulatively considerable contribution to significant cumulative impact	None
Result in effects on water quality related beneficial uses.	Not cumulatively considerable contribution to significant cumulative impact	None
Water Supply		
Construction could substantially reduce the annual supply of water available to CVP, SWP, or other water users.	Not cumulatively considerable contribution to significant cumulative impact	None
Operation could substantially reduce the annual supply of water available to CVP, SWP, or other water users.	Not cumulatively considerable contribution to significant cumulative impact	None
Air Quality		
Conflict with or obstruct implementation of the applicable air quality plan.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact after mitigation	AQ-1, AQ-2, AQ-3, AQ-4
Expose sensitive receptors to substantial pollutant concentrations.	Not cumulatively considerable contribution to significant cumulative impact	None
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Not cumulatively considerable contribution to significant cumulative impact	None
Cause temporary and short-term construction-related emissions of criteria pollutants or precursors that would exceed the general conformity de minimis thresholds.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact after mitigation	AQ-1, AQ-2, AQ-3, AQ-4
Greenhouse Gas Emissions		
Generate GHG emissions, either directly or indirectly, that could have a significant impact on the environment.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	AQ-1, AQ-2, GHG-1, GHG-2
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	AQ-1, AQ-2, GHG-1, GHG-2

Significance Criteria	Contribution to Cumulative Condition	Mitigation
Visual Resources		
Have a substantial adverse effect on a scenic vista.	Not cumulatively considerable contribution to significant cumulative impact	None
Substantially damage scenic resources within a state scenic highway corridor.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	VIS-2
Substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable regulations governing scenic quality.	Not cumulatively considerable contribution to significant cumulative impact	None
Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	VIS-1
Noise and Vibration		
Expose sensitive receptors to noise levels in excess of standards established in the local general plan or noise ordinance.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact	None
Expose sensitive receptors to excessive ground-borne vibration or ground-borne noise.	Not cumulatively considerable contribution to significant cumulative impact	None
Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact	None
Operational sources located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport that could expose people residing or working in the study area to excessive noise levels.	Not cumulatively considerable contribution to significant cumulative impact	None
Traffic and Transportation		
Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	Not cumulatively considerable contribution to significant cumulative impact	None
Cause a substantial increase in traffic in relation to the existing traffic load and capacity of the street system.	Not cumulatively considerable contribution to significant cumulative impact	None
Hazards and Hazardous Materials		
Substantially increase traffic hazards due to a geometric design feature or incompatible uses.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TR-1
Result in inadequate emergency access.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TR-1

Significance Criteria	Contribution to Cumulative Condition	Mitigation
During construction activities, the transport, use, or disposal of hazardous materials could increase the risk of exposure from hazardous materials to the public and construction workers.	Not cumulatively considerable contribution to significant cumulative impact	None
During construction activities, there is potential to encounter contaminated soil or groundwater, which could result in an accidental release of hazardous materials and pose a threat to the public and the environment.	Not cumulatively considerable contribution to significant cumulative impact	None
Construction activities at San Luis Reservoir could conflict with seaplane maneuvers on San Luis Reservoir and operations at the San Luis Reservoir Seaplane Base, resulting in safety hazards for pilots and people working and residing in the area.	Not cumulatively considerable contribution to significant cumulative impact	None
During construction activities use of Basalt Road and SR 152 for site access could temporarily interfere with an emergency response plan or emergency evacuation plan for the State Responsibility Area.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	HAZ-1, TR-1
The use of mechanical equipment during construction could increase the risk of wildfire within the vicinity of the study area.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	HAZ-1, TR-1
Aquatic Resources		
Have a substantial adverse effect, either directly or through habitat modifications, on any aquatic species identified as an endangered, threatened, candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW, NMFS, or USFWS.	Not cumulatively considerable contribution to significant cumulative impact	None
Interfere substantially with the movement of any native resident or migratory fish.	Not cumulatively considerable contribution to significant cumulative impact	None
Terrestrial Resources		
Construction activities could remove or adversely affect sensitive habitats including wetland and riparian vegetation communities	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TERR-16
Construction activities could kill, harm, or disturb terrestrial wildlife, including special status species, or their habitats.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TERR-1 through TERR-5, and TERR-11 through TERR-15

