BUREAU OF RECLAMATION

Record of Decision

B.F. Sisk Dam Raise and Reservoir Expansion Project

U.S. Department of the Interior
Bureau of Reclamation
California - Great Basin

October 2023

Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

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.

Record of Decision

B.F. Sisk Dam Raise and Reservoir Expansion Project

Recommended by:

Date: Oct 20, 2023

Ernest A. Conant
Regional Director
Bureau of Reclamation
Interior Region 10 · California-Great Basin

Approved by:

Date: Oct 20, 2023

Michael Brain
Principal Deputy Assistant Secretary for Water and Science
U.S. Department of the Interior

This page intentionally left blank

Introduction

The United States Department of the Interior, Bureau of Reclamation (Reclamation), as the federal lead agency under the National Environmental Policy Act (NEPA), and the San Luis and Delta-Mendota Water Authority (SLDMWA), as the state lead agency under the California Environmental Quality Act (CEQA), prepared the B.F. Sisk Dam Raise and Reservoir Expansion Project (Project) Environmental Impact Report (EIR)/Supplemental Environmental Impact Statement (SEIS) to assess the impacts of the proposed Project. The Project proposes to raise the B.F. Sisk Dam and expand the reservoir to increase long-term reliability and quantity of water to South-of-Delta contractors who depend on the San Luis Reservoir and to increase the certainty of access to water supplies stored by the South-of-Delta contractors in the San Luis Reservoir in subsequent water years.

Background

B.F. Sisk Dam was constructed to create the offstream San Luis Reservoir, which provides supplemental storage capacity for the Central Valley Project (CVP) and State Water Project (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. 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 the California Aqueduct for use by water contractors (Reclamation and DWR 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 pumped and diverted from the west side of San Luis Reservoir at the Pacheco Pumping Plant to supply water to two CVP contractors (Reclamation and DWR 2019). In addition to storing and supplying water, San Luis Reservoir provides recreation opportunities.

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 Safety of Dams (SOD) Modification Project Final 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

[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

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 (ROD) 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.), as amended by P.L. 114-113, includes authority for Reclamation to develop additional project benefits in conjunction with Safety of Dams projects. 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.

As a connected action to the B.F. Sisk Dam SOD Modification Project, Reclamation and SLDMWA propose an increase in storage capacity of San Luis Reservoir. SLDMWA, in coordination with Reclamation, conducted a Feasibility Study to verify that the Project 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 the Interior's finding of feasibility, has federal benefits pursuant to the Water Infrastructure Improvements for the Nation (WIIN) Act (P.L. 114-322) §4007, and can be accomplished without negatively impacting the B.F. Sisk Dam SOD Modification Project.

Purpose and Need

Reclamation's federal discretionary actions associated with the B.F. Sisk Dam Raise and Reservoir Expansion Project include implementation of the project and providing project funding in the form of a cost-share pursuant to the WIIN Act and in accordance with the SOD Act. In compliance with NEPA, Reclamation evaluated the potential effects of the range of alternatives identified in the Feasibility Study to meet the project purpose of increasing water storage supply and improving water supply reliability in San Luis Reservoir.

Alternatives Considered

The Final EIR/SEIS evaluates three project alternatives: the No Action Alternative, the Non-Structural Alternative, and Dam Raise Alternative.

No Action Alternative

The No Action Alternative reflects the implementation of the Crest Raise Alternative as described in the B.F. Sisk Dam SOD Modification Project ROD. The Crest Raise Alternative 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).

Action Alternatives

Two action alternatives were analyzed in the Final EIR/SEIS to implement the Proposed Action: the Non-Structural Alternative and the Dam Raise Alternative.

Non-Structural Alternative

The Non-Structural Alternative would consist of operational measures that would contribute to the project purpose and need. This alternative would include a change in the current approach for annual CVP water supply allocations. Under this 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 years.[2] This water would be reserved in San Luis Reservoir for allocation to South-of-Delta CVP contractors in subsequent drier years. In these drier years, the 310 TAF in reserved supply would be allocated to South-of-Delta CVP contractors, consistent with the CVP's current allocation of water supply stored in San Luis Reservoir, but only if supply is sufficient to meet the demands of senior water rights contractors. 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 this new operational configuration, allocated water supply not used by CVP contractors could not be carried over for use in a subsequent year. Although the Non-Structural Alternative would not completely meet the purpose and need of the Proposed Action, it was analyzed in the B.F. Sisk Dam Raise and Reservoir Expansion EIR/SEIS in accordance with the *Directive and Standard – Developing Additional Project Benefits in Conjunction with a Safety of Dams Modification Project* (Reclamation 2016) which requires the evaluation of "a non-structural alternative that meets the needs and objectives of the additional benefits of the additional benefits project".

Dam Raise Alternative

The Dam Raise Alternative would be completed by placing 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 and 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 the expanded storage capacity. In addition to construction of the dam raise, all subalternatives under the Dam Raise Alternative would also include modifications to the following facilities:

B.F. Sisk Dam Embankment and Reservoir Facilities. All Dam Raise subalternatives would include installation of downstream stability berms and crack filters and 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. The existing approximate 500-foot-wide dike east of the Pacheco Pumping Plant would be replaced with a new dike 20-feet taller than the existing structure. With increased reservoir

[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.

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 would require modifications to a section of SR 152 where it crosses over Cottonwood Bay. Under all Dam Raise subalternatives, the maximum water level would increase 10 feet. The SR 152 embankment between milepost MER R5.239 and MER R5.806 would be modified to allow adequate freeboard to protect SR 152 against wave action.

Operational Subalternatives

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.

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,[3] and non-Project water.[4] 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 annual rescheduling guidelines in place at the time the Final EIR/SEIS was prepared, 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 municipal and industrial (M&I) South-of-Delta CVP water contractors.

Storage priority would 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 share of the overall reservoir storage. The additional storage would follow current operating criteria and the storage priority will follow the rescheduling guidelines in place at the time of operation.

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

---

[3] Current practice. 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).

[4] 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).

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 risk of "spill" (converted to CVP supplies for following year's allocation). 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.

Preferred Alternative

Reclamation's preferred alternative is the Dam Raise Alternative with an operational configuration that is a hybrid of the CVP Only Storage and Investor Directed Storage subalternatives evaluated in the 2020 EIR/SEIS (see **Decision**). Implementation of this preferred alternative would increase water storage supplies in San Luis Reservoir to provide an additional benefit in conjunction with the current B.F. Sisk Dam SOD Modification Project, is consistent with the requirements of the SOD Act, is consistent with Reclamation Law, is supported by a Secretary of the Interior's finding of feasibility, provides federal benefits pursuant to the WIIN Act by increasing water storage supply and improving water supply reliability in San Luis Reservoir, and can be accomplished without negatively impacting the B.F. Sisk Dam SOD Modification Project. In addition, it is the locally preferred alternative.

The preferred alternative's operational configuration does not propose physical changes in design or planned construction of the Dam Raise Alternative different from what was evaluated in the 2020

EIR/SEIS and only differs from the configurations evaluated in the 2020 EIR/SEIS in its assignment of the expanded storage capacity between the CVP and the non-federal investors. However, because the preferred alternative's operational configuration was not specifically evaluated in the 2020 EIR/SEIS, an analysis was completed to determine whether the potential environmental effects of the preferred alternative's operational configuration would be within the range of the environmental effects identified in the 2020 EIR/SEIS. The potential environmental effects of the preferred alternative's operational configuration were determined to be within the range of effects identified in the 2020 EIR/SEIS. For a full assessment of potential effects, refer to Attachment A.

Environmentally Preferable Alternative

Section 1505.2(b)[5] of the Council on Environmental Quality (CEQ) Regulations requires the NEPA lead agency to identify the environmentally preferable alternative in a ROD. CEQ provides guidance in its 40 Most Asked Questions, answer to question 6a, stating that "the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." Although CEQ regulations require the identification of the environmentally preferred alternative, they do not require that this alternative is adopted.

The No Action Alternative reflects the implementation of the Crest Raise Alternative as described in the B.F. Sisk Dam SOD Modification Project ROD. The No Action Alternative would not result in any additional impacts to the environment beyond what is described in the B.F. Sisk Dam SOD Modification Project ROD and therefore is identified as the environmentally preferable alternative. By contrast, the Non-Structural Alternative would result in additional impacts to South-of-Delta CVP water supply, and the Dam Raise Alternative would result in additional impacts to air quality, noise, recreation, traffic and transportation, and cultural resources.

Decision

The decision is to implement the Dam Raise Alternative as described in Chapter 2.4.3 of the Final EIR/SEIS, with an operational configuration that is a hybrid of the CVP Only Storage and Investor Directed Storage subalternatives evaluated in the 2020 EIR/SEIS as outlined above and further described below.

The operational configuration would split the 130 TAF of new storage capacity as a 30%/70% split between federal storage managed by Reclamation for the CVP (subsequently described as the "CVP portion"; 30%) and additional storage managed by Reclamation in a manner that recognizes the

[5] The environmental impact statement for which this Record of Decision is issued was begun before September 14, 2020. Therefore, all references to CEQ regulations are those regulations at 40 CFR parts 1500-1508 as of July 2005.

non-federal investors' investment in that storage (subsequently described as the "Investor portion"; 70%).