Significance Criteria	Contribution to Cumulative Condition	Mitigation
Construction activities could disturb nesting migratory and special status birds including raptors. Construction activities for the Dam Raise Alternative could result in impacts on migratory birds if construction occurs during nesting season or results in destruction of nesting habitat for migratory birds.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TERR-6 through TERR-10
Construction activities could kill, damage, or adversely affect special status plants.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TERR-1
Construction activities could result in conflicts with local policies or ordinances protecting biological resources.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	TERR-1 through TERR-16
Recreation		
Project construction could substantially reduce recreational use of trails.	Not cumulatively considerable contribution to significant cumulative impact	None
Project construction could result in temporary closure to recreation facilities, resulting in a substantial loss of recreation opportunities.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact	None
Project construction could displace visitors and substantially contribute to overcrowded conditions at other local and regional recreation sites.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact	None
Operational changes to water levels in recreational water bodies could affect recreational uses.	Not cumulatively considerable contribution to significant cumulative impact	None
	Not cumulatively considerable contribution to significant cumulative impact after mitigation	REC-1 and REC-2
Cultural Resources		
Construction activities or operational changes could result in adverse effects to historic properties listed or eligible for listing in the NRHP or substantial adverse changes to historical resources, unique archaeological resources, or tribal cultural resources listed or eligible for listing in the CRHR or result in the disturbance of human remains.	Not cumulatively considerable contribution to significant cumulative impact	None
	Cumulatively considerable contribution to significant cumulative impact after mitigation	CR-1, CR-2, CR-3
Geology and Soils		
Construction activities could directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death, through rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.	Not cumulatively considerable contribution to significant cumulative impact	None

Significance Criteria	Contribution to Cumulative Condition	Mitigation
Construction activities on unstable soils could result in the risk of loss, injury, or death as a result of liquefaction or landslides.	Not cumulatively considerable contribution to significant cumulative impact	None
Construction activities could take place on expansive soils, creating a substantial risk to life or property.	Not cumulatively considerable contribution to significant cumulative impact	None
Maintenance activities during operations could expose people or structures to adverse effects related to the rupture of a known earthquake fault.	Not cumulatively considerable contribution to significant cumulative impact	None
Operations could result in long-term impacts to geology, soils, or mineral resources.	Not cumulatively considerable contribution to significant cumulative impact	None
Construction activities could result in the loss of availability of a known mineral resource of regional or local importance.	Not cumulatively considerable contribution to significant cumulative impact	None
Construction activities could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Not cumulatively considerable contribution to significant cumulative impact after mitigation	GEO-1
Public Utilities and Power		
Construction activities would generate solid waste, the disposal of which could exceed the capacity of landfills designated to accommodate the project's solid waste disposal needs.	Not cumulatively considerable contribution to significant cumulative impact	None
Adverse impacts associated with the use and/or depletion of local or regional energy supplies.	Not cumulatively considerable contribution to significant cumulative impact	None

CDFW – California Department of Fish and Wildlife; CRHR – California Register of Historical Resources; CVP – Central Valley Project; GHG – greenhouse gas; NMFS – National Marine Fisheries Service; NRHP – National Register of Historic Places; SR – State Route; SWP – State Water Project; USFWS – United States Fish and Wildlife Service

Chapter 6 Disclosures, Coordination, and Supplemental Material

CEQA and NEPA require consideration of irreversible and irretrievable commitments of resources, significant and unavoidable impacts, growth-inducing impacts, relationship between short-term uses and long-term productivity, and areas of controversy and issues to be resolved. These considerations are described in this chapter. In addition, this chapter summarizes activities undertaken by Reclamation and SLDMWA for public and agency involvement required for the B.F. Sisk Dam Raise and Reservoir Expansion Project. For a complete list of regulatory requirements necessary for implementation of the B.F. Sisk Dam Raise and Reservoir Expansion alternatives, see Appendix C. Appendix P provides supplemental information, including a list of preparers, acronyms, references, and index.