The 39 TAF of new CVP storage managed by Reclamation would be operated consistent with current CVP operations. Similar to the CVP-only subalternative evaluated in the 2020 EIR/SEIS, the new CVP storage would be used to store CVP Project water, carried-over water, non-Project water and Incremental Level 4 refuge water supplies. It is anticipated that the Reclamation-controlled CVP storage of agricultural and M&I water supplies would be allocated based on historic contract allocations and historic rescheduling quantities.

The 91 TAF in new storage managed by Reclamation in a manner that recognizes the non-federal investors' investment in that storage could be used to store additional water supply available for diversion under a CVP water right, previously allocated CVP project water, carried-over water, and non-Project water. This 91 TAF in expanded storage managed by Reclamation in a manner that recognizes the non-federal investors may be used by investors to store carried-over water at a higher priority level than supplies carried over in the portion of San Luis Reservoir managed by Reclamation, subject to contractual agreements. This operation configuration would allocate the 91 TAF of storage managed by Reclamation in a manner that recognizes the non-federal investors' investment among the SLDMWA investor group to agriculture and M&I water contractors. Reclamation's operation and use of the new storage capacity for non-federal investors will neither negatively impact existing CVP Contractors or Reclamation's ability to meet existing legal obligations and operations will be coordinated with DWR consistent with the rights and obligations of and between Reclamation and DWR agreed to in other independent agreements.

Basis for Decision

The Dam Raise Alternative with a hybrid operational configuration of the CVP Only Storage and Investor Directed Storage subalternatives evaluated in the 2020 EIR/SEIS have been selected because it best meets the project purpose and need. The Dam Raise Alternative would raise the B.F. Sisk Dam embankment by 10-feet and would increase reservoir storage capacity by 130 TAF. This decision was made based on the information and analysis in the Final EIR/SEIS, and on the results of consultation and coordination with public agencies, tribes, special interest groups, and individuals. No Indian Trust Assets were identified in the project area and there would be no impacts to Indian Trust Assets. The decision to implement the Dam Raise Alternative is based on meeting the Proposed Action's purpose, potential environmental impacts, and implementation of environmental commitments[6] to reduce environmental effects. The Dam Raise Alternative is the only alternative that fulfills the purpose and need of the Proposed Action. Although it would result in significant and unavoidable impacts to air quality, noise and vibration, traffic and transportation, recreation, and cultural resources, the benefits provided to water storage supply outweigh these adverse effects.

[6] Attachment B presents a summary of the environmental commitments identified in the Final EIR/SEIS.

Through execution of this Record of Decision, the decision maker certifies that the agency has considered all alternatives, information, analyses, and objections submitted by State, tribal, and local governments and public commenters for consideration in developing the Final EIR/SEIS.

Public Involvement

Public involvement was considered throughout the planning, alternatives development, and decision-making process. The scoping process began with the publication of the Notice of Intent to prepare a SEIS in the Federal Register on May 14, 2020. A total of 25 scoping comments were provided through email, voicemail, and written comments, and used in the development of a reasonable range of alternatives and identification of key issues for analysis.

The Notice of Availability for the Draft EIR/SEIS was published in the Federal Register on August 14, 2020. The Draft EIR/SEIS identified three alternatives: the No Project/No Action Alternative, the Non-Structural Alternative, and Dam Raise Alternative, as described above. A public meeting was scheduled for August 25, 2020. The public meeting was rescheduled and held on September 3, 2020 virtually via Microsoft Teams due to the coronavirus pandemic and the associated precautions and procedures being followed throughout California. The public comment period concluded September 28, 2020. Written comments were received from eight federal, state, and local agencies and four individual members of the public. Responses to substantive comments were provided in the Final EIR/SEIS and the document was revised accordingly.

Endangered Species Act

While the B.F. Sisk Dam Raise and Expansion Project is distinct from the B.F. Sisk Dam SOD Modification Project, they are connected actions. As such, the consultation for the construction of the B.F. Sisk Dam Raise and Expansion Project built upon the consultation completed for the construction of the B.F. Sisk Dam SOD Modification Project and captured the additional construction, conservation measures, and effects of the preferred alternative. In a memo dated April 2, 2021, Reclamation initiated formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7(a)(2) of the Endangered Species Act (16 USC § 1536) for the construction of the B.F. Sisk Dam Raise and Expansion Project. Reclamation determined that constructing the project may affect, and is likely to adversely affect, the San Joaquin kit fox (*Vulpes macrotis mutica*), the California tiger salamander (*Ambystoma californiense*), the California red-legged frog (*Rana draytonii*) and designated critical habitat for the California red-legged frog. A Biological Opinion was issued on December 5, 2022 for construction of the Dam Raise and Expansion Project. (USFWS Biological Opinion 2023-0012686). The operation of San Luis Reservoir is integrated with the operation of the CVP and SWP and included in the 2019 Biological Opinions (Biological Opinion on Long-Term Operation (LTO) of the CVP and SWP [National Marine Fisheries Service (NMFS) 2019] and the Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the CVP and the SWP [USFWS 2019]). On September 30, 2021, Reclamation requested reinitiation of

consultation on the 2019 Biological Opinions. Operation of San Luis Reservoir is fully integrated and coordinated with the LTO of the CVP and SWP. Then on February 28, 2022, Reclamation published a notice of intent to prepare an Environmental Impact Statement for analyzing potential modifications to the LTO of the CVP and SWP in the Federal Register. Because Reclamation is in consultation on the LTO of the CVP, including the San Luis Reservoir, Reclamation committed to consult on the Project's operational effects on federally listed fish species and their designated critical habitat resulting from water diversion from the Delta in the reinitiated consultation on the 2019 Biological Opinions prior to increasing the water surface elevation to the Project's expanded reservoir pool elevation. The Project's 2022 Biological Opinion for construction includes this commitment.

National Historic Preservation Act

Reclamation is responsible for complying with 54 U.S.C. § 306108, commonly known as Section 106 of the National Historic Preservation Act. Reclamation, in coordination with SLDMWA, determined that implementation of the Project may adversely affect historic properties, but those impacts could not be fully determined prior to implementation of the undertaking, pursuant to 36 CFR § 800.14(b)(1)(ii). An existing Programmatic Agreement (PA) with the State Historic Preservation Officer (SHPO) for the B.F Sisk Safety of Dams Modification Project was executed on September 12, 2019. Reclamation coordinated with the SHPO to amend the PA to include the Dam Raise Project, which was executed in May 2023. Reclamation will continue its assessment of the potential adverse effect on historic properties and resolve any such effect through implementation of the Amended PA with the SHPO.

Clean Air Act

In accordance with requirements of Section 176(c) of the Clean Air Act (CAA) (40 U.S.C. 7506(c)), Reclamation completed a General Conformity Determination (GCD) to ensure that the Project conforms with the CAA. Reclamation conducted an evaluation following all regulatory criteria and procedures and in coordination with the U.S. Environmental Protection Agency, California Air Resources Board, and San Joaquin Valley Air Pollution Control District (SJVAPCD). Reclamation determined that the Project, as designed, will conform to the approved state implementation plan (SIP). By entering a Voluntary Emissions Reduction Agreement (VERA) with the District, Reclamation will provide mitigation for the Project by purchasing mitigation to offset up to 401.11 tons and 73.86 tons of the project's nitrogen oxides (NOx) and volatile organic compound (VOC) construction emissions, respectively. The SJVAPCD will administer grants on behalf of Reclamation, quantify and enforce the emission reductions, and certify that project emissions have been mitigated.

Reclamation published a Draft GCD for comment on March 10, 2023. The public comment period closed on April 8, 2023. Written comments were received from the U.S. Environmental Protection Agency and the San Joaquin Valley Air Pollution Control District. The Draft GCD was revised

accordingly, and responses to substantive comments were provided in the Final GCD published on May 19, 2023.

Environmental Commitments

Reclamation and the SLDMWA have adopted all practicable means to avoid, minimize, and compensate for potential adverse environmental effects caused by the Project and are committed to implementing the measures identified in the Final EIR/SEIS as well as those identified through consultation with resource agencies and tribes. Relevant environmental commitments associated with the B.F. Sisk Dam SOD Modification Project were carried forward for implementation under the Dam Raise Alternative, including measures related to air quality, greenhouse gases, hazards and hazardous materials, terrestrial resources, and water quality. Additional measures, specific to the B.F. Sisk Dam Raise and Expansion Project, were identified for the following: air quality, visual resources, noise, traffic, hazards and hazardous materials, terrestrial resources, recreation, and cultural resources. Attachment B to this ROD includes a detailed description of the mitigation measures, the responsible agency, and the time and method of verification.

Comments Received on the Final Supplemental EIS

A Notice of Availability of the Final EIR/SEIS was published in the Federal Register by the U.S. Environmental Protection Agency on December 18, 2020. The Final EIR/SEIS was posted on Reclamation's website and a press release was issued by Reclamation. Notices of availability of the Final EIR/SEIS were sent to interested parties. Electronic copies of the Final EIR/SEIS on compact discs were distributed to cooperating agencies, stakeholders, and parties that submitted verbal and written comments on the Draft EIR/SEIS.

A comment letter was received on the Final EIR/SEIS from California State Parks. A meeting was held to discuss the concerns which focused on impacts to park facilities, including park area closures as well as facility improvements and modifications needed as a result of the increased reservoir elevation. A response to the comment letter was shared with State Parks in February 2021.