6.1 Other Reclamation Environmental Compliance Requirements

In addition to resources analyzed in Chapter 4, Department of the Interior Regulations, Executive Orders, and Reclamation guidelines require a discussion of Indian Trust Assets (ITAs), Indian Sacred Sites (EO 13007) and Environmental Justice (EO 12898). The B.F. Sisk Dam SOD Modification Project EIS/EIR[17] did not identify any ITAs or Indian Sacred Sites within the construction study area. Therefore, none of the Project alternatives would affect ITAs or Indian Sacred Sites.

The Environmental Justice impact analysis in the B.F. Sisk Dam SOD Modification Project EIS/EIR identified temporarily adverse effects on minority and low-income populations but determined that those effects would not be disproportionately focused on these populations. Construction of Alternative 3 would be completed within the same schedule and study area evaluated for the B.F. Sisk Dam SOD Modification Project. Therefore, the incremental impacts generated by Alternative 3 would, similarly to the B.F. Sisk Dam SOD Modification Project (Alternative 1), not generate effects disproportionately focused on these same populations. Under Alternative 2, there would be no new construction and there would no incremental effects on minority and low-income populations in the study area.

6.2 Irreversible and Irretrievable Commitment of Resources

Construction of Alternative 3 evaluated in this draft EIR/SEIS would involve the consumption of nonrenewable natural resources. These nonrenewable natural resources would consist of petroleum for fuels necessary to operate equipment used during construction activities. This would include generation of waste from earthmoving activities during site preparation for the embankment for the placement of new materials, and the demolition of sections of the Gianelli Intake Structure and an

[17] The B.F. Sisk Dam SOD Modification Project Final EIS/EIR is available for review at the following hyperlink: https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=34281

existing berm at Pacheco Pumping Plant under Alternative 3. Soils would be placed on-site, near the areas where they were excavated, or potentially reused under some of the alternatives to support the development of new infrastructure. Construction waste from the disposal of nonsoil materials removed during the construction of Alternative 3 would be hauled to regional landfills. Petroleum fuels would be used to haul these materials to the disposal sites. In addition to fuels used in transportation, the use of the disposal sites would constitute an irreversible and irretrievable commitment of resources. Operation of Alternative 3 would result in newly inundated lands. The commitment of this land would result in an irretrievable loss of this resource.

6.3 Significant and Unavoidable Impacts

Significant and unavoidable adverse effects refer to the environmental consequences of an action that cannot be avoided by redesigning the project, changing the nature of the project, or implementing mitigation measures. CEQA Guidelines require a discussion on significant environmental effects that cannot be avoided and those that can be mitigated but not reduced to an insignificant level (Sections 15126.2[a] and 15126.2[b]). NEPA requires a discussion of any adverse impacts that cannot be avoided (40 CFR 1502.16). This section discusses the significant and unavoidable impacts of the action alternatives presented in Chapter 4.

Table 6-1 presents the impacts that, even after mitigation measures are implemented, may remain significant and unavoidable for the action alternatives.

Table 6-1. Summary of Significant and Unavoidable Impacts

Impact	Alternative	Mitigation Measures	Evaluation of Significant and Unavoidable Impacts
WS: Operational impacts on water supply would be considered significant if the alternative would substantially reduce the annual supply of water available to CVP, SWP, refuges, or other water users during the long-term operation of the alternative.	2	No feasible mitigation measures are proposed.	Section 4.2.4
AQ: Construction activities could cause temporary and short-term construction-related emissions of criteria pollutants or precursors that would exceed the significance thresholds.	3	AQ-1: Tier 4 emission standards, AQ-2: Model Year 2015 or better emission standards, AQ-3: Diesel oxidation catalysts, AQ-4: Pave haul and access roads	Section 4.3.5
NOI: Construction activities could expose sensitive receptors to noise levels in excess of standards established in the local general plan or noise ordinance.	3	No feasible mitigation measures are proposed.	Section 4.6.5
NOI: Construction activities could cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	3	No feasible mitigation measures are proposed.	Section 4.6.5

Impact	Alternative	Mitigation Measures	Evaluation of Significant and Unavoidable Impacts
TR: Cause a substantial increase in traffic in relation to the existing traffic load and capacity of the street system	3	No feasible mitigation measures are proposed.	Section 4.7.5
REC: Evaluation of the degree to which construction activities and long-term placement of new infrastructure could reduce recreation opportunities through the closure of available recreation facilities within the San Luis SRA.	3	REC-1: Expansion of San Luis Creek Use Area and boat launch	Section 4.11.5
CUL: Construction and operation of the project could result in adverse effects to historic properties, historical resources, unique archaeological resources, or tribal cultural resources or result in the disturbance of human remains.	3	CEQA and NEPA mitigation: CR-1: Complete Cultural Resource Evaluation Efforts; CR-2: Implement Avoidance or Mitigation Measures; CR-3: Implement a Detailed Inadvertent Discovery Plan. NEPA-only mitigation: an amendment to the Programmatic Agreement for the B.F. Sisk Dam SOD Modification Project will be negotiated with SHPO and executed; it will outline a process for completing evaluation efforts and resolving adverse effects to historic properties. Despite implementation of mitigation measures, operational impacts to cultural resources, or mechanical and biochemical impacts that will result from increasing the storage capacity of San Luis Reservoir and Cottonwood Bay are expected to remain significant and unavoidable.	Section 4.12.5

CEQA – California Environmental Quality Act; NEPA – National Environmental Policy Act

Impacts with the potential to result in an unavoidable cumulatively considerable contribution to a significant cumulative impact are shown in Table 6-2.

Table 6-2. Impacts of the Action Alternatives with the Potential to Result in an Unavoidable Cumulatively Considerable Incremental Contribution to a Significant Cumulative Impact

Resource Area	Impact
Water Supply	The Non-structural Alternative could cause substantial reduction in South-of-Delta CVP water supply that would be cumulatively considerable.
Air Quality	The Dam Raise Alternative could cause temporary and short-term construction-related emissions of criteria pollutants or precursors that would exceed the significance thresholds and conflict with an applicable air quality plan.

Resource Area	Impact
Water Supply	The Non-structural Alternative could cause substantial reduction in South-of-Delta CVP water supply that would be cumulatively considerable.
Noise and Vibration	The Dam Raise Alternative construction actions could cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels, even without the project. Additionally, construction activities associated with the Dam Raise Alternative could expose sensitive receptors to noise levels in excess of standards established in the local general plan or noise ordinance.
Traffic and Transportation	The Dam Raise Alternative construction traffic would cause a temporary increase in traffic levels in the project vicinity.
Recreation	The Dam Raise Alternative construction actions could cause temporary closure of recreation facilities and simultaneous closures at multiple use areas could displace visitors and cause overcrowding at other recreation sites.
Cultural Resources	Dam Raise Alternative construction action and the resulting increased inundation of land surrounding San Luis Reservoir could result in adverse effects to cultural resources.

6.4 Growth-Inducing Impacts

Direct growth-inducing impacts generally stem from the construction of new housing, businesses, or infrastructure. Indirect growth inducement could result if a project establishes substantial new permanent employment opportunities or if it would remove obstacles hindering population growth, such as the expansion or the provision of urban services and infrastructure in an undeveloped area. Under CEQA, growth inducement may not necessarily be considered detrimental, beneficial, or of insignificant consequence. Induced growth is considered a significant impact only if it directly (or indirectly) affects the ability of agencies to provide needed public services or if it can be demonstrated that the potential growth significantly affects the environment.