References

2019. *B.F. Sisk Safety of Dams Modification Project Record of Decision*. November 2019. Available at: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=41521

Reclamation. 2006. B.F. Sisk Dam Seismic Deformation Analysis and Seismic Risk Analysis.

---.2016. Reclamation Manual Directives and Standards- Developing Additional Project Benefits in Conjunction with a Safety of Dams Modification Project. August 18, 2016. Available at: https://www.usbr.gov/recman/temporary_releases/factrmr-95.pdf

B.F. Sisk Dam Raise and Reservoir Expansion Project

Attachment A
Environmental Evaluation

This page left blank intentionally.

Attachment A Environmental Evaluation

A.1 Purpose

In December 2020, the Bureau of Reclamation (Reclamation) and San Luis & Delta-Mendota Water Authority (SLDMWA) finalized the B.F. Sisk Dam Raise and Reservoir Expansion Project (Project) Environmental Impact Report/ Supplemental Environmental Impact Statement (EIR/SEIS). The EIR/SEIS identified the Dam Raise Alternative as the proposed project/preferred alternative. The EIR/SEIS presented potential environmental impacts for a range of operational configurations of the Dam Raise Alternative that were further configured as "bookends" to cover the high- and low-end of potential environmental effects. The Dam Raise Alternative included six operational configurations: CVP Only Storage, CVP/SWP Split Storage and four Investor Directed Storage configurations. Since the completion of the EIR/SEIS, SLDMWA's member agencies and Reclamation have coordinated on the selection of an operational configuration for the expanded reservoir. The preferred operational configuration selected by SLDMWA's member agencies and Reclamation was not specifically evaluated in the EIR/SEIS. This preferred operational configuration is a hybrid of the CVP Only Storage and the Investor Directed Storage subalternatives evaluated in the EIR/SEIS.

This memorandum presents an evaluation of the potential environmental impacts generated by this preferred operational configuration to support a comparison between these impacts and the impacts identified for the multiple operational configurations evaluated in the 2020 EIR/SEIS. As discussed in detail below, potential environmental impacts identified for the preferred operational configuration fall within the bookends previously evaluated under the Dam Raise Alternative in the EIR/SEIS.

Pursuant to CEQA Guidelines (Section 15088.5) and NEPA regulations (40 Code of Federal Regulations 1502.9[c]),[1] the selection of the operational configuration does not require recirculation or supplement of the Final EIR/SEIS. CEQA Guidelines Section 15088.5(a) states that a lead agency is required to recirculate an EIR when significant new information is added to the EIR. Significant new information requiring recirculation includes:

> "(1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
>
> (2) A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.

[1] The Notice of Intent (NOI) for which the Final Supplemental Environmental Impact Statement is issued was published before September 14, 2020. Therefore, all references to CEQ regulations are to those regulations at 40 CFR parts 1500-1508 in existence as of the date the NOI was published in the Federal Register on May 14, 2020.

(3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt it.

(4) The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded. (*Mountain Lion Coalition v. Fish and Game Com.* (1989) 214 Cal.App.3d 1043)."

CEQA Guideline Section 15088.5(b) goes on to explain that "recirculation is not required where the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR."

NEPA regulations (40 Code of Federal Regulations 1502.9[c]) state that agencies shall prepare supplements to either draft or final EIS if:

"(i) The agency makes substantial changes to the proposed action that are relevant to environmental concerns; or

(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."

The selection of an operational configuration does not constitute "significant new information," given the similarity between the preferred operational configuration and the configurations evaluated in the 2020 EIR/SEIS. The preferred operational configuration does not propose physical changes in design or planned construction of the Dam Rise Alternative from what was evaluated in the EIR/SEIS. The preferred operational configuration does not include recipients of the additional water supply generated by the expanded reservoir that were not identified in the EIR/SEIS. The preferred operational configuration only differs from the configurations evaluated in the EIR/SEIS, in its assignment of the expanded storage capacity between the CVP and the non-federal investors. The analysis presented in this memorandum further indicates that the preferred operational configuration would not generate a substantial increase in the severity of an environmental impact or in new significant impacts.

A.2 Environmental Analysis

This section presents the potential environmental impacts under the preferred operational configuration of the Dam Raise Alternative in comparison to the impacts evaluated in the 2020 EIR/SEIS.

A.2.1 Construction-Related Impacts

Under the preferred operational configuration, no changes would be made to the design or planned construction approach for the Dam Raise Alternative, including construction practices, footprint, schedule, duration, equipment list, and number of workers. Therefore, construction-related impacts under the preferred operational configuration would not change from the impacts identified for the Dam Raise Alternative in the EIR/SEIS. Given this consistency between the Dam Raise Alternative evaluated in the EIR/SEIS and in this memorandum, anticipated effects on the following resources would not change from the effects identified in the EIR/SEIS and they are not discussed in further

detail: air quality, greenhouse gases, visual resources, noise and vibration, traffic, hazards and hazardous materials, geology, public utilities and services, and power.

A.2.2 Operational Impacts

The preferred operational configuration would be operated as a 30%/70% split between Reclamation-owned CVP storage (30 percent) and storage managed by Reclamation in a manner that recognizes the non-federal investors' investment in that storage (70 percent). Given the potential changes in storage and drawdown patterns under this preferred operational configuration from what was evaluated in the EIR/SEIS, shifts in operational effects would be generated for water quality, surface water supply, aquatic resources, terrestrial resources, recreation, and cultural resources.

The operational impacts discussed below are based on the California Simulation Model II (CalSim II), which was used to estimate both existing (short term) and future (long term) changes in reservoir storage and stream flow. The CalSim II model's monthly simulation of an actual daily (or even hourly) operation of CVP and SWP results in several limitations in the 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 percent due to model assumptions and approaches. Therefore, if quantitative changes between an operational configuration and the No Action Alternative are 5 percent or less, conditions under the specific alternative would be considered "similar" to conditions under the No Action Alternative.

Under extreme hydrologic and operational conditions where there is not enough water supply to meet all requirements, CalSim II utilizes a series of operating rules to reach a solution to allow for continuation of the simulation. It is recognized that these operating rules are a simplified version of complex decision processes that CVP and SWP operators would use in actual extreme conditions. Therefore, model results and potential changes under these extreme conditions should be evaluated on a comparative basis between configurations and approximate extreme operational conditions.

A.2.2.1 Water Quality

The water quality impacts evaluated in the EIR/SEIS were considered to 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.

To determine impacts to water quality, the EIR/SEIS evaluated changes to the following parameters: salinity (X2), Delta outflow, South-of-Delta exports, reservoir storage, and reservoir elevation. This environmental analysis for water quality evaluated these same parameters.

Salinity (X2) All subalternatives analyzed in the EIR/SEIS experienced negligible changes to Delta water quality, on average, resulting from changes in Delta outflows compared to the No

Action Alternative. As shown in Tables 6 through 11 in Appendix D of the EIR/SEIS, the total average annual difference in Delta X2 for all water year types would be zero for all subalternatives analyzed in the EIR/SEIS. Average annual changes to X2 would be less than 100 meters under all subalternatives analyzed in the EIR/SEIS.

Table 1 below presents X2 results that model potential changes in salinity under the preferred operational configuration of the Dam Raise Alternative in comparison to the No Action Alternative. Positive values indicate movement of the salinity zone further east and potentially higher salinity concentrations in the Delta while negative values indicate the zones movement further west and lower salinity concentration in the Delta. As shown in Table 1, the total average annual difference in Delta X2 for all water year types would remain zero, which is the same as presented in the EIR/SEIS. **Therefore, impacts associated with Delta salinity presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Table 1. Modeled Difference in Delta X2 between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (km change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
AN	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
BN	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1
D	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Delta Outflow Similar to the X2 analysis above, Delta outflows were also analyzed in the EIR/SEIS to determine potential changes in salinity concentrations. As shown in Tables 24 through 29 in Appendix D of the EIR/SEIS, modeled changes in average annual Delta outflow across all water year types for all subalternatives ranged from 669 cfs to -238 cfs. These modeled changes in Delta outflow would be a less than 1 percent change and are not expected to have a measurable impact on water quality conditions in the Delta.