The action alternatives would not result in new housing construction, either directly or indirectly. The action alternatives would provide improved water supply reliability within established parameters but would not provide additional water in excess of existing CVP and SWP contracts. As discussed in Section 4.2, the action alternatives do not provide a reliable source of water that could be used to approve specific development projects by local agencies. In addition, the action alternatives would not provide new, sewer, electricity, or natural gas infrastructure or facilities and would not require or create any new public services such as schools, public services, or public roads that could support increased growth in the study area. Therefore, the action alternatives would not induce growth.

Alternative 3 would require construction workers to perform the necessary construction work. Any employment required for the alternatives would be temporary and would be needed only during a construction period of up to 8 years for Alternative 3. Construction workers would likely commute to the sites from the surrounding local communities or find temporary accommodations for the construction duration. Thus, there would be no need for new housing construction. Implementation of Alternative 3would not generate any permanent employment opportunities that would attract a substantial number of people to the region.

6.5 Relationship Between Short-Term Uses and Long-Term Productivity

The B.F. Sisk Dam SOD Modification Project evaluated under Alternative 1 involves demolition and construction activities. Alternative 3 involves construction activities only. These alternatives would require short-term uses of capital, labor, fuels, and construction materials. Alternative 2 would not include any construction activities and would not require short-term uses of capital, labor, fuels and construction materials.

Construction of the additional 10-foot crest raise at B.F. Sisk Dam and the resulting expanded capacity at San Luis Reservoir under Alternative 3 would generate long-term improvements in local water supply reliability for SLDMWA and its member agencies, the CVP, and the SWP. Alternative 2 would provide dry year water supply reliability to SLDMWA and its member agencies, the CVP, and the SWP. However, Alternative 2 would not result in an overall improvement in water supply reliability as it would result in a decrease in average annual yield for SLDMWA and its member agencies, the CVP, and the SWP.

6.6 Decision To Be Made and Uses of the B. F. Sisk Dam Raise and Reservoir Expansion Project EIR/SEIS

SLDMWA will use the B. F. Sisk Dam Raise and Reservoir Expansion Project EIR/SEIS as the environmental analysis for a decision on whether to implement the dam raise and SR 152 modifications actions analyzed in this document. Reclamation will use the subject document to decide whether to approve the dam raise action as a connected action to the B. F. Sisk Dam SOD Modification Project. Caltrans will use the subject document to decide whether to approve the SR 152 Modification action.

6.7 Areas of Controversy and Issues to be Resolved

CEQA and NEPA require disclosure of areas of controversy raised by agencies and the public and issues to be resolved. Table 6-3 summarizes comments received during the scoping period. The Public Scoping Report (Appendix Q) provides further information on issues identified by agencies and the public during the public scoping process. Issues to be resolved include final selection of the proposed action/project and final selection of mitigation measures to reduce significant impacts.

Table 6-3. Comments received during the Public Scoping Period

Areas of Controversy/Issue	Summary of Issue	Document/Section Addressing Issue
Trustee and Responsible Agencies	Project would require CWA Section 404 Dredge and Fill permit, Water Quality Certification under CWA Section 401, NPDES under CWA 402	Chapter 6. Disclosures, Coordination and Supplemental Material
Alternatives Analyzed in the EIS/EIR	Evaluate a range of alternatives that reduce environmental impact;	Chapter 2 Project Description