Table 2 and Table 3 present the change in Delta outflow under the preferred alternative's operational configuration. Similar to the subalternatives evaluated in the EIR/SEIS, the operation of the preferred configuration under the Dam Raise Alternative would on average, generate a less than 1 percent annual change in Delta outflow compared to the No Action Alternative. **Therefore, impacts associated with Delta outflow presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Table 2. Modeled Difference in Delta Outflow between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (cubic feet per second)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-13	72	37	-120	-99	-341	-451	-218	0	40	0	123	-970
AN	99	0	0	-75	-226	-154	-198	-128	0	0	0	0	-681
BN	0	0	-71	33	-173	-123	-151	-21	0	0	0	0	-506
D	0	0	0	0	-67	-71	-96	-46	0	0	0	0	-281
C	0	0	0	-96	0	-78	0	-80	0	0	0	0	-254
All	11	23	2	-60	-107	-178	-218	-115	0	13	0	39	-589

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 3. Modeled Difference in Delta Outflow between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-0.2%	0.5%	0.1%	-0.1%	-0.1%	-0.4%	-0.9%	-0.6%	0.0%	0.4%	0.0%	1.1%	-0.2%
AN	1.6%	0.0%	0.0%	-0.1%	-0.3%	-0.3%	-0.7%	-0.8%	0.0%	0.0%	0.0%	0.0%	-0.2%
BN	0.0%	0.0%	-0.7%	0.2%	-0.5%	-0.6%	-1.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	-0.3%
D	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.3%	-0.6%	-0.5%	0.0%	0.0%	0.0%	0.0%	-0.2%
C	0.0%	0.0%	0.0%	-0.8%	0.0%	-0.7%	0.0%	-1.3%	0.0%	0.0%	0.0%	0.0%	-0.3%
All	0.2%	0.3%	0.0%	-0.1%	-0.2%	-0.4%	-0.8%	-0.6%	0.0%	0.2%	0.0%	0.6%	-0.2%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

South-of-Delta Exports South-of-Delta exports were analyzed in the EIR/SEIS to determine water quality impacts to central and southern Delta and South-of-Delta CVP and SWP water supplies. Greater exports during winter and spring, particularly during storm events, could draw turbidity and TDS from the Sacramento and San Joaquin Rivers into the central and southern Delta. Greater exports during the summer and spring, lower Delta inflow months, could draw salinity further into the central and southern Delta. As shown in Tables 14 through 21 in Appendix D of the EIR/SEIS, the total average annual difference in South-of-Delta exports under all water year types ranged from 14 TAF to 39 TAF. All subalternatives under the Dam Raise Alternative (Alternative 3)[2] would experience a less than 1 percent change on average in South-of-Delta exports and are not expected to have a measurable impact on water quality conditions.

Tables 4 and 5 presents change in South-of-Delta exports under the preferred operational configuration of the Dam Raise Alternative. As shown in Table 4, the total average annual difference in South-of-Delta exports under all water year types would be 35 TAF, which is within the range presented in the EIR/SEIS. This change in South-of-Delta exports would be a less than 1 percent change on average compared to the No Action conditions and is not expected to have a measurable impact on water quality conditions in the Delta. **Therefore, impacts associated with South-of-Delta export presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Table 4. Modeled Difference in Total South-of-Delta Exports between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (1,000 AF)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	1	-2	2	0	5	16	23	13	0	0	0	0	59
AN	0	0	0	5	7	9	12	8	0	0	0	0	40
BN	0	0	4	-2	10	8	9	1	0	0	0	0	30
D	0	0	0	0	4	4	6	3	0	0	0	0	17
C	0	0	0	6	0	5	0	5	0	0	0	0	16
All	0	-1	1	1	5	9	12	7	0	0	0	0	35

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Your document is ready for your review. Type – Sacramento River Water Year Type; W – Wet

[2] The EIR/SEIS evaluated two action alternatives: the Non-Structural Alternative (Alternative 2) and the Dam Raise Alternative (Alternative 3). Three subalternatives that evaluate different operational configurations were analyzed under Alternative 3. Full descriptions of these alternatives and subalternatives are presented in the EIR/SEIS.

Table 5. Modeled Difference in Total South-of-Delta Exports between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	0.3%	-0.3%	0.3%	0.0%	0.9%	3.0%	4.7%	2.8%	0.0%	0.0%	0.0%	0.0%	1.0%
AN	0.0%	0.0%	0.0%	1.0%	1.5%	2.4%	2.9%	2.2%	0.0%	0.0%	0.0%	0.0%	0.8%
BN	0.0%	0.0%	0.8%	-0.5%	2.4%	2.3%	2.9%	0.5%	0.0%	0.0%	0.0%	0.0%	0.6%
D	0.0%	0.0%	0.0%	0.0%	1.0%	1.3%	2.2%	1.1%	0.0%	0.0%	0.0%	0.0%	0.4%
C	0.0%	0.0%	0.0%	1.7%	0.0%	1.9%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	0.6%
All	0.1%	-0.1%	0.2%	0.3%	1.1%	2.4%	3.4%	2.2%	0.0%	0.0%	0.0%	0.0%	0.7%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Your document is ready for your review. Type – Sacramento River Water Year Type; W – Wet

Reservoir Storage Reservoir storage levels in San Luis Reservoir under all subalternatives would increase. As shown in Tables 32 through 39 in Appendix D of the EIR/SEIS, the total average annual difference in reservoir storage under all water year types ranged from 271 TAF to 694 TAF, with a less than 6 percent change throughout the year. Higher reservoir storage levels would not change the water quality or temperature. As noted in the EIR/SEIS, no impacts to water quality related to reservoir storage are anticipated.

Tables 6 and 7 summarize the change in total San Luis Reservoir storage under the preferred operational configuration of the Dam Raise Alternative. Similar to the subalternatives evaluated in the EIR/SEIS, operation of the preferred alternative's operational configuration would lead to monthly average increases in storage of less than 6 percent throughout the year compared to the No Action Alternative. Higher reservoir storage as a result of the preferred operational configuration would result in no impacts to water quality or temperature. **Therefore, impacts associated with reservoir storage presented in the EIR/SEIS would remain unchanged under the preferred operational configuration.**

Table 6. Modeled Difference in San Luis Reservoir Storage between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (1,000 AF)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	79	86	89	91	95	105	117	92	48	62	80	95	1,038
AN	54	59	61	66	74	77	79	60	27	36	49	58	702
BN	70	76	82	81	90	90	87	59	25	29	35	43	766
D	49	53	55	56	58	58	55	38	15	19	23	28	507
C	21	23	23	29	28	31	27	23	12	11	10	11	248
All	58	63	66	68	72	76	79	59	28	35	45	53	703

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 7. Modeled Difference in San Luis Reservoir Storage between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	13.3%	10.6%	8.9%	7.0%	6.0%	6.0%	6.4%	5.4%	3.5%	5.7%	8.7%	13.9%	7.1%
AN	12.1%	8.9%	6.7%	5.4%	5.1%	5.0%	4.9%	4.3%	2.8%	5.5%	9.4%	21.3%	6.0%
BN	15.7%	11.3%	9.1%	7.0%	6.5%	6.2%	6.0%	4.8%	3.0%	4.6%	7.2%	8.6%	6.9%
D	13.2%	9.3%	6.7%	5.1%	4.3%	3.9%	3.7%	2.9%	1.5%	2.5%	5.5%	6.7%	4.6%
C	5.0%	4.2%	3.4%	3.0%	2.3%	2.3%	2.1%	2.0%	1.3%	1.9%	3.3%	3.7%	2.6%
All	12.3%	9.4%	7.4%	5.8%	5.1%	4.9%	5.0%	4.2%	2.6%	4.4%	7.7%	11.4%	5.8%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Reservoir Elevation Average water surface elevation at San Luis Reservoir would increase under all subalternatives as shown in Appendix D, Section D.6.5 of the EIR/SEIS. Following construction, storage in the newly expanded reservoir footprint is anticipated to result in the loss of primarily grassland vegetation. 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. As shown in Tables 42 through 49 in Appendix D of the EIR/SEIS, the maximum monthly increase in San Luis Reservoir elevation under Alternative 3 would be up to 12.7 feet. Under all subalternatives, no impacts on water quality in San Luis Reservoir from long-term operation would be anticipated.

Tables 8 and 9 summarize the monthly change in total San Luis Reservoir elevation as a result of implementing the preferred operational configuration of the Dam Raise Alternative. As shown in Table 8, the maximum monthly increase in San Luis Reservoir elevation under the preferred operational configuration would be up to 11.2 feet, which is within the range presented in the EIR/SEIS. Increased reservoir elevation would not result in impacts to water quality. **Therefore, impacts presented in the EIR/SEIS would not change under the preferred operational configuration.**

Table 8. Modeled Difference in San Luis Reservoir Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	9.6	9.0	8.6	8.0	7.9	8.5	9.3	7.5	4.2	5.9	8.2	11.2
AN	7.2	6.8	6.4	6.2	6.5	6.5	6.5	5.1	2.4	3.9	5.8	8.5
BN	8.8	8.1	7.8	7.3	7.7	7.7	7.4	5.3	2.5	3.3	4.5	5.5
D	6.8	6.2	5.7	5.2	5.1	4.9	4.7	3.4	1.4	1.9	2.9	3.5
C	2.8	2.6	2.4	2.7	2.4	2.6	2.3	2.0	1.0	1.1	1.3	1.4
All	7.4	6.9	6.5	6.2	6.2	6.3	6.5	5.0	2.5	3.6	5.0	6.7

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 9. Modeled Difference in San Luis Reservoir Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	2.4%	2.1%	1.9%	1.7%	1.6%	1.6%	1.8%	1.5%	0.9%	1.3%	1.9%	2.7%
AN	1.9%	1.6%	1.4%	1.3%	1.3%	1.3%	1.3%	1.1%	0.5%	1.0%	1.5%	2.3%
BN	2.3%	2.0%	1.8%	1.6%	1.6%	1.6%	1.5%	1.1%	0.6%	0.8%	1.1%	1.4%
D	1.8%	1.5%	1.3%	1.1%	1.1%	1.0%	0.9%	0.7%	0.3%	0.5%	0.8%	0.9%
C	0.7%	0.7%	0.6%	0.6%	0.5%	0.5%	0.5%	0.4%	0.2%	0.3%	0.3%	0.4%
All	1.9%	1.7%	1.5%	1.3%	1.3%	1.3%	1.3%	1.0%	0.6%	0.8%	1.2%	1.7%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Upstream Reservoirs Under all subalternatives analyzed in the EIR/SEIS, reservoir elevations would experience no change as is the case for Trinity Reservoir or minimal change, as is the case for Shasta, Folsom, and Oroville Reservoirs. The maximum monthly decrease in Shasta Reservoir elevation under Alternative 3 would be 0.4 feet, with a maximum monthly increase of 0.6 feet, as shown in Table 50 in Appendix D of the EIR/SEIS. The maximum monthly decrease in Folsom Reservoir elevation under Alternative 3 would be 0.2 feet, with a maximum monthly increase of 0.2 feet, as shown in Table 52 in Appendix D of the EIR/SEIS. The maximum monthly decrease in Oroville Reservoir elevation would be 0.9 feet, with a maximum monthly increase of 0.2 feet, as shown in Table 54 in Appendix D of the EIR/SEIS. All three upstream reservoirs would experience an average 0 percent change in all water year types (shown in Tables 51, 53, and 55 in Appendix D of the EIR/SEIS). No water supply impacts associated with reservoir elevations are anticipated.

The preferred operational configuration of the Dam Raise Alternative is not forecasted to generate measurable changes to water surface elevations in upstream reservoirs, with all three upstream reservoirs experiencing an average 0 percent change in all water year types under the preferred operational configuration, which is the same as presented in the EIR/SEIS. The maximum monthly decrease in Shasta Reservoir elevation under the preferred operational configuration would be 0.4 feet, with the maximum monthly increase of 0.6 feet, as shown below in Table 10. The maximum monthly decrease in Folsom Reservoir elevation under the preferred operational configuration would be 0.2 feet, with the maximum monthly increase of 0.4 feet, as shown below in Table 12. The maximum monthly decrease in Oroville Reservoir elevation under the preferred operational configuration would be 0.9 feet, with the maximum monthly increase of 0.2 feet, as shown below in Table 14. The maximum monthly increases and decreases in upstream reservoir elevations under the operational configuration would be within the range presented in the EIR/SEIS. **Therefore, water supply impacts related to upstream reservoir elevations evaluated in the EIR/SEIS would remain the same under the preferred operational configuration.**

Table 10. Modeled Difference in Shasta Lake Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.2	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	0.6
AN	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3
BN	-0.2	-0.4	-0.4	-0.3	-0.2	-0.2	-0.1	0.0	0.0	-0.3	0.0	0.0
D	0.1	0.1	0.0	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.3
C	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.3	-0.2
All	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 11. Modeled Difference in Shasta Lake Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
AN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
All	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 12. Modeled Difference in Folsom Lake Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.2	0.2
AN	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
BN	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
D	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
C	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.2
All	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1

Note: Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 13. Modeled Difference in Folsom Lake Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
BN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
All	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 14. Modeled Difference in Lake Oroville Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1
AN	-0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.8	-0.9
BN	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	-0.4	-0.5	-0.8
D	-0.4	-0.3	-0.5	-0.5	-0.4	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	0.0
C	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3	-0.3	-0.8	-0.6
All	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.4	-0.4

Note: Totals may not add up due to rounding.

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 15. Modeled Difference in Lake Oroville Elevation between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%
BN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%
D	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%
All	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

A.2.2.2 Surface Water Supply

The EIR/SEIS considered water supply impacts significant if the alternative would substantially reduce the annual supply of water available to CVP, SWP, refuges, or other water users. The EIR/SEIS also analyzed water supply impacts relating to changes in upstream reservoir surface elevation. This environmental analysis evaluated water supply impacts using these same parameters.

Deliveries to CVP Contractors

Deliveries to North-of-Delta CVP Contractors Under all subalternatives analyzed in the EIR/SEIS, changes to North-of-Delta CVP deliveries were forecast to be minimal, with a decrease of approximately 1 TAF under certain water year types. As noted in the EIR/SEIS, no impacts to North-of-Delta CVP deliveries were anticipated.

Under the preferred operational configuration of the Dam Raise Alternative, no changes to North-of-Delta CVP deliveries are expected. Therefore, impacts to North-of-Delta CVP deliveries evaluated in the EIR/SEIS would remain the same under the preferred operational configuration.

Agricultural Deliveries to South-of-Delta CVP Contractors As noted in the EIR/SEIS, average annual South-of-Delta CVP agricultural deliveries are expected to increase under certain water year types. As shown in Tables 12 through 23 in Appendix E of the EIR/SEIS, the total average annual difference in agricultural deliveries to South-of-Delta CVP contractors under all water year types ranged from 3 TAF to 49 TAF. This increase would result in a beneficial effect on South-of-Delta CVP contractors.

Under the preferred operational configuration of the Dam Raise Alternative, average annual South-of-Delta CVP agricultural deliveries are expected to increase up to 25.9 TAF in certain water year types. As summarized below in Tables 16 and 17, the total average annual difference in CVP agricultural deliveries under all water year types would be 17.3 TAF, which is within the range presented in the EIR/SEIS. **Impacts to agricultural deliveries to South-of-Delta CVP Contractors under the preferred operational configuration would remain beneficial as presented in the EIR/SEIS.**

Table 16. Averaged Modeled Difference in Total CVP Agricultural Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (1,000 acre-feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-1.9	-1.9	-0.5	-0.1	0.6	2.4	4.8	12.5	15.0	-4.3	-4.5	-4.5	17.6
AN	-1.3	-1.4	-0.5	0.2	0.5	2.0	3.5	9.2	12.2	-1.6	-2.9	-2.5	17.3
BN	-2.0	-2.1	-0.8	-0.3	0.5	3.0	5.1	10.3	12.6	1.3	0.0	-1.7	25.9
D	-1.0	-1.2	-0.4	0.1	0.7	1.7	3.0	7.1	8.7	-0.1	-0.8	-1.6	16.1
C	-0.3	-0.3	0.0	0.2	0.5	0.7	1.6	3.4	4.4	0.7	0.4	-0.1	11.1
All	-1.4	-1.4	-0.4	0.0	0.6	2.0	3.7	9.0	11.1	-1.4	-2.0	-2.5	17.3

Notes: Modeling Period 1922-2003, Data results from CalSim modeling.
Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 17. Averaged Modeled Difference in Total CVP Agricultural Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-6.7%	-10.0%	-1.3%	-0.2%	0.7%	3.2%	4.5%	7.1%	5.4%	-1.4%	-2.2%	-12.3%	1.2%
AN	-6.1%	-10.3%	-1.9%	0.3%	0.7%	3.8%	4.2%	6.0%	5.3%	-0.7%	-1.9%	-10.8%	1.6%
BN	-7.8%	-12.8%	-2.3%	-0.5%	0.7%	6.7%	7.5%	9.0%	7.2%	0.7%	0.0%	-6.1%	2.7%
D	-5.2%	-9.1%	-1.4%	0.2%	1.1%	5.7%	5.8%	7.4%	6.1%	-0.1%	-0.9%	-7.1%	2.2%
C	-2.3%	-3.9%	-0.1%	0.6%	1.4%	3.6%	6.6%	8.2%	7.2%	1.1%	0.9%	-0.5%	3.1%
All	-6.1%	-9.8%	-1.5%	0.0%	0.8%	4.2%	5.2%	7.2%	5.8%	-0.7%	-1.5%	-9.3%	1.8%

Notes: Modeling Period 1922-2003, Data results from CalSim modeling. CalSim II model output includes minor fluctuations of up to 5% due to model assumptions and approaches.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Municipal and Industrial Deliveries to South-of-Delta CVP Contractors Under all subalternatives under the Dam Raise Alternative (Alternative 3) analyzed in the EIR/SEIS, average annual South-of-Delta M&I deliveries are expected to slightly increase under certain water year types. As shown in Tables 24 through 35 in Appendix E of the EIR/SEIS, the total average annual difference in South-of-Delta M&I deliveries under all water year types ranged from 1 TAF to 51 TAF. This small increase would result in a beneficial effect on South-of-Delta CVP contractors.

Under the preferred operational configuration of the Dam Raise Alternative, average annual South-of-Delta CVP M&I deliveries are expected to increase up to 18.1 TAF in certain water year types. As summarized below in Tables 18 and 19, the total average annual difference in CVP M&I deliveries under all water year types would be 14.5 TAF, which is within the range presented in the EIR/SEIS. **Impacts to M&I deliveries to South-of-Delta CVP Contractors under the preferred operational configuration would remain beneficial as presented in the EIR/SEIS.**

Table 18. Averaged Modeled Difference in Total CVP M&I Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (1,000 acre-feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	1.3	1.3	1.3	1.5	1.5	0.8	0.8	1.0	1.1	1.1	1.0	0.7	13.3
AN	0.6	0.6	0.6	0.7	0.7	0.4	0.6	1.0	1.5	1.7	1.3	0.5	10.2
BN	0.5	0.4	0.5	0.6	0.6	1.5	1.6	2.2	2.8	3.2	2.6	1.6	18.1
D	1.0	1.0	1.1	1.2	1.3	1.2	1.3	1.7	2.1	2.3	1.9	1.3	17.5
C	0.7	0.7	0.8	0.9	0.9	0.9	1.1	1.3	1.6	1.8	1.5	1.0	13.3
All	0.9	0.9	1.0	1.1	1.1	0.9	1.0	1.3	1.7	1.9	1.6	1.0	14.5