Areas of Controversy/Issue	Summary of Issue	Document/Section Addressing Issue
Baseline Condition	Evaluate effects using existing conditions as baseline. Verify historical date (5 years or older) are representative of current conditions	Chapter 2 Project Description Chapter 3 Affected Environment/ Environmental Setting
Water Rights and Supply	Determine if water right permits are required, document water rights uses; complete analysis of potential project impacts to CVP water users, operations, water rights and contracts, and appropriate mitigation measures	Section 4.2 Water Supply
Balance Water Supply and Biological Resource Benefits	Balance and fulfill competing obligations to protect and recover sensitive fish species and provide a more reliable water supply	Chapter 2 Project Description and Appendix A Alternatives Formulation Report
Biological Resources	Fully evaluate all potential direct, indirect, and cumulative impacts to diversion, rediversion, storage, and use of water; Evaluate all petitioned, listed species and critical habitat	Section 4.9 Aquatic Resources Section 4.10 Terrestrial Resources
Bay-Delta Watershed	Evaluate potential effects at the life-stage and population level of native Delta fish populations; Evaluate Delta conveyance and upstream reservoir operations under alternatives	Section 4.9 Aquatic Resources
Groundwater	Evaluate each alternative's effect to groundwater systems	Chapter 4 Environmental Consequences/Environmental Impacts
Air Quality	Include air quality impact analysis of emissions estimates; provide mitigation measure; provide a general conformity applicability analysis	Section 4.3 Air Quality
Tribal and Cultural Resources	Process and outcome of SHPO and THPO consultation efforts; Address Section 106 of the NHPA; Comply with AB 52 and SB 18; include mitigation measures	Section 4.12 Cultural Resources Chapter 6. Disclosures, Coordination and Supplemental Material
Environmental Justice	Include evaluation of environmental justice populations	Chapter 6 Disclosures, Coordination and Supplemental Material
Recreation	Evaluate temporarily or permanently impact to public access and use of wildlife and recreation areas	Section 4.11 Recreation
Cumulative Effects	Evaluate the reasonably foreseeable future major diversion and storage projects	Chapter 5 Cumulative Effects

6.8 Agency Coordination

The development of the B.F. Sisk Dam Raise and Reservoir Expansion EIR/SEIS and implementation of the proposed action/project have required and will require coordination with a variety of federal, state, and local agencies. The following sections describe these agencies and their roles in the process.

6.8.1 United States Fish and Wildlife Service

Reclamation will consult with USFWS to ensure its actions do not jeopardize the continued existence of any species listed pursuant to the ESA. Reclamation will also coordinate with USFWS in their preparation of a Fish and Wildlife Coordination Act Report.

6.8.2 United States Army Corps of Engineers

The Dam Raise Alternative has the potential to impact wetlands. Therefore, Reclamation and SLDMWA will coordinate with the USACE Regulatory Division regarding development of any CWA Section 404 permit.

6.8.3 United States Environmental Protection Agency

EPA will receive a copy of the draft EIR/SEIS for review.

6.8.4 California Department of Parks and Recreation

CDPR manages the lands surrounding San Luis Reservoir. The NOI/NOP was sent to CDPR and CDPR will receive a copy of this draft EIR/SEIS for its review. Reclamation and SLDMWA will coordinate with CDPR regarding potential impacts to recreation and land management from the B.F. Sisk Dam Raise and Reservoir Expansion Project.

6.8.5 State Historic Preservation Officer

Implementation of the alternative selected for the B.F. Sisk Dam Raise and Reservoir Expansion Project will require compliance with 54 U.S.C. Section 306108, commonly known as NHPA Section 106. To complete the NHPA Section 106 process, as outlined in 36 CFR Part 800, Reclamation is required to consult with the SHPO and afford the Advisory Council on Historic Preservation the opportunity to comment regarding the effects of the proposed undertaking on historic properties. Historic properties are cultural resources that are listed or eligible for listing in the NRHP. Reclamation must fully comply with NHPA Section 106 as outlined at 36 CFR Part 800.

6.8.6 Central Valley Regional Water Quality Control Board

The Dam Raise Alternative could require several permits from RWQCB, including a dewatering permit and coverage under a NPDES permit for General Construction. Reclamation and SLDMWA will consult with RWQCB to determine permitting requirements. The construction contractor will obtain these permits prior to construction. RWQCB will receive a copy of the draft EIR/SEIS for review.