Notes: Modeling Period 1922-2003, Data results from CalSim modeling
Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 19. Averaged Modeled Difference in Total CVP M&I Deliveries between the No Project/No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	14.6%	10.1%	10.1%	16.9%	36.5%	5.6%	6.9%	8.4%	9.6%	8.8%	7.6%	6.0%	9.9%
AN	6.9%	5.1%	5.1%	8.5%	18.4%	3.2%	5.7%	9.2%	13.5%	15.0%	10.2%	4.9%	8.3%
BN	4.9%	3.4%	3.7%	7.2%	16.5%	12.8%	16.8%	22.4%	29.0%	30.7%	22.4%	12.4%	14.8%
D	12.3%	8.6%	8.9%	15.6%	34.7%	11.2%	14.1%	18.7%	22.6%	23.1%	17.7%	11.4%	15.2%
C	10.4%	6.9%	7.2%	13.1%	29.4%	9.1%	13.9%	17.3%	21.8%	21.6%	16.2%	9.6%	13.5%
All	10.9%	7.6%	7.8%	13.4%	29.6%	7.8%	10.4%	13.7%	17.1%	17.3%	13.2%	8.6%	12.0%

Notes: Modeling Period 1922-2003, Data results from CalSim modeling. CalSim II model output includes minor fluctuations of up to 5% due to model assumptions and approaches.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Deliveries to South-of-Delta CVP Refuges As noted in the EIR/SEIS, South-of-Delta CVP refuge deliveries are expected to increase under all subalternatives, as shown in Tables 36 through 39 in Appendix E of the EIR/SEIS. As such, impacts to CVP refuge deliveries would be beneficial under all subalternatives under the Dam Raise Alternative (Alternative 3).

Under the preferred operational configuration of the Dam Raise Alternative, average annual South-of-Delta CVP refuge deliveries are expected to slightly increase up to 3.2 TAF in certain water year types, as summarized below in Tables 20 and 21. Consistent with the subalternatives presented in the EIR/SEIS, the preferred operational configuration would generate a beneficial effect. **Impacts to South-of-Delta CVP refuge deliveries under the preferred operational configuration would remain beneficial as presented in the EIR/SEIS.**

Table 20. Averaged Modeled Difference in Total CVP Refuge Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (1,000 acre-feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-0.7	-0.6	-0.2	-0.2	0.0	0.7	1.2	3.5	3.9	-1.5	-2.1	-1.5	2.5
AN	-0.5	-0.5	-0.2	-0.1	0.0	0.5	0.9	2.3	2.9	-1.2	-1.4	-0.9	1.8
BN	-0.5	-0.5	-0.2	-0.1	0.1	0.6	1.0	2.6	2.9	-0.8	-0.9	-0.8	3.2
D	-0.4	-0.4	-0.2	-0.1	0.0	0.4	0.7	1.7	2.0	-0.4	-0.5	-0.5	2.3
C	-0.1	-0.1	-0.1	0.0	0.1	0.2	0.3	0.7	0.9	0.1	0.0	-0.1	1.9
All	-0.5	-0.5	-0.2	-0.1	0.0	0.5	0.9	2.4	2.7	-0.9	-1.1	-0.8	2.4

Notes: Modeling Period 1922-2003, Data results from CalSim modeling
Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 21. Averaged Modeled Difference in Total CVP Refuge Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-1.0%	-1.6%	-1.3%	-2.4%	0.0%	11.8%	9.9%	13.7%	14.1%	-21.0%	-17.4%	-3.4%	0.9%
AN	-0.8%	-1.2%	-1.3%	-0.8%	0.3%	9.9%	7.3%	9.0%	10.3%	-17.1%	-12.2%	-2.7%	0.7%
BN	-0.8%	-1.3%	-1.1%	-1.3%	0.9%	11.3%	9.1%	10.2%	10.6%	-11.7%	-7.7%	-1.7%	1.2%
D	-0.7%	-1.1%	-1.1%	-1.4%	0.8%	7.9%	5.7%	6.8%	7.1%	-6.3%	-4.2%	-0.9%	0.8%
C	-0.2%	-0.4%	-0.3%	-0.4%	1.0%	4.2%	3.3%	3.5%	3.9%	0.9%	0.0%	-0.1%	0.8%
All	-0.8%	-1.2%	-1.1%	-1.5%	0.5%	9.5%	7.5%	9.4%	10.0%	-12.7%	-9.7%	-1.9%	0.9%

Notes: Modeling Period 1922-2003, Data results from CalSim modeling. CalSim II model output includes minor fluctuations of up to 5% due to model assumptions and approaches.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Deliveries to SWP Contractors In the majority of the subalternatives analyzed in the EIR/SEIS, there would be a slight reduction in Table A SWP deliveries, an average of 12 TAF or less than 1 percent of total deliveries. As summarized in Tables 40, 41, 46, and 47 in Appendix E of the EIR/SEIS, the total average annual difference in Table A SWP deliveries under all water year types would range from a reduction in 12 TAF to an addition of 9 TAF. CalSim II relies on assumptions and approaches that contribute to minor fluctuations of up to 5 percent, and projected changes of less than 5 percent 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 EIR/SEIS noted that the existence and/or extent of any SWP water supply reduction from the 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. Impacts to South-of-Delta SWP contractors would be less than significant.

Under the preferred operational configuration of the Dam Raise Alternative, there would be an increase in Table A SWP deliveries. As summarized below in Table 22 and 23, the total average annual difference in Table A SWP deliveries under all water year types would be 0.3 TAF, which is within the range presented in the EIR/SEIS. As previously stated, CalSim II relies on assumption and approaches that contribute to minor fluctuations of up to 5 percent and projected changes of less than 5 percent are not identified as an adverse or beneficial water supply effect. **Impacts to Table A SWP Deliveries under the preferred operational configuration would be within the range of impacts represented in the EIR/SEIS.**

Table 22. Averaged Modeled Difference in Table A SWP Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (1,000 acre-feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

Notes: Modeling Period 1922-2003, Data results from CalSim modeling
Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

Table 23. Averaged Modeled Difference in Table A SWP Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BN	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
All	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes: Modeling Period 1922-2003, Data results from CalSim modeling. CalSim II model output includes minor fluctuations of up to 5% due to model assumptions and approaches.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

The CalSim II model tracks Article 21 (i.e., surplus or interruptible). Article 21 water is available to SWP contractors when SWP storage in San Luis Reservoir is full and there is excess water in the Delta. All subalternatives analyzed in the EIR/SEIS would reduce potential surplus water supply (Article 21) deliveries to SWP contractors as CVP deliveries increase. As summarized in Tables 42, 45, and 48 in Appendix E of the EIR/SEIS, the total average annual difference in Article 21 SWP deliveries under all water year types would result in a reduction up to 16 TAF. As noted above and in the EIR/SEIS, the existence and/or extent of any SWP water supply reduction from the 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. Impacts to South-of-Delta SWP contractors due to reductions in Article 21 deliveries would be less than significant.

Under the preferred operational configuration, there would be a slight increase in Article 21 SWP deliveries. As summarized below in Table 24, the total average annual difference in Article 21 SWP deliveries under all water year types would be 0.2 TAF, therefore SWP water users would not experience negative impacts under the preferred operational configuration.

Table 24. Averaged Modeled Difference in Article 21 SWP Deliveries between the No Action Conditions and the Dam Raise Alternative – Preferred Operational Configuration by Water Year Type (1,000 acre-feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2
AN	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2

Notes: Modeling Period 1922-2003, Data results from CalSim modeling
Totals may not add up due to rounding.
Key: AN – Above Normal; BN – Below Normal; C – Critical; D – Dry; Sac Yr Type – Sacramento River Water Year Type; W – Wet

A.2.2.3 Aquatic Resources

Fisheries and aquatic ecosystems impacts evaluated in the EIR/SEIS were found to 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 percent 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 percent was chosen because it was considered to exceed the predictive model error (noise). For Delta conveyance, a positive change of 5 percent 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.

Hydrologic indicators for habitat quality that were used in the aquatic resources analysis in the EIR/SEIS include Sacramento River flow, Delta outflow, X2, Old and Middle River flows, and Delta exports. This environmental analysis evaluated aquatic resources impacts using these same parameters.

Upstream Reservoirs As noted above, all subalternatives analyzed in the EIR/SEIS were 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 in those upstream reservoirs. **The preferred operational configuration would remain consistent with what is presented in the EIR/SEIS and no impacts to fish species in upstream reservoirs would be anticipated.**

Sacramento River Flow Across all subalternatives analyzed in the EIR/SEIS, there were only slight changes (<2%) in modeled Sacramento River flow and Delta outflow across all months and water years compared to the No Action Alternative. As summarized in Table 8 in Appendix J2 of the EIR/SEIS, the average monthly change in Sacramento River flow under all water year types would be zero under all subalternatives. Operational impacts to special status fish species and their habitats or the movement of fish species were determined to be less than significant in the EIR/SEIS.