6.8.7 State Water Resources Control Board

Reclamation and SLDMWA will coordinate with SWRCB to ensure the project is covered under existing water right permits. The SWRCB will receive a copy of the draft EIR/SEIS for review.

6.8.8 San Joaquin Air Pollution Control District

The Dam Raise Alternative has the potential to impact air quality in Merced County. Reclamation and SLDMWA will coordinate with the SJVAPCD regarding air quality impacts in Merced County. If necessary, Reclamation will prepare a General Conformity Determination. SJVAPCD will receive a copy of the draft EIR/SEIS for review.

6.8.9 California Department of Fish and Wildlife

The B.F. Sisk Dam Raise and Reservoir Expansion EIR/SEIS has the potential to affect species covered under the California Endangered Species Act. SLDMWA will consult with CDFW to ensure compliance with the California Endangered Species Act. CDFW will receive a copy of the draft EIR/SEIS for review.

6.8.10 California Department of Water Resources

The Dam Raise Alternative would change operations at San Luis Reservoir. DWR operates San Luis Reservoir in coordination with Reclamation. DWR will receive a copy of the draft EIR/SEIS for review. Reclamation will coordinate with DWR on potential changes to San Luis Reservoir operations.

6.8.11 California Department of Transportation

Implementation of the Dam Raise Alternative would include modifications to a section of SR 152, SR 33, and intersections with Basalt Road and Romero Visitor Center that crosses over Cottonwood Creek within Caltrans' right-of-way. Reclamation and SLDMWA have started coordination with Caltrans, a Responsible Agency for the EIR and a Cooperating Agency for the SEIS. Caltrans will receive a copy of the draft EIR/SEIS for review.

6.8.12 Native American Heritage Commission

The Native American Heritage Commission conducted a search of the Sacred Lands Inventory as it encompasses the APE for Alternatives 1 and 3. SLDMWA is pursuing formal consultation with Native American tribes consistent with Assembly Bill 52 (Chapter 532, Statutes of 2014), and Reclamation will conduct tribal consultation under NHPA Section 106 as part of the project.

6.8.13 Local Governments

The B.F. Sisk Dam Raise and Reservoir Expansion Project EIR/SEIS has the potential to impact facilities within Merced County. Merced County will receive a copy of the draft EIR/SEIS for review. SLDMWA will coordinate with Merced County.

6.9 Distribution List

Copies of the draft EIR/SEIS will be sent to the agencies and organizations listed in Table 6.4:

Table 6.4. Distribution List

Federal Agencies	
National Marine Fisheries Service	U.S. Department of the Interior, Office of the Solicitor
U.S. Army Corps of Engineers	U.S. Department of Justice
Bureau of Indian Affairs	U.S. Environmental Protection Agency
Bureau of Land Management	U.S. Fish and Wildlife Service
State Agencies	
California Bay-Delta Authority	California High Speed Rail Authority
California Department of Fish and Wildlife	California Office of Historic Preservation
California Department of Parks and Recreation	California Regional Water Quality Control Board (Region 5)
California Department of Transportation	California State Water Resources Control Board

California Department of Water Resources	Native American Heritage Commission
California Environmental Protection Agency	Department of Forestry and Fire Protection
Regional and Local Agencies	
Alameda County	Orange County
Bay Area Air Quality Management District	Pacific Gas & Electric
City of Gilroy	San Benito County
City of Gustine	San Bernardino County
City of Los Banos	San Diego County
City of San Jose	San Joaquin County
Contra Costa County	San Joaquin Valley Air Pollution Control District
East Bay Municipal Utility District	San Luis Obispo County
Fresno County	Santa Barbara County
Kern County	Santa Clara County
Kings County	Santa Clara Valley Water District
Los Angeles County	Stanislaus County
Madera County	Tulare County
Merced County	Ventura County
Amah Mutsun Tribal Band	North Valley Yokuts Tribe
Dumna Wo-Wah Tribal Government	Southern Sierra Miwuk Nation


SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
BUREAU OF
RECLAMATION