Under the preferred operational configuration of the Dam Raise Alternative, modeled Sacramento River flow at Hood differs by less than 1 percent on average across all water-year types compared to the No Action Alternative. As summarized below in Table 25, average monthly change in Sacramento River flow for all water year types would remain zero, which is the same as presented in the EIR/SEIS. During most months of most years, the Sacramento River flows remain relatively unchanged. **Impacts presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Table 25. Modeled Difference in Sacramento River Flow at Hood between the Dam Raise Alternative – Preferred Operational Configuration and No Action Alternative Conditions (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
W	-0.1%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	-0.7%	0.1%	-0.2%	0.0%
AN	-0.2%	0.1%	-0.2%	-0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	-0.1%	0.1%	-0.1%	0.0%
BN	0.0%	0.5%	-0.1%	-0.4%	0.1%	0.0%	-0.4%	-0.2%	0.0%	0.9%	-0.5%	0.5%	0.0%
D	-0.1%	0.1%	0.6%	-0.1%	0.0%	0.1%	0.0%	-0.1%	0.0%	0.1%	0.3%	-0.2%	0.1%
C	0.1%	0.0%	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
All	-0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	-0.1%	0.0%

Key: Sac Yr Type = Sacramento River Water Year Type; W = Wet; AN = Above Normal; BN = Below Normal; D = Dry; C = Critical

Delta Outflow Across all subalternatives analyzed in the EIR/SEIS, there are only slight changes (less than 1 percent) in modeled average Delta outflow across all months and water year types compared to the No Action Alternative (see Table 8 in Appendix J2 of the EIR/SEIS). Operational impacts to special status fish species and their habitats or the movement of fish species were determined to be less than significant in the EIR/SEIS.

Under the preferred operational configuration, modeled average Delta outflow would change by less than 1 percent in all months of all water-year types compared to the No Action Alternative, as summarized in Table 3 in the Water Quality section above. The percent change under the preferred

operational configuration is less than 1 percent, which is the same as presented in the EIR/SEIS. During most months of most years, Delta outflows remain relatively unchanged. **Impacts presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Low Salinity Zone and X2 Across all subalternatives analyzed in the EIR/SEIS, CalSim II modeling results indicate that there are only slight changes to flows and locations of the low salinity zone (LSZ) resulting from changes in Delta water operations compared to the No Action Alternative. The modeled location of X2 only differed by a maximum of 0.1 kilometers across all months and water years for all subalternative compared to the No Action Alternative. As summarized in Table 8 in Appendix J2 of the EIR/SEIS, the average monthly change in modeled X2 under all water year types would be zero under all subalternatives. Operational impacts to special status fish species and their habitats or the movement of fish species were determined to be less than significant in the EIR/SEIS.

Under the preferred operational configuration, modeled X2 location would not change when compared to the No Action Alternative for all months of all water-year types. As presented in Table 1 in the Water Quality above, average monthly change in modeled X2 for all water year types would remain zero, which is the same as presented in the EIR/SEIS. **Impacts presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Old and Middle River Flows Across all subalternatives analyzed in the EIR/SEIS, modeled Old and Middle River (OMR) flow differences from the No Action Alternative are less than 5 percent for most months and water years, with mean differences across all months and water years less than 1 percent for each subalternative. However, modeled differences in OMR flows from the No Action Alternative were above 5 percent for all subalternatives (18.8 percent max) during the months of February through April in above normal or wet water year types (Table 8 in Appendix J2 of the EIR/SEIS). The months that exceed the 5 percent threshold for OMR flow have values well below (less negative) the -5,000 cfs threshold believed to have deleterious effects to listed fish species. Project operations would be subject to all OMR requirements in the then current biological opinions and incidental take permits that might impose less negative OMR flows during times when listed species were at greater risk of entrainment. Operational impacts to special status fish species and their habitats or the movement of fish species were determined to be less than significant in the EIR/SEIS.

Under the preferred operational configuration of the Dam Raise Alternative, modeled negative flow changes of less than 4 percent occur in January through June of most water-year types, as summarized in Tables 26 and 27. Modeled OMR flows differ more than negative 5 percent during June of above normal and dry water year types. However, OMR flow during these months have values below (less negative than) the -5,000 cfs threshold believed to have deleterious effects to listed species. Operations of the preferred configuration would also be subject to all OMR requirements. **Impacts presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

Table 26. Modeled difference in Old and Middle River Flows between the Dam Raise Alternative – Preferred Operational Configuration and No Action Alternative Conditions (% change)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	0.0%	0.0%	1.2%	2.2%	2.6%	9.5%	4.9%	1.6%	-1.6%	0.0%	0.0%	0.0%
AN	0.0%	0.0%	0.2%	3.1%	0.2%	-2.6%	2.0%	-3.3%	-6.4%	0.0%	0.0%	0.0%
BN	0.0%	0.0%	0.2%	-0.9%	1.8%	-0.3%	-0.6%	0.3%	-4.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.8%	0.9%	-3.5%	0.7%	0.7%	-6.5%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	2.1%	-0.1%	0.0%	0.0%	0.0%	-2.1%	0.0%	0.0%	0.0%

Key: Sac Yr Type = Sacramento River Water Year Type; W = Wet; AN = Above Normal; BN = Below Normal; D = Dry; C = Critical

Table 27. Modeled Old and Middle River Flows under the Dam Raise Alternative – Preferred Operational Configuration (cfs)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
W	-4,931	-7,761	-5,152	-2,203	-1,988	-1,015	-1,644	-1,979	-4,405	-8,363	-10,148	-3,712
AN	-4,250	-6,662	-6,355	-4,352	-3,648	-2,840	-3,211	-3,265	-4,862	-8,171	-9,883	-2,778
BN	-4,307	-7,695	-7,411	-4,747	-4,821	-3,406	-2,883	-3,145	-4,951	-8,984	-9,155	-7,360
D	-4,106	-6,508	-6,666	-4,617	-4,869	-3,352	-2,487	-2,934	-4,740	-6,938	-4,262	-5,757
C	-3,767	-4,324	-4,567	-4,412	-4,432	-3,030	-1,698	-1,752	-2,412	-2,546	-2,400	-3,636
All	-4,368	-6,769	-5,930	-3,797	-3,691	-2,490	-2,272	-2,539	-4,341	-7,217	-7,403	-4,541

Note: Totals may not add up due to rounding.
Key: Sac Yr Type = Sacramento River Water Year Type; W = Wet; AN = Above Normal; BN = Below Normal; D = Dry; C = Critical

Delta Exports Across all subalternatives analyzed in the EIR/SEIS, modeled Delta export flow difference from the No Action Alternative was less than 5 percent for most months and water years, with mean differences across all months and water years less than 1 percent for each subalternative. However, modeled differences in Delta export from No Action Alternative were above 5 percent for certain subalternatives (5.6% max) during March and April under the wet water year type (summarized in Table 8 of Appendix J2 in the EIR/SEIS). As shown in Tables 14 through 21 in Appendix D of the EIR/SEIS, the total average annual difference in South-of-Delta exports under all water year types ranged from 14 TAF to 39 TAF. All subalternatives under the Dam Raise Alternative (Alternative 3) generated less than significant impacts to special status fish species and their habitats or the movement of fish species related to Delta exports.

Under the preferred operational configuration, modeled Delta exports increase by less than 5 percent in all months of all water-year types compared to the No Action Alternative, as shown below in Table 5 in the Water Quality section above. During most months of the year, Delta exports remain relatively unchanged. As shown in Table 4 above in the Water Quality section, the total average annual difference in South-of-Delta exports under all water year types would be 35 TAF, which is within the range presented in the EIR/SEIS. **Impacts presented in the EIR/SEIS would remain less than significant under the preferred operational configuration.**

A.2.2.4 Terrestrial Resources

The terrestrial resources impacts evaluated in the EIR/SEIS were 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. This environmental analysis evaluated aquatic resources impacts using these same parameters.

The EIR/SEIS analyzed terrestrial impacts from inundation of 445 acres of land, including common and sensitive natural communities, around the reservoir's shore when full. Affected sensitive natural communities include aquatic resources (e.g., wetlands, other jurisdictional waters) and special status plant species. Impacts relating to inundation would be significant under all subalternatives analyzed in the EIR/SEIS. With implementation of mitigation measures that provide compensatory mitigation for unavoidable impacts to wetlands and other jurisdictional waters and compensate for the loss of special status plant species and sensitive natural communities, impacts would be reduced to less than significant.

As noted in the EIR/SEIS, significant impacts to the California red-legged frog (CRLF) and San Joaquin Kit Fox (SJKF) would occur due to reservoir inundation. Mitigation would be provided for operational impacts to CRLF and SJKF that would reduce impacts to less than significant.

Other special status wildlife species analyzed in the EIR/SEIS that could be present within the operations footprint include San Joaquin whipsnake, special status birds, and American badger. 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.

Operation of all subalternatives evaluated in the EIR/SEIS could result in the seasonal inability of SJKF to negotiate obstacles (e.g., roads, waterbodies), 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 State Route 152 would further restrict movement of this species. With implementation of a mitigation measure, which provides a land bridge over the dam spillway and wildlife movement design considerations at State Route 152, impacts to SJKF movement during operations, this impact would be less than significant.

Under the preferred operational configuration, the inundation area (445 acres) would remain the same as what is presented in the EIR/SEIS. **Terrestrial resource impacts evaluated in the EIR/SEIS would remain the same under the preferred operational configuration.**

A.2.2.5 Recreation

The recreational resources impacts evaluated in the EIR/SEIS were 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 State Recreation Area 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.

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, the recreation analysis in the EIR/SEIS estimated 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 of the EIR/SEIS. This environmental analysis evaluated recreational impacts using the same methodology.

The EIR/SEIS analyzed recreational impacts from inundation of 445 acres of land around the shore of the reservoir (based on a maximum reservoir elevation of 554 feet). Modifications to Dinosaur Point Boat Launch, Goosehead Point Boat Launch, Dinosaur Point Boat Launch Parking Lot and Dinosaur Point Parking were included to prevent impacts from inundation. Portions of Lone Oak Trail would also be inundated when the reservoir is full, requiring the temporary trail closure until water levels recede. In order to reduce these temporary impacts to recreation opportunities, portions of the trail would be relocated, reducing the impact to less than significant.

Under the preferred operational configuration of the Dam Raise Alternative, the maximum reservoir elevation (554 feet) and the increase in inundation area (445 acres) would remain the same. Operational recreation **impacts evaluated in the EIR/SEIS would remain the same under the preferred operational configuration.**

A.2.2.6 Cultural Resources

As noted in the EIR/SEIS, cultural resources impacts would be significant if they resulted in adverse effects to historic properties listed or eligible for listing in the National Register of Historic Places; result in substantial adverse changes to historical resources, unique archaeological resources, or tribal cultural resources listed or eligible for listing in the California Register of Historical Resources; or disturb human remains, including those interred outside of formal cemeteries. This environmental analysis evaluated cultural resources impacts using the same methodology.

Operational impacts to cultural resources were analyzed in the EIR/SEIS. Due to the maximum water levels in San Luis Reservoir increasing to 554 feet, nine prehistoric sites, a historic period transmission pole alignment and debris scatter, and three historic period road segments would be susceptible to mechanical and biochemical impacts from increased wave action and fluctuating water levels. Operational impacts to cultural resources would be significant and unavoidable, even with implementation of mitigation measures.

Under the preferred operational configuration of the Dam Raise Alternative, the maximum water levels in San Luis Reservoir would remain the same as what was analyzed in the EIR/SEIS. **No additional cultural resources would be impacted beyond what was evaluated in the EIR/SEIS and operational impacts would remain significant and unavoidable under the preferred operational configuration.**

A.2.2.7 Cumulative Impacts

The impact evaluation presented above noted that environmental impacts under the preferred operational configuration of the Dam Raise Alternative would remain the same as what is presented in the EIR/SEIS. Consequently, cumulative impacts to water quality, water supply, aquatic resources, terrestrial resources, recreation, and cultural resources under the preferred operational configuration would also remain the same as what is presented in the EIR/SEIS.

B.F. Sisk Dam Raise and Reservoir Expansion Project

Attachment B
Summary Of Environmental Commitments For The Dam Raise Alternative

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
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 San Joaquin Valley Air Board (SJVAB). Records will be maintained by the construction contractor to demonstrate that actual emissions would not exceed San Joaquin Valley Air Pollution Control District (SJVAPCD) significance criteria and will be submitted monthly to SLDMWA. If nitrogen oxide (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.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction
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.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction
AQ-3	Construction contractors will install diesel oxidation catalysts on all off-road construction equipment capable of achieving an 85%[1] reduction in NOx.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction

[1] Mitigation Measure AQ-3 has been revised since the completion of the EIR/SEIS to clarify its applicability to marine construction equipment. The shift in emission control requirements for marine construction equipment with this revision will reduce the total forecast NOx emissions generated by the project when compared to the emission estimates identified in the EIR/SEIS. NOx emission levels generated by all other construction equipment proposed for use on the B.F. Sisk Dam Raise and Reservoir Expansion Project, are controlled by the requirements identified in Mitigation Measures AQ-1 and AQ-2 and for that equipment, there would be no change from the emission estimates identified in the EIR/SEIS.

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
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.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction
AQ-5	Construction contractors will be required to incorporate the following administrative control measures to minimize air pollutant and greenhouse gas (GHG) emissions: • Coordinate with appropriate air quality agencies to identify a construction schedule that minimizes cumulative impacts from other planned projects in the region, if feasible. • Locate diesel engines, motors, and equipment staging areas as far as possible from residential areas and other sensitive receptors (e.g., schools, daycare centers, hospitals, senior centers, etc.). • Avoid routing truck traffic near sensitive land uses to the fullest extent feasible. • Use cement blended with the maximum feasible amount of fly ash or other materials that reduce GHG emissions from cement production. • Recycle construction debris to the maximum extent feasible. • Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking.[2] • Reduce construction-related trips of workers and equipment, including trucks. • Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction

[2] Suitability of control devices is based on: whether there is reduced normal availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	• Identify all commitments to reduce construction emissions and quantify air quality improvements that would result from adopting specific air quality measures. • Identify where implementation of mitigation measures is rejected based on economic infeasibility.			
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.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction
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).	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction
VIS-1	To reduce visual intrusion from light sources, the construction contractor will implement measures at the State Route (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.	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
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).	SLDMWA and Reclamation	Construction contract requirement	Prior to and during construction
TR-1	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 exiting the area during an emergency.	SLDMWA and Reclamation	Final Design and Construction contract requirement	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	In addition to the temporary traffic control plan, prior to any construction actions, construction contractors will develop and adhere to a health and safety plan (HASP) outlining all applicable Occupational Safety and Health Administration (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.			
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.	SLDMWA and Reclamation	Documentation on file with SLDMWA	Prior to and during construction
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 California Department Fish and Wildlife's (CDFW) 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),	SLDMWA and Reclamation	Field verification	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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 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.			

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			
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 valley elderberry longhorn beetle (VELB).	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
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 California red-legged frogs (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.	SLDMWA and Reclamation	Field verification	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	• 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			

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			
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.	SLDMWA and Reclamation	Field verification	Prior to construction
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	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			
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.	SLDMWA and Reclamation	Field verification	Prior to construction
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 as provided in CDFW's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (1994). This includes permanently disturbed construction sites. CDFW will approve the location and types of habitats preserved.	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
TERR-8	**Bald and Golden Eagles and California Condor.** The following measures address potential impacts on nesting eagles near San Luis Reservoir. An Eagle Conservation Plan would be developed and subsequently approved by USFWS before construction begins. Eagle nest avoidance buffers would be 1 to 2 miles, depending on the type of activity, as specified in the USFWS's Recommended Buffer Zones for Human Activities around Nesting Sites of Bald Eagles in California and Nevada and the USFWS Recommended Buffer Zones for Ground-based Human Activities around Nesting Sites of Golden Eagles in California and Nevada (USFWS 2017a and USFWS 2020). If active eagle nests are identified and avoidance guidelines cannot be feasibly implemented, then coordination with the USFWS would be warranted to discuss how to implement the project and avoid take. If take cannot be avoided, take authorization through the issuance of an Eagle Take Permit by the USFWS would be necessary. • 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.	SLDMWA and Reclamation	Field verification	Prior to construction
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	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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 be 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			

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			
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	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			
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	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			
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	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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			

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	and submitted for USFWS review and will be incorporated into the project: o 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 o 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 o 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			
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.	SLDMWA and Reclamation	Field verification	Prior to construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	• 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.			
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.	SLDMWA and Reclamation	Field verification	Prior to construction
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	SLDMWA and Reclamation	Field verification	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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			
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.**	SLDMWA and Reclamation	Field verification	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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, United States Army Corps of Engineers (USACE), or Regional Water Quality Control Board (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			

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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.			

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
REC-1	The following measure will be implemented in coordination with California Department of Parks and Recreation (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.	SLDMWA and Reclamation in coordination with CDPR	Documentation on file with Reclamation, SLDMWA, and field verification	Prior to construction
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.	SLDMWA and Reclamation in coordination with CDPR	Documentation on file with Reclamation, SLDMWA, and field verification	Prior to construction
CR-1	**Complete Cultural Resource Evaluation Efforts.** Following congressional authorization but prior to the signing of a Record of Decision (ROD) to implement the project, an agreement document will be executed.[3] Reclamation will follow implementing regulations for National Historic Preservation Act (NHPA) Section 106 to identify historic properties within the area of potential effects (APE) for the selected alternative using National Register of Historic Places (NRHP) criteria (see Appendix M of the Draft EIR/SEIS). Reclamation will consult with the State Historic Preservation Office (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 California Register of Historic Resources (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 Code of Federal Regulations [CFR] Part 61), as appropriate, and specific methodologies	Reclamation	Documentation on file with Reclamation	Prior to Construction

[3] The Amended Programmatic Agreement with the State Historic Preservation Officer was executed in May 2023

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	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 California Historic Resources Information System (CHRIS).			
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 Native American Graves Protection and Repatriation Act (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.	SLDMWA and Reclamation	Documentation on file with Reclamation	Prior to and during construction
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,	SLDMWA and Reclamation	Documentation on file with Reclamation	Prior to and during construction

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	Native American tribal representatives, and other consulting parties, a detailed inadvertent discovery plan will be prepared for the project.[4] 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 the 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	Reclamation	Documentation on file with Reclamation	Prior to Construction

[4] This plan has been prepared and can be found in Appendix E of the Amended Programmatic Agreement (Plan of Action)

Measure No.	Mitigation Measure	Responsible Party	Method of Verification	Timing of Verification
	negotiated with the SHPO to satisfy NHPA Section 106 compliance requirements.[5] 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 National Environmental Policy Act (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).			
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.	SLDMWA and Reclamation	Documentation on file with SLDMWA	During construction

[5] The Amended Programmatic Agreement with the State Historic Preservation Officer was executed in May 2